Firelands Wind, LLC
Case No. 18-1607-EL-BGN

Application Part 6 of 17

Part 6 includes:

- **Exhibit G** **Noise Impact Assessment**
- **Exhibit H** **Shadow Flicker Report**
- **Exhibit I** **Cultural Resources Records Review**
- **Exhibit J** **Aviation Correspondence**
- **Exhibit K** **USFWS and ODNR Correspondence**

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Exhibit G
Noise Impact Assessment

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EMERSON CREEK WIND

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1.0 INTRODUCTION

Apex Clean Energy, Inc. is submitting a permit application to Ohio Power Siting Board ("OPSB") to build the Emerson Creek Wind Farm ("Emerson Creek") in Erie and Huron Counties. The facility will involve the construction of up to 71 wind turbines for a project rating of up to 297.66 MW. The turbines would be installed in an area south of Interstate 80 ("I-80"), mostly west of Ohio Route 99 ("OH-99"), north of US Route 224 ("US-224"), and east of Seneca and Sandusky Counties. For the application, RSG has performed a sound level assessment of the project based on the current turbine layout. Included in this report are:

- A description of the project;
- A discussion of sound level standards;
- Background sound level monitoring procedure and results;
- Sound propagation modeling procedure and results;
- A discussion on construction noise; and
- Conclusions.

Appendix A includes a primer on the science of sound, including descriptions of some of the acoustical terms used in this report. Appendix B provides a discussion on several topics related to wind turbine acoustics in general.

The information presented in this report leads us to conclude that the proposed Emerson Creek Wind Farm can be constructed and operated in such a way as to comply with the OPSB requirements and noise limits for wind energy projects at all non-participating sensitive receptors.

2.0 PROJECT DESCRIPTION

Emerson Creek Wind Farm is proposed to be located in Erie and Huron Counties. The project area is generally south of I-80, west of OH-99, north of US-224, and east of the Seneca and Sandusky Counties. There are however eight turbines east of OH-99 in the northeast corner of the project area.

The wind project is designed to include up to 71 turbines with hub heights between 105 meters (344 feet) and 125 meters (410 feet), depending on the final turbine selection. The turbine models currently under consideration are shown in Table 1. The project will also include two 100-133-167 MVA transformers at a collector substation to be located on Sand Hill Road approximately 1 kilometer (3,280 feet) north of US-20.

TABLE 1: TURBINE MODELS UNDER CONSIDERATION FOR EMERSON CREEK WIND

TURBINE MAKE/MODEL	TURBINE OUTPUT (MW)	HUB HEIGHT (m)
Vestas V150	4.2	105
Siemens Gamesa SG 4.5-145	4.5	107.5
Nordex N149	4.5	109 or 125

The area around the project is composed primarily of agricultural land uses with rural residences. Terrain in the area is mostly flat. There are several rail lines running through the area, an interstate at the northern end of the project area, US-20 transecting the northern third of the project area, and US-224 at the southern end of the project area. There are two other proposed wind farms near the proposed Emerson Creek Wind Farm: Republic Wind Farm to the west in Sandusky and Seneca Counties and Seneca Wind Farm to the southwest in Seneca County.

A map of the proposed project showing the proposed turbine layout is provided in Figure 1.

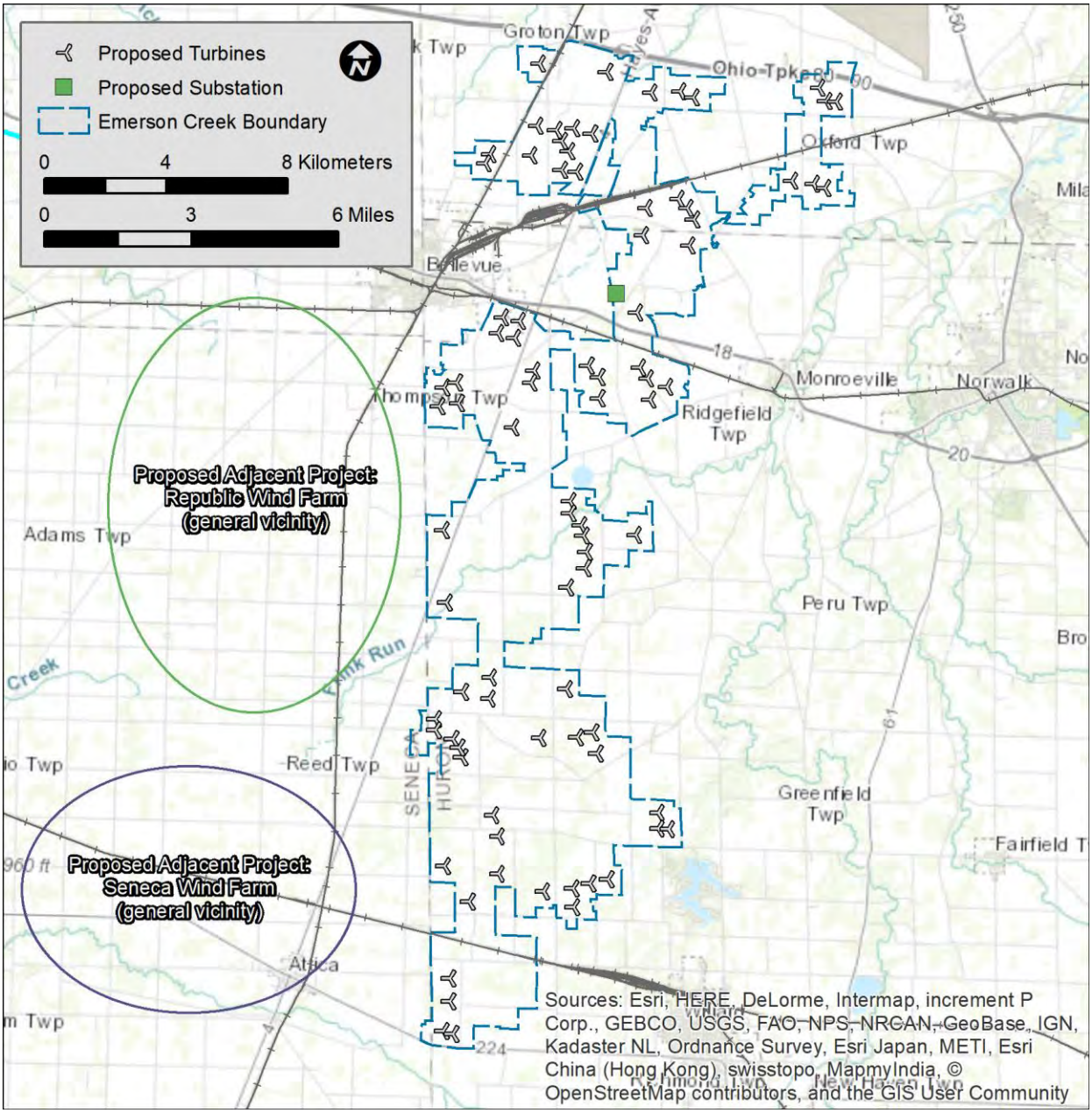


FIGURE 1: PROJECT OVERVIEW MAP

3.0 SOUND LEVEL LIMITS AND REGULATIONS

Sound levels from wind power projects are regulated under Section 4906-4-09(F) of the Ohio Administrative Code ("OAC") which states:

> (2) The facility shall be operated so that the facility noise contribution does not result in noise levels at any non-participating sensitive receptor within one mile of the project boundary that exceed the project area ambient nighttime average sound level (Leq) by five A-weighted decibels (dBA). During daytime operation only (seven a.m. to ten p.m.), the facility may operate at the greater of: the project area ambient nighttime Leq plus five dBA; or the validly measured ambient Leq plus five dBA at the location of the sensitive receptor. After measured ambient Leq plus five dBA at the location of the sensitive receptor. After commencement of commercial operation, the applicant shall conduct further review of the impact and possible mitigation of all project-related noise complaints through its complaint resolution process. Non-participating, as used in this context, refers to a property for which the owner has not signed a waiver or otherwise agreed to be subject to a higher noise level.

Based on ambient sound monitoring conducted at nine locations throughout the Emerson Creek project area (see Sections 4 & 5), the average existing nighttime background L_{eq} in the area is 44 dBA. Applying the OPSB sound level limit results in a nighttime sound level limit of 49 dBA. As discussed in Section 4, the daytime sound levels are generally higher than the nighttime sound levels throughout the project area, so a higher daytime limit may be possible at some sensitive receptors, but for the purposes of this assessment, the nighttime sound level limit of 49 dBA is applied.

Section 4906-4-09(F) also limits the hours of construction activities that increase sound above ambient levels at sensitive receptors to the hours of 7 AM to 7 PM or dusk, whichever is later. Pile driving, blasting, and rock hammering are further restricted to the hours of 10 AM to 5 PM. There are also requirements regarding notification of property owners and tenants related to construction activities.

4.0 BACKGROUND SOUND LEVEL MONITORING PROCEDURES

Section 4906-4-08(A)(3)(e) of the OAC requires a preconstruction background noise study which includes daytime and nighttime sound level monitoring be provided with the project application. This Section provides a description of the procedures and results of background sound level monitoring that was conducted for this project.

Background sound levels were measured at nine locations around the project area. A map showing all nine locations is provided in Figure 2. Monitoring was conducted over two periods. The sound levels in the northern half of the project area (Monitors 1 through 5) were measured from March 14 to March 28, 2018, and sound levels in the southern half of the project area (Monitors 6 through 9) were measured from September 13 to September 27, 2018.

4.1 EQUIPMENT

Sound levels at each location were measured using either a Cesva SC-310 or a Svantec SV979 sound level meter, which are both ANSI/IEC Type 1 instruments. All meters logged A-weighted and 1/3 octave band equivalent continuous sound levels once each second. The Cesva meters were attached to external audio recorders (Roland R-05), while the Svantek recorded audio internally to aid in source identification and soundscape characterization.

Each sound level meter's microphone was mounted on a wooden stake at a height of approximately 1.5 meters (5 feet) and covered with a weather-resistant windscreen. The windscreen acts to reduce the influence of wind-induced self-noise on the measurements. The sound level meters were calibrated before and after each measurement period.

Wind data was logged at each site using an ONSET anemometer. This recorded average wind speed and wind gust speed data once per minute and was installed at microphone height (1.5 meters). Other meteorological data was taken from the National Weather Service ASOS station in Mansfield, Ohio (MFD).

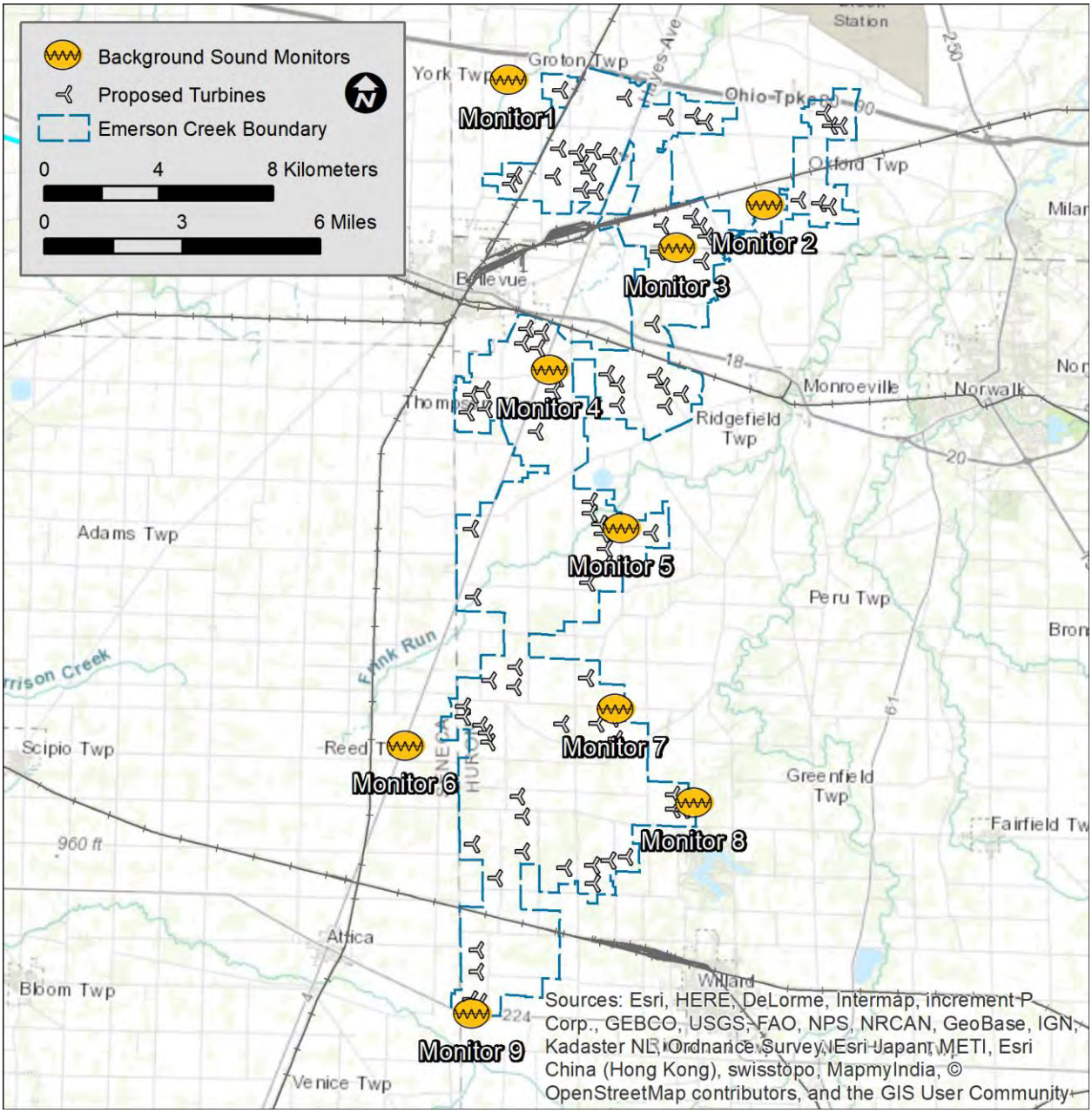


FIGURE 2: MAP OF BACKGROUND SOUND MONITOR LOCATIONS

4.2 LOCATION DESCRIPTIONS

Monitor 1

Monitor 1 was located next to a dormant agricultural field just northwest of the project area. The monitor was situated approximately 240 meters (787 feet) south of Portland Road, 910 meters

(2,985 feet) south of I-80, and 2.5 kilometers (1.5 miles) west of Hanson Aggregates' Sandusky Quarry. The nearest proposed turbine to this monitor location is T1 approximately 1.9 kilometers (1.2 miles) to the east-southeast. The area surrounding the monitor is primarily agricultural with a small patch of forest adjacent to the monitor. I-80 was clearly audible at this site.

A picture of the monitoring setup is shown in Figure 3, and a map of the monitoring location is provided in Figure 4.

FIGURE 3: PHOTOGRAPH OF MONITOR 1 LOOKING TO THE NORTHWEST (3-14-18)

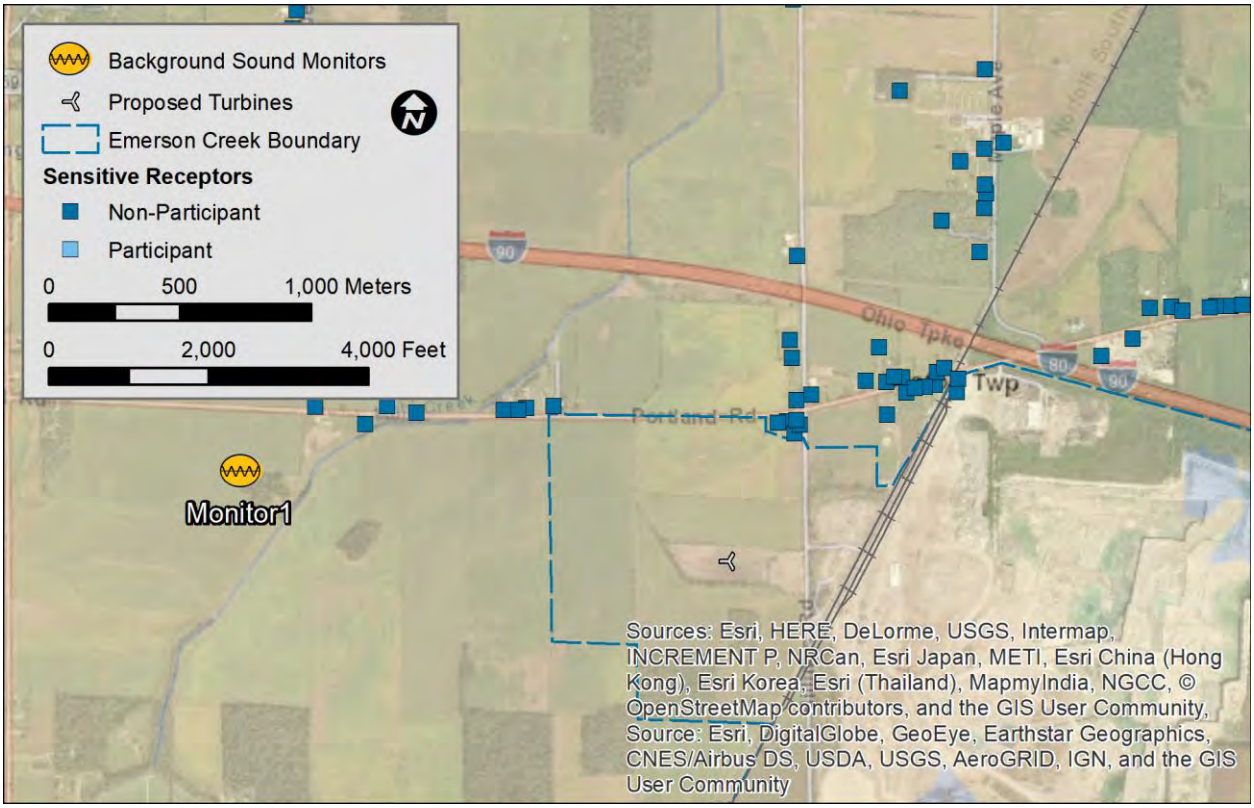


FIGURE 4: MAP OF MONITOR 1

Monitor 2

Monitor 2 was located in the northeast corner of the project area at a residence on Patten Tract Road. The monitor was situated approximately 62 meters (203 feet) east of Patten Tract Road, 725 meters (2,379 feet) south of a rail line, and 75 meters (246 feet) north of the residence that is located at the property. The nearest proposed turbine to this monitor location is T14 approximately 1.2 kilometers (0.75 miles) to the east. The area surrounding the monitor is primarily agricultural and rural residential with a small patch of forest to the east and south.

A picture of the monitoring setup is shown in Figure 5, and a map of the monitoring location is provided in Figure 6.

FIGURE 5: PHOTOGRAPH OF MONITOR 2 LOOKING TO THE SOUTHWEST (3-14-18)

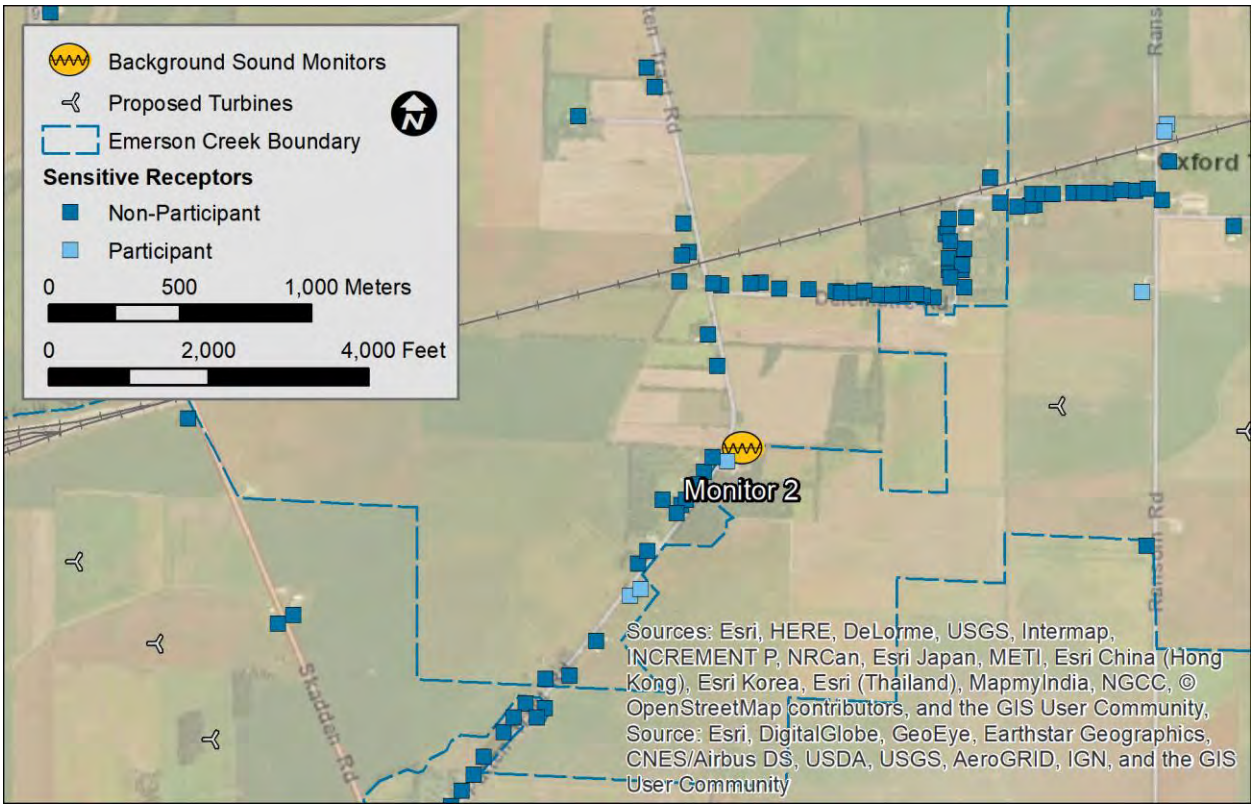


FIGURE 6: MAP OF MONITOR 2

Monitor 3

Monitor 3 was located in the north-central part of the project area on the Erie/Huron County Line. It was on a private property across from a residence on Yingling Road. The monitor was situated approximately 100 meters (328 feet) west of Yingling Road, 160 meters (525 feet) south of Edison Highway, and 1,430 meters (4,691 feet) south of a rail line. The nearest proposed turbine to this monitor location is T21 approximately 960 meters (2,165 feet) to the west. The area surrounding the monitor is primarily agricultural and rural residential.

A picture of the monitoring setup is shown in Figure 7, and a map of the monitoring location is provided in Figure 8.

FIGURE 7: PHOTOGRAPH OF MONITOR 3 LOOKING TO THE NORTH (3-14-18)

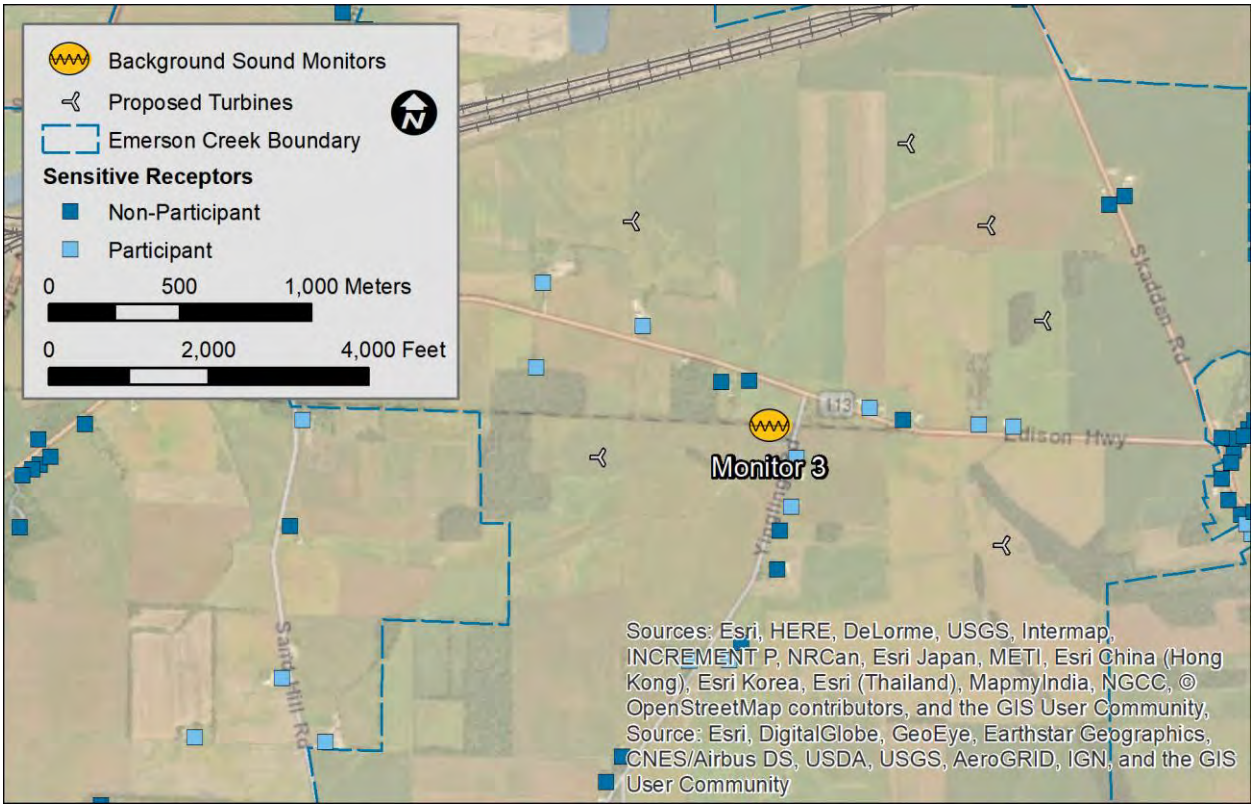


FIGURE 8: MAP OF MONITOR 3

Monitor 4

Monitor 4 was located in the central part of the project area adjacent to an agricultural field near the corner of OH-4 and Young Road. The monitor was situated approximately 225 meters (738 feet) east of OH-4 and 75 meters (246 feet) southeast of Young Road. The nearest proposed turbine to this monitor location is T29 approximately 385 meters (1,263 feet) to the southeast. The area surrounding the monitor is primarily agricultural and rural residential with a small patch of forest next to the nearby residences on Young Road.

A picture of the monitoring setup is shown in Figure 9, and a map of the monitoring location is provided in Figure 10.

FIGURE 9: PHOTOGRAPH OF MONITOR 4 LOOKING TO THE WEST (3-14-18)

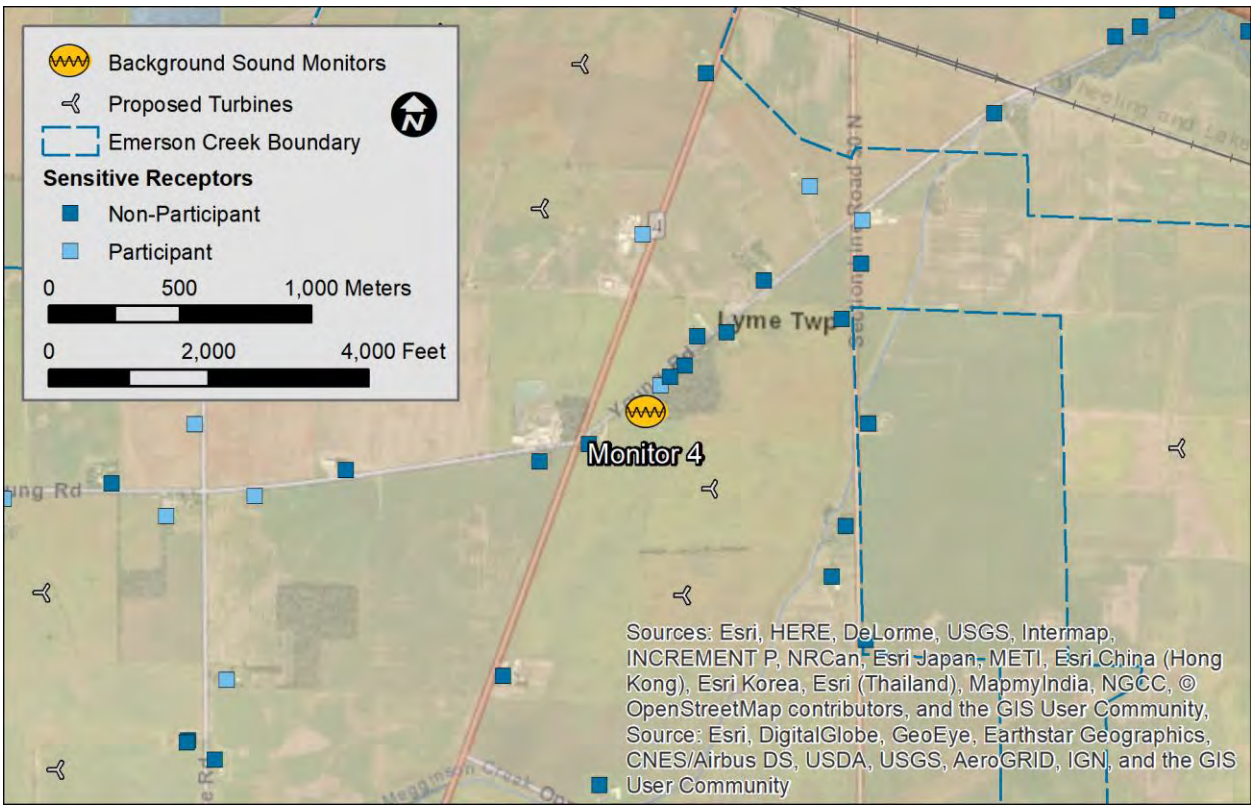


FIGURE 10: MAP OF MONITOR 4

Monitor 5

Monitor 5 was located in the central part of the project area adjacent to a forested area on Dogtown Road. The monitor was situated approximately 23 meters (75 feet) west of Dogtown Road and 1.5 kilometers (0.9 miles) south-southeast of Bellevue Reservoir. The nearest proposed turbine to this monitor location is T77 approximately 670 meters (2,198 feet) to the west. The area surrounding the monitor is primarily agricultural and rural residential with a forested area immediately adjacent to and west of the monitor.

A picture of the monitoring setup is shown in Figure 11, and a map of the monitoring location is provided in Figure 12.

FIGURE 11: PHOTOGRAPH OF MONITOR 5 LOOKING TO THE NORTHEAST (3-14-18)

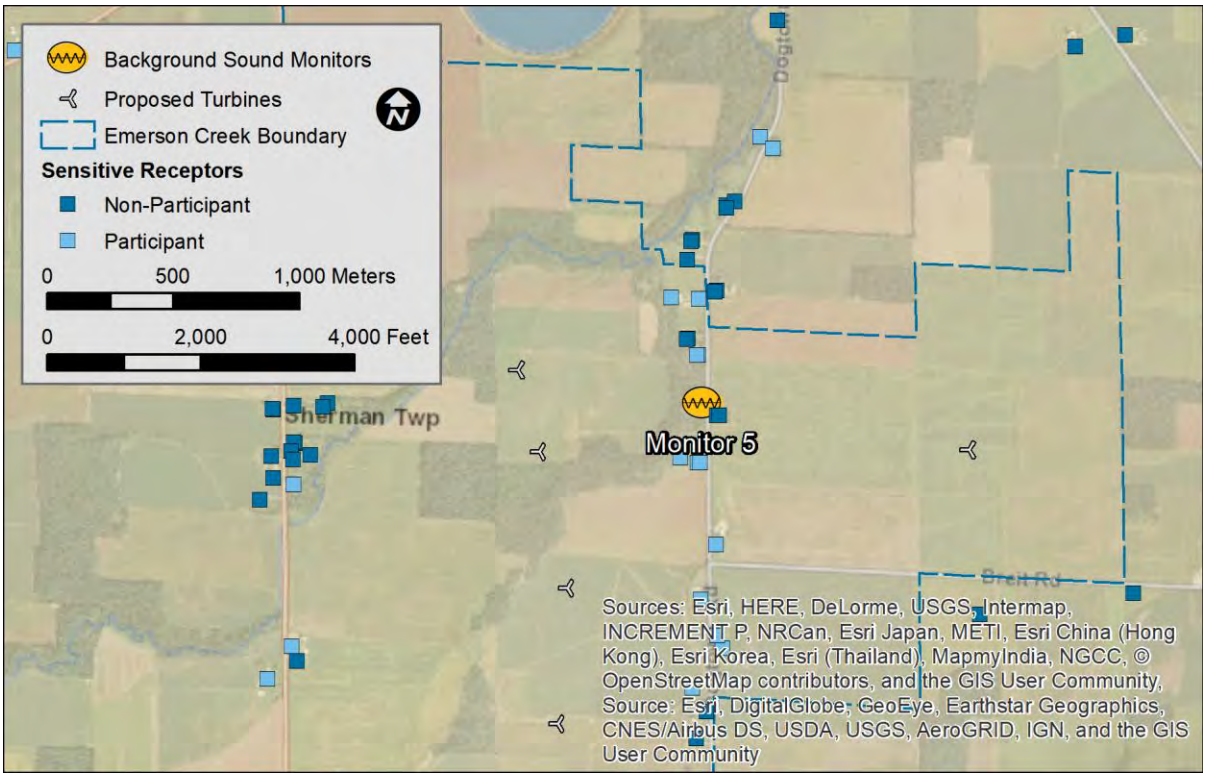


FIGURE 12: MAP OF MONITOR 5

Monitor 6

Monitor 6 was located near a residence and agricultural operation on OH-4 southwest of the project area. It was situated 600 meters (1,970 feet) north of OH-162 in Attica. The monitor was placed approximately 47 meters (154 feet) east of Ohio State Route 4, and 20 meters (66 feet) south of the residence. The location was 1,190 meters (3,905 feet) east of a rail line. The nearest proposed turbine to this monitor location is T53 approximately 2.3 kilometers (1.4 miles) to the northeast. The area surrounding the monitor is primarily agricultural with several large agricultural buildings on the property where the monitor was installed. The closest was located approximately 36 meters (120 feet) from the monitor.

A picture of the monitoring setup is shown in Figure 13, and a map of the monitoring location is provided in Figure 14.

FIGURE 13: PHOTOGRAPH OF MONITOR 6 LOOKING TO THE SOUTHEAST (9-13-18)

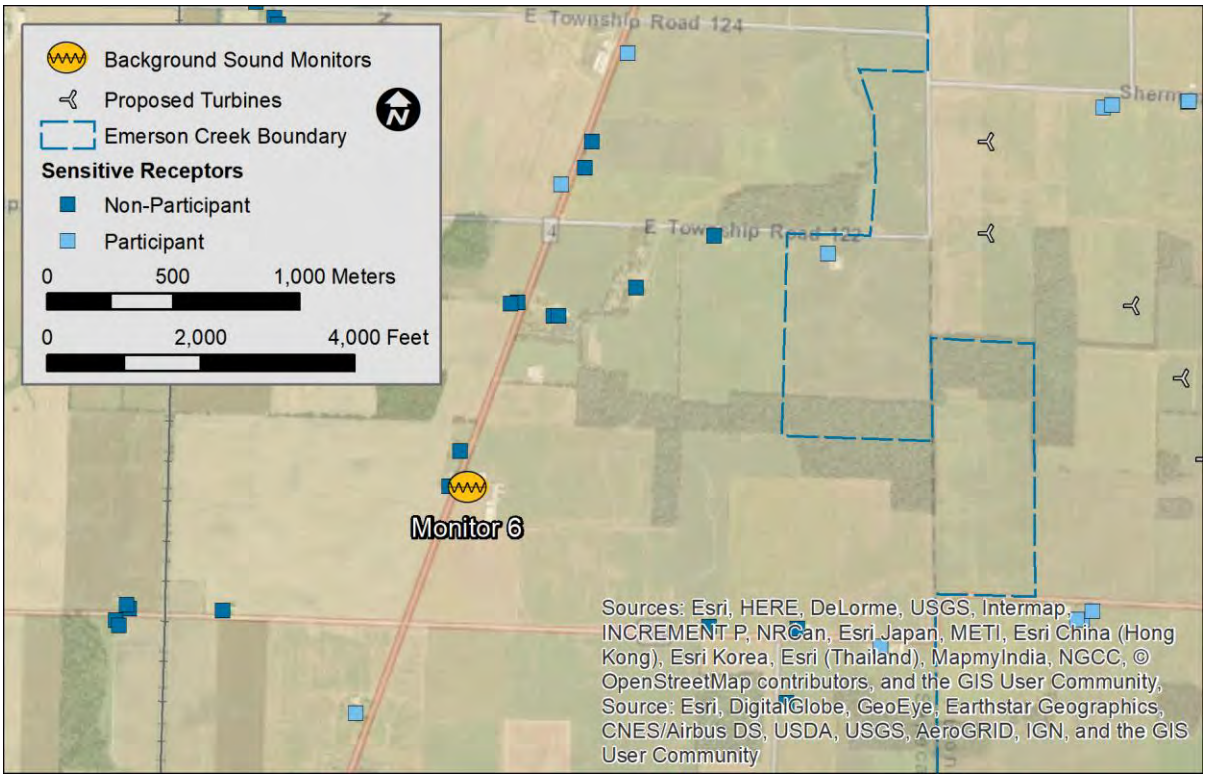


FIGURE 14: MAP OF MONITOR 6

Monitor 7

Monitor 7 was located at a residence on Sherman-Norwich Road in the town of Willard in the south-central part of the project area. It was situated 1,390 meters (4,560 feet) east of Section Line Road 30 S and 37 meters (121 feet) south of Sherman-Norwich Road. The property featured a house and several outbuildings. The house was the closest and situated 20 meters (66 feet) west-northwest of the monitor. The remaining outbuildings were at least 45 meters (148 feet) away, generally to the west and southwest. The broader area surrounding the monitor was agricultural, with residences scattered along Sherman-Norwich Road. The nearest proposed turbine to this monitor location is T54 approximately 370 meters (1,214 feet) to the south-southwest.

A picture of the monitoring setup is shown in Figure 15, and a map of the monitoring location is provided in Figure 16.

FIGURE 15: PHOTOGRAPH OF MONITOR 7 LOOKING TO THE SOUTH (9-13-18)

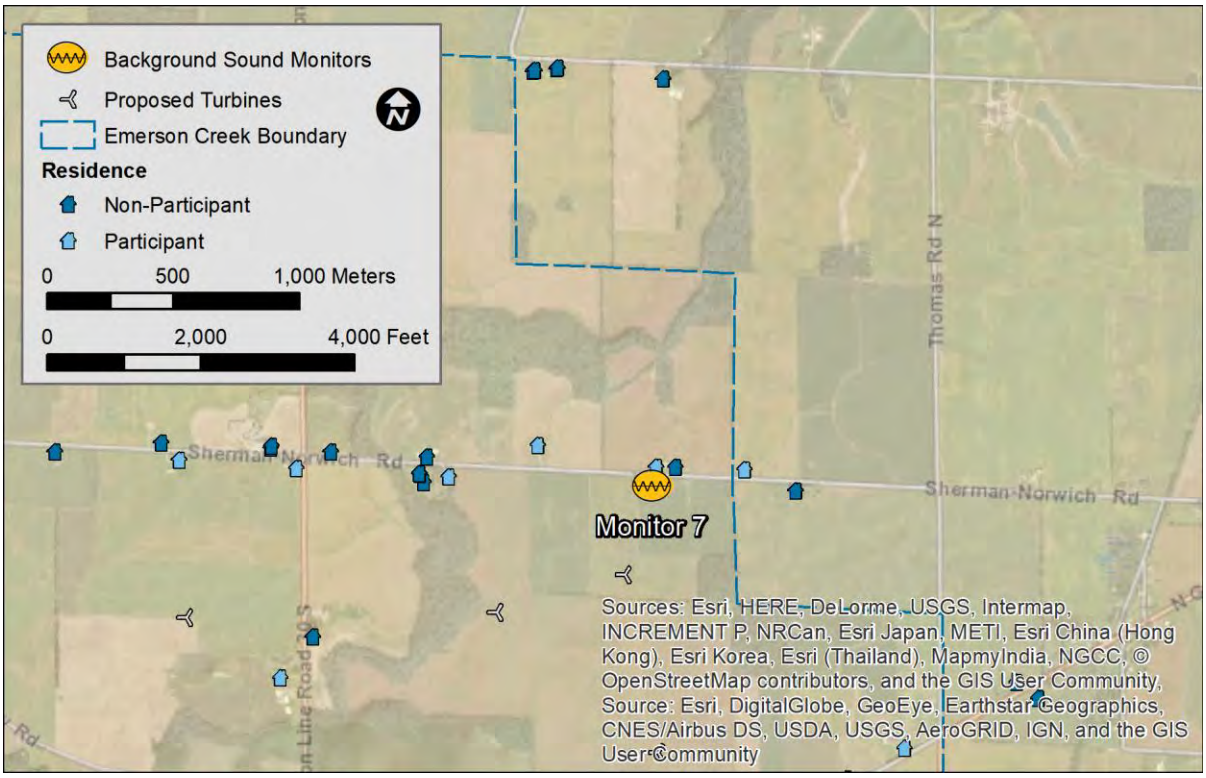


FIGURE 16: MAP OF MONITOR 7

Monitor 8

Monitor 8 was located at a residence on Town Line Rd 26 in Willard, Ohio in the southeastern portion of the project area. It was positioned 40 meters (131 feet) west of Town Line Rd 26, and 21 meters (69 feet) north of the residence on the property. The area surrounding the residence was largely agricultural. Additionally, a golf course was positioned 330 meters (108 feet) to the south, and Holiday Lake and associated residences were located approximately 1,308 meters (4,292 feet) to the south. The nearest proposed turbine to this monitor location is T79 approximately 435 meters (1,427 feet) to the southwest.

A picture of the monitoring setup is shown in Figure 17, and a map of the monitoring location is provided in Figure 18.

FIGURE 17: PHOTOGRAPH OF MONITOR 8 LOOKING TO THE NORTHWEST (9-13-18)

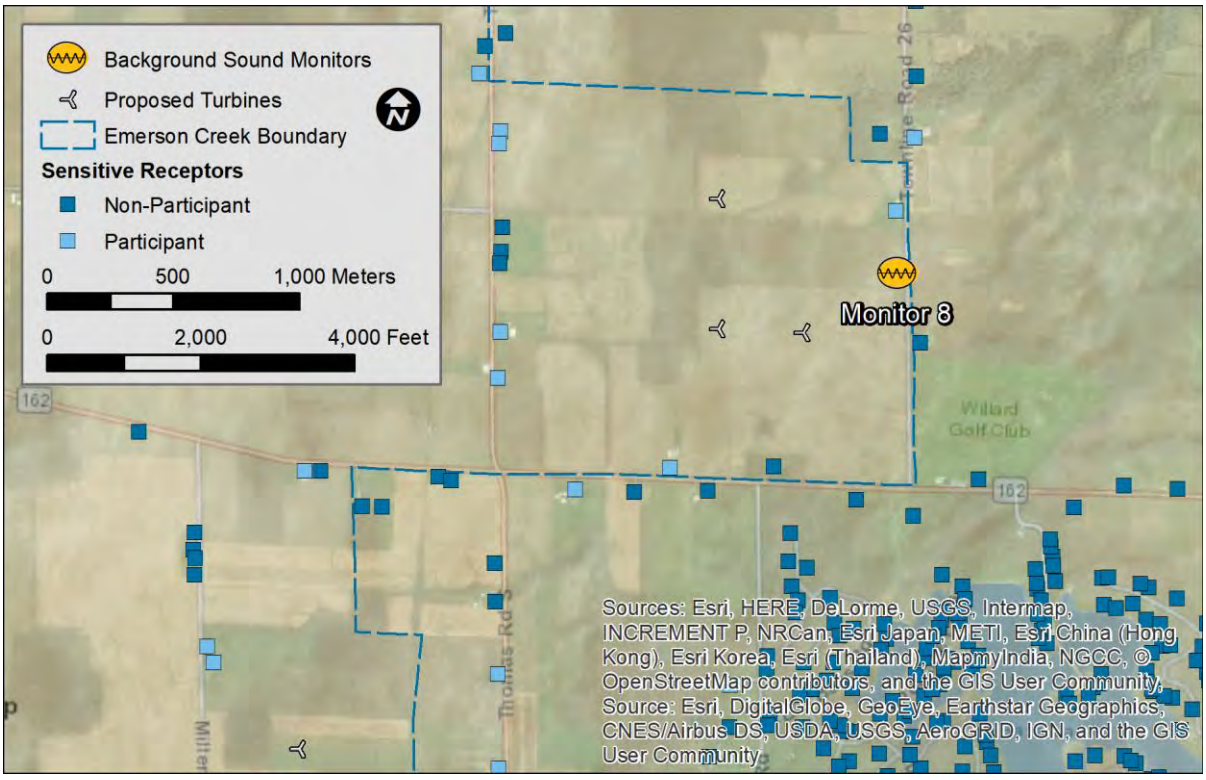


FIGURE 18: MAP OF MONITOR 8

Monitor 9

Monitor 9 was east of Attica, approximately 60 meters (197 feet) north of US-224, along the southern border of the project boundary, and 390 meters (1,280 feet) west of the Huron-Seneca county line. The site was located at a farm and house, with agricultural buildings and infrastructure, the closest located approximately 30 meters (164 feet) north of the monitor location. The broader area near the monitoring location is predominately farmland, with other residences and farming operations dispersed along US-224. The nearest proposed turbines to this monitor location are T82 approximately 480 meters (1,575 feet) to the north, and T83 approximately 500 meters (1640 feet) to the northeast.

A picture of the monitoring setup is shown in Figure 19, and a map of the monitoring location is provided in Figure 20.

FIGURE 19: PHOTOGRAPH OF MONITOR 9 LOOKING TO THE NORTHEAST (9-13-18)

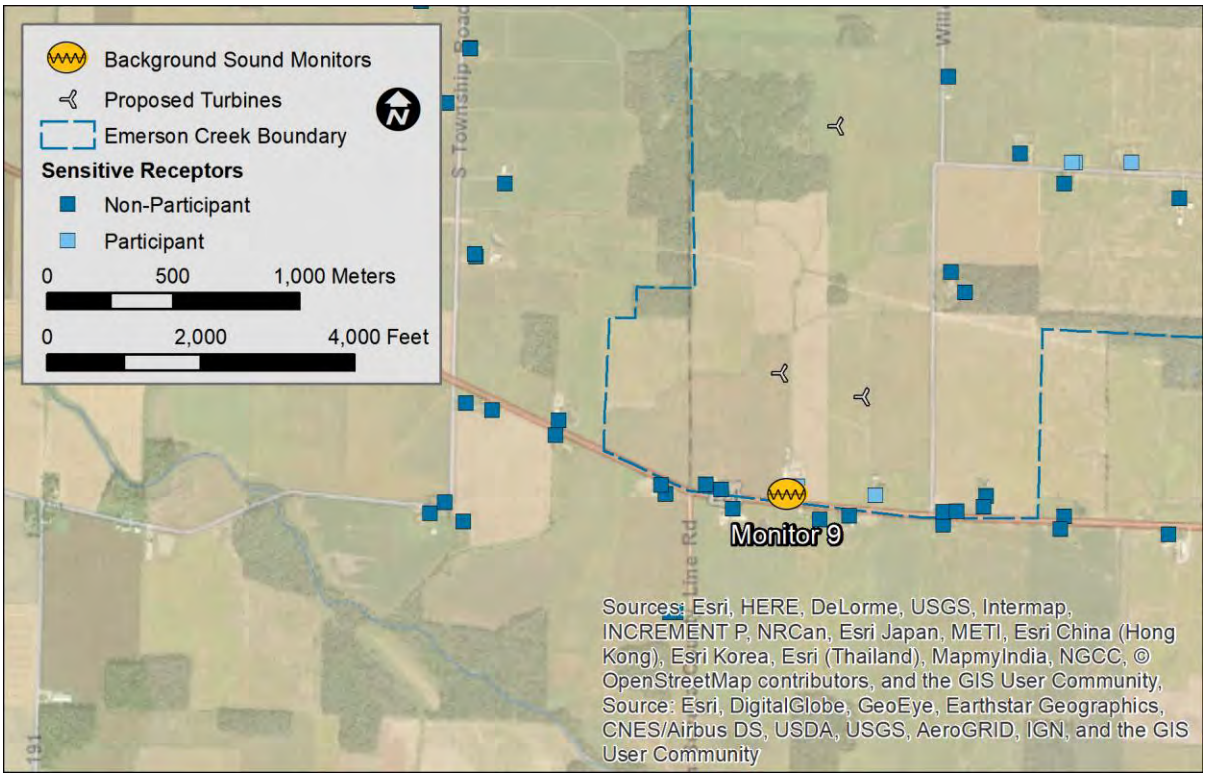


FIGURE 20: MAP OF MONITOR 9

4.3 DATA PROCESSING

Following the collection of the meters, data was downloaded, processed, and summarized into 10-minute, overall day, overall night, and full monitoring-period length durations. For each 10-minute period, equivalent average (L_{eq}), upper 10th percentile(L_{10}), median (L_{50}), and lower 10th percentile (L_{90}) sound levels were also calculated.

During analysis, sound level data was removed from the dataset to maintain the integrity of the background sound levels during periods that would cause false sound level readings or artificially high levels. These periods included:

- Wind speeds above 11 mph (5 m/s);
- Temperatures below 14°F;
- Precipitation and thunderstorm events;
- Anomalous events; or
- Equipment interactions by RSG staff, other people, or animals.

Monitors located near railway crossings also had train crossing horns removed from the data.

5.0 MONITORING RESULTS

5.1 RESULTS SUMMARY

Meteorology

Wind speed and gust speed varied by location. A summary of the maximum wind speeds and gusts recorded at microphone height at all sites is presented in Table 2. Monitor 5 and Monitor 8 saw the least amount of wind, while Monitors 1, 2, and 3 in the northern portion of the project area saw the most wind. Generally, the locations that were monitored in March experienced more wind over the monitoring period than the locations that were monitored in September.

TABLE 2: SUMMARY OF WIND SPEED DATA COLLECTED AT EACH MONITOR AT MICROPHONE HEIGHT

Location	Max Gust Speed		Average Wind Speed	
	m/s	mph	m/s	mph
Monitor 1	12.6	28.1	2.1	4.6
Monitor 2	12.3	27.6	1.8	4.1
Monitor 3	13.4	29.9	2.6	5.7
Monitor 4	10.6	23.6	1.1	2.5
Monitor 5	9.1	20.3	0.8	1.8
Monitor 6	10.1	22.5	0.8	1.8
Monitor 7	11.1	24.8	1.0	2.2
Monitor 8	7.6	16.9	0.4	0.9
Monitor 9	11.1	24.8	0.9	2.1

Precipitation events were obtained from nearby airport data and were corroborated through both analysis of the sound level spectrograms and from the audio recordings. During the March monitoring period there was precipitation for a portion of the day on March 17, during the night on March 21, and during the day on March 27 through the night of March 28. During the September monitoring period there was a short period of rain on September 19, and during the nights of September 25 and 26.

Temperature is only a concern if it drops below 14°F, which was not an issue during either the March or September monitoring period.

Background Sound Level Summary

Daytime, nighttime, and overall summaries are provided in this Section, followed by time-history graphs for each monitor in Section 5.2.

Sound levels for each location are summarized as daytime, nighttime, and entire period levels in Table 3. They include equivalent continuous average (L_{eq}), the 10th-percentile (L_{90}), the 50th-percentile (L_{50}), and 90th-percentile (L_{10}) levels. The nighttime L_{eq} across the project area ranged from 35 dBA at Monitor 7 to 52 dBA at Monitors 6 and 9. The average nighttime L_{eq} across the project area was 44 dBA. As discussed in Section 3.0, this sets the nighttime sound level limit for Emerson Creek at 49 dBA. The daytime L_{eq} across the project area ranged from 41 dBA at Monitor 8 to 56 dBA at Monitors 6 and 9. The average daytime L_{eq} across the project area was 48 dBA.

TABLE 3: SUMMARY OF BACKGROUND SOUND LEVELS BY LOCATION AND AVERAGED ACROSS THE PROJECT SITE[1]

Location	Sound Pressure Level (dBA)											
	Overall				Day				Night			
	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}	L_{eq}	L_{90}	L_{50}	L_{10}
Monitor 1	51	42	49	54	51	42	50	54	50	42	48	54
Monitor 2	46	33	40	49	47	35	42	50	44	31	38	46
Monitor 3	46	35	42	49	47	37	43	50	45	33	41	48
Monitor 4	45	34	41	48	45	35	41	49	43	32	39	46
Monitor 5	43	28	34	45	44	29	36	47	40	27	32	41
Monitor 6	55	29	43	58	56	34	46	59	52	25	38	54
Monitor 7	40	21	29	39	42	24	31	41	35	20	25	35
Monitor 8	40	24	34	40	41	27	34	41	36	22	31	37
Monitor 9	55	30	51	58	56	34	51	59	52	25	47	53
Average					**48**				**44**			

5.2 MONITORING RESULTS BY LOCATION

For display purposes, the one second data that was collected is displayed in 10-minute summarized values in the time history-graphs to show overall trends. Sound levels are plotted along with ambient temperature for the data collected in March, and wind speed to show relating trends. Time periods during which data was removed for the sound level summary presented in Section 5.1 are indicated with color-coded markers. Sound level data during periods when the entire 10-minute interval was excluded for wind, rain, temperature, or anomalies are still present in these graphs as lighter colors, with the darker colors representing 10-minute intervals where

[1] There was some high frequency biogenic sound during the September monitoring period (Monitors 6 through 9). This type of sound is not a strong component of wind turbine noise and can have a strong influence one the overall background Leq. It was therefore filtered out of the data during periods where it was present using an ANS weighting (defined in ANSI S12.100, “Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas”) which simply discounts sound levels above the 1 kHz 1/1 octave band, the frequency range in which the biogenic sounds occur.

there were no data exclusions or only partial data exclusions.[2] The duration of each time history graph in Section 5.2 is one week, and each graph exhibits day/night shading where night is defined as 22:00 to 7:00 and shaded grey.

Monitor 1

Background sound level monitoring results for Monitor 1 are shown in Figure 21 through Figure 23. Being at the edge of a field and in the open, it was one of the windier sites. Background sound levels were driven by geophonic sounds such as wind passing over foliage and distant traffic on I-80. The daytime and nighttime L_{eq} were 51 and 50 dBA, respectively. The small difference between daytime and nighttime sound levels is due primarily to the consistent source of traffic noise from I-80.

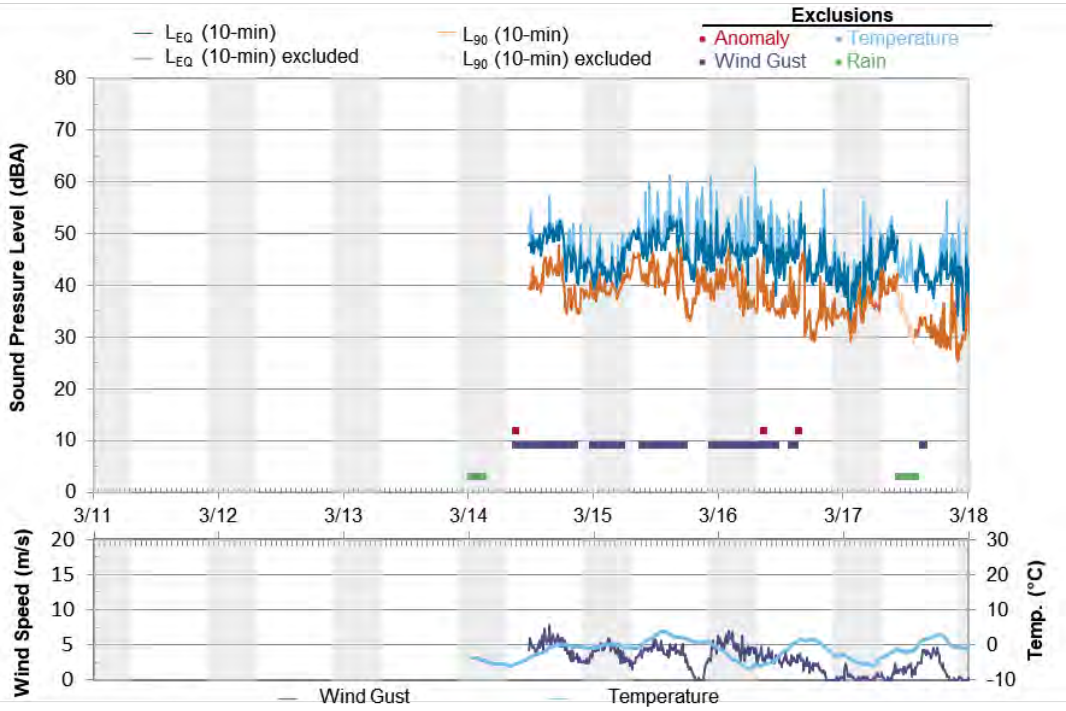


FIGURE 21: SOUND PRESSURE LEVELS OVER TIME - MONITOR 1, MARCH 13 TO MARCH 18

[2] For some 10-minute periods, shorter durations within the 10-minutes are excluded due to wind, rain, temperature, or anomalies, but the rest of the 10-minute interval is still used in the summary. These periods are shown in the darker colors (Leq and L90) as only some of the 10-minute period was excluded.

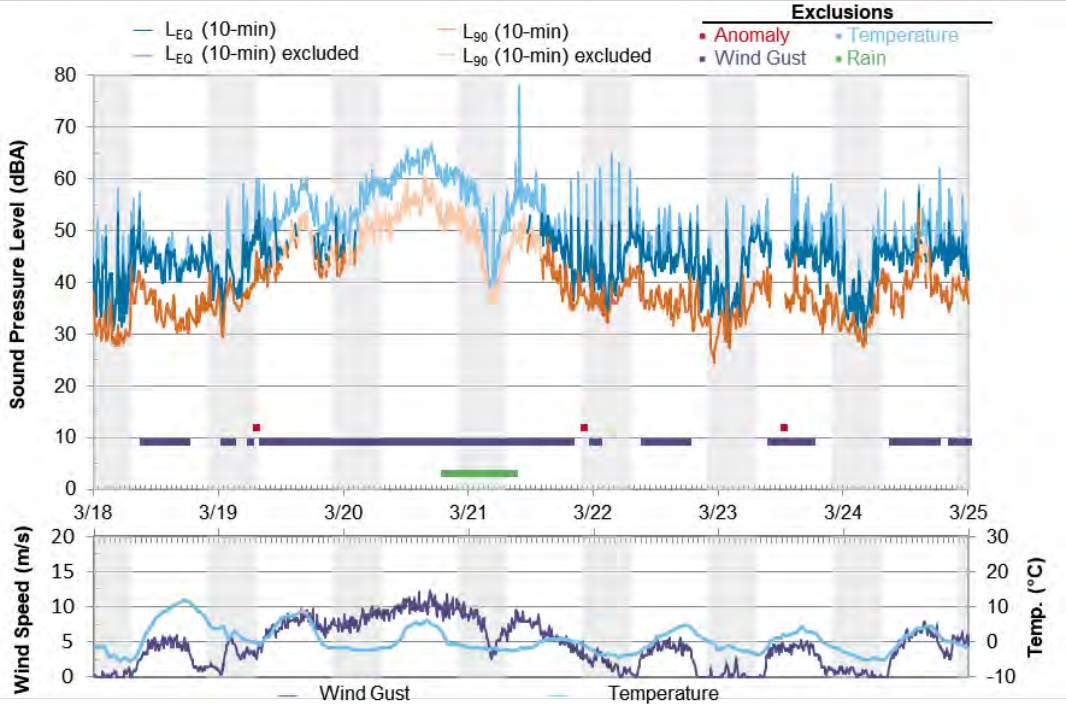


FIGURE 22: SOUND PRESSURE LEVELS OVER TIME - MONITOR 1, MARCH 18 TO MARCH 25

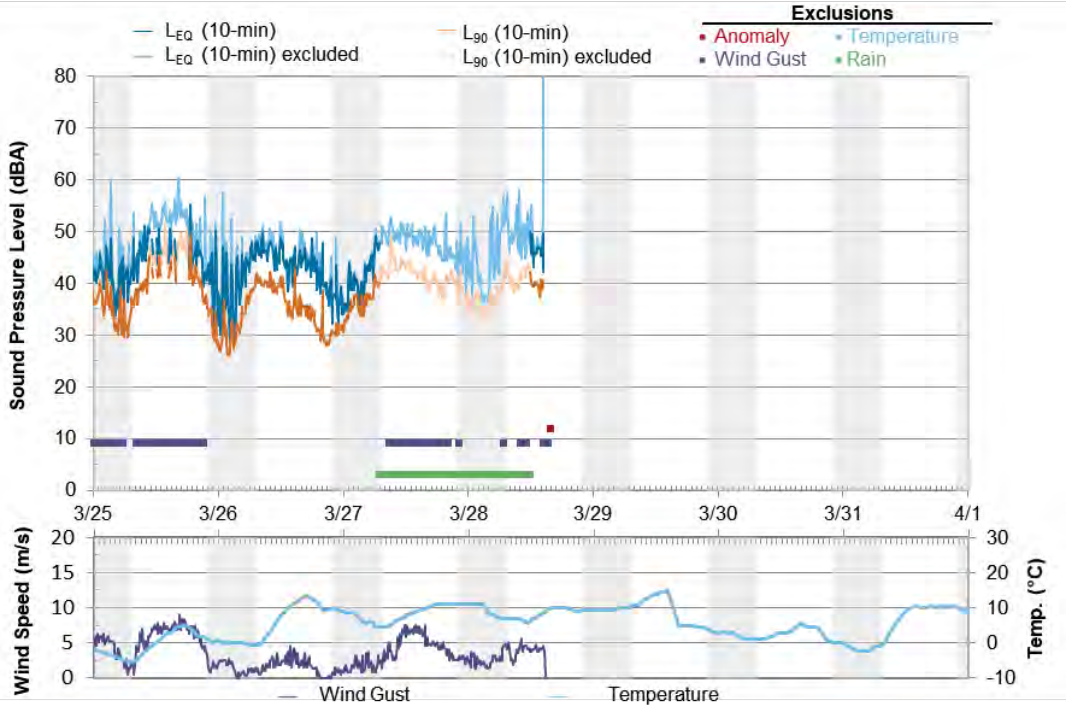


FIGURE 23: SOUND PRESSURE LEVELS OVER TIME - MONITOR 1, MARCH 25 TO MARCH 28

Monitor 2

Background sound level monitoring results for Monitor 2 are shown in Figure 24 through Figure 26. Monitor 2 was also one of the windier sites. Background sound levels were driven by geophonic sounds and local traffic on Patten Tract Road. There was also occasional sound from train passbys on the nearby rail line. The daytime and nighttime L_{eq} were 47 and 44 dBA, respectively.

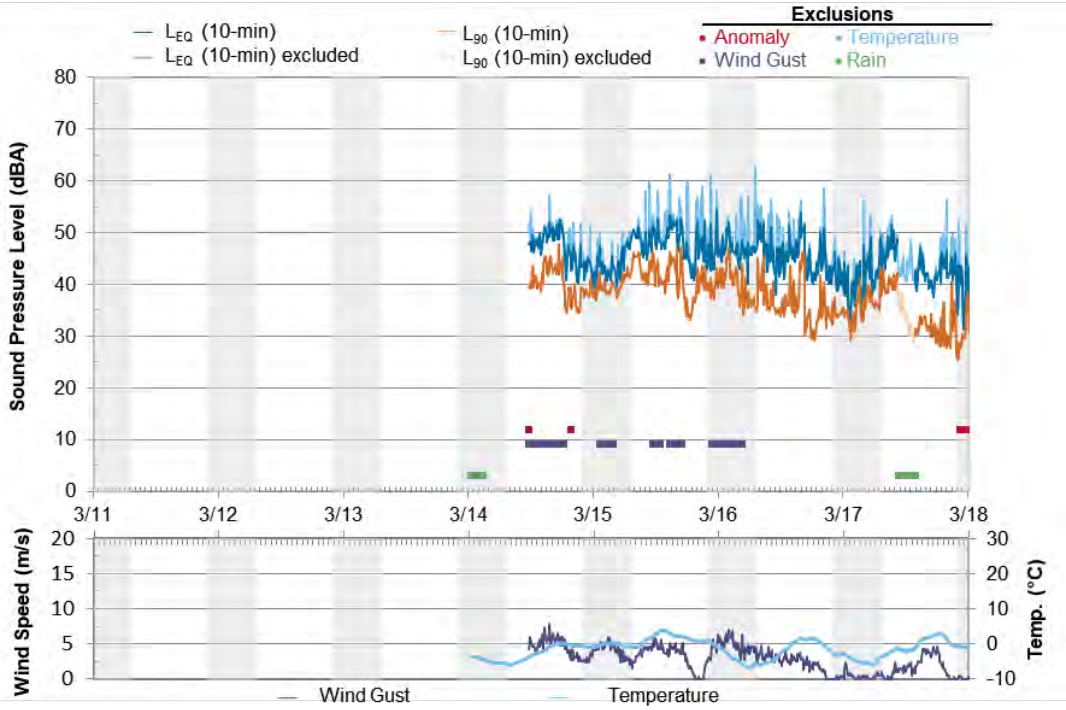


FIGURE 24: SOUND PRESSURE LEVELS OVER TIME - MONITOR 2, MARCH 13 TO MARCH 18

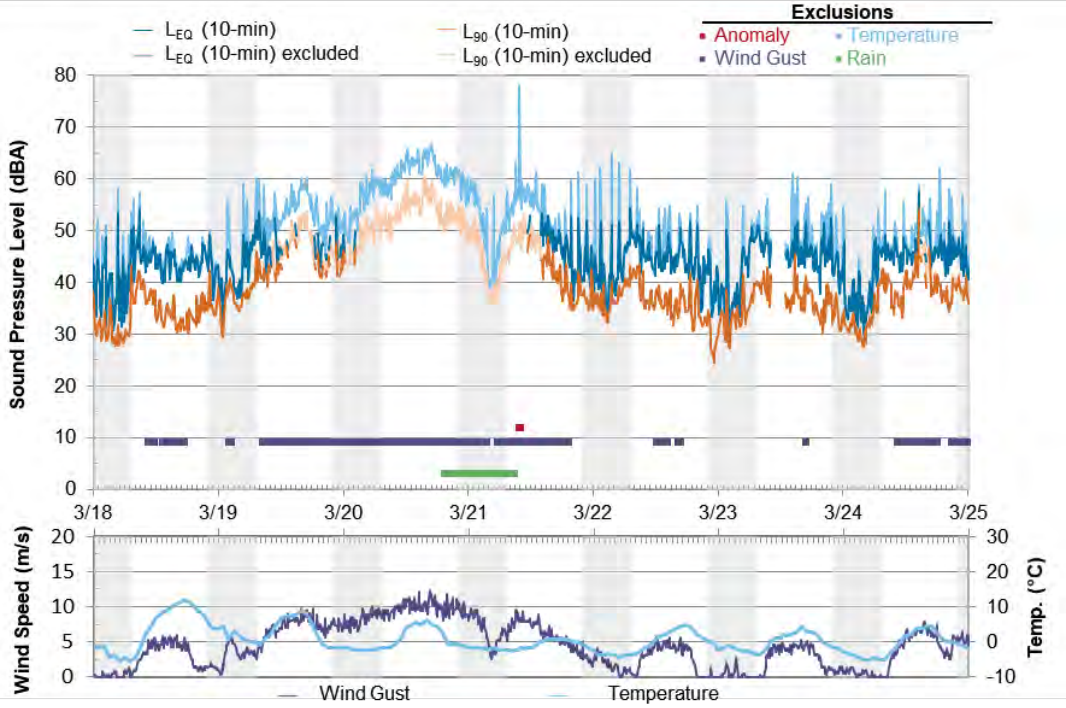


FIGURE 25: SOUND PRESSURE LEVELS OVER TIME - MONITOR 2, MARCH 18 TO MARCH 25

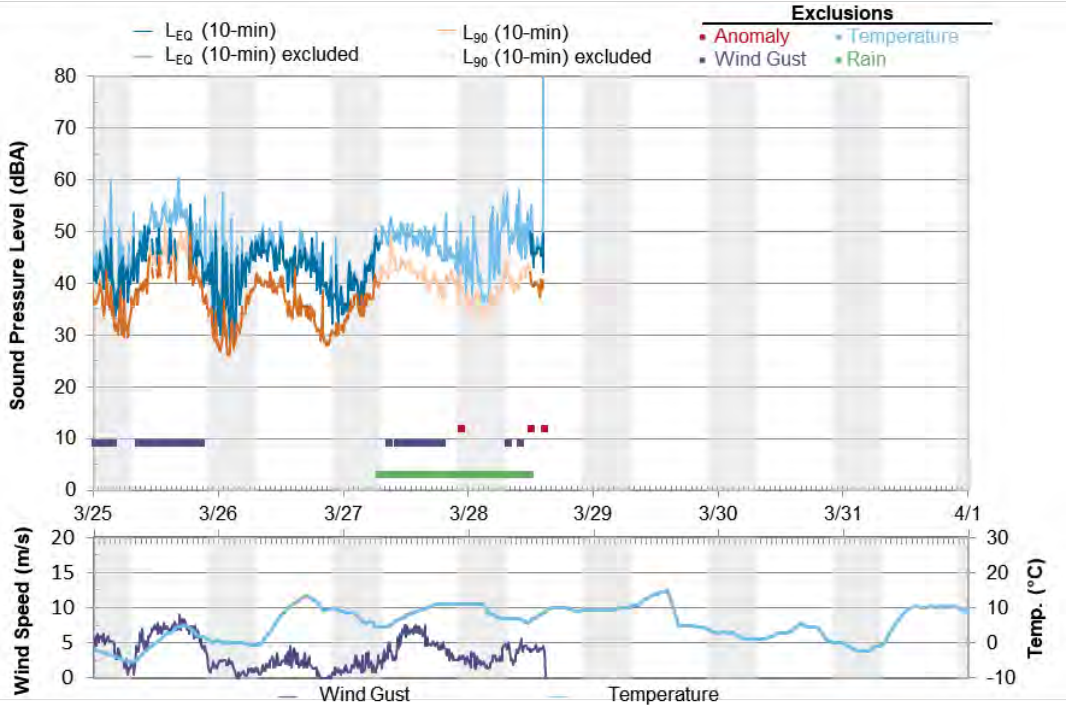


FIGURE 26: SOUND PRESSURE LEVELS OVER TIME - MONITOR 2, MARCH 25 TO MARCH 28

Monitor 3

Background sound level monitoring results for Monitor 3 are shown in Figure 27 through Figure 29. Monitor 3 was the windiest site monitored. Background sound levels were driven by geophonic sounds and local traffic on Yingling Road and Edison Highway. There was also occasional sound from train passbys on the nearby rail line. This site was very similar in soundscape character to that of Monitor 2. The daytime and nighttime L_{eq} were 47 and 45 dBA, respectively.

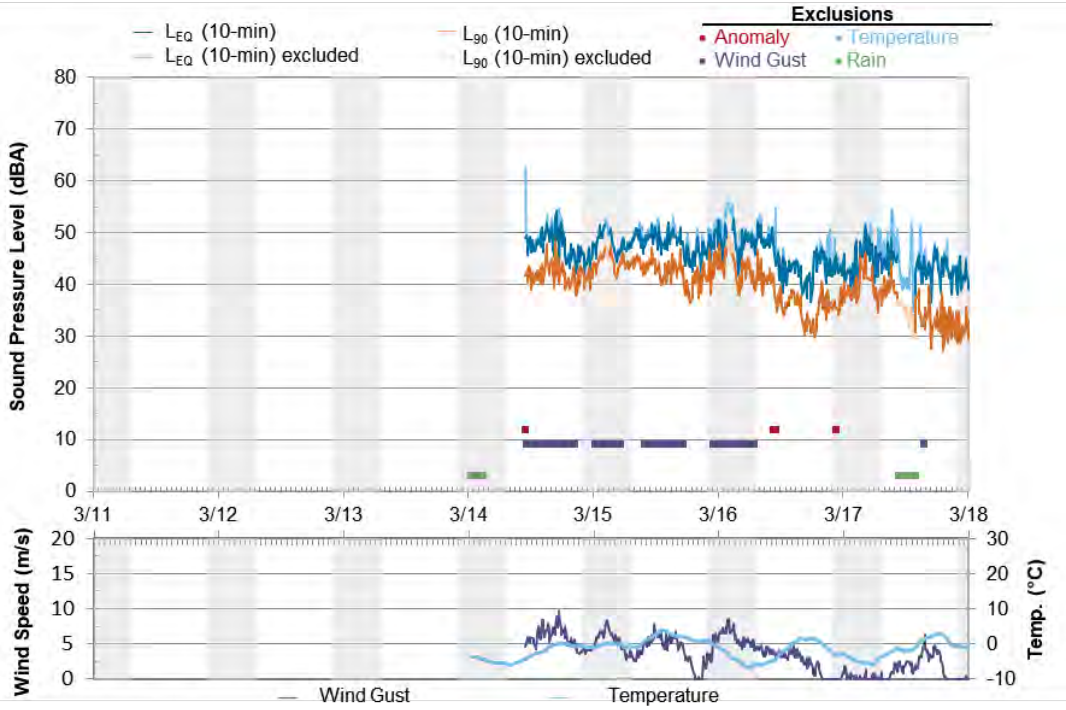


FIGURE 27: SOUND PRESSURE LEVELS OVER TIME - MONITOR 3, MARCH 13 TO MARCH 18

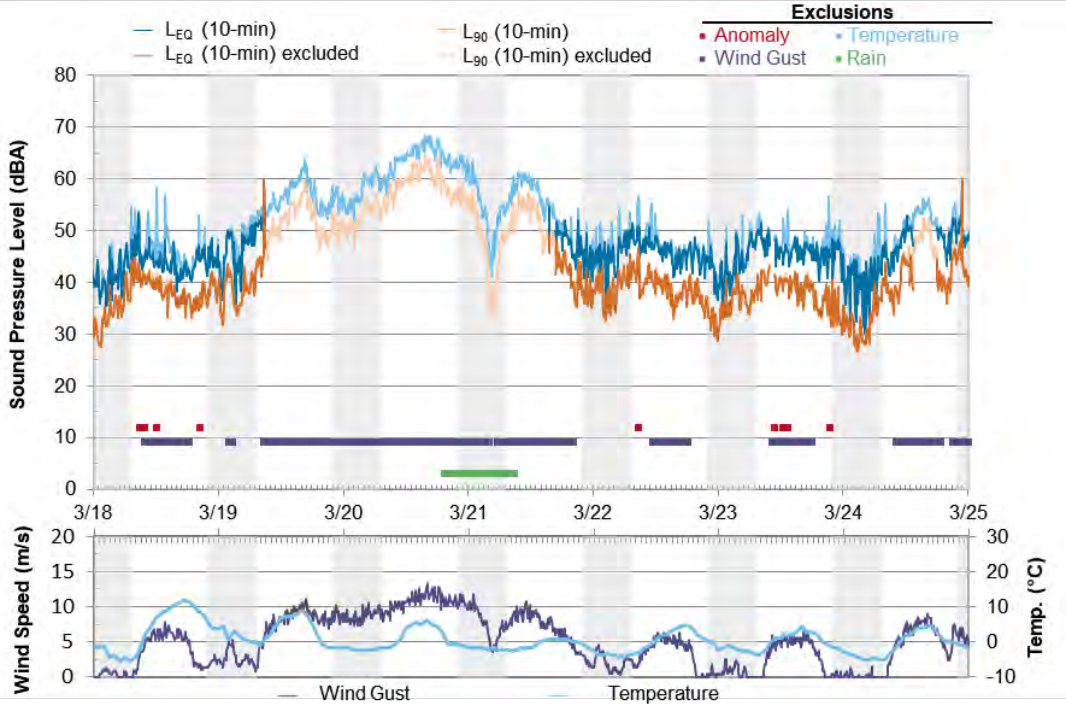


FIGURE 28: SOUND PRESSURE LEVELS OVER TIME - MONITOR 3, MARCH 18 TO MARCH 25

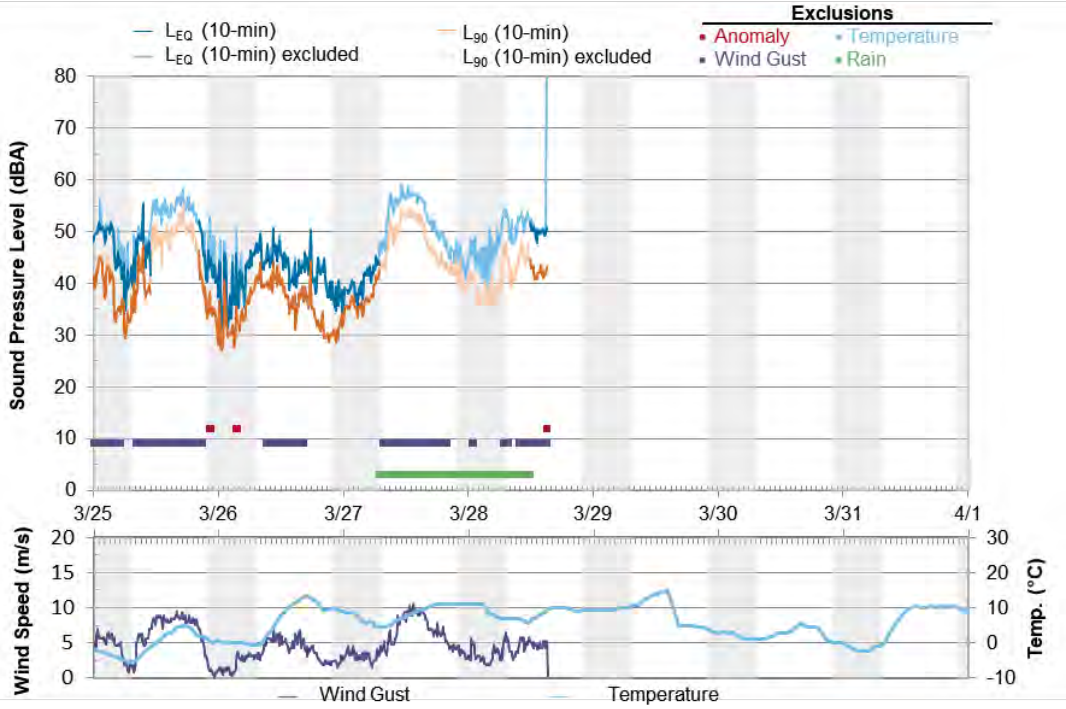


FIGURE 29: SOUND PRESSURE LEVELS OVER TIME - MONITOR 3, MARCH 25 TO MARCH 28

Monitor 4

Background sound level monitoring results for Monitor 4 are shown in Figure 30 through Figure 32. It was periodically windy at this site, but less so than some other sites. Background sound levels were driven by traffic on OH-4, local traffic on Young Road, and geophonic sounds. There was also occasional sound from train passbys on the nearby rail line. The daytime and nighttime L_{eq} were 45 and 43 dBA, respectively.

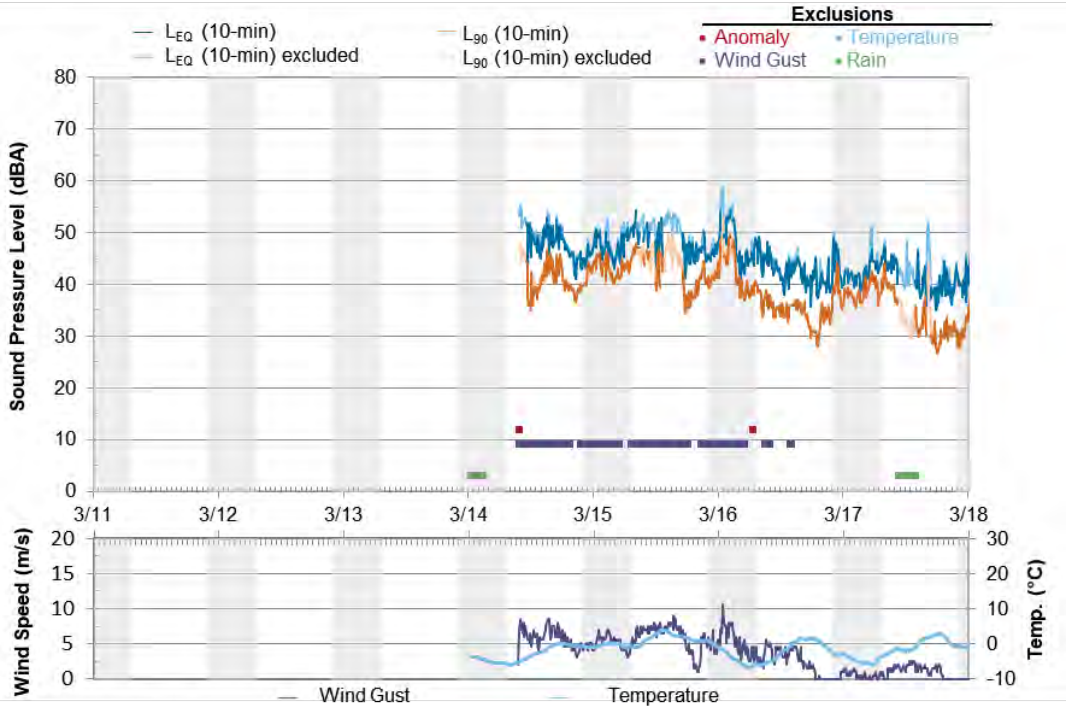


FIGURE 30: SOUND PRESSURE LEVELS OVER TIME - MONITOR 4, MARCH 13 TO MARCH 18

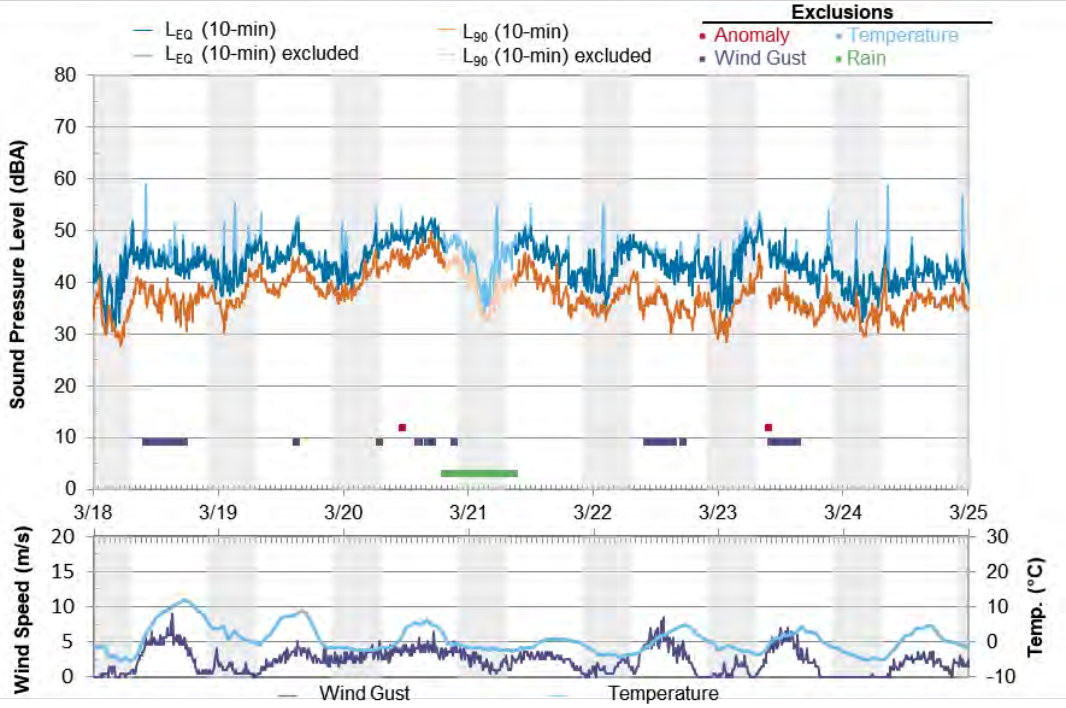


FIGURE 31: SOUND PRESSURE LEVELS OVER TIME - MONITOR 4, MARCH 18 TO MARCH 25

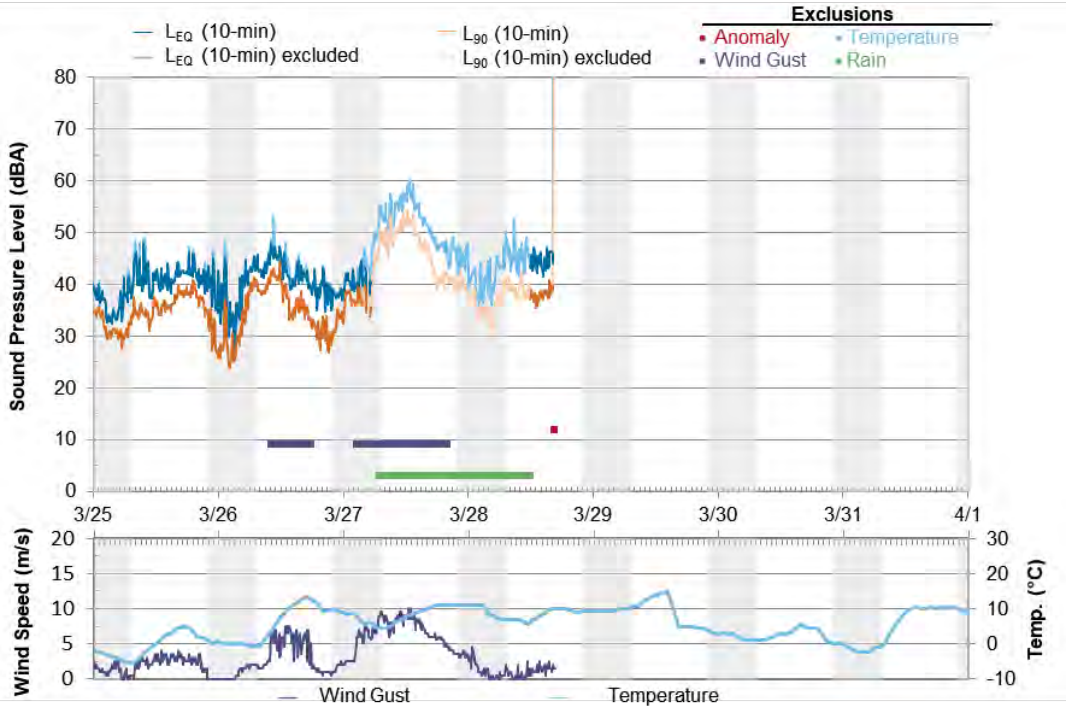


FIGURE 32: SOUND PRESSURE LEVELS OVER TIME - MONITOR 4, MARCH 25 TO MARCH 28

Monitor 5

Background sound level monitoring results for Monitor 5 are shown in Figure 33 through Figure 35. Monitor 5 was one of the less windy sites and was more rural than the other locations. Background sound levels were driven by geophonic sounds, occasional biogenic sounds (e.g. bird calls), and occasional local traffic on Dogtown Road. The daytime and nighttime L_{eq} were 44 and 40 dBA, respectively.

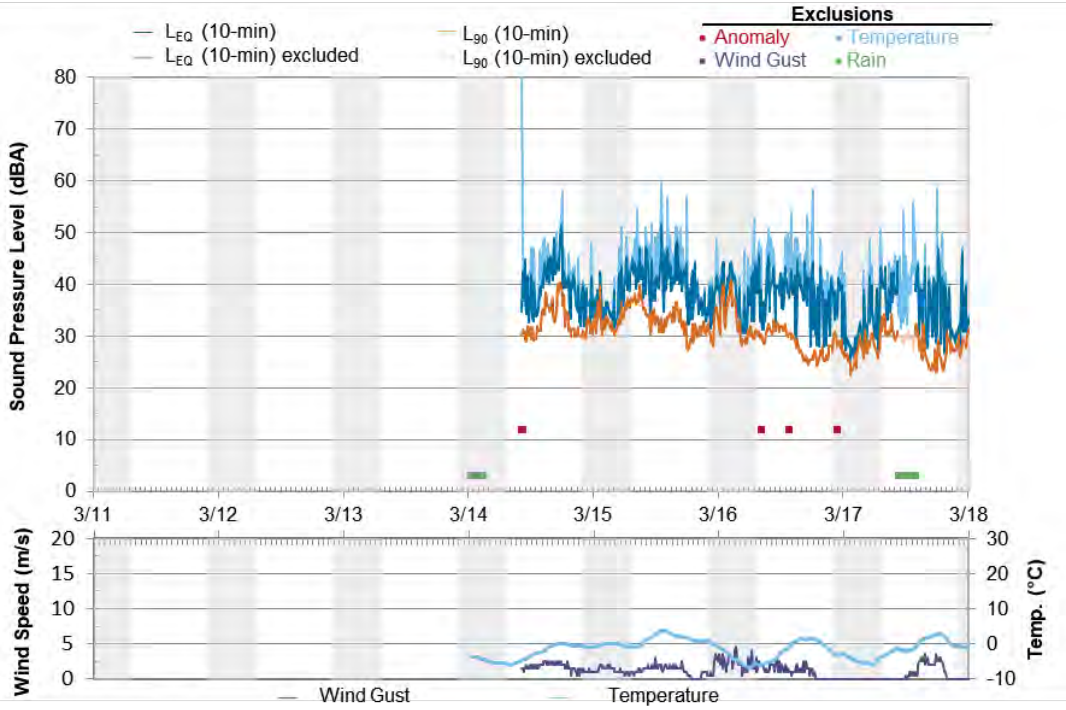


FIGURE 33: SOUND PRESSURE LEVELS OVER TIME - MONITOR 5, MARCH 13 TO MARCH 18

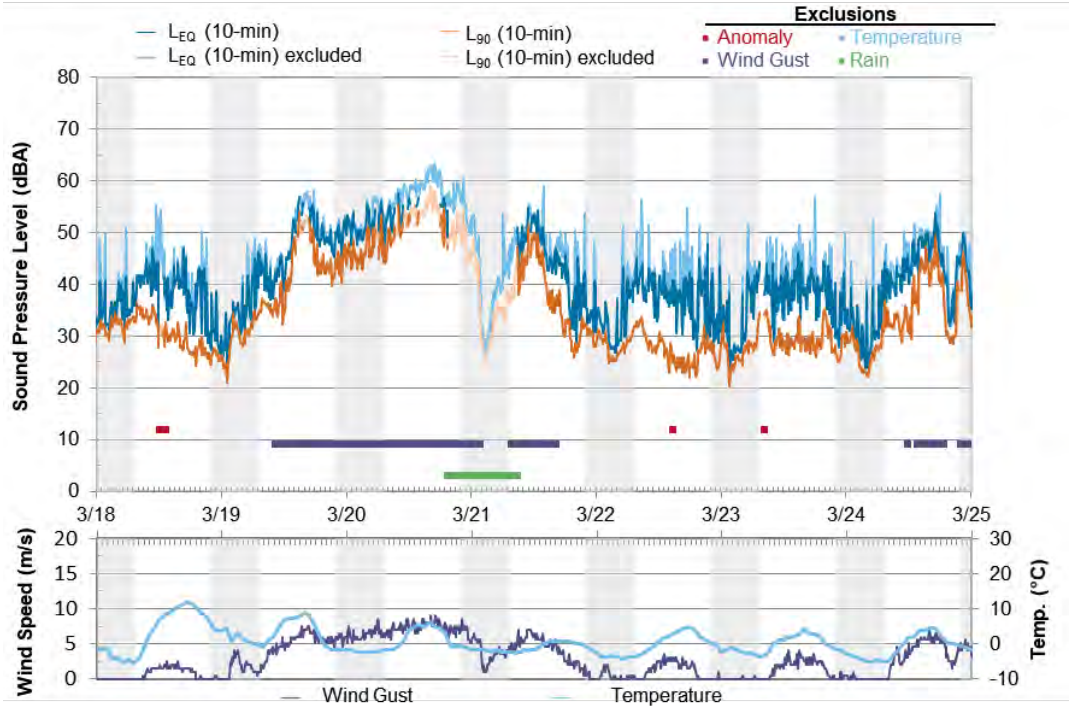


FIGURE 34: SOUND PRESSURE LEVELS OVER TIME - MONITOR 5, MARCH 18 TO MARCH 25

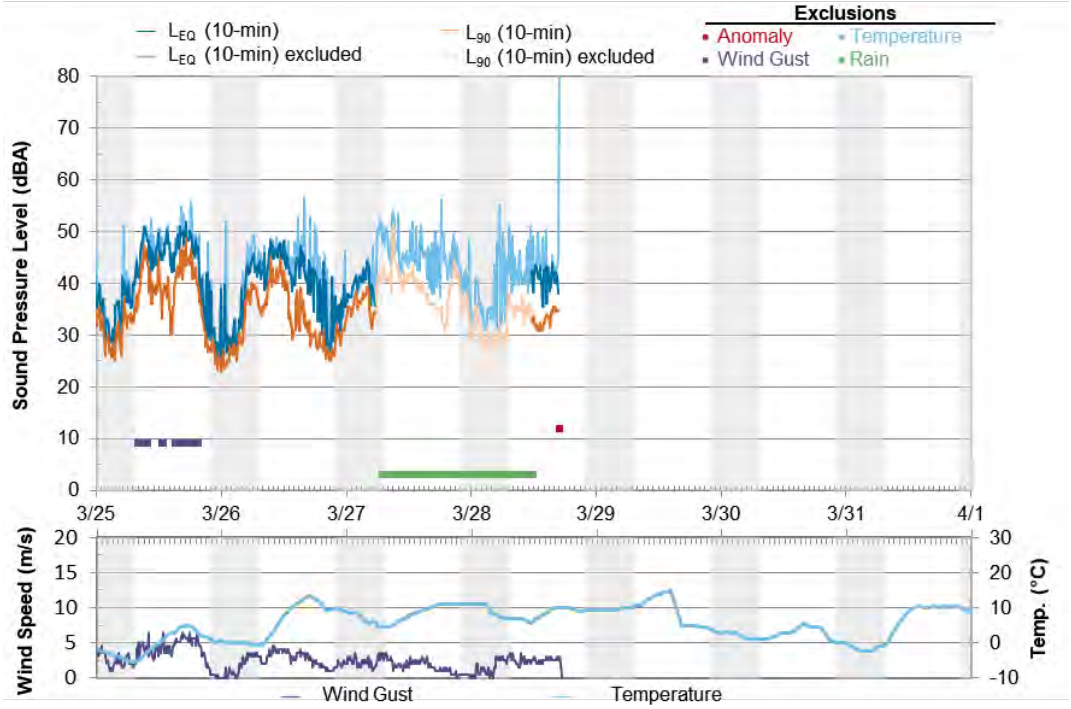


FIGURE 35: SOUND PRESSURE LEVELS OVER TIME - MONITOR 5, MARCH 25 TO MARCH 28

Monitor 6

Background sound level monitoring results for Monitor 6 are shown in Figure 36 through Figure 38. Monitor 6 was one of the less windy sites. Background sound levels were driven by geophonic sounds, the agricultural nature of the site, and passing traffic on OH-4. There was also occasional sound from train passbys on the nearby rail line. The strong diurnal pattern in sound levels at this site are indicative of daytime anthropogenic sound such as agricultural functions and traffic on OH-4. The large difference between the L_{eq}, and $L_{90,}$ particularly during the day, indicates that much of the sound is due to short duration events, such as vehicle passbys. The daytime and nighttime L_{eq} were 56 and 52 dBA, respectively.

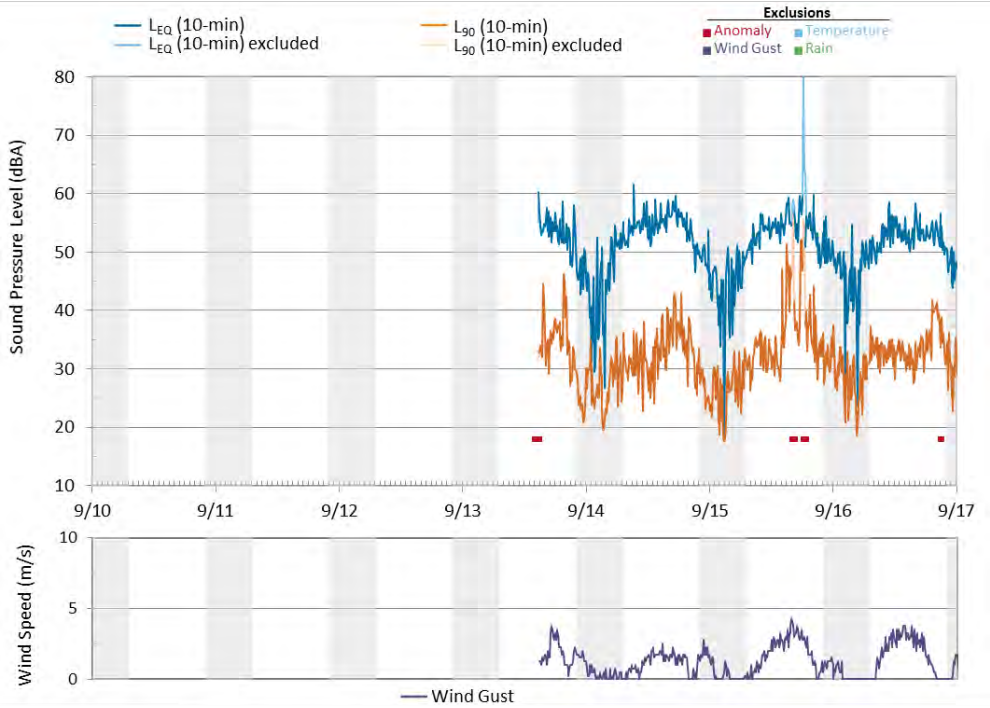


FIGURE 36: SOUND PRESSURE LEVELS OVER TIME - MONITOR 6, SEPT. 13 TO SEPT. 17

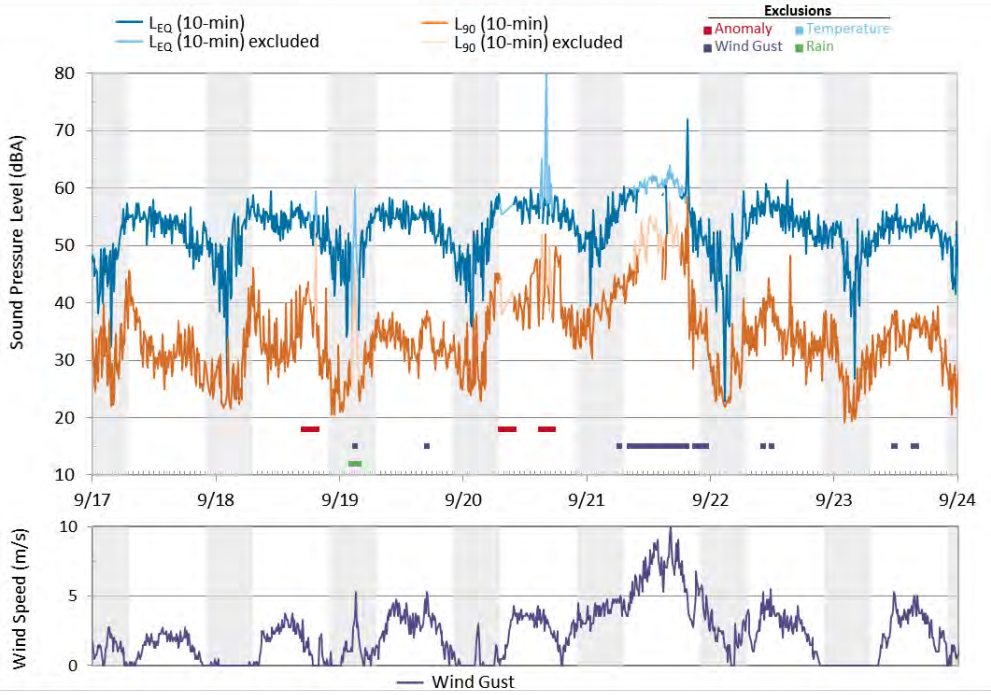


FIGURE 37: SOUND PRESSURE LEVELS OVER TIME - MONITOR 6, SEPT. 17 TO SEPT. 24

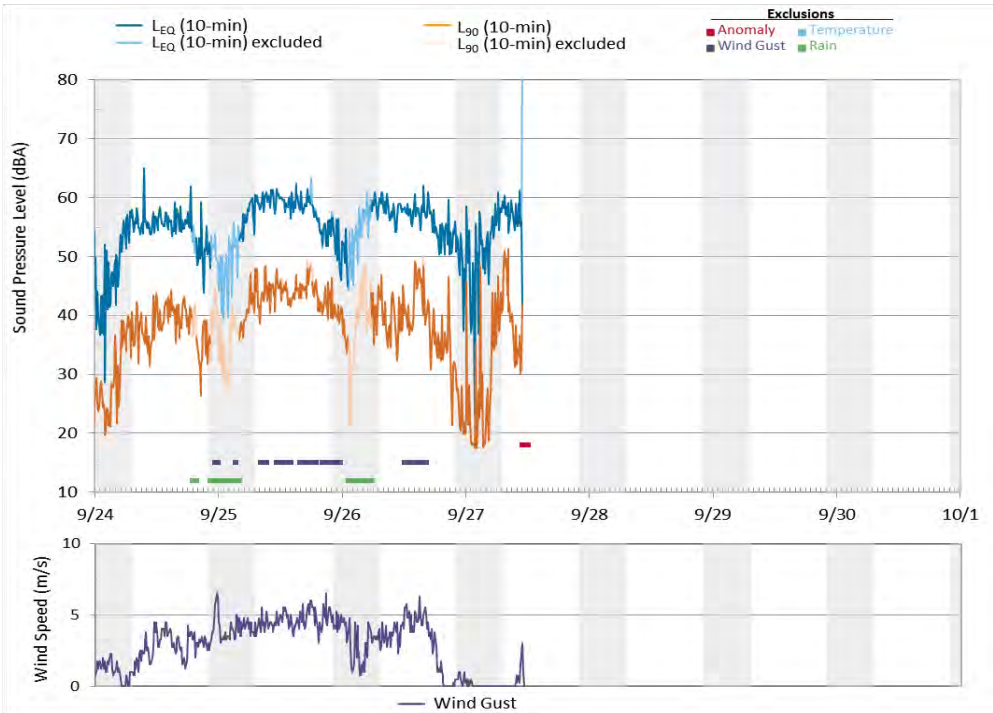


FIGURE 38: SOUND PRESSURE LEVELS OVER TIME - MONITOR 6, SEPT. 24 TO SEPT. 27

Monitor 7

Background sound level monitoring results for Monitor 7 are shown in Figure 39 through Figure 41. It was periodically windy at this site, but less so than some other sites. This was one of the most rural and quietest sites monitored. Background sound levels were driven by geophonic sounds, occasional agricultural sounds, and infrequent traffic on Sherman-Norwich Road. The daytime and nighttime L_{eq} were 42 and 35 dBA, respectively.

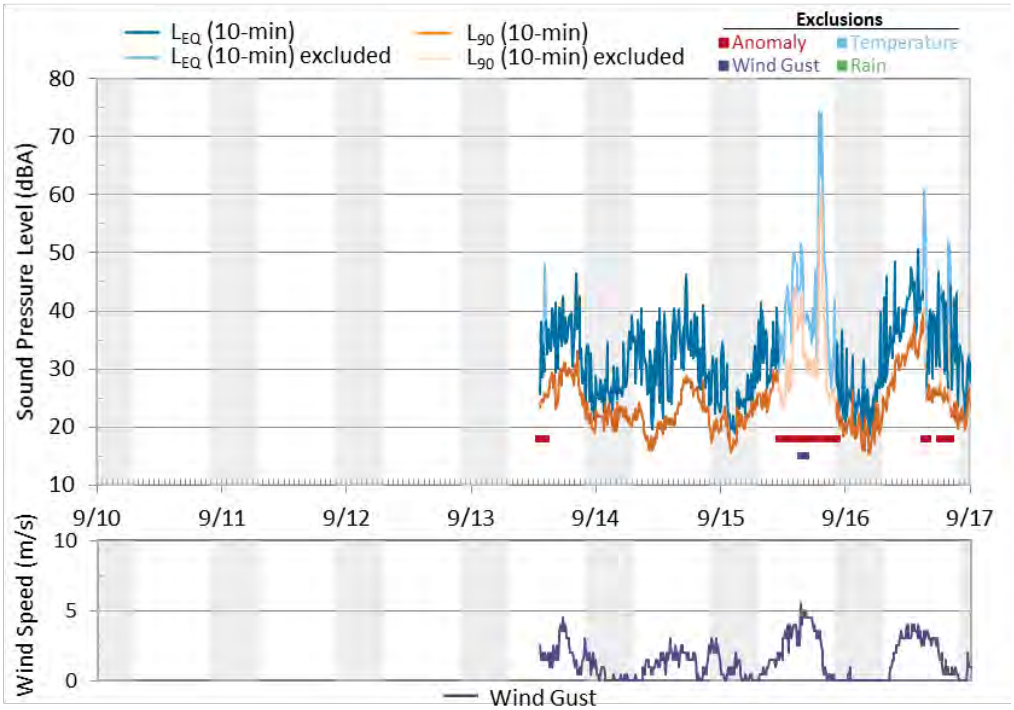


FIGURE 39: SOUND PRESSURE LEVELS OVER TIME - MONITOR 7, SEPT. 13 TO SEPT. 17

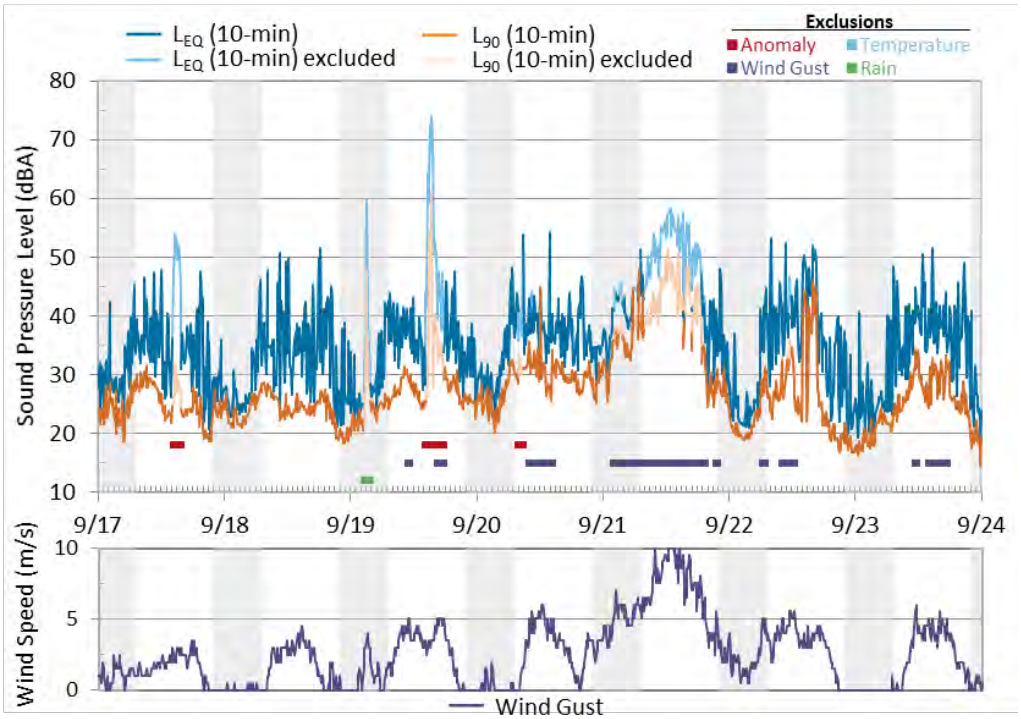


FIGURE 40: SOUND PRESSURE LEVELS OVER TIME - MONITOR 7, SEPT. 17 TO SEPT. 24

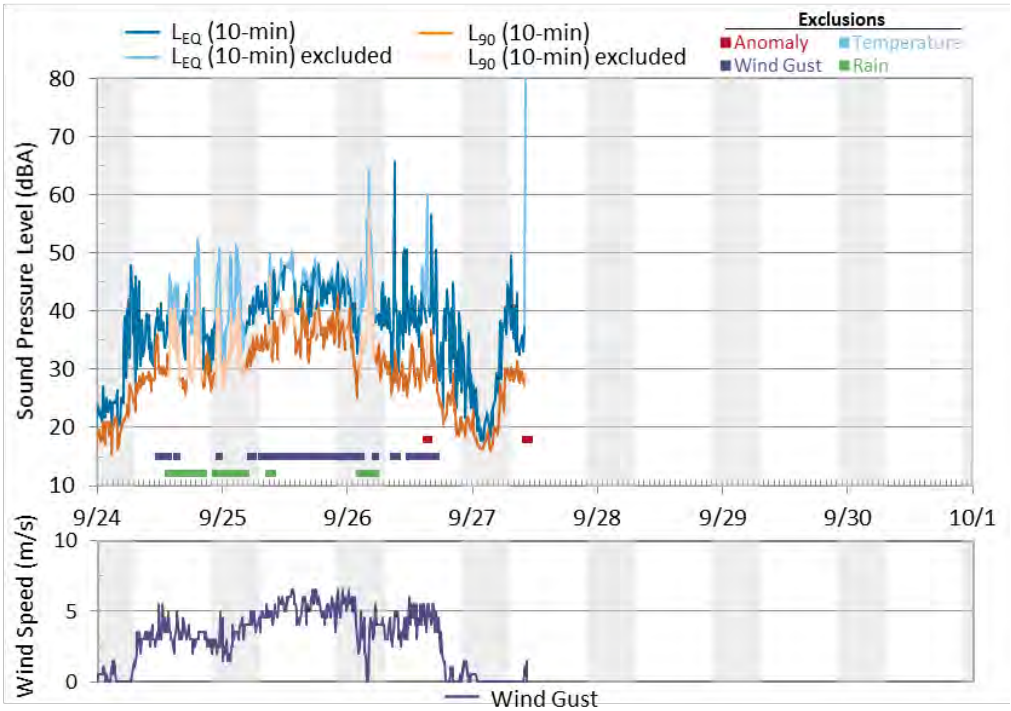


FIGURE 41: SOUND PRESSURE LEVELS OVER TIME - MONITOR 7, SEPT. 24 TO SEPT. 27

Monitor 8

Background sound level monitoring results for Monitor 8 are shown in Figure 42 through Figure 44. Monitor 8 was the least windy site and was one of the most rural and quiet sites monitored. This site was very similar in soundscape character to Monitor 7. Background sound levels were driven by geophonic sounds, occasional agricultural sounds, and infrequent local traffic. The daytime and nighttime L_{eq} were 41 and 36 dBA, respectively.

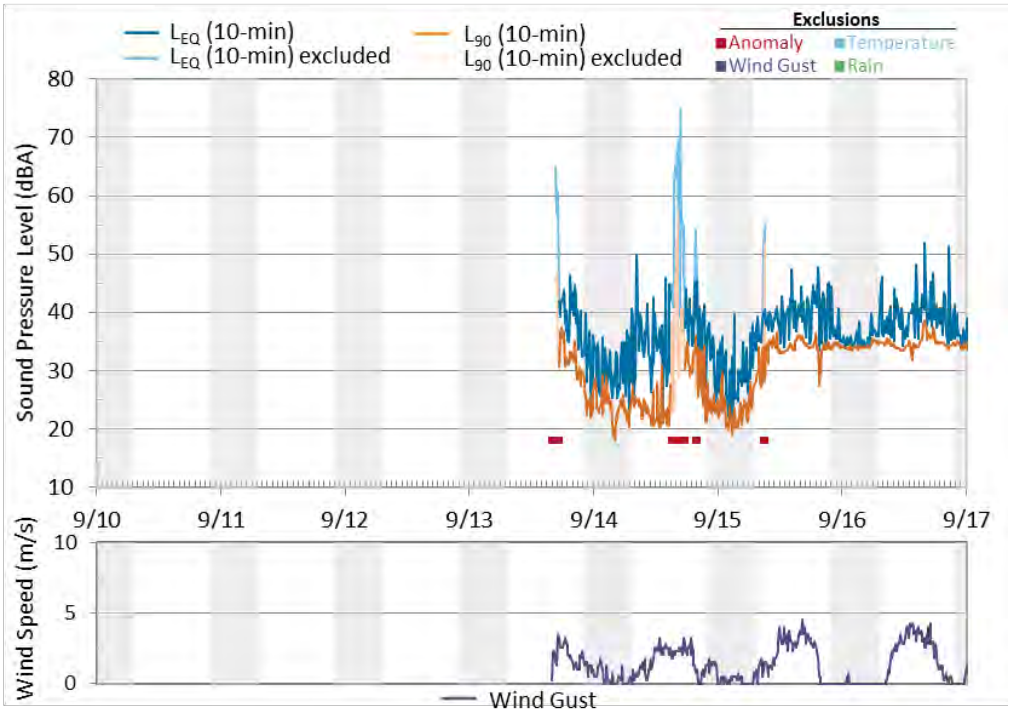


FIGURE 42: SOUND PRESSURE LEVELS OVER TIME - MONITOR 8, SEPT. 13 TO SEPT. 17

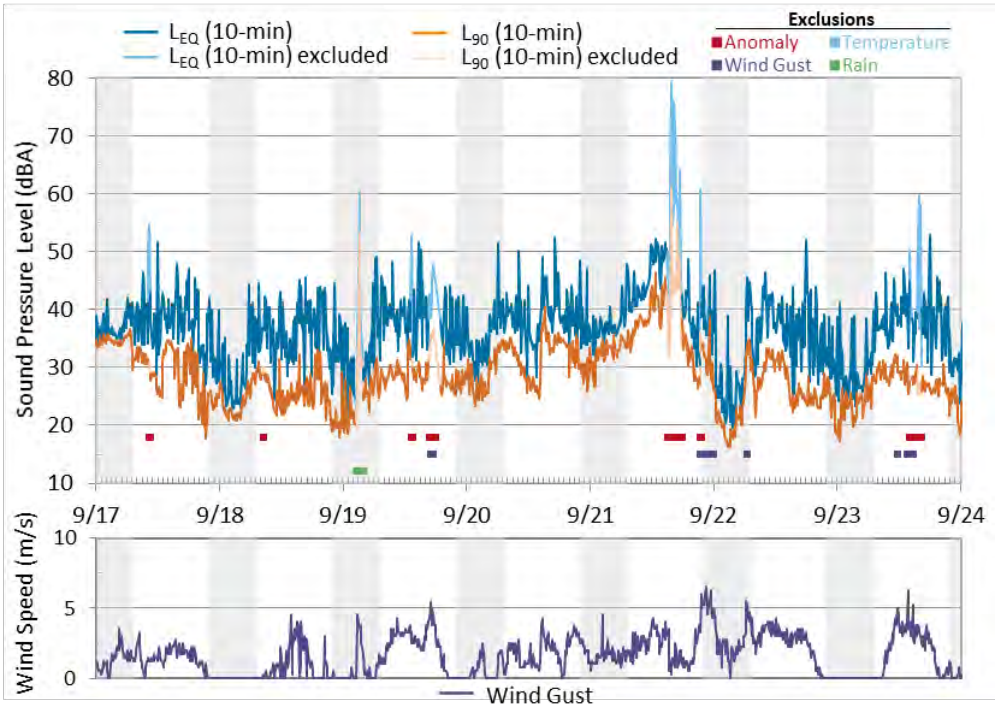


FIGURE 43: SOUND PRESSURE LEVELS OVER TIME - MONITOR 8, SEPT. 17 TO SEPT. 24

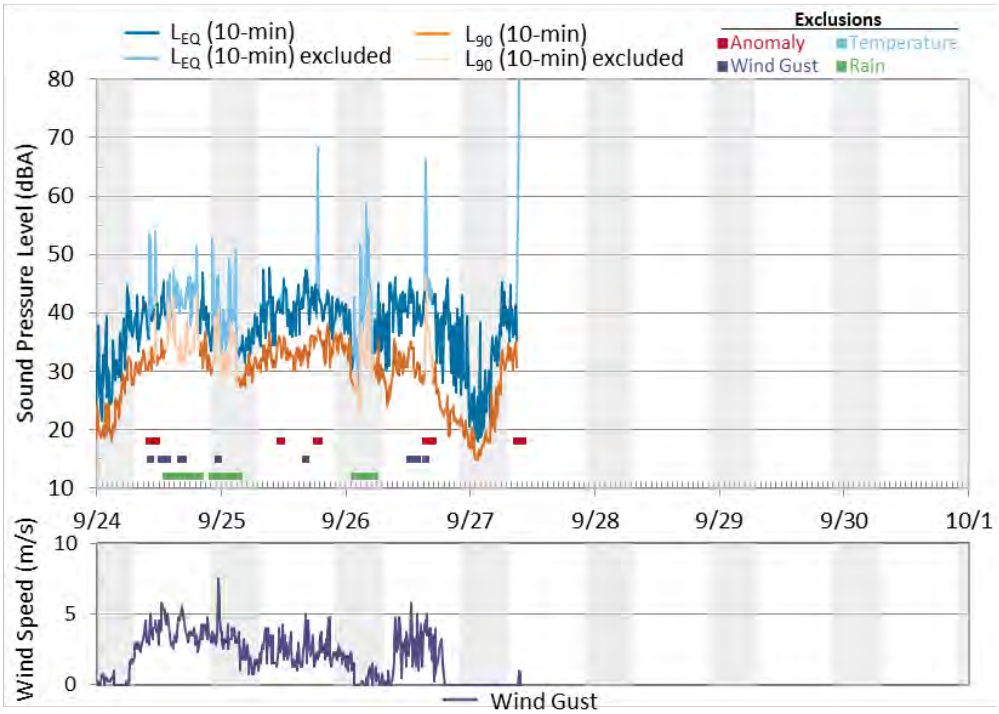


FIGURE 44: SOUND PRESSURE LEVELS OVER TIME - MONITOR 8, SEPT. 24 TO SEPT. 27

Monitor 9

Background sound level monitoring results for Monitor 9 are shown in Figure 45 through Figure 47. It was periodically windy at this site, but less so than some other sites. This site had notable agricultural activity which was the driver of background sound levels, particularly during the second week of monitoring, where there was a persistent mechanical sound during the day and night associated with the agricultural operation. This accounted for sound levels rarely dipping below 50 dBA during the second week. Additional sources included frequent passing traffic on US-224 and occasional train passbys on the distant rail line. The daytime and nighttime L_{eq} were 56 and 52 dBA, respectively.

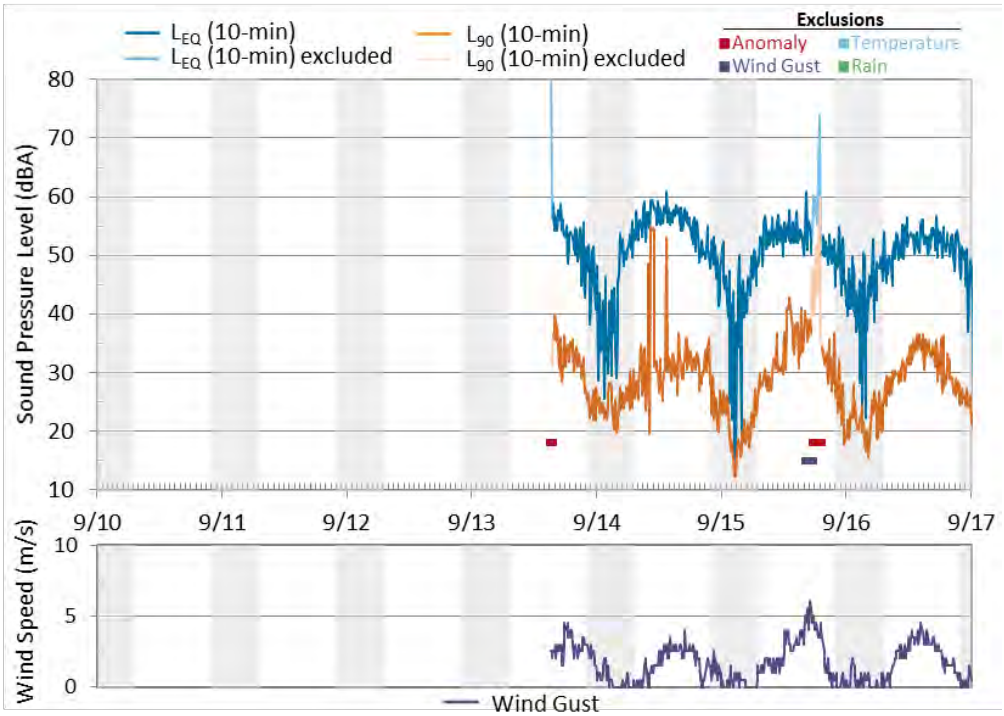


FIGURE 45: SOUND PRESSURE LEVELS OVER TIME - MONITOR 9, SEPT. 13 TO SEPT. 17

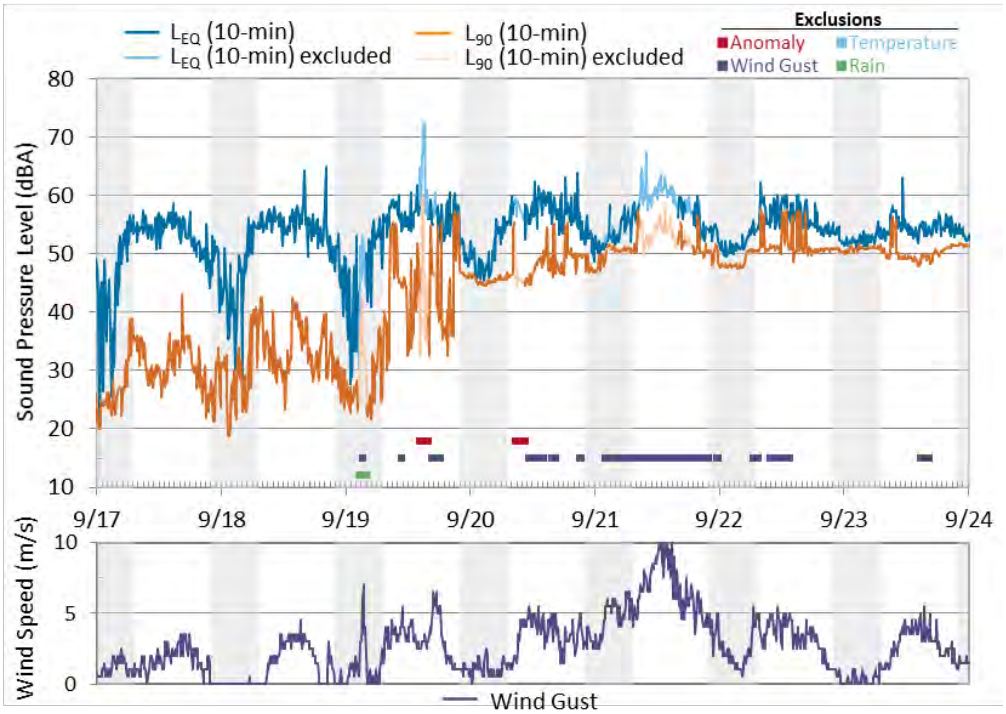


FIGURE 46: SOUND PRESSURE LEVELS OVER TIME - MONITOR 9, SEPT. 17 TO SEPT. 24

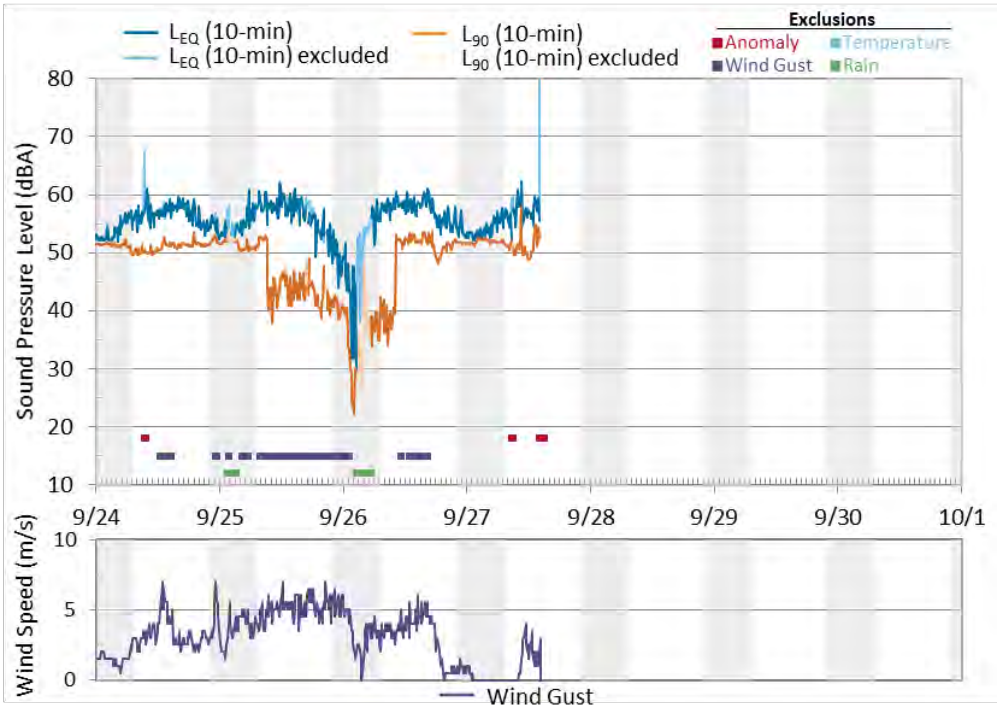


FIGURE 47: SOUND PRESSURE LEVELS OVER TIME - MONITOR 9, SEPT. 24 TO SEPT. 27

6.0 SOUND PROPAGATION MODELING PROCEDURES

6.1 MODELING PROCEDURES

Modeling for this project was in accordance with the standard ISO 9613-2, "Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation." The ISO standard states,

> This part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level … under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation … or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.

The model takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain. The acoustical modeling software used here was CadnaA, from Datakustik GmbH. CadnaA is a widely accepted acoustical propagation modeling tool, used by many noise control professionals in the United States and internationally.

ISO 9613-2 also assumes downwind sound propagation between every source and every receptor, consequently, all wind directions, including the prevailing wind directions, are taken into account.

Model input parameters are listed in Appendix. For this analysis we utilized a ground absorption factor of G=0.5. A 2 dB factor was added to the turbine sound power level per typical manufacturer warranty confidence interval specifications.

Over 3,200 discrete receivers placed at sensitive receptors[3] within 1 mile of the project were modeled at a height of 4 meters (13 feet) above ground level. In addition, a grid of receivers spaced 50 meters by 50 meters was setup at a height of 4 meters (13 feet) above ground, covering approximately 1,295 sq. km. (500 sq. mi.) around the project area.

While only up to 71 turbines are planned to be constructed, all 87 turbine locations under consideration were included in the model. A total of five model runs are included in this report:

1. 87 Emerson Creek turbines only - Vestas V150, 4.2 MW with a hub height of 105 meters

[3] Of the 3,236 sensitive receptors modeled, most of them are residences. There are however 6 churches, 197 businesses, and 1 school within the 1 mile buffer that were included in the model.

2. 87 Emerson Creek turbines only - Nordex N149, 4.5 MW with a hub height of 109 meters
3. 87 Emerson Creek turbines only - Nordex N149, 4.5 MW with a hub height of 125 meters
4. 87 Emerson Creek turbines only - Siemens Gamesa SG 4.5-145, 4.5 MW with a hub height of 107.5 meters
5. Cumulative Effect: 27 Republic Wind turbines (SG 4.5-145) within 3 miles of Emerson Creek, 31 Seneca Wind turbines (mixture of GE 2.5-127 and 2.3-116 turbines per the Seneca Wind permit application) within 3 miles of Emerson Creek, and 87 Emerson Creek turbines using Siemens Gamesa SG 4.5-145, 4.5 MW with a hub height of 107.5 meters

Each model run also included the sound emissions from two transformers at the project substation. The transformers have a NEMA TR-1 sound pressure level of 82 dBA with no cooling (ONAN), 84 dBA with stage 1 cooling, and 86 dBA with stage 2 cooling (ONAF), but it is our understanding that Apex intends to specify from the transformer manufacturer that the transformers meet a sound specification of at least a 5 dB less than the NEMA TR-1 sound level. As such, the transformers were modeled as a sound pressure level of 81 dBA with stage 2 cooling.

6.2 MODEL RESULTS

A summary of the sound propagation model results for each turbine model is provided in Table 4, and Appendix D provides a list of the calculated overall sound pressure levels at each discrete receiver for all five model runs and maps showing all receiver identification numbers for reference to the chart.

As shown in Table 4, all non-participating sensitive receptors are projected at 49 dBA or less from all four model runs that include only the Emerson Creek turbines. That is less than the 49 dBA OPSB limit that is applicable to this project.

The highest participating sensitive receptor is 54 dBA which is a participating receptor located adjacent to the project substation. The modeled sound level at that receptor is due to the two project transformers during stage two cooling (ONAF) which would involve cooling fans operating. The cooling fans typically operate periodically during the day when the ambient temperature is high (e.g. hot summer day). At night the transformers would typically operate with natural convection cooling (ONAN) which does not involve cooling fans. Under ONAN conditions the sound level at the closest participating receptor to the substation would be 49 dBA.

TABLE 4: SUMMARY OF MODELED SOUND PRESSURE LEVELS (dBA) FOR EACH MODEL RUN

Receptor Classification	V150			N149 at 109m			N149 at 125m			SG 4.5-145			Cummulative (Emerson, Republic, Seneca)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
All	35	54	24	36	54	24	36	54	24	37	54	26	38	54	28
Participating	40	54	28	40	54	28	40	54	28	42	54	30	42	54	31
Non-Participating	35	46	24	35	47	24	35	47	24	37	48	26	38	51	28

If Emerson Creek, Republic Wind, and Seneca Wind were all constructed the highest sound level due to wind turbines at a non-participating receptor within 1 mile of Emerson Creek is 51 dBA (see Table 4). In fact, there are three non-participating receptors (ID 2175, 2964, & 3022 in Appendix D) that would exceed 49 dBA under the cumulative scenario. The receptors are located on the border between Emerson Creek and Seneca Wind in the southwest corner of the Emerson Creek project area, between 1,450 meters (4,757 feet) and 1,550 meters (5,085 feet) west of T80. The cause of the sound levels in excess of 49 dBA at these four receivers is due primarily to Seneca Wind as the sound attributable to the Emerson Creek Project alone is 37 dBA at ID 2175 and ID 3022 and 36 dBA at ID 2964.It is important to note that Noise Reduced Operations (NRO) was proposed by Seneca Wind[4] for some turbines, but it is not apparent from their sound report which turbines would implement that technology. If it is planned to be incorporated into the operation of the turbines closest to ID 2175, 2964, and 3022 then the projected sound levels at those receptors from the cumulative model run would likely be less than what is reported in this document.

Table 4 shows that, of the current wind turbines under consideration for Emerson Creek, the SG 4.5-145 produces the highest sound level at the modeled receptors. As such, model results for the SG 4.5-145 are shown in Figure 48 in a contour line map format. Results are presented as contour lines representing 5-dB increments of calculated A-weighted sound pressure level from 25 to 55 dBA. In addition, a red dashed contour line is shown that represents 49 dBA, the applicable OPSB limit for Emerson Creek. At the full scale shown in Figure 48, it is difficult to visually discern, but there are no non-participating receptors within the 49 dBA sound level limit contour.

The results of the cumulative effect model run which takes into account turbines from the proposed Republic Wind and Seneca Wind projects is provided in Figure 49.

[4] "Seneca Wind Acoustic Assessment", Tetratech, July 2018, pg. 12.

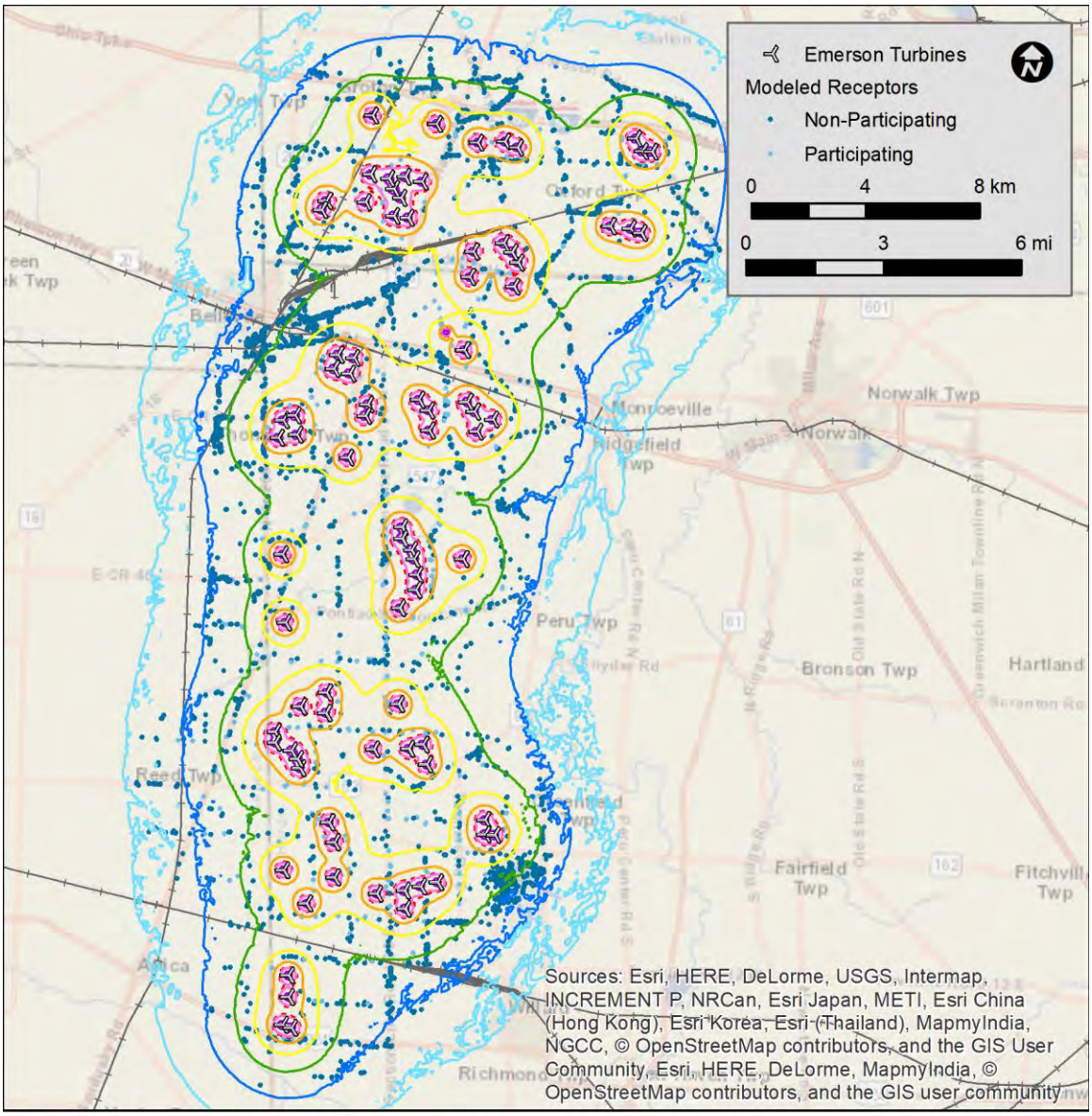


FIGURE 48: SOUND PROPAGATION MODEL RESULTS – SG 4.5-145, EMERSON TURBINES ONLY

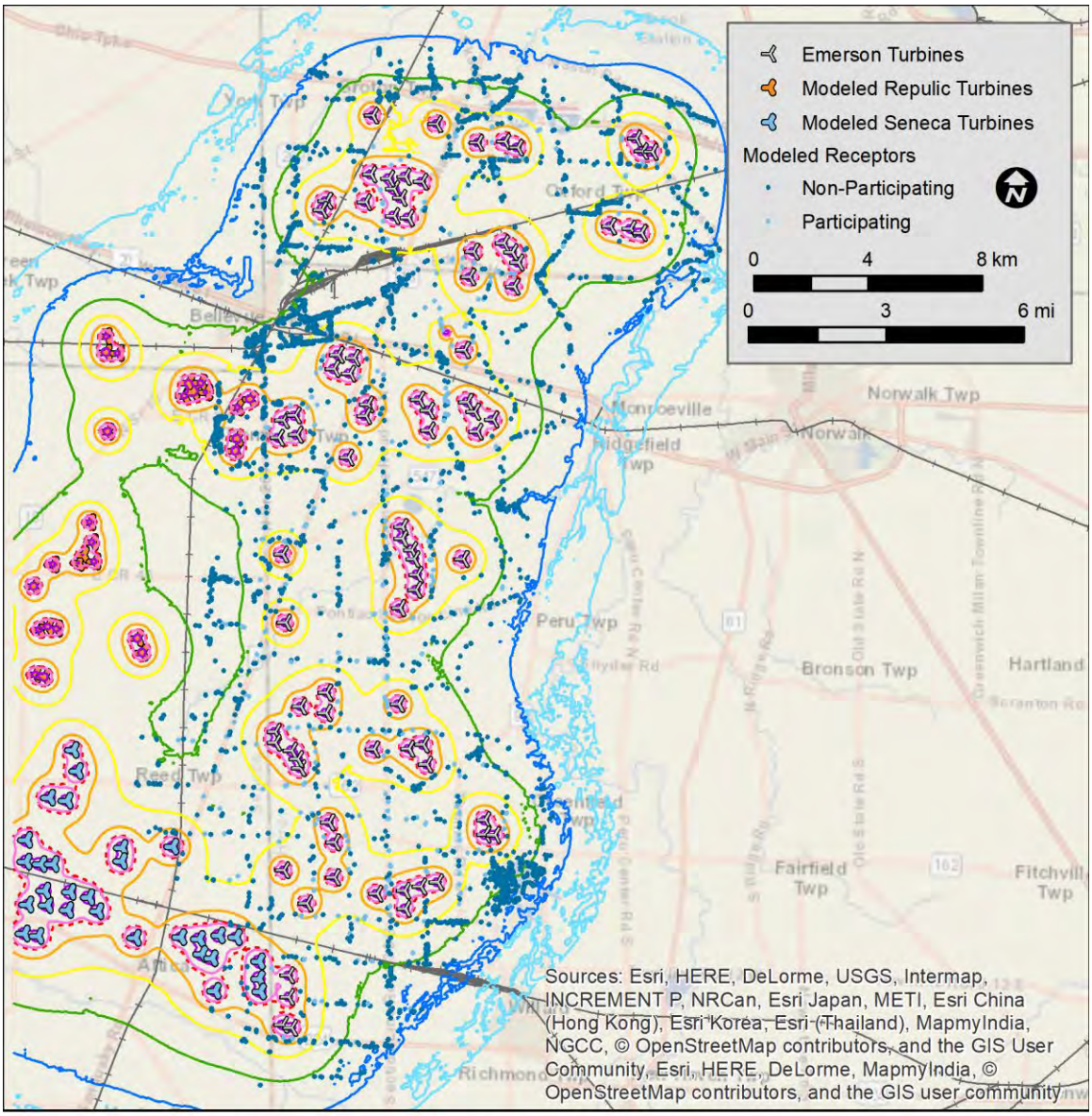


FIGURE 49: SOUND PROPAGATION MODEL RESULTS – CUMMULATIVE MODEL RUN, EMERSON CREEK (SG 4.5-145), REPUBLIC WIND, AND SENECA WIND

7.0 CONSTRUCTION NOISE

Construction for the project will be primarily at the wind turbine sites. While there may be activity closer to residences for road construction and utility work, such work will be of a relatively short duration.

Equipment used for construction will vary. Some of the louder pieces of equipment are shown in Table 5 along with the approximate maximum sound pressure levels at 15 meters (50 feet) and 447 meters (1,468 feet), the closest distance between a turbine site and a non-participating receptor.

TABLE 5: MAXIMUM SOUND LEVELS FROM VARIOUS TYPES OF CONSTRUCTION EQUIPMENT ASSUMING NO ATTENUATION FROM TREES OR TERRAIN

Equipment	Maximum Sound Pressure Level at 447 meters (1,468 feet) (dBA)[5]	Maximum Sound Pressure Level at 15 meters (50 feet) (dBA)
M-250 Liftcrane	48	83
2250 S3 Liftcrane	43	78
Excavator	50	83
Dump truck being loaded	54	86
Dump truck at 25 mph accelerating	44	76
Tractor trailer at 25 mph accelerating	49	80
Concrete truck	46	81
Bulldozer	50	85
Rock drill	62	100
Loader	42	80
Backhoe	45	80
Wood chipper	64	96

Major construction work, such as clearing for the access roads and any drilling or blasting, will occur during the day. Per OPSB requirements, any construction activities that increase sound above ambient levels at sensitive receptors will be limited to the hours of 7 AM to 7 PM or dusk, whichever is later. Pile driving, blasting, and rock hammering will occur between the hours of 10 AM to 5 PM.

[5] Assumes hard ground around construction site, and ISO 9613-2 propagation with no vegetation reduction. Actual sound levels will likely be lower given the prevalence of vegetation and soft ground around the site.

8.0 SUMMARY & CONCLUSIONS

Emerson Creek is a proposed wind power project that would be located in Erie, Huron and Seneca Counties. The facility is permitting up to 87 wind turbine locations but is planning to construct up to 71 wind turbines for a project rating of up to 297.66 MW. In preparation for OPSB permitting, RSG conducted a sound level assessment of the project that included background sound level monitoring of the existing environment in and around the project area and sound propagation modeling to predict project-only sound levels at nearby residences.

Summary and conclusions are as follows:

1. Emerson Creek is current considering three turbine models: the Vestas V150 4.2 MW with a hub height of 105 meters, the Siemens Gamesa SG 4.5-145 4.5 MW with a hub height of 107.5 meters, and the Nordex N149 4.5 MW with a hub height of 109 meters and 125 meters under consideration.
2. Sound sources in the existing soundscape include agricultural activities, vehicle passbys and distant traffic, train passbys (near and far), airplane overflights, and biogenic and geophonic sounds.
    a. Background sound levels vary some around the project site. As reported in Section 5.0, sound levels were highest at Monitor 1, Monitor 6, and Monitor 9 with nighttime sound levels (L_{eq}) between 50 and 52 dBA due to distant traffic and agricultural activities. In contrast, Monitors 7 and 8 were the quietest with nighttime sound levels (L_{eq}) between 35 and 36 dBA.
    b. The average nighttime L_{eq} across the project area was 44 dBA.
3. The applicable sound level standard comes from Section 4906-4-09(F) of the OAC and sets a limit of “the project area ambient nighttime L_{eq} plus five dBA.” In this case, the measured nighttime L_{eq} was 44 dBA setting a sound level limit of 49 dBA for Emerson Creek.
4. Sound propagation modeling was performed in accordance with ISO 9613-2 at over 3,200 discrete receivers that represent sensitive receptors within 1 mile of the project. Modeling was performed assuming spectral ground attenuation, a ground factor of G=0.5 and an additional 2 dB per typical manufacturer warranty confidence interval specifications.
5. Modeling was completed for five scenarios:
    a. 87 Emerson Creek turbines only - Vestas V150, 4.2 MW with a hub height of 105 meters

   b. 87 Emerson Creek turbines only - Nordex N149, 4.5 MW with a hub height of 109 meters
   c. 87 Emerson Creek turbines only - Nordex N149, 4.5 MW with a hub height of 125 meters
   d. 87 Emerson Creek turbines only - Siemens Gamesa SG 4.5-145, 4.5 MW with a hub height of 107.5 meters
   e. Cumulative Effect: 27 Republic Wind turbines (SG 4.5-145) within 3 miles of Emerson Creek, 31 Seneca Wind turbines (mixture of GE 2.5-127 and 2.3-116 turbines per the Seneca Wind permit application) within 3 miles of Emerson Creek, and 87 Emerson Creek turbines using Siemens Gamesa SG 4.5-145, 4.5 MW with a hub height of 107.5 meters

6. Model results are summarized in Section 6.2, and provided in tabular format for all model runs in Appendix D. For all four Emerson Creek only model run, all non-participating receptors were less than 49 dBA, meeting the applicable OPSB limit for the project.
7. For the Cumulative Effect model run, there were three non-participating receptors in excess of 49 dBA (up to 51 dBA) along the border between Seneca Wind and Emerson Creek Wind. This is due primarily to the projected sound levels from Seneca Wind which may be providing Noise Reduced Operation (NRO) for some of their turbines, but the turbines Seneca plans to implement NRO on did not appear to be specified in the noise report for the project.
   a. If needed, the contribution from Emerson Creek at the three affected receivers could be marginally reduced by implementing NRO on Emerson Creek's T80.
8. Construction activities that increase sound above ambient levels at sensitive receptors will be limited to the hours of 7 AM to 7 PM or dusk, whichever is later. Sound levels due to construction and summarized in Section 7.

APPENDIX A. ACOUSTICS PRIMER

Expressing Sound in Decibel Levels

The varying air pressure that constitutes sound can be characterized in many different ways. The human ear is the basis for the metrics that are used in acoustics. Normal human hearing is sensitive to sound fluctuations over an enormous range of pressures, from about 20 micropascals (the "threshold of audibility") to about 20 pascals (the "threshold of pain").[6] This factor of one million in sound pressure difference is challenging to convey in engineering units. Instead, sound pressure is converted to sound "levels" in units of "decibels" (dB, named after Alexander Graham Bell). Once a measured sound is converted to dB, it is denoted as a level with the letter "L".

The conversion from sound pressure in pascals to sound level in dB is a four-step process. First, the sound wave's measured amplitude is squared and the mean is taken. Second, a ratio is taken between the mean square sound pressure and the square of the threshold of audibility (20 micropascals). Third, using the logarithm function, the ratio is converted to factors of 10. The final result is multiplied by 10 to give the decibel level. By this decibel scale, sound levels range from 0 dB at the threshold of audibility to 120 dB at the threshold of pain.

Typical sound sources, and their sound pressure levels, are listed on the scale in Figure 50.

Human Response to Sound Levels: Apparent Loudness

For every 20 dB increase in sound level, the sound pressure increases by a *factor* of 10; the sound *level* range from 0 dB to 120 dB covers 6 factors of 10, or one million, in sound *pressure*. However, for an increase of 10 dB in sound *level* as measured by a meter, humans perceive an approximate doubling of apparent loudness: to the human ear, a sound level of 70 dB sounds about "twice as loud" as a sound level of 60 dB. Smaller changes in sound level, less than 3 dB up or down, are generally not perceptible.

[6] The pascal is a measure of pressure in the metric system. In Imperial units, they are themselves very small: one pascal is only 145 millionths of a pound per square inch (psi). The sound pressure at the threshold of audibility is only 3 one-billionths of one psi: at the threshold of pain, it is about 3 one-thousandths of one psi.

FIGURE 50: A SCALE OF SOUND PRESSURE LEVELS FOR TYPICAL SOUND SOURCES

Frequency Spectrum of Sound

The “frequency” of a sound is the rate at which it fluctuates in time, expressed in Hertz (Hz), or cycles per second. Very few sounds occur at only one frequency: most sound contains energy at many different frequencies, and it can be broken down into different frequency divisions, or bands. These bands are similar to musical pitches, from low tones to high tones. The most common division is the standard octave band. An octave is the range of frequencies whose upper frequency limit is twice its lower frequency limit, exactly like an octave in music. An octave band is identified by its center frequency: each successive band’s center frequency is twice as high (one octave) as the previous band. For example, the 500 Hz octave band includes all sound whose frequencies range between 354 Hz (Hertz, or cycles per second) and 707 Hz. The next band is centered at 1,000 Hz with a range between 707 Hz and 1,414 Hz. The range of human hearing is divided into 10 standard octave bands: 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1,000 Hz, 2,000 Hz, 4,000 Hz, 8,000 Hz, and 16,000 Hz. For analyses that require finer frequency detail, each octave-band can be subdivided. A commonly-used subdivision creates three smaller bands within each octave band, or so-called 1/3-octave bands.

Human Response to Frequency: Weighting of Sound Levels

The human ear is not equally sensitive to sounds of all frequencies. Sounds at some frequencies seem louder than others, despite having the same decibel level as measured by a sound level meter. In particular, human hearing is much more sensitive to medium pitches (from about 500 Hz to about 4,000 Hz) than to very low or very high pitches. For example, a tone measuring 80 dB at 500 Hz (a medium pitch) sounds quite a bit louder than a tone measuring 80 dB at 60 Hz (a very low pitch). The frequency response of normal human hearing ranges from 20 Hz to 20,000 Hz. Below 20 Hz, sound pressure fluctuations are not “heard”, but sometimes can be “felt”. This is known as “infrasound”. Likewise, above 20,000 Hz, sound can no longer be heard by humans; this is known as “ultrasound”. As humans age, they tend to lose the ability to hear higher frequencies first; many adults do not hear very well above about 16,000 Hz. Most natural and man-made sound occurs in the range from about 40 Hz to about 4,000 Hz. Some insects and birdsongs reach to about 8,000 Hz.

To adjust measured sound pressure levels so that they mimic human hearing response, sound level meters apply filters, known as “frequency weightings”, to the signals. There are several defined weighting scales, including “A”, “B”, “C”, “D”, “G”, and “Z”. The most common weighting scale used in environmental noise analysis and regulation is A-weighting. This weighting represents the sensitivity of the human ear to sounds of low to moderate level. It attenuates sounds with frequencies below 1000 Hz and above 4000 Hz; it amplifies very slightly sounds between 1000 Hz and 4000 Hz, where the human ear is particularly sensitive. The C-weighting scale is sometimes used to describe louder sounds. The B- and D- scales are seldom used. All of these frequency weighting scales are normalized to the average human hearing response at

1000 Hz: at this frequency, the filters neither attenuate nor amplify. When a reported sound level has been filtered using a frequency weighting, the letter is appended to “dB”. For example, sound with A-weighting is usually denoted “dBA”. When no filtering is applied, the level is denoted “dB” or “dBZ”. The letter is also appended as a subscript to the level indicator “L”, for example “L_A” for A-weighted levels.

Time Response of Sound Level Meters

Because sound levels can vary greatly from one moment to the next, the time over which sound is measured can influence the value of the levels reported. Often, sound is measured in real time, as it fluctuates. In this case, acousticians apply a so-called “time response” to the sound level meter, and this time response is often part of regulations for measuring sound. If the sound level is varying slowly, over a few seconds, “Slow” time response is applied, with a time constant of one second. If the sound level is varying quickly (for example, if brief events are mixed into the overall sound), “Fast” time response can be applied, with a time constant of one-eighth of a second.[7] The time response setting for a sound level measurement is indicated with the subscript “S” for Slow and “F” for Fast: L_S or L_F. A sound level meter set to Fast time response will indicate higher sound levels than one set to Slow time response when brief events are mixed into the overall sound, because it can respond more quickly.

In some cases, the maximum sound level that can be generated by a source is of concern. Likewise, the minimum sound level occurring during a monitoring period may be required. To measure these, the sound level meter can be set to capture and hold the highest and lowest levels measured during a given monitoring period. This is represented by the subscript “max”, denoted as “L_{max}”. One can define a “max” level with Fast response L_{Fmax} (1/8-second time constant), Slow time response L_{Smax} (1-second time constant), or Continuous Equivalent level over a specified time period L_{EQmax}.

Accounting for Changes in Sound Over Time

A sound level meter’s time response settings are useful for continuous monitoring. However, they are less useful in summarizing sound levels over longer periods. To do so, acousticians apply simple statistics to the measured sound levels, resulting in a set of defined types of sound level related to averages over time. An example is shown in Figure 51. The sound level at each instant of time is the grey trace going from left to right. Over the total time it was measured (1 hour in the figure), the sound energy spends certain fractions of time near various levels, ranging from the minimum (about 27 dB in the figure) to the maximum (about 65 dB in the figure). The simplest descriptor is the average sound level, known as the Equivalent Continuous

[7] There is a third-time response defined by standards, the “Impulse” response. This response was defined to enable use of older, analog meters when measuring very brief sounds; it is no longer in common use.

Sound Level. Statistical levels are used to determine for what percentage of time the sound is louder than any given level. These levels are described in the following sections.

Equivalent Continuous Sound Level - Leq

One straightforward, common way of describing sound levels is in terms of the Continuous Equivalent Sound Level, or L_{EQ}. The L_{EQ} is the average sound pressure level over a defined period of time, such as one hour or one day. L_{EQ} is the most commonly used descriptor in noise standards and regulations. L_{EQ} is representative of the overall sound to which a person is exposed. Because of the logarithmic calculation of decibels, L_{EQ} tends to favor higher sound levels: loud and infrequent sources have a larger impact on the resulting average sound level than quieter but more frequent sounds. For example, in Figure 51, even though the sound levels spends most of the time near about 34 dBA, the L_{EQ} is 41 dBA, having been “inflated” by the maximum level of 65 dBA and other occasional spikes over the course of the hour.

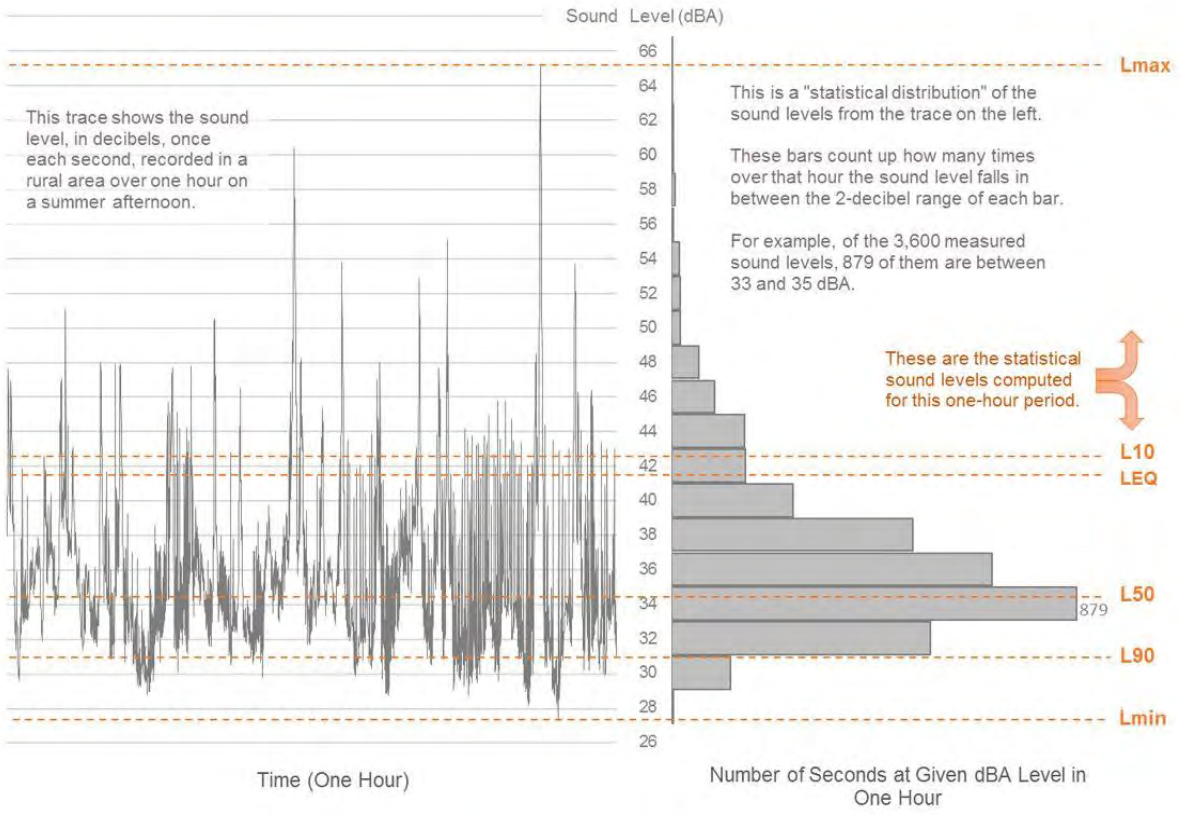


FIGURE 51: EXAMPLE OF DESCRIPTIVE TERMS OF SOUND MEASUREMENT OVER TIME

Percentile Sound Levels – Ln

Percentile sound levels describe the statistical distribution of sound levels over time. "L_N" is the level above which the sound spends "N" percent of the time. For example, L_{90} (sometimes called the "residual base level") is the sound level exceeded 90% of the time: the sound is louder than L_{90} most of the time. L_{10} is the sound level that is exceeded only 10% of the time. L_{50} (the "median level") is exceeded 50% of the time: half of the time the sound is louder than L_{50}, and half the time it is quieter than L_{50}. Note that L_{50} (median) and L_{EQ} (mean) are not always the same, for reasons described in the previous section.

L_{90} is often a good representation of the "ambient sound" in an area. This is the sound that persists for longer periods, and below which the overall sound level seldom falls. It tends to filter out other short-term environmental sounds that aren't part of the source being investigated. L_{10} represents the higher, but less frequent, sound levels. These could include such events as barking dogs, vehicles driving by and aircraft flying overhead, gusts of wind, and work operations. L_{90} represents the background sound that is present when these event sounds are excluded.

Note that if one sound source is very constant and dominates the soundscape in an area, all of the descriptive sound levels mentioned here tend toward the same value. It is when the sound is varying widely from one moment to the next that the statistical descriptors are useful.

APPENDIX B. WIND TURBINE ACOUSTICS

Sources of Sound Generation by Wind Turbines

Wind turbines generate two principal types of noise: aerodynamic noise, produced from the flow of air around the blades, and mechanical noise, produced from mechanical and electrical components within the nacelle.

Aerodynamic noise is the primary source of noise associated with wind turbines. These acoustic emissions can be either tonal or broad band. Tonal noise occurs at discrete frequencies, whereas broadband noise is distributed with little peaking across the frequency spectrum.

While unusual, tonal noise can also originate from unstable air flows over holes, slits, or blunt trailing edges on blades. Most modern wind turbines have upwind rotors designed to prevent blade impulsive noise. Therefore, the majority of audible aerodynamic noise from wind turbines is broadband at the middle frequencies, roughly between 200 Hz and 1,000 Hz.

Wind turbines emit aerodynamic broadband noise as the spinning blades interact with atmospheric turbulence and as air flows along their surfaces. This produces a characteristic “whooshing” sound through several mechanisms (Figure 52):

- Inflow turbulence noise occurs when the rotor blades encounter atmospheric turbulence as they pass through the air. Uneven pressure on a rotor blade causes variations in the local angle of attack, which affects the lift and drag forces, causing aerodynamic loading fluctuations. This generates noise that varies across a wide range of frequencies but is most significant at frequencies below 500 Hz.
- Trailing edge noise is produced as boundary-layer turbulence as the air passes into the wake, or trailing edge, of the blade. This noise is distributed across a wide frequency range but is most notable at high frequencies between 700 Hz and 2 kHz.
- Tip vortex noise occurs when tip turbulence interacts with the surface of the blade tip. While this is audible near the turbine, it tends to be a small component of the overall noise further away.
- Stall or separation noise occurs due to the interaction of turbulence with the blade surface.

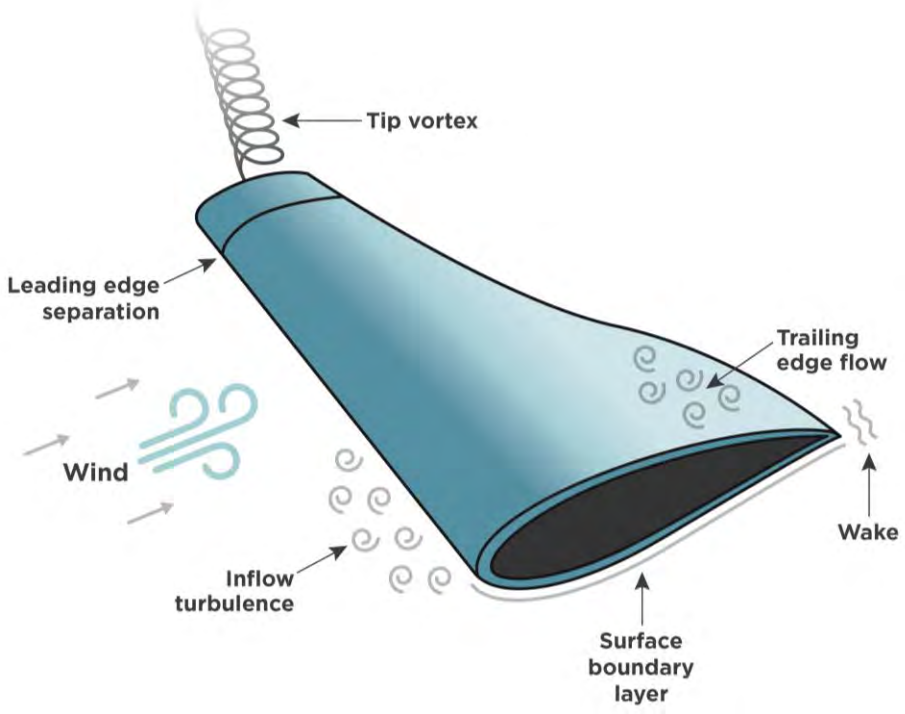


FIGURE 52: AIRFLOW AROUND A ROTOR BLADE

Mechanical sound from machinery inside the nacelle tends to be tonal in nature but can also have a broadband component. Potential sources of mechanical noise include the gearbox, generator, yaw drives, cooling fans, and auxiliary equipment. These components are housed within the nacelle, whose surfaces, if untreated, radiate the resulting noise. However modern wind turbines have nacelles that are designed to reduce internal noise, and rarely is the mechanical noise a significant portion of the total noise from a wind turbine.

Amplitude Modulation

Amplitude modulation (AM) is a fluctuation in sound level that occurs at the blade passage frequency. No consistent definition exists for how much of a sound level fluctuation is necessary for blade swish to be considered AM, however sound level fluctuations in A-weighted sound level can range up to 10 dB. Fluctuations in individual 1/3 octave bands are typically more and can exceed 15 dB. Fluctuations in individual 1/3 octave bands can sometimes synchronize and desynchronize over periods, leading to increases and decreases in magnitude of the A-weighted fluctuations. Similarly, in wind farms with multiple turbines, fluctuations can

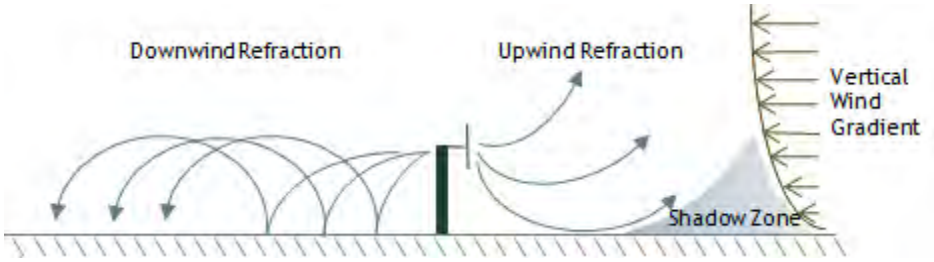
synchronize and desynchronize, leading to variations in AM depth.[8] Most amplitude modulation is in the mid frequencies and most overall A-weighted AM is less than 4.5 dB in depth.[9]

Many confirmed and hypothesized causes of AM exist, including: blade passage in front of the tower, blade tip sound emission directivity, wind shear, inflow turbulence, and turbine blade yaw error. It has recently been noted that although wind shear can contribute to the extent of AM, wind shear does not contribute to the existence of AM in and of itself. Instead, there needs to be detachment of airflow from the blades for wind shear to contribute to AM.[10] While factors like the blade passing in front of the tower are intrinsic to wind turbine design, other factors vary with turbine design, local meteorology, topography, and turbine layout. Mountainous areas, for example, are more likely to have turbulent airflow, less likely to have high wind shear, and less likely to have turbine layouts that allow for blade passage synchronization for multiple turbines. AM extent varies with the relative location of a receptor to the turbine. AM is usually experienced most when the receptor is between 45 and 60 degrees from the downwind or upwind position and is experienced least directly with the receptor directly upwind or downwind of the turbines.

Meteorology

Meteorological conditions can significantly affect sound propagation. The two most important conditions to consider are wind shear and temperature lapse. Wind shear is the difference in wind speeds by elevation and temperature lapse rate is the temperature gradient by elevation. In conditions with high wind shear (large wind speed gradient), sound levels upwind from the source tend to decrease and sound levels downwind tend to increase due to the refraction, or bending, of the sound (Figure 53).

[8] McCunney, Robert, et al. “Wind Turbines and Health: A Critical Review of the Scientific Literature.” *Journal of Occupational and Environmental Medicine.* 56(11) November 2014: pp. e108-e130.
[9] RSG, et al., “Massachusetts Study on Wind Turbine Acoustics,” Massachusetts Clean Energy Center and Massachusetts Department of Environmental Protection, 2016
[10] “Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause and Effect.” *RenewableUK.* December 2013.



Not to scale

FIGURE 53: SCHEMATIC OF THE REFRACTION OF SOUND DUE TO VERTICAL WIND GRADIENT (WIND SHEAR)

With temperature lapse, when ground surface temperatures are higher than those aloft, sound will tend to refract upwards, leading to lower sound levels near the ground. The opposite is true when ground temperatures are lower than those aloft (an inversion condition).

High winds and high solar radiation can create turbulence which tends to break up and dissipate sound energy. Highly stable atmospheres, which tend to occur on clear nights with low ground-level wind speeds, tend to minimize atmospheric turbulence and are generally more favorable to downwind propagation.

In general terms, sound propagates along the ground best under stable conditions with a strong temperature inversion. This tends to occur during the night and is characterized by low ground-level winds. As a result, worst-case conditions for wind turbines tend to occur downwind under moderate nighttime temperature inversions. Therefore, this is the default condition for modeling wind turbine sound.

Masking

As mentioned above, sound levels from wind turbines are a function of wind speed. Background sound is also a function of wind speed, i.e., the stronger the winds, the louder the resulting background sound. This effect is amplified in areas covered by trees and other vegetation.

The sound from a wind turbine can often be masked by wind noise at downwind receptors because the frequency spectrum from wind is similar to the frequency spectrum from a wind turbine. Figure 54 compares the shape of the sound spectrum measured during a 5 m/s wind event to that of a Vestas V150 STE 4.2 MW wind turbine. As shown, the shapes of the spectra are similar at lower frequencies. At higher frequencies, the sounds from the masking wind noise are higher than the wind turbine. As a result, the masking of turbine noise occurs at higher wind speeds for some meteorological conditions. Masking will occur most, when ground wind speeds are relatively high, creating wind-caused noise such as wind blowing through the trees and interaction of wind with structures.

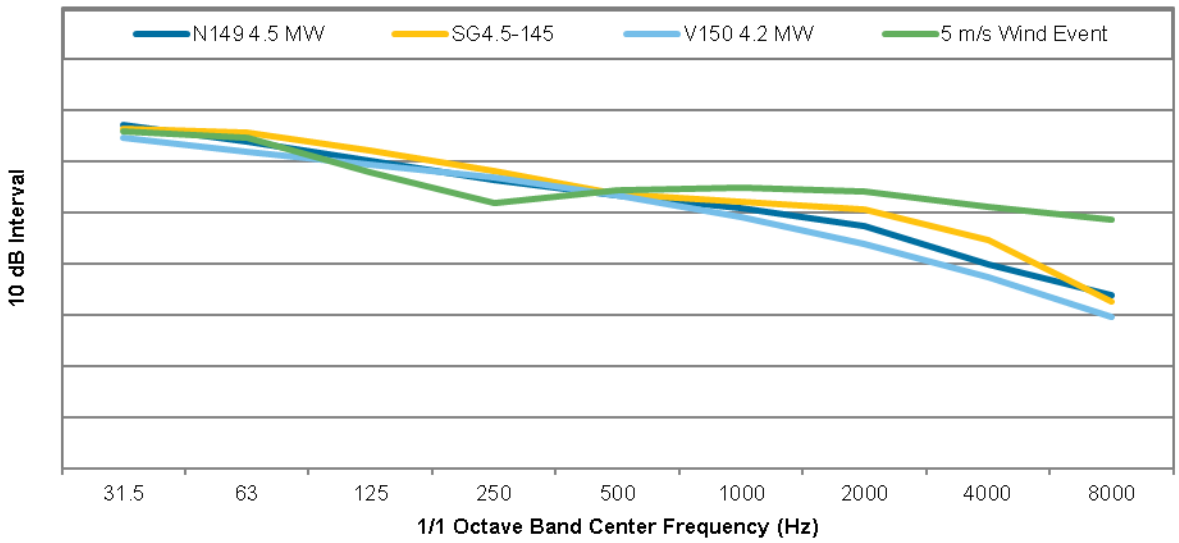


FIGURE 54: COMPARISON OF NORMALIZED FREQUENCY SPECTRA MEASURED FROM A 5 M/S WIND EVENT AND THE SOUND POWER SPECTRA FROM VESTAS V150, SIEMENS SG4.5-145, AND NORDEX N149 WIND TURBINES [11]

It is important to note that while winds may be blowing at turbine height, there may be little to no wind at ground level. This is especially true during strong wind gradients (high wind shear), which mostly occur at night. This can also occur on the leeward side of ridges where the ridge blocks the wind.

Infrasound and Low-Frequency Sound

Infrasound is sound pressure fluctuations at frequencies below about 20 Hz. Sound below this frequency is only audible at high magnitudes. Low-frequency sound is in the audible range of human hearing, that is, above 20 Hz, but below 100 to 200 Hz depending on the definition.

Low-frequency aerodynamic tonal noise is typically associated with downwind rotors on horizontal axis wind turbines. In this configuration, the rotor plane is behind the tower relative to the oncoming wind. As the turbine blades rotate, each blade crosses behind the tower's aerodynamic wake and experiences brief load fluctuations. This causes short, low-frequency pulses or thumping sounds called blade impulsive noise. Large modern wind turbines are "upwind", where the rotor plane is upwind of the tower. As a result, this type of low-frequency noise is at a much lower magnitude with upwind turbines than downwind turbines, well below established infrasonic hearing thresholds.

[11] The purpose of this Figure is to show the shapes to two spectra relative to one another and not the actual sound level of the two sources of sound. The level of each source was normalized independently.

Figure 55 shows the sound levels 350 meters from a wind turbine when the wind turbine was operating (T-on) and shut down (T-off) for wind speeds at hub height greater than 9 m/s. Measurements were made over approximately two weeks.[12] The red 90 dBG line is shown here as the ISO 7196:1995 perceptibility threshold. As shown, the wind turbines generated measurable infrasound, but at least 20 dB below audibility thresholds.

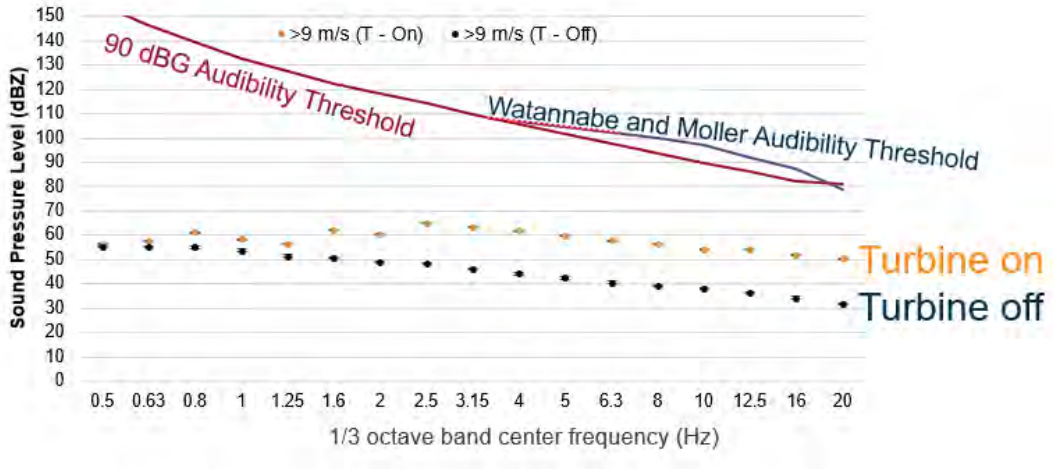


FIGURE 55: INFRASOUND FROM A WIND TURBINE AT 350 METERS COMPARED WITH PERCEPTION THESHOLDS

Existing background infrasound in rural areas are generally comparable to wind turbine infrasound at typical receptor distances. As an example, RSG measured background infrasound just east of the Boutwell Hill State Forest, a relatively remote area in the Town of Cherry Creek, NY.[13] We then compared these measured background levels to those measured 350 meters from an operating wind turbine in Massachusetts.[14] As shown in Figure 56, the background infrasound levels are generally within 10 dB of the wind turbine infrasound, even with the wind turbine operating with wind speeds greater than 9 m/s. In all cases, both background and wind turbine infrasound are over 30 dB below the 90 dBG infrasound perception threshold.

[12] RSG, et al., "Massachusetts Study on Wind Turbine Acoustics," Massachusetts Clean Energy Center and Massachusetts Department of Environmental Protection, 2016 – Graphic from RSG presentation to MassDEP WNTAG, March 2016
[13] RSG, "Cassadaga Wind Preconstruction Noise Impact Assessment," Prepared for Cassadaga Wind, LLC, May 2016.
[14] RSG, et al. "Massachusetts study on wind turbine acoustics." Prepared for MassCEC and MassDEP, February 2016

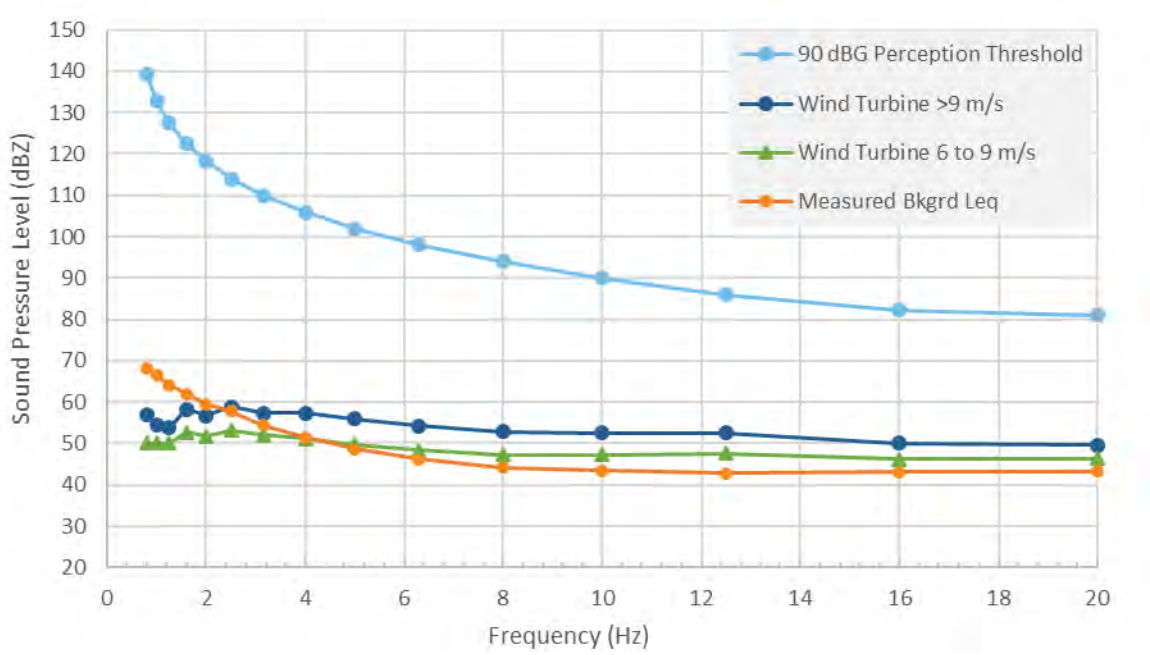


FIGURE 56: COMPARISON OF MEASURED BACKGROUND INFRASOUND AT A REMOTE SITE IN CHERRY CREEK NY WITH THOSE FROM MEASURED 350 METERS FROM AN OPERATING WIND TURBINE AND THE 90 dBG PERCEPTION THRESHOLD.

Low-frequency sound is produced, in part, by the generator and mechanical components. Much of this mechanical noise has been reduced in modern wind turbines through improved sound insulation at the hub. Low-frequency sound can also be generated by the blades at higher wind speeds when the inflow air is turbulent. At these wind speeds, low-frequency sound from the wind turbine blades is often masked by wind noise at the downwind receptors.

Finally, low-frequency sound is absorbed less by the atmosphere and ground than higher frequency sound. Our modeling takes into account frequency-specific ground attenuation and atmospheric absorption factors.

Wind Turbine Noise Abatement Measures

Wind turbine noise can be abated using either factory-installed measures, siting methods, or measures implemented after the project is constructed.

Wind Turbine Design

Horizontal axis wind turbines, with three blades, positioned upwind of the tower are the only type typically used for utility-scale wind power. Turbines with the blades positioned downwind of the tower are obsolete and cause more noise issues than upwind designs due to the blades passing through the wake of the tower. Vertical axis wind turbines are not available in megawatt scale.

The design of the blade can have a substantial impact on noise generation. Noise control is considered during the blade design process.

Some turbine models are available with serrated trailing edges, that reduce wind turbine aerodynamic noise by smoothing the flow of air behind the blade, reducing turbulence and therefore noise emissions. Depending on the turbine model selected for construction, serrated trailing edge technology may or may not be available. On some models, serrations can be installed after the project is constructed.

Project Siting

Changing of turbine setbacks from sensitive sound receptors can be used to decrease sound levels, however wind turbine layouts must also consider

- Energy production,
- Compliance with wind ordinance setback requirements,
- Compliance with setback requirements for other environmental conditions (water, flora, fauna, etc.),
- Spacing requirements for the turbines themselves,
- Access, and
- Landowner preferences.

As a result, modification of turbine arrangements to decrease sound pressure levels at receptors must be weighed against project performance and feasibility.

Noise Reduced Operations (NRO)

NROs are operations changes to the wind turbine to reduce noise generation. NROs are usually accomplished by adjusting turbine blade pitch, slowing the rotor speed of the turbines, which reduces aerodynamic noise produced by the blades. NROs are a readily available technology on most modern wind turbines and may be used to bring reduce turbine sound power to a level at or below the sound power of the turbine modeled in the Application. NROs can be implemented on as as-needed basis. For example, they can be programmed for selected wind speeds, wind directions, and times of day. The programs can be adjusted at any time after the wind turbines have commenced operations.

Physical Abatement

Due to the inherent size of wind turbines, many physical noise control measures, such as noise barriers, active noise control, and tree plantings, tend to be impractical and we are unaware of them being implemented at any operating wind projects. At receptors, white noise machines or air conditioning can be used to reduce the prominence of wind turbine noise inside buildings,

and the retrofits of residences, such as improved windows can be used to reduce interior sound levels.

APPENDIX C. MODEL INPUT DATA

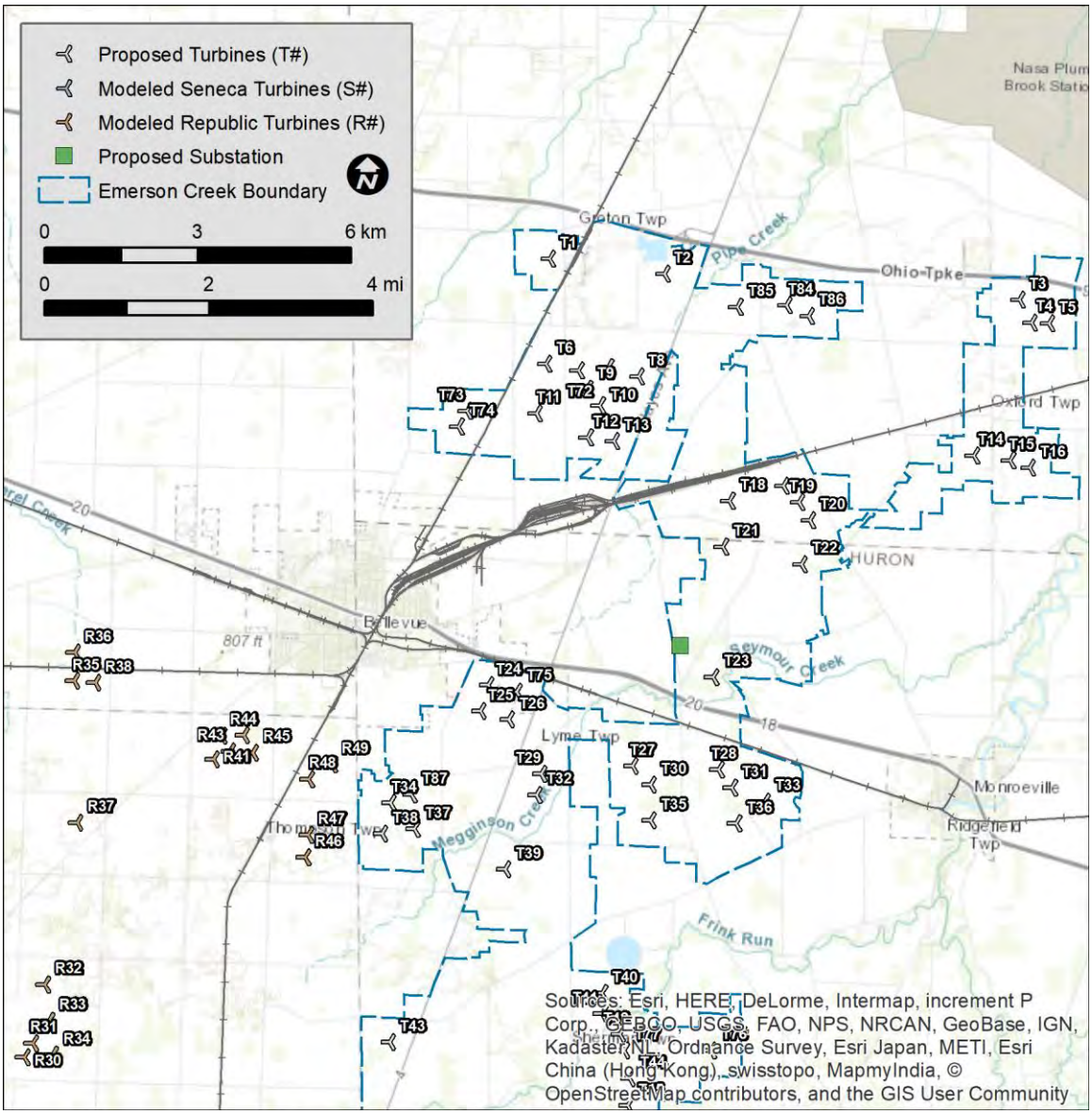


FIGURE 57: MAP OF MODELED SOURCES (NORTHERN AREA)

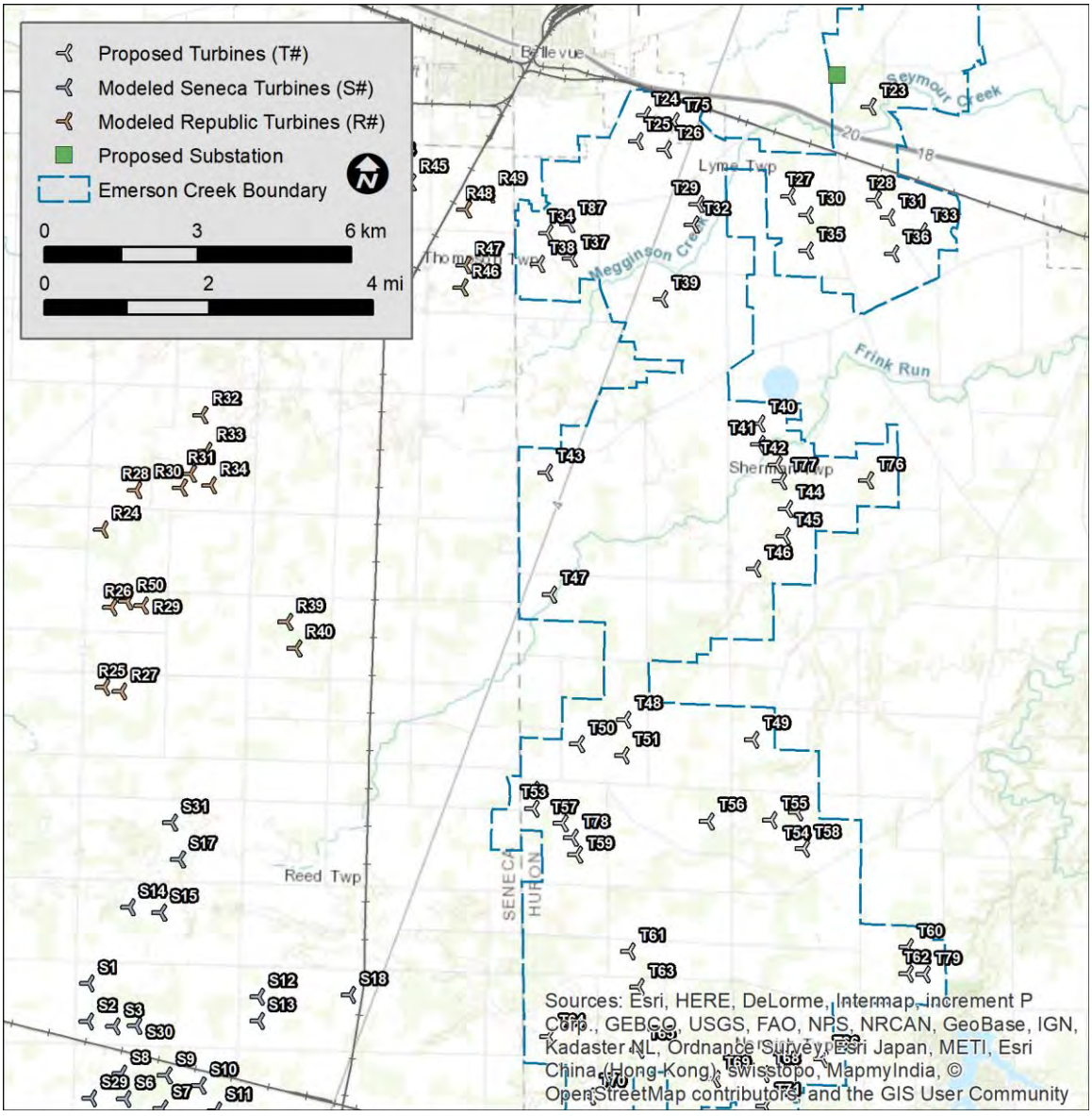


FIGURE 58: MAP OF MODELED SOURCES (MIDDLE AREA)

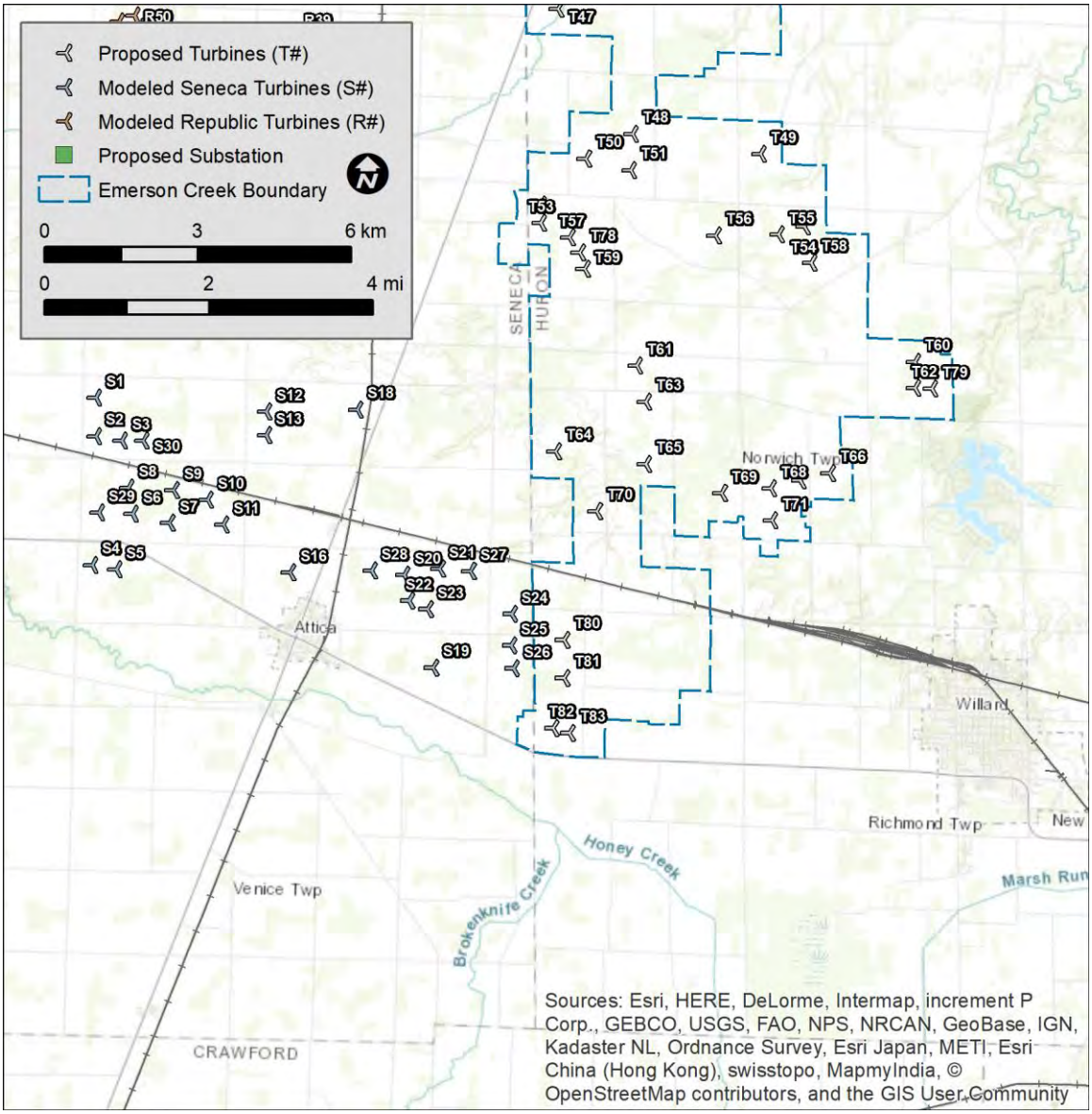


FIGURE 59: MAP OF MODELED SOURCES (SOUTHERN AREA)

TABLE 6: SOUND PROPGATION MODELING PARAMETERS

Parameter	Setting
Ground Absorption	Spectral for all sources, Mixed Ground (G=0.5)
Atmospheric Attenuation	Based on 10 Degrees Celsius, 70% Relative Humidity
Reflections	None
Receiver Height	4 meters for residences and grid
Search Distance	8,000 meters

APPENDIX D. DETAILED MODEL RESULTS

This section provides the model results for each model run at all 3,236 sensitive receptors in Table 7. At the end of the results table are foldout maps (Figure 60 through Figure 65) that provides the location of the receptor IDs that corresponds to the IDs in the results table. The maps are 11”x17”.

TABLE 7: MODEL RESULTS AND RECEIVER COORDINATES FOR ALL SENSITIVE RECEPTORS

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1	Non-participating	35	35	35	36	36	353229	4555368	258
2	Non-participating	39	39	39	40	40	351971	4551976	270
3	Non-participating	41	42	41	43	43	352230	4569172	239
4	Non-participating	33	33	33	35	37	348649	4546603	295
5	Non-participating	39	39	39	41	41	353658	4568766	234
6	Participating	44	45	45	47	47	351513	4556129	256
7	Non-participating	43	43	43	45	45	347724	4554982	265
8	Non-participating	35	35	35	37	37	354816	4551509	262
9	Non-participating	40	40	40	41	41	353048	4577587	222
10	Non-participating	37	38	38	39	40	347147	4569722	241
11	Participating	44	44	44	46	46	347408	4556393	263
12	Participating	38	39	39	40	40	347106	4553301	267
13	Non-participating	37	37	37	38	38	352114	4565265	240
14	Non-participating	35	35	35	36	37	350187	4548458	280
15	Non-participating	42	43	43	44	46	345797	4566154	248
16	Non-participating	39	39	39	40	40	353657	4569026	234
17	Non-participating	33	34	34	35	36	345291	4561441	258
18	Non-participating	34	34	34	36	36	353382	4555452	258
19	Participating	41	41	41	42	42	352856	4570343	237
20	Non-participating	37	38	38	39	39	352798	4565458	238
21	Non-participating	41	42	42	43	43	347892	4569862	242
22	Non-participating	35	35	35	36	40	345792	4568779	242
23	Non-participating	37	38	38	39	39	352606	4553875	264

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
24	Non-participating	31	31	31	33	34	350187	4547405	287
25	Non-participating	42	42	42	44	44	348655	4566909	244
26	Non-participating	43	44	44	45	45	350575	4556102	255
27	Participating	40	41	41	42	42	350270	4551427	269
28	Non-participating	37	37	37	38	41	346094	4550068	281
29	Non-participating	41	41	41	43	43	357524	4574391	220
30	Non-participating	40	41	41	42	42	357523	4574412	221
31	Non-participating	41	42	42	43	43	358610	4574557	217
32	Non-participating	44	45	45	47	47	359196	4575959	213
33	Participating	41	42	42	43	43	352420	4572652	233
34	Participating	40	40	40	42	42	353513	4571307	230
35	Non-participating	37	37	37	38	38	356876	4574320	221
36	Non-participating	36	36	36	38	38	356604	4574142	221
37	Non-participating	40	41	41	42	45	346674	4548267	291
38	Non-participating	38	39	39	40	40	354582	4551944	256
39	Non-participating	38	38	38	39	39	350352	4554193	264
40	Non-participating	39	39	39	41	41	351670	4549484	274
41	Non-participating	38	38	38	40	40	355503	4576077	221
42	Non-participating	34	34	34	35	35	359820	4572362	213
43	Non-participating	38	38	38	39	39	359948	4573474	213
44	Non-participating	40	40	40	42	42	352845	4577517	222
45	Non-participating	41	41	41	43	43	353876	4576036	225
46	Non-participating	40	40	40	41	41	352002	4569123	240
47	Non-participating	41	41	41	43	43	347527	4551727	279
48	Participating	36	36	36	37	38	348421	4558912	255
49	Non-participating	35	35	35	36	36	356218	4576260	220
50	Non-participating	38	39	39	40	40	357955	4577125	218
51	Non-participating	38	38	38	40	40	350566	4565854	244
52	Non-participating	38	38	38	40	41	347575	4545306	292
53	Non-participating	35	35	35	37	38	345869	4563307	250
54	Participating	44	44	44	46	46	347645	4555057	266
55	Non-participating	32	32	32	33	34	350267	4547660	283
56	Non-participating	35	36	36	37	38	350180	4548624	280

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
57	Non-participating	40	40	40	41	41	353835	4575824	223
58	Non-participating	41	41	41	42	43	350022	4568482	242
59	Non-participating	42	43	43	44	44	348436	4557851	257
60	Non-participating	34	35	35	36	38	348345	4548161	286
61	Non-participating	32	32	32	34	34	360307	4578181	211
62	Non-participating	36	36	36	37	37	354167	4578198	212
63	Non-participating	43	44	44	45	45	350113	4562562	245
64	Participating	44	45	45	46	46	350095	4562953	246
65	Non-participating	37	37	37	39	40	346363	4565208	248
66	Non-participating	38	39	39	40	41	347752	4570146	239
67	Non-participating	35	36	36	37	38	346716	4569681	241
68	Non-participating	41	41	41	42	42	350087	4554842	261
69	Non-participating	32	32	32	34	35	348530	4545212	291
70	Non-participating	37	37	37	38	39	347562	4570399	236
71	Non-participating	37	37	37	38	38	351992	4553073	264
72	Non-participating	39	39	39	41	41	352661	4551610	266
73	Non-participating	35	35	35	36	36	357098	4576124	220
74	Non-participating	39	39	39	41	41	357991	4577122	218
75	Participating	38	39	38	40	40	351886	4572221	234
76	Non-participating	38	38	38	39	39	350397	4572776	229
77	Participating	47	48	48	49	49	354598	4572195	225
78	Non-participating	37	37	37	38	39	348305	4573128	227
79	Non-participating	41	41	41	43	43	346838	4560484	254
80	Non-participating	34	34	34	36	36	348422	4578302	218
81	Non-participating	33	33	33	35	35	359428	4578463	213
82	Non-participating	36	36	36	38	38	356336	4573271	224
83	Non-participating	39	39	39	40	40	355544	4571708	225
84	Non-participating	35	35	35	37	38	348854	4548812	283
85	Non-participating	40	40	40	42	42	346043	4560379	256
86	Participating	38	39	39	40	40	349686	4560271	250
87	Participating	45	46	45	47	47	350142	4557205	256
88	Non-participating	38	39	39	40	40	349856	4578512	223
89	Non-participating	41	42	41	43	43	357466	4574287	220

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
90	Non-participating	35	35	35	36	36	360302	4574299	212
91	Participating	44	45	44	46	46	352181	4567715	240
92	Non-participating	36	36	36	38	38	351055	4572206	234
93	Non-participating	38	39	39	40	40	348569	4554584	261
94	Non-participating	41	42	42	43	46	345801	4567370	244
95	Non-participating	43	44	44	45	46	346311	4567623	242
96	Non-participating	44	45	45	46	46	354709	4576167	220
97	Non-participating	34	34	34	36	36	357759	4572090	219
98	Non-participating	42	42	42	44	44	351676	4563037	241
99	Non-participating	35	36	36	37	37	354114	4565428	234
100	Non-participating	39	40	40	41	41	350070	4564063	244
101	Participating	35	36	36	37	37	349601	4558664	250
102	Non-participating	43	44	44	45	45	348139	4556289	262
103	Non-participating	40	41	41	42	42	355457	4572148	224
104	Non-participating	44	45	45	46	46	352174	4567157	240
105	Participating	36	36	36	37	37	351193	4553147	262
106	Non-participating	37	37	37	39	39	347924	4564968	248
107	Non-participating	39	40	40	41	41	354055	4566057	235
108	Non-participating	33	34	34	35	35	353435	4555569	257
109	Non-participating	33	34	34	35	37	345322	4552965	275
110	Non-participating	36	36	36	38	38	356502	4573493	224
111	Non-participating	39	40	40	41	41	357296	4574297	221
112	Participating	37	37	37	39	39	345753	4562890	254
113	Participating	42	43	43	44	44	353826	4577333	220
114	Non-participating	41	42	42	43	46	345801	4567317	244
115	Non-participating	38	38	38	40	40	347685	4570183	238
116	Non-participating	35	35	35	37	37	351846	4578748	224
117	Non-participating	33	33	33	35	35	359272	4578486	213
118	Participating	38	38	38	39	39	351972	4570994	235
119	Non-participating	36	36	36	38	38	356431	4573515	223
120	Non-participating	40	40	40	41	41	351512	4569660	242
121	Non-participating	35	35	35	36	38	346173	4569216	241
122	Non-participating	37	37	37	39	39	347671	4570389	236

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
123	Non-participating	39	39	39	40	40	351043	4554129	264
124	Non-participating	39	39	39	41	41	353404	4577741	218
125	Non-participating	37	37	37	38	38	350972	4564942	242
126	Non-participating	29	29	29	31	32	350266	4546388	297
127	Non-participating	42	43	43	44	46	345817	4566194	248
128	Non-participating	35	35	35	36	37	348411	4562116	249
129	Non-participating	37	38	38	39	39	352674	4554779	261
130	Non-participating	39	39	39	40	40	352437	4551955	268
131	Non-participating	38	38	38	39	39	360024	4577342	214
132	Non-participating	35	35	35	37	37	351530	4578710	223
133	Non-participating	37	37	37	39	39	352046	4549462	272
134	Non-participating	38	38	38	40	40	352624	4553662	263
135	Non-participating	38	39	39	40	40	346967	4574989	225
136	Non-participating	36	36	36	37	38	346807	4569693	241
137	Participating	43	44	44	45	45	351700	4562581	242
138	Non-participating	31	31	31	33	34	349347	4546655	295
139	Non-participating	36	36	36	37	37	355024	4566656	230
140	Non-participating	39	39	39	40	41	348175	4570335	238
141	Non-participating	35	35	35	37	37	354876	4551637	261
142	Non-participating	39	39	39	41	41	354016	4575678	222
143	Participating	46	46	46	48	48	349258	4568017	246
144	Non-participating	44	45	45	46	46	347943	4573987	226
145	Non-participating	42	43	43	44	44	352318	4566469	240
146	Non-participating	43	43	43	45	45	348849	4569916	241
147	Non-participating	38	38	38	40	40	347596	4570141	238
148	Non-participating	36	36	36	37	37	349858	4558561	253
149	Non-participating	38	39	39	40	41	346701	4565405	249
150	Non-participating	36	37	37	38	38	347798	4573124	227
151	Non-participating	39	39	39	40	40	350383	4572986	229
152	Non-participating	37	37	37	39	39	353894	4577969	215
153	Participating	44	45	45	46	46	354049	4572266	226
154	Non-participating	35	35	35	36	37	345664	4561060	257
155	Non-participating	41	42	42	43	43	350006	4562178	245

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
156	Non-participating	35	35	35	37	37	351088	4558585	252
157	Non-participating	39	40	40	41	41	357719	4574646	220
158	Non-participating	40	40	40	42	42	357851	4574638	220
159	Non-participating	40	41	41	42	42	351996	4569421	240
160	Non-participating	36	36	36	38	38	356588	4573619	223
161	Non-participating	36	36	37	38	38	344808	4555561	269
162	Non-participating	38	38	38	40	40	354329	4568216	232
163	Non-participating	36	37	37	38	42	345306	4545729	289
164	Non-participating	35	35	35	37	37	348455	4562792	249
165	Non-participating	38	38	38	40	40	347693	4565281	248
166	Non-participating	33	33	33	35	35	345199	4561430	259
167	Non-participating	34	34	34	36	36	345464	4560913	258
168	Non-participating	35	36	36	37	37	354333	4551170	264
169	Participating	39	40	40	41	41	352673	4551172	270
170	Non-participating	38	38	38	40	42	346468	4549738	285
171	Non-participating	41	42	42	43	43	358318	4576290	216
172	Non-participating	37	38	38	39	39	351808	4578358	223
173	Non-participating	38	38	38	39	39	352713	4565517	238
174	Non-participating	40	41	41	42	42	349233	4576495	223
175	Non-participating	34	34	34	36	37	347401	4564043	248
176	Non-participating	38	39	39	40	41	347395	4569750	242
177	Non-participating	34	35	35	36	38	346121	4569209	241
178	Non-participating	36	36	36	38	38	346203	4558869	257
179	Non-participating	37	37	37	38	38	350401	4578410	222
180	Non-participating	40	40	40	42	42	355544	4572258	224
181	Non-participating	39	40	40	41	41	355665	4572405	224
182	Non-participating	43	44	44	45	46	346259	4545337	294
183	Non-participating	36	36	36	37	38	345964	4561199	256
184	Non-participating	34	35	35	36	36	353337	4555182	258
185	Non-participating	36	37	37	38	38	354436	4551418	265
186	Non-participating	42	43	43	44	44	353969	4576188	223
187	Participating	37	37	37	39	39	346571	4561321	254
188	Non-participating	34	34	34	36	37	345388	4553453	274

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
189	Non-participating	40	40	40	42	42	352257	4576347	223
190	Non-participating	37	38	38	39	39	350993	4569349	242
191	Non-participating	41	41	41	43	43	348169	4570098	240
192	Non-participating	38	39	39	40	41	347724	4570118	239
193	Non-participating	41	42	42	43	43	348855	4551861	272
194	Non-participating	37	37	37	39	39	349960	4552401	267
195	Non-participating	34	35	35	36	38	345622	4552512	276
196	Non-participating	35	36	36	37	37	354235	4578242	211
197	Participating	48	49	49	50	50	349904	4575140	223
198	Non-participating	37	37	37	39	47	345218	4567181	245
199	Non-participating	41	42	42	43	46	345881	4567518	243
200	Non-participating	43	44	44	45	45	350589	4556069	256
201	Non-participating	35	35	35	37	38	347989	4545233	288
202	Non-participating	39	39	39	41	41	348870	4576511	222
203	Non-participating	37	37	37	39	39	352717	4565375	238
204	Non-participating	38	39	39	40	40	346375	4560736	256
205	Non-participating	36	36	36	38	38	352943	4555276	259
206	Non-participating	41	42	42	43	43	354095	4551863	262
207	Participating	43	43	43	45	45	347145	4549677	283
208	Non-participating	37	37	37	39	39	354236	4574932	223
209	Non-participating	40	40	40	42	42	352520	4576339	224
210	Non-participating	39	39	39	41	41	347452	4569757	243
211	Non-participating	42	43	43	44	44	346262	4560367	256
212	Participating	41	41	41	43	43	350086	4561425	246
213	Non-participating	36	37	37	38	38	352869	4554555	262
214	Participating	42	42	42	44	44	350084	4556125	258
215	Non-participating	36	36	36	38	38	356654	4574331	220
216	Non-participating	40	40	40	42	42	357357	4574299	221
217	Non-participating	41	42	42	43	43	357572	4574389	220
218	Non-participating	40	41	41	42	42	358235	4574692	218
219	Non-participating	37	38	38	39	39	351476	4572625	233
220	Non-participating	40	41	40	42	44	346936	4548248	290
221	Non-participating	43	44	44	45	45	351732	4561166	243

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
222	Participating	43	44	44	46	46	351041	4556215	257
223	Non-participating	36	37	37	38	38	354169	4570124	231
224	Non-participating	39	40	40	41	41	351028	4557704	253
225	Non-participating	43	44	44	45	45	347418	4556330	263
226	Non-participating	34	35	35	36	36	356312	4576163	220
227	Non-participating	44	45	45	46	46	349910	4567290	243
228	Non-participating	42	43	43	44	44	350100	4562231	245
229	Non-participating	37	38	38	39	40	346647	4552551	277
230	Non-participating	40	40	40	42	42	352864	4577559	222
231	Non-participating	40	41	41	42	42	353959	4575917	223
232	Non-participating	44	45	45	46	46	350152	4555457	256
233	Non-participating	44	45	45	46	46	353769	4551995	265
234	Non-participating	41	41	41	42	42	351988	4569306	242
235	Non-participating	38	39	39	40	40	347681	4570145	238
236	Non-participating	38	39	39	40	40	353873	4568579	238
237	Non-participating	40	41	41	42	42	349858	4549572	276
238	Non-participating	29	29	29	31	33	350196	4546586	295
239	Non-participating	35	36	36	37	39	347980	4548181	286
240	Non-participating	38	39	39	40	43	345557	4545630	288
241	Participating	39	39	39	40	41	347959	4565262	247
242	Non-participating	37	38	38	39	39	345899	4560556	256
243	Non-participating	34	35	35	36	36	354541	4551300	263
244	Non-participating	36	37	37	38	38	348842	4578319	218
245	Non-participating	39	40	40	41	41	354001	4566061	235
246	Non-participating	36	36	36	38	42	345882	4568507	241
247	Non-participating	31	31	31	32	34	350201	4547321	288
248	Non-participating	38	38	38	39	40	347591	4565296	247
249	Non-participating	33	34	34	35	35	354445	4551153	262
250	Non-participating	37	38	38	39	39	357794	4577110	218
251	Non-participating	37	38	38	39	39	355981	4572718	223
252	Participating	41	41	41	43	43	350125	4573402	226
253	Participating	36	37	37	38	38	353814	4578116	216
254	Non-participating	40	41	41	42	44	345816	4565902	248

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
255	Non-participating	41	41	41	43	43	348095	4565598	246
256	Non-participating	32	32	32	33	35	348645	4545281	292
257	Non-participating	29	29	29	31	32	350206	4546296	298
258	Non-participating	34	34	34	35	40	345058	4545318	287
259	Participating	35	35	35	37	37	347256	4563342	248
260	Non-participating	37	37	37	38	39	347905	4564854	248
261	Non-participating	40	41	41	42	42	349127	4556190	260
262	Non-participating	34	35	35	36	39	345273	4551786	280
263	Non-participating	37	37	37	38	38	350188	4578550	223
264	Non-participating	41	42	42	43	43	352613	4577227	222
265	Non-participating	40	40	40	41	41	352044	4569134	240
266	Non-participating	38	38	38	40	40	347300	4569738	241
267	Non-participating	34	35	35	36	36	348403	4560972	251
268	Non-participating	36	36	36	38	38	352390	4560308	242
269	Non-participating	34	34	34	36	44	345720	4549278	283
270	Non-participating	37	38	38	39	39	354171	4574759	222
271	Non-participating	37	37	37	39	39	359876	4574368	212
272	Non-participating	41	42	42	43	43	349837	4578271	224
273	Non-participating	38	39	39	40	40	347060	4573920	224
274	Participating	34	34	34	36	37	347583	4563986	248
275	Participating	45	46	46	47	48	345961	4566804	245
276	Non-participating	35	35	35	36	39	346116	4569168	241
277	Participating	45	45	45	47	47	350140	4557015	258
278	Non-participating	41	42	42	43	44	347266	4545387	295
279	Participating	43	44	44	45	45	346614	4562783	253
280	Participating	47	47	47	47	47	352048	4570388	236
281	Non-participating	40	40	40	41	41	349773	4573347	227
282	Participating	36	36	36	38	38	356307	4573147	223
283	Non-participating	37	37	37	39	39	350133	4559428	250
284	Non-participating	40	41	41	42	42	355437	4572104	225
285	Non-participating	39	40	40	41	41	348957	4576500	222
286	Non-participating	38	39	39	40	40	357907	4577123	218
287	Non-participating	37	37	37	39	39	350430	4572693	228

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
288	Participating	43	44	44	45	45	350071	4557308	256
289	Non-participating	35	35	35	37	37	356127	4576785	220
290	Non-participating	33	34	33	35	35	350590	4579082	221
291	Non-participating	40	41	41	42	42	352144	4569061	239
292	Non-participating	34	34	34	36	36	357127	4572096	220
293	Non-participating	38	38	38	40	40	349992	4564270	244
294	Participating	39	40	40	41	41	348087	4570209	240
295	Non-participating	36	37	37	38	39	347576	4570429	235
296	Participating	33	34	34	35	37	349087	4548134	284
297	Non-participating	33	33	33	34	34	360015	4578249	213
298	Participating	42	42	42	44	44	352907	4568928	234
299	Non-participating	39	40	40	41	41	354483	4577656	217
300	Non-participating	37	37	37	39	39	354048	4578008	215
301	Non-participating	38	38	38	40	40	345895	4560480	257
302	Non-participating	34	34	34	36	36	353341	4555532	258
303	Non-participating	38	38	38	40	40	355639	4571586	225
304	Non-participating	43	44	44	45	47	345777	4566429	247
305	Participating	41	42	42	43	43	347708	4567596	246
306	Non-participating	33	34	34	35	37	345313	4553002	275
307	Non-participating	35	36	35	37	38	348760	4548911	282
308	Non-participating	32	32	32	34	35	350257	4547795	284
309	Non-participating	35	36	36	37	37	350045	4558666	252
310	Participating	40	41	41	42	42	348787	4556261	260
311	Non-participating	33	34	34	35	36	345326	4553206	273
312	Non-participating	39	39	39	40	40	351558	4549360	277
313	Non-participating	37	38	38	39	39	357884	4576036	218
314	Non-participating	36	37	37	38	39	348896	4549284	280
315	Non-participating	38	39	39	40	40	354609	4566484	231
316	Non-participating	34	35	35	36	36	348487	4560910	249
317	Non-participating	38	39	39	40	40	353167	4570701	234
318	Non-participating	30	30	30	31	33	349157	4545190	294
319	Non-participating	44	45	45	46	46	354350	4552485	267
320	Non-participating	41	41	41	42	42	352345	4576711	223

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
321	Non-participating	39	39	39	40	41	348092	4570309	238
322	Non-participating	39	39	39	41	41	347805	4570109	240
323	Non-participating	38	39	39	40	40	347673	4570121	238
324	Participating	38	39	39	40	40	352600	4553553	262
325	Participating	39	40	40	41	41	352676	4550799	266
326	Non-participating	29	29	29	31	32	350265	4546659	293
327	Non-participating	39	40	40	41	43	347192	4548158	290
328	Non-participating	40	41	41	42	42	345881	4562145	256
329	Non-participating	39	40	40	41	41	345780	4562224	256
330	Non-participating	42	43	43	44	44	353508	4551897	267
331	Non-participating	38	38	38	39	40	348807	4549619	278
332	Participating	42	43	42	44	44	359914	4576818	214
333	Non-participating	40	40	40	41	42	347552	4565759	246
334	Participating	37	38	38	39	39	347837	4558618	256
335	Non-participating	41	42	42	43	43	349549	4556225	259
336	Participating	43	43	43	45	45	347205	4554311	269
337	Non-participating	37	37	37	39	39	354012	4577983	215
338	Non-participating	36	37	37	38	43	345885	4568343	241
339	Non-participating	38	38	38	40	40	347559	4545255	291
340	Non-participating	37	37	37	38	39	347894	4564883	248
341	Non-participating	40	40	40	41	42	347556	4565765	246
342	Non-participating	35	36	36	37	37	354869	4551676	260
343	Non-participating	36	36	36	37	37	354878	4570381	228
344	Non-participating	41	42	42	43	43	358324	4576201	217
345	Non-participating	37	38	38	39	39	350761	4569585	243
346	Non-participating	37	38	38	39	39	350374	4564617	244
347	Non-participating	42	43	43	44	45	346924	4549759	284
348	Non-participating	38	38	38	40	40	346988	4565325	247
349	Non-participating	34	35	35	36	37	345596	4561006	258
350	Participating	42	42	42	44	44	347544	4550966	274
351	Non-participating	42	42	42	44	44	346663	4562849	252
352	Non-participating	39	40	40	41	41	353322	4577656	219
353	Non-participating	41	41	41	42	42	351983	4569366	241

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
354	Non-participating	38	38	38	39	40	347584	4565292	247
355	Non-participating	38	39	39	40	40	347723	4570179	238
356	Non-participating	34	35	35	36	36	353100	4560695	240
357	Non-participating	36	36	36	38	38	348847	4558644	251
358	Non-participating	33	33	33	34	34	350500	4579261	220
359	Non-participating	36	36	36	38	38	358247	4577901	218
360	Participating	46	47	47	48	48	353807	4576810	224
361	Non-participating	35	35	35	37	37	351211	4558529	251
362	Participating	40	41	41	42	42	352684	4552529	267
363	Non-participating	31	32	32	33	33	360646	4578091	210
364	Non-participating	38	39	39	40	40	350394	4572944	229
365	Participating	39	40	40	41	41	352339	4573592	225
366	Non-participating	40	41	40	42	42	349125	4576496	223
367	Non-participating	35	35	35	37	43	345301	4565438	250
368	Non-participating	41	41	41	43	43	347800	4569850	242
369	Non-participating	37	38	38	39	39	349018	4554113	267
370	Participating	43	44	44	45	45	346541	4562806	255
371	Non-participating	41	41	41	42	42	348720	4573901	225
372	Participating	41	42	41	43	43	349827	4568777	243
373	Non-participating	38	38	38	39	40	347630	4570191	237
374	Non-participating	37	38	38	39	39	350118	4552148	267
375	Non-participating	36	37	37	38	38	351818	4553328	264
376	Non-participating	42	42	42	44	44	353695	4571653	229
377	Participating	39	39	39	40	40	358358	4574946	218
378	Non-participating	37	38	38	39	39	348168	4570526	237
379	Non-participating	29	30	29	31	33	350165	4546608	294
380	Participating	40	40	40	42	42	348063	4570148	241
381	Non-participating	37	37	37	38	39	346386	4561128	254
382	Participating	45	46	46	47	47	351627	4562173	241
383	Non-participating	39	40	40	41	41	348565	4555317	264
384	Non-participating	40	41	41	42	42	352691	4552943	264
385	Non-participating	42	43	43	45	45	359920	4576696	213
386	Non-participating	34	34	34	36	36	353974	4562887	242

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
387	Participating	40	41	41	42	42	350248	4551465	267
388	Non-participating	39	40	40	41	42	347555	4569766	243
389	Non-participating	36	36	36	38	38	346202	4558849	257
390	Participating	45	45	45	47	47	358397	4576871	215
391	Non-participating	39	39	39	40	40	354018	4575635	222
392	Non-participating	34	35	35	36	40	345116	4545363	286
393	Non-participating	38	39	39	40	41	346855	4565400	247
394	Non-participating	38	39	39	40	40	350220	4578295	222
395	Non-participating	34	34	34	36	36	351856	4578925	224
396	Non-participating	44	45	45	46	46	349397	4568206	245
397	Non-participating	38	38	38	40	40	352789	4577937	222
398	Non-participating	38	38	38	40	40	347660	4570210	237
399	Participating	44	45	45	46	46	351771	4561830	243
400	Non-participating	41	42	42	43	43	351952	4569438	240
401	Non-participating	40	41	41	42	42	346036	4562819	258
402	Non-participating	38	39	39	40	40	350114	4559700	247
403	Non-participating	37	38	38	39	39	351996	4549454	273
404	Participating	46	47	47	49	49	350142	4550519	275
405	Non-participating	37	37	37	39	39	354192	4574827	223
406	Non-participating	40	40	40	42	42	353503	4575941	223
407	Non-participating	43	44	44	46	46	354282	4576189	221
408	Participating	42	43	43	45	45	350070	4557364	256
409	Non-participating	34	35	35	36	36	348177	4563393	249
410	Non-participating	39	39	39	40	41	347011	4552480	278
411	Non-participating	34	35	34	36	36	354832	4551345	261
412	Participating	40	41	40	42	42	351450	4549498	277
413	Non-participating	35	35	35	37	37	352008	4578698	224
414	Non-participating	31	31	31	33	33	360641	4572622	212
415	Non-participating	34	34	34	36	36	355829	4577665	222
416	Non-participating	40	40	40	42	42	354024	4575861	222
417	Non-participating	42	42	42	44	44	347565	4551197	277
418	Non-participating	41	41	41	43	46	345797	4567453	244
419	Non-participating	32	33	33	34	34	360021	4578306	212

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
420	Non-participating	40	41	41	42	42	352645	4577524	222
421	Non-participating	41	42	42	43	43	353437	4576097	224
422	Non-participating	43	44	44	45	45	350017	4563022	246
423	Non-participating	44	44	44	46	46	351657	4562647	242
424	Participating	42	42	42	44	44	349619	4556157	259
425	Non-participating	40	40	40	42	42	358284	4574699	218
426	Non-participating	38	38	38	39	39	351581	4572652	234
427	Participating	47	48	48	49	49	349978	4574706	223
428	Non-participating	42	42	42	44	44	357582	4574324	220
429	Non-participating	43	43	43	45	45	350093	4562379	245
430	Participating	38	39	39	40	40	352497	4555013	261
431	Participating	36	36	36	38	38	351490	4552901	264
432	Non-participating	37	38	38	39	39	350293	4578380	222
433	Non-participating	32	32	32	34	34	360323	4572529	213
434	Non-participating	37	38	38	39	39	355984	4572830	223
435	Non-participating	37	38	38	39	39	349987	4564393	244
436	Participating	36	36	36	38	38	350156	4553102	268
437	Participating	41	42	42	43	43	347510	4553283	267
438	Non-participating	38	39	39	40	40	350531	4569056	240
439	Non-participating	38	39	39	40	40	347651	4570131	238
440	Non-participating	37	38	38	39	39	354332	4553838	263
441	Non-participating	41	41	41	43	44	347401	4546746	298
442	Participating	40	41	41	42	42	353964	4566128	235
443	Non-participating	41	41	41	42	43	347472	4568103	243
444	Non-participating	39	39	39	40	40	355571	4571787	225
445	Non-participating	37	38	38	39	41	346062	4550304	281
446	Non-participating	31	31	31	32	34	350140	4547226	288
447	Non-participating	43	43	43	45	46	345885	4567227	243
448	Non-participating	37	37	38	39	39	350422	4572712	228
449	Non-participating	39	39	39	41	41	355749	4572534	223
450	Non-participating	35	35	35	36	36	356546	4572050	222
451	Non-participating	43	44	44	45	46	346278	4567619	242
452	Non-participating	39	39	39	41	41	353823	4568555	237

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
453	Non-participating	36	36	36	37	37	354508	4551383	264
454	Participating	39	40	40	41	41	349368	4549669	277
455	Participating	34	34	34	36	37	347581	4563973	248
456	Non-participating	37	38	38	39	39	348946	4578328	218
457	Non-participating	37	38	38	39	39	349849	4578580	222
458	Non-participating	39	40	40	41	41	355632	4572237	223
459	Non-participating	38	39	39	40	40	347334	4569736	242
460	Non-participating	38	38	38	40	40	353426	4561634	241
461	Non-participating	41	41	41	43	43	347380	4553095	270
462	Non-participating	37	37	37	38	38	353851	4578050	215
463	Non-participating	36	36	36	37	37	355870	4571208	226
464	Non-participating	36	36	36	37	37	356623	4574339	219
465	Non-participating	33	34	34	35	35	356468	4577278	219
466	Non-participating	43	44	44	45	46	346153	4545432	293
467	Non-participating	40	41	41	42	44	345810	4565930	249
468	Non-participating	38	38	38	40	40	347779	4565267	248
469	Non-participating	38	39	39	40	40	347714	4570152	239
470	Non-participating	34	34	34	36	37	348460	4546619	293
471	Non-participating	32	32	32	33	35	348657	4545285	292
472	Non-participating	29	29	29	31	32	350203	4546300	298
473	Non-participating	33	33	33	35	35	350598	4579138	221
474	Non-participating	40	41	41	42	42	352129	4569071	239
475	Non-participating	42	43	42	44	44	346741	4562791	252
476	Non-participating	40	40	40	42	46	345887	4567695	242
477	Non-participating	42	43	43	44	44	351774	4562837	242
478	Non-participating	37	38	38	39	39	346753	4561495	254
479	Participating	43	44	44	45	45	347562	4556232	262
480	Non-participating	34	35	35	36	36	354887	4551539	261
481	Non-participating	37	37	37	38	38	353057	4550640	264
482	Non-participating	42	42	42	44	44	350482	4549391	277
483	Non-participating	36	36	36	37	37	357511	4576100	219
484	Non-participating	39	40	40	41	41	349426	4573471	227
485	Non-participating	40	40	40	42	42	357997	4574685	219

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
486	Non-participating	39	40	40	41	41	353261	4577671	219
487	Participating	45	46	46	47	47	352803	4572744	229
488	Non-participating	38	38	38	40	40	345898	4560486	257
489	Non-participating	39	39	39	41	46	345814	4567816	242
490	Non-participating	40	41	41	42	42	349535	4566246	243
491	Non-participating	38	38	38	40	40	357902	4577210	219
492	Participating	43	43	43	45	45	352270	4567998	239
493	Non-participating	36	36	36	37	37	350880	4572051	236
494	Non-participating	40	41	41	42	42	355427	4572058	226
495	Non-participating	38	38	38	40	40	357092	4574309	221
496	Participating	41	42	42	43	50	346100	4547861	295
497	Non-participating	35	35	35	36	39	346170	4569165	241
498	Non-participating	40	41	41	42	42	350157	4554825	259
499	Non-participating	38	38	38	39	39	355679	4571604	225
500	Participating	44	45	45	46	46	352193	4567289	242
501	Non-participating	44	45	45	46	46	352253	4567621	244
502	Non-participating	37	37	37	38	39	347479	4570300	236
503	Participating	41	42	42	43	43	347480	4567871	244
504	Non-participating	35	35	35	36	37	345632	4560981	257
505	Participating	35	36	36	37	37	349492	4558680	251
506	Non-participating	35	36	36	37	37	349983	4558640	252
507	Non-participating	37	37	37	38	38	353932	4578049	214
508	Non-participating	40	40	40	41	41	349773	4569705	243
509	Non-participating	39	40	40	41	41	354625	4567394	232
510	Participating	45	46	46	47	47	354258	4552740	264
511	Non-participating	30	30	30	31	33	349153	4545195	294
512	Non-participating	36	37	37	38	38	356177	4572974	223
513	Non-participating	39	39	39	41	41	353169	4577735	221
514	Non-participating	36	37	37	38	38	349672	4572655	230
515	Non-participating	39	40	40	41	41	353042	4570841	236
516	Non-participating	38	39	38	40	40	348871	4573395	226
517	Participating	40	41	41	42	42	349922	4573377	227
518	Participating	43	44	44	45	45	350097	4560304	248

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
519	Participating	44	45	45	46	46	346998	4556297	264
520	Non-participating	40	40	40	42	42	348931	4553155	269
521	Non-participating	38	38	38	39	40	348820	4554397	266
522	Non-participating	32	32	32	34	34	360407	4578143	210
523	Non-participating	41	42	42	43	43	359180	4574345	214
524	Non-participating	38	38	38	40	40	352880	4577931	222
525	Non-participating	37	37	37	38	39	350076	4564911	244
526	Non-participating	34	35	35	36	37	345628	4561056	257
527	Participating	38	38	38	39	40	350189	4551977	267
528	Non-participating	43	43	43	45	45	351177	4549585	274
529	Non-participating	44	45	45	46	46	351459	4550162	273
530	Non-participating	35	35	35	36	36	349876	4578899	220
531	Non-participating	36	37	37	38	38	350411	4578458	222
532	Non-participating	35	35	35	37	37	360683	4576054	208
533	Non-participating	36	36	36	38	43	345465	4565556	250
534	Non-participating	43	43	43	45	45	348156	4569886	242
535	Participating	37	38	38	39	39	350129	4558088	255
536	Non-participating	37	37	37	39	39	351377	4548969	275
537	Non-participating	31	32	32	33	33	360537	4578144	209
538	Non-participating	38	39	39	40	40	350360	4572943	229
539	Non-participating	36	36	36	38	45	345241	4546338	297
540	Non-participating	41	42	42	43	43	348209	4570076	241
541	Non-participating	43	44	44	46	46	350217	4556764	257
542	Non-participating	34	34	34	35	35	354503	4551220	263
543	Non-participating	38	39	39	40	40	352674	4550401	270
544	Non-participating	40	40	40	42	44	345907	4565791	249
545	Non-participating	37	37	37	38	38	346793	4558645	258
546	Non-participating	40	41	41	42	42	351275	4554269	262
547	Non-participating	40	41	41	42	42	352590	4577641	222
548	Non-participating	34	35	35	36	41	345388	4565187	250
549	Non-participating	42	42	42	44	44	346730	4565814	251
550	Non-participating	38	38	38	40	40	347711	4570182	238
551	Non-participating	35	36	36	37	37	345695	4559201	257

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
552	Non-participating	39	40	40	41	41	357589	4574590	220
553	Non-participating	41	42	42	43	43	348963	4576139	221
554	Non-participating	43	44	43	45	45	358665	4576046	217
555	Non-participating	38	38	38	40	40	358247	4577626	218
556	Non-participating	36	36	36	37	37	354941	4570369	228
557	Non-participating	37	37	37	39	39	347670	4570347	236
558	Non-participating	35	35	35	37	37	345685	4561006	257
559	Non-participating	41	41	41	43	43	350106	4561367	246
560	Non-participating	39	40	40	41	41	351184	4554207	263
561	Non-participating	35	35	35	37	37	351222	4578701	223
562	Participating	46	47	47	49	49	354467	4572202	225
563	Participating	41	41	41	42	42	349640	4576668	224
564	Non-participating	41	41	41	43	43	352166	4568451	240
565	Non-participating	34	34	34	36	39	345986	4569177	241
566	Non-participating	38	39	39	40	41	345738	4562229	256
567	Non-participating	38	38	38	40	40	351790	4560113	246
568	Non-participating	33	33	33	35	35	359212	4578508	213
569	Non-participating	42	43	43	44	44	352313	4566468	239
570	Participating	43	43	43	45	45	347602	4566895	246
571	Participating	42	43	43	44	44	351039	4560143	247
572	Non-participating	36	36	36	37	37	350127	4558552	252
573	Non-participating	37	38	38	39	40	346646	4552558	277
574	Non-participating	42	43	43	44	44	353743	4576210	224
575	Non-participating	37	37	37	39	39	349349	4563858	246
576	Non-participating	44	44	44	46	46	351691	4561059	244
577	Non-participating	34	34	34	36	36	354146	4562143	240
578	Non-participating	33	34	34	35	35	354189	4561900	240
579	Non-participating	39	40	40	41	41	354323	4551800	254
580	Participating	46	47	47	49	49	347938	4552465	276
581	Participating	44	45	44	46	46	359611	4576021	214
582	Non-participating	37	37	37	39	39	352574	4565450	237
583	Non-participating	41	41	41	43	43	348983	4551490	274
584	Non-participating	34	35	35	36	39	345263	4551791	280

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
585	Non-participating	38	38	38	40	40	347648	4570158	238
586	Participating	39	40	40	41	41	352685	4553323	264
587	Participating	31	31	31	32	34	349468	4546621	296
588	Non-participating	39	39	39	40	40	357682	4574744	219
589	Non-participating	37	38	38	39	39	351191	4569448	241
590	Non-participating	38	39	39	40	41	346401	4565410	249
591	Participating	40	40	40	42	42	348074	4570160	241
592	Non-participating	38	38	38	40	40	348167	4570444	236
593	Participating	38	39	39	40	40	345851	4559631	257
594	Non-participating	42	42	42	44	44	353143	4569988	233
595	Non-participating	35	35	35	36	36	356183	4576161	220
596	Non-participating	43	44	44	45	45	351467	4574491	224
597	Non-participating	38	38	38	40	40	353699	4575477	224
598	Non-participating	43	44	44	45	45	354146	4576189	222
599	Non-participating	45	46	46	47	47	349349	4568095	246
600	Non-participating	34	34	34	36	36	353384	4555317	258
601	Non-participating	42	42	42	44	44	354621	4573824	221
602	Non-participating	41	41	41	42	42	351979	4569374	241
603	Non-participating	29	29	29	31	32	350306	4546386	297
604	Non-participating	38	39	39	40	43	345568	4545688	289
605	Participating	43	44	44	45	45	346550	4562812	255
606	Non-participating	38	39	39	40	40	347411	4569815	241
607	Non-participating	34	35	35	36	37	345468	4560743	257
608	Participating	43	44	44	46	46	348759	4552313	273
609	Non-participating	39	40	40	41	41	351597	4549496	275
610	Non-participating	35	36	36	37	37	351794	4578679	224
611	Non-participating	41	42	42	43	43	358321	4576229	217
612	Participating	37	38	38	39	41	347842	4546710	297
613	Non-participating	38	39	39	40	40	351116	4557711	253
614	Participating	43	44	44	45	45	347647	4555453	265
615	Non-participating	41	41	41	43	43	348752	4553216	270
616	Non-participating	36	36	36	38	39	345449	4554210	275
617	Participating	44	45	45	46	46	350625	4576196	225

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
618	Non-participating	37	38	38	39	39	346904	4573988	223
619	Non-participating	35	36	36	37	37	354364	4551235	264
620	Participating	38	39	39	40	40	352744	4550496	269
621	Non-participating	37	37	37	39	39	354141	4574854	223
622	Participating	39	39	39	41	41	358491	4575609	217
623	Non-participating	31	31	31	33	33	360674	4572622	212
624	Participating	39	39	39	41	41	351945	4563446	239
625	Non-participating	41	42	42	43	43	347256	4545343	295
626	Non-participating	40	41	41	42	46	345557	4566604	245
627	Non-participating	36	36	36	37	37	354352	4569796	232
628	Participating	44	45	45	46	46	351675	4561259	244
629	Non-participating	34	34	34	36	36	351796	4578897	224
630	Participating	43	43	43	45	45	350079	4563539	245
631	Participating	43	43	43	45	45	348032	4569818	242
632	Non-participating	36	36	36	37	37	350124	4559017	250
633	Non-participating	34	34	34	36	36	353328	4555474	258
634	Non-participating	40	40	40	41	41	355466	4571860	225
635	Non-participating	40	41	41	42	42	352223	4569064	237
636	Non-participating	42	43	43	44	44	350040	4567048	244
637	Non-participating	34	35	35	36	40	345804	4568847	242
638	Non-participating	34	34	34	35	37	348549	4546700	294
639	Non-participating	36	36	36	38	41	345728	4565326	249
640	Non-participating	33	34	34	35	37	345315	4553177	273
641	Non-participating	44	45	45	46	47	347115	4547050	299
642	Non-participating	33	34	34	35	37	348593	4546608	295
643	Non-participating	40	41	41	42	42	352046	4569307	241
644	Non-participating	36	37	37	38	38	352057	4565189	241
645	Non-participating	38	38	38	40	40	347659	4570157	238
646	Non-participating	34	34	34	36	39	345776	4568972	242
647	Non-participating	37	37	37	39	39	354357	4553863	263
648	Participating	44	45	45	46	46	348676	4552509	274
649	Non-participating	36	37	37	38	38	349630	4572641	230
650	Participating	41	41	41	42	42	352901	4570406	237

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
651	Non-participating	34	35	35	36	36	353300	4555378	258
652	Participating	44	45	45	46	46	351520	4551282	271
653	Participating	41	42	42	43	43	352439	4572720	233
654	Non-participating	36	37	37	38	39	348917	4549246	279
655	Non-participating	38	39	39	40	40	347961	4565210	247
656	Non-participating	38	38	38	40	40	354130	4568440	232
657	Participating	41	42	42	43	43	352549	4577023	222
658	Non-participating	41	41	41	42	42	353903	4575974	224
659	Participating	43	43	43	44	44	353749	4571891	228
660	Non-participating	36	37	37	38	38	347869	4573129	227
661	Non-participating	40	40	40	41	41	352003	4569150	241
662	Non-participating	34	35	35	36	39	345252	4551767	281
663	Non-participating	40	40	40	42	42	346961	4562776	252
664	Non-participating	36	37	37	38	39	347202	4563018	250
665	Participating	43	43	43	45	46	346372	4567707	242
666	Non-participating	34	35	35	36	36	348415	4560615	251
667	Non-participating	36	37	37	38	39	346407	4553366	271
668	Non-participating	36	37	37	38	38	356804	4574343	220
669	Non-participating	36	36	36	38	38	356639	4574023	222
670	Non-participating	38	38	38	40	40	357864	4577126	218
671	Non-participating	35	35	35	37	39	348124	4548220	286
672	Participating	30	30	30	32	34	349062	4545265	293
673	Non-participating	31	32	32	33	35	348733	4545287	292
674	Non-participating	31	31	31	33	34	350272	4547453	286
675	Non-participating	33	33	33	35	36	349039	4548053	283
676	Non-participating	35	35	35	36	36	356259	4576464	221
677	Non-participating	37	38	38	39	39	350216	4578420	222
678	Non-participating	37	38	38	39	39	351836	4571816	235
679	Non-participating	40	41	41	42	42	355494	4572185	224
680	Non-participating	38	38	38	39	39	349988	4564379	244
681	Non-participating	38	38	38	39	40	347228	4569729	242
682	Non-participating	43	44	44	45	45	350572	4556104	255
683	Participating	42	43	43	44	45	348790	4552039	270

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
684	Non-participating	40	41	41	42	42	357523	4574436	221
685	Non-participating	40	41	41	42	42	358134	4574682	218
686	Non-participating	39	40	40	41	41	353119	4577664	221
687	Non-participating	38	38	38	40	40	355907	4572735	223
688	Participating	44	45	45	46	46	351382	4574432	224
689	Non-participating	38	38	38	40	40	354486	4567965	233
690	Non-participating	36	36	36	38	38	354434	4551385	265
691	Non-participating	41	41	41	43	43	347450	4551641	279
692	Non-participating	35	35	35	37	38	345873	4563308	250
693	Non-participating	44	45	45	46	46	347455	4566665	246
694	Non-participating	37	37	37	38	38	350169	4553813	264
695	Non-participating	38	39	39	40	40	355574	4571691	225
696	Non-participating	44	45	45	46	46	358967	4575963	215
697	Non-participating	37	37	37	38	39	347588	4570390	236
698	Non-participating	37	38	38	39	39	347581	4570257	236
699	Non-participating	44	44	44	46	46	348796	4567729	247
700	Participating	36	36	36	38	38	350189	4553105	267
701	Non-participating	40	40	40	42	42	350255	4549296	277
702	Non-participating	38	38	38	40	40	352940	4577907	223
703	Non-participating	35	35	35	37	37	347736	4562612	251
704	Non-participating	41	41	41	43	43	348047	4565834	245
705	Non-participating	38	39	39	40	40	347747	4570178	239
706	Participating	39	40	40	41	41	348019	4554197	264
707	Non-participating	33	33	33	35	35	359641	4578430	212
708	Non-participating	36	36	36	38	38	348755	4578314	218
709	Non-participating	36	36	36	38	38	356373	4573318	224
710	Participating	42	42	42	42	42	352013	4570611	236
711	Non-participating	36	36	36	37	37	350046	4558631	252
712	Non-participating	35	35	35	36	36	351743	4559373	244
713	Non-participating	41	42	42	43	43	349986	4556214	258
714	Non-participating	39	39	39	41	41	352661	4551611	266
715	Non-participating	34	35	35	36	36	356977	4576132	219
716	Non-participating	38	38	38	40	40	353512	4570481	231

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
717	Non-participating	36	37	37	38	38	354102	4578129	213
718	Non-participating	43	44	44	45	45	351772	4562341	242
719	Non-participating	35	35	35	36	38	348244	4548169	286
720	Participating	36	36	36	37	38	345298	4557378	263
721	Non-participating	34	34	34	36	36	350572	4578916	222
722	Non-participating	41	41	41	42	42	351812	4563174	240
723	Non-participating	38	38	38	39	40	348823	4554301	267
724	Non-participating	41	41	41	43	43	351366	4554327	261
725	Non-participating	40	41	41	42	42	357423	4574294	220
726	Non-participating	35	36	36	37	37	360189	4574323	211
727	Participating	37	38	38	39	39	355489	4577244	221
728	Participating	44	45	45	46	46	352266	4567695	241
729	Non-participating	41	41	41	42	42	355432	4572149	224
730	Non-participating	37	38	38	39	39	346951	4573920	225
731	Non-participating	38	39	39	40	40	357180	4574303	221
732	Non-participating	32	32	32	34	35	350268	4547842	283
733	Participating	40	41	41	42	42	350097	4560005	249
734	Non-participating	40	41	41	42	42	352687	4552846	264
735	Non-participating	36	36	36	38	38	356521	4573514	224
736	Non-participating	31	31	31	32	34	348869	4545187	293
737	Non-participating	37	38	38	39	41	346035	4544924	287
738	Non-participating	37	37	37	39	39	351573	4549097	276
739	Non-participating	42	43	42	44	44	358324	4576393	216
740	Non-participating	42	42	42	44	44	352339	4566412	239
741	Non-participating	36	36	36	37	37	350877	4572146	234
742	Non-participating	39	40	40	41	41	353657	4577655	218
743	Non-participating	43	43	43	45	46	346219	4567625	242
744	Non-participating	38	39	39	40	40	354622	4567620	232
745	Non-participating	35	35	35	37	37	351916	4578753	224
746	Non-participating	37	37	37	38	38	346907	4575336	222
747	Non-participating	39	40	40	41	41	357511	4574526	220
748	Non-participating	41	41	41	43	43	358323	4576143	217
749	Non-participating	37	38	38	39	39	352680	4565496	238

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
750	Non-participating	37	37	37	39	39	354818	4566508	232
751	Non-participating	35	35	35	36	38	346174	4569245	241
752	Participating	45	45	45	47	47	351708	4561611	243
753	Participating	37	37	37	39	39	348394	4558597	254
754	Non-participating	34	35	35	36	36	353330	4555286	257
755	Non-participating	42	42	42	43	43	354014	4577451	218
756	Non-participating	41	41	41	42	42	352344	4576714	223
757	Non-participating	34	35	35	36	40	345192	4545287	286
758	Non-participating	34	34	34	36	37	347501	4563805	248
759	Non-participating	40	40	40	42	42	347644	4569840	242
760	Non-participating	41	42	42	43	43	350014	4562092	245
761	Participating	36	36	36	38	38	350112	4559235	250
762	Participating	39	39	39	40	40	352686	4550451	270
763	Non-participating	33	33	33	35	35	359332	4578475	213
764	Non-participating	38	38	38	39	39	359958	4577418	213
765	Non-participating	34	34	34	35	35	351858	4578988	224
766	Participating	37	37	37	38	38	351805	4571238	235
767	Non-participating	34	35	35	36	37	345595	4560990	257
768	Participating	36	36	36	38	38	350148	4553377	266
769	Non-participating	40	40	40	42	42	351240	4554240	263
770	Non-participating	45	46	46	47	47	350305	4550810	271
771	Non-participating	37	37	37	38	38	350976	4564946	242
772	Non-participating	41	42	42	43	46	345803	4567357	244
773	Non-participating	32	33	32	34	35	350269	4547880	283
774	Non-participating	35	35	35	36	37	345689	4561039	257
775	Non-participating	35	35	35	36	37	345658	4561062	257
776	Non-participating	41	42	42	43	43	349866	4578224	223
777	Non-participating	40	40	40	42	42	357834	4574637	220
778	Non-participating	38	38	38	40	40	347604	4570156	238
779	Participating	43	43	43	45	45	351702	4562804	243
780	Non-participating	40	40	40	42	42	351470	4551732	270
781	Participating	37	38	38	39	39	352675	4550109	272
782	Non-participating	36	36	36	37	37	354246	4578189	213

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
783	Non-participating	37	37	37	39	39	353943	4577980	215
784	Non-participating	37	37	37	38	38	352790	4565323	237
785	Participating	44	45	45	46	46	351697	4562153	242
786	Non-participating	35	35	35	36	36	348490	4559530	253
787	Non-participating	45	46	45	47	47	346742	4556724	264
788	Participating	38	38	38	39	39	350126	4558014	255
789	Non-participating	39	39	39	40	40	350409	4572991	229
790	Non-participating	31	31	31	33	33	360754	4578010	209
791	Non-participating	38	39	39	40	40	348167	4570415	237
792	Non-participating	29	29	29	31	32	350175	4546265	297
793	Participating	41	42	42	43	43	346580	4554244	273
794	Non-participating	42	43	43	44	45	350342	4549535	276
795	Non-participating	40	40	40	42	42	352204	4576277	223
796	Non-participating	41	42	42	43	43	358321	4576318	216
797	Non-participating	35	35	35	37	37	358304	4578085	217
798	Non-participating	42	42	42	43	43	349949	4568273	242
799	Non-participating	40	40	40	41	41	357840	4574680	220
800	Non-participating	34	35	35	36	38	346147	4569240	241
801	Participating	37	37	37	38	39	346788	4558585	259
802	Non-participating	34	34	34	35	35	353254	4556040	257
803	Non-participating	36	36	36	38	38	347732	4573126	227
804	Non-participating	42	42	42	44	44	347095	4545273	296
805	Non-participating	36	36	36	37	42	345200	4545754	289
806	Non-participating	37	38	38	39	39	347245	4562813	251
807	Non-participating	34	35	35	36	36	348127	4563335	249
808	Non-participating	39	39	39	41	41	350107	4559776	248
809	Non-participating	39	40	40	41	41	348596	4555286	264
810	Non-participating	40	41	41	42	43	347885	4549723	280
811	Non-participating	39	39	39	40	40	352500	4574832	224
812	Non-participating	35	36	36	37	37	360051	4573010	213
813	Non-participating	39	40	40	41	41	352633	4577746	222
814	Non-participating	38	38	38	40	40	347671	4573443	226
815	Non-participating	37	37	37	38	48	345355	4546628	296

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
816	Non-participating	39	39	39	40	41	347422	4569751	242
817	Non-participating	40	40	40	42	42	357784	4574631	220
818	Non-participating	39	39	39	41	41	347101	4573981	224
819	Non-participating	41	41	41	42	43	348151	4570106	240
820	Non-participating	34	35	35	36	36	348418	4561180	250
821	Non-participating	41	42	42	43	43	353214	4551893	270
822	Non-participating	37	38	38	39	39	349687	4552409	271
823	Participating	43	44	44	45	45	350203	4551016	270
824	Non-participating	42	43	43	44	44	359982	4576463	212
825	Non-participating	37	37	37	39	42	346359	4549648	282
826	Non-participating	41	41	41	43	46	345797	4567414	244
827	Non-participating	45	46	46	47	47	347844	4569157	242
828	Non-participating	36	37	37	38	38	348483	4558714	255
829	Non-participating	35	35	35	36	36	351792	4578780	224
830	Non-participating	39	39	39	41	42	346461	4565471	249
831	Non-participating	38	39	39	40	40	347707	4570121	239
832	Non-participating	42	43	43	44	44	348011	4569871	243
833	Non-participating	34	35	35	36	36	348476	4560720	250
834	Non-participating	43	43	43	44	44	350160	4562184	244
835	Non-participating	36	36	36	37	37	350115	4558492	253
836	Non-participating	34	34	34	36	36	355788	4577835	220
837	Non-participating	39	39	39	40	40	353220	4575704	225
838	Non-participating	44	45	45	46	46	354569	4576160	220
839	Non-participating	31	31	31	33	33	360581	4572616	212
840	Non-participating	38	38	38	40	40	349999	4565708	244
841	Non-participating	39	40	40	41	41	351578	4549458	276
842	Non-participating	35	35	35	37	37	353098	4555340	258
843	Non-participating	39	39	39	40	40	348796	4576511	222
844	Non-participating	40	40	40	42	42	352351	4576345	223
845	Non-participating	42	42	42	44	44	353144	4570004	233
846	Non-participating	41	42	42	43	43	347570	4566093	245
847	Non-participating	37	37	37	39	39	346990	4558715	256
848	Non-participating	40	41	41	42	42	347355	4553143	268

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
849	Non-participating	38	38	38	39	39	355951	4572682	223
850	Participating	38	38	38	40	40	349117	4549568	276
851	Non-participating	38	38	38	39	42	346438	4549702	284
852	Non-participating	36	36	36	38	41	345721	4565328	249
853	Non-participating	40	41	41	42	42	355477	4572161	224
854	Non-participating	40	41	41	42	42	355417	4571916	227
855	Non-participating	45	46	46	47	47	355022	4573074	223
856	Non-participating	35	35	35	36	36	356252	4576154	220
857	Non-participating	44	45	45	47	47	349431	4569208	242
858	Non-participating	36	36	36	38	38	349642	4572606	230
859	Non-participating	34	35	35	36	40	345813	4568883	242
860	Participating	44	45	45	46	46	353139	4569793	234
861	Non-participating	42	43	43	44	44	350095	4562235	245
862	Non-participating	39	39	39	41	41	352036	4572642	233
863	Non-participating	40	40	40	42	42	352909	4577564	222
864	Non-participating	42	42	42	44	46	345800	4567218	244
865	Non-participating	39	40	40	41	41	345996	4561840	256
866	Participating	37	37	37	39	39	352704	4554608	262
867	Non-participating	33	33	33	34	34	360061	4578221	213
868	Non-participating	40	40	40	42	42	357332	4574297	220
869	Non-participating	42	43	43	44	44	351656	4562959	241
870	Non-participating	44	45	45	46	46	349964	4567481	242
871	Participating	43	44	44	45	45	350129	4550974	271
872	Non-participating	36	37	37	38	44	345753	4568254	242
873	Participating	40	40	40	42	42	348818	4556197	261
874	Non-participating	35	35	35	37	37	354812	4551533	263
875	Non-participating	33	33	33	35	35	354426	4551131	262
876	Non-participating	41	41	41	43	43	349995	4573422	226
877	Non-participating	35	36	36	37	37	356530	4574459	220
878	Participating	36	36	36	38	38	353805	4578177	218
879	Participating	44	45	45	46	46	350101	4563273	246
880	Non-participating	43	44	44	45	45	351782	4562341	242
881	Non-participating	39	39	39	41	41	352663	4551458	265

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
882	Non-participating	44	45	45	46	47	346721	4545308	294
883	Non-participating	38	39	39	40	41	346809	4565397	248
884	Non-participating	35	35	35	36	36	353194	4555411	258
885	Non-participating	41	42	42	43	43	347510	4552119	277
886	Non-participating	36	36	36	37	42	346091	4549639	279
887	Non-participating	40	40	40	42	42	346965	4562776	252
888	Non-participating	35	35	35	36	36	352979	4556063	258
889	Participating	37	37	37	39	39	345780	4554139	276
890	Non-participating	37	37	37	38	38	352190	4549472	273
891	Non-participating	34	35	35	36	36	352515	4578738	227
892	Non-participating	36	36	36	38	38	356767	4574339	220
893	Non-participating	41	41	41	43	43	357575	4574410	220
894	Non-participating	40	40	40	42	42	358181	4574696	218
895	Non-participating	39	40	40	41	41	353149	4577675	220
896	Non-participating	39	40	40	41	42	347575	4546627	298
897	Non-participating	44	44	44	46	46	346214	4545413	293
898	Non-participating	38	39	39	40	40	347675	4570149	238
899	Non-participating	40	41	41	42	42	353957	4568099	236
900	Non-participating	35	36	36	37	37	350156	4558839	251
901	Non-participating	41	41	41	42	42	351464	4551664	271
902	Non-participating	36	37	37	38	40	347679	4548237	287
903	Participating	41	42	42	43	43	352520	4577112	222
904	Non-participating	38	38	38	40	40	350139	4578425	222
905	Non-participating	36	37	37	38	38	347938	4573106	227
906	Non-participating	30	30	30	32	33	349109	4545249	294
907	Non-participating	38	38	38	40	40	347277	4569738	241
908	Non-participating	42	43	43	44	45	346325	4567718	242
909	Non-participating	39	39	39	40	46	345809	4567858	242
910	Non-participating	35	36	36	37	37	349710	4558644	252
911	Participating	41	42	42	43	43	346620	4554278	272
912	Non-participating	39	39	39	40	41	349778	4569906	241
913	Non-participating	34	34	34	36	36	356928	4572044	221
914	Participating	44	45	45	46	46	354903	4576237	221

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
915	Non-participating	36	36	37	38	38	351969	4564265	236
916	Non-participating	39	39	39	41	41	354630	4567471	232
917	Non-participating	38	38	38	39	39	351808	4560091	246
918	Non-participating	35	35	35	37	38	345405	4553915	278
919	Non-participating	38	39	39	40	40	350381	4572964	229
920	Participating	36	36	36	38	38	356346	4573173	223
921	Non-participating	41	42	42	43	43	349801	4578266	224
922	Non-participating	38	38	38	40	40	355631	4571598	225
923	Participating	44	45	45	46	47	345895	4566816	244
924	Non-participating	37	38	38	39	39	347593	4570274	236
925	Non-participating	41	41	41	43	43	348055	4567696	244
926	Participating	38	39	39	40	40	349672	4560262	250
927	Non-participating	44	45	45	46	46	350163	4549957	275
928	Non-participating	38	39	39	40	40	357148	4574305	221
929	Non-participating	40	40	40	42	42	357881	4574678	219
930	Non-participating	37	37	37	38	38	354060	4578082	214
931	Non-participating	40	41	41	42	42	352252	4568752	238
932	Participating	44	44	44	45	45	351695	4562580	242
933	Non-participating	37	37	37	39	39	350487	4564709	244
934	Non-participating	35	35	35	36	37	345683	4561023	257
935	Non-participating	36	36	36	38	38	351045	4558290	253
936	Non-participating	34	34	34	35	35	350427	4579034	221
937	Non-participating	39	39	39	40	41	347123	4573906	224
938	Participating	43	44	44	45	45	351593	4562809	242
939	Non-participating	36	36	36	37	38	346775	4569685	241
940	Participating	46	46	46	48	48	346662	4556274	265
941	Participating	45	46	46	47	47	346699	4556285	266
942	Non-participating	39	39	39	40	41	345119	4555767	267
943	Participating	38	39	38	40	40	355419	4577211	222
944	Non-participating	40	40	40	42	42	358264	4576067	217
945	Non-participating	41	41	41	43	43	355392	4572153	224
946	Non-participating	41	41	41	43	43	351472	4551632	271
947	Non-participating	36	37	37	38	38	350093	4552649	269

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
948	Participating	44	45	45	46	46	347638	4552918	274
949	Non-participating	39	39	39	41	41	353368	4577748	218
950	Non-participating	38	38	38	39	39	354680	4566505	232
951	Non-participating	43	43	43	45	45	351682	4560860	246
952	Non-participating	36	36	36	38	42	345999	4549935	282
953	Non-participating	34	34	34	35	44	345665	4549252	284
954	Non-participating	36	36	36	38	38	360174	4573916	211
955	Non-participating	38	38	38	40	40	352895	4577886	222
956	Participating	43	44	44	45	45	352186	4567835	240
957	Participating	33	33	33	35	36	349615	4548101	285
958	Participating	39	40	40	41	43	347235	4548163	290
959	Non-participating	35	35	35	37	44	345203	4565546	249
960	Non-participating	37	38	38	39	41	346011	4544926	287
961	Participating	37	38	38	39	39	346802	4563189	250
962	Participating	43	43	43	45	45	351590	4566165	242
963	Non-participating	35	36	36	37	37	354867	4551706	259
964	Non-participating	41	41	41	43	43	347633	4554303	268
965	Non-participating	40	40	40	42	42	348961	4573771	226
966	Non-participating	43	43	43	45	45	350914	4576328	225
967	Non-participating	37	37	37	39	39	352685	4565427	237
968	Non-participating	42	42	42	44	45	345811	4566113	248
969	Non-participating	40	41	41	42	43	347751	4569838	242
970	Non-participating	39	39	39	41	41	354336	4553542	260
971	Participating	39	39	39	41	42	347619	4546710	298
972	Non-participating	39	40	40	41	41	357519	4574552	220
973	Non-participating	40	41	41	42	42	352326	4576558	223
974	Non-participating	40	40	40	42	42	360032	4576959	213
975	Non-participating	44	45	45	46	46	347161	4567645	243
976	Non-participating	39	39	39	41	41	347793	4570125	240
977	Non-participating	37	38	38	39	39	348093	4570528	236
978	Non-participating	37	37	37	39	39	346459	4560988	255
979	Non-participating	37	38	38	39	39	350253	4548933	281
980	Non-participating	43	44	44	45	46	347182	4546195	292

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
981	Non-participating	38	39	39	40	40	347687	4570125	238
982	Non-participating	37	37	37	39	41	346100	4550230	280
983	Non-participating	36	36	36	37	37	354673	4570223	229
984	Non-participating	33	33	33	35	35	359381	4578463	213
985	Non-participating	37	38	38	39	39	353836	4577882	219
986	Non-participating	41	41	41	43	43	358324	4576168	217
987	Non-participating	39	40	40	41	41	355624	4572345	224
988	Non-participating	37	37	37	39	39	350003	4565251	245
989	Non-participating	31	32	32	33	33	360681	4578051	209
990	Non-participating	34	35	35	36	37	345606	4561043	257
991	Non-participating	35	35	35	36	36	348486	4559535	253
992	Non-participating	40	41	41	42	42	350254	4554770	259
993	Non-participating	39	40	40	41	41	352037	4573772	226
994	Non-participating	41	41	41	43	43	348814	4550416	276
995	Non-participating	34	34	35	36	36	348477	4560775	250
996	Non-participating	29	29	29	31	32	350178	4546266	297
997	Non-participating	42	43	43	44	44	353860	4576204	224
998	Participating	46	47	47	48	48	349188	4568594	242
999	Non-participating	43	43	43	45	46	345898	4567282	243
1000	Non-participating	41	41	41	43	43	346353	4562940	257
1001	Non-participating	35	35	35	37	37	348520	4562825	249
1002	Non-participating	36	37	37	38	38	346842	4575344	222
1003	Non-participating	41	41	41	43	43	349887	4578256	223
1004	Non-participating	44	44	44	46	46	358897	4575970	215
1005	Non-participating	41	41	41	43	43	354501	4567102	232
1006	Non-participating	41	41	41	43	43	352816	4561551	243
1007	Non-participating	37	38	38	39	39	352167	4552998	266
1008	Non-participating	42	42	42	44	44	347527	4553226	269
1009	Non-participating	38	39	39	40	40	347050	4573981	224
1010	Non-participating	39	39	39	40	40	348894	4576687	223
1011	Non-participating	39	39	39	41	41	353865	4575707	223
1012	Non-participating	39	40	40	41	41	347547	4569819	242
1013	Participating	46	47	47	48	49	346750	4567586	242

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1014	Non-participating	41	42	42	43	43	347558	4566094	245
1015	Non-participating	31	32	32	33	34	350290	4547598	285
1016	Non-participating	35	35	35	37	37	356170	4576511	221
1017	Non-participating	36	36	36	37	37	358312	4577993	218
1018	Non-participating	40	41	41	42	42	353559	4571374	230
1019	Non-participating	40	40	40	42	42	352094	4576282	223
1020	Non-participating	41	42	42	43	43	353758	4576127	224
1021	Non-participating	38	38	38	40	40	352615	4565593	239
1022	Non-participating	42	43	43	44	44	350084	4562200	245
1023	Non-participating	34	34	34	36	36	351855	4578894	224
1024	Participating	40	40	40	42	42	348058	4570129	241
1025	Non-participating	38	38	38	39	40	351248	4552131	268
1026	Non-participating	31	31	31	32	34	349324	4546573	295
1027	Non-participating	33	33	33	35	36	349352	4548038	283
1028	Non-participating	36	36	36	38	38	347018	4575643	219
1029	Non-participating	38	39	39	40	40	353909	4575563	222
1030	Participating	44	45	45	47	47	358398	4576931	216
1031	Non-participating	38	38	38	40	40	347664	4570192	237
1032	Non-participating	41	41	41	43	43	352414	4566196	239
1033	Non-participating	40	41	41	42	42	352669	4576334	223
1034	Non-participating	35	35	35	37	37	351887	4578752	224
1035	Non-participating	39	40	40	41	41	350072	4564060	244
1036	Non-participating	40	41	41	42	42	351844	4563189	241
1037	Non-participating	35	35	35	36	37	348408	4561940	250
1038	Participating	42	42	42	44	44	350094	4562068	243
1039	Non-participating	36	37	37	38	38	352245	4549448	275
1040	Non-participating	43	44	44	45	45	359913	4576629	213
1041	Non-participating	38	38	38	40	40	352999	4575300	225
1042	Non-participating	34	34	34	35	35	354143	4562647	240
1043	Participating	46	47	47	49	49	350142	4550503	275
1044	Non-participating	43	43	43	45	45	350138	4551042	269
1045	Participating	44	45	45	46	46	350020	4555293	259
1046	Non-participating	35	35	35	36	36	351791	4578807	224

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1047	Non-participating	39	39	39	40	40	351500	4569368	243
1048	Non-participating	42	43	43	44	44	348862	4551191	272
1049	Non-participating	42	43	43	44	44	348050	4569879	242
1050	Non-participating	31	32	32	33	33	360543	4572597	212
1051	Non-participating	34	34	34	36	36	355804	4577739	220
1052	Non-participating	39	39	39	41	41	353392	4575782	224
1053	Non-participating	41	41	41	42	42	351953	4569336	242
1054	Participating	39	39	39	41	41	351997	4563400	239
1055	Non-participating	44	45	45	46	46	351589	4556129	256
1056	Participating	47	48	48	49	49	349990	4574656	223
1057	Non-participating	35	35	35	36	36	353196	4563805	242
1058	Non-participating	37	37	37	39	39	352618	4565404	236
1059	Non-participating	44	44	44	46	46	347742	4553279	272
1060	Non-participating	41	42	42	43	43	351470	4551566	271
1061	Non-participating	36	37	37	38	41	345713	4565364	249
1062	Non-participating	35	35	35	36	36	354877	4551600	262
1063	Non-participating	37	37	37	39	39	350278	4578437	222
1064	Non-participating	34	34	34	35	35	360038	4578064	211
1065	Non-participating	40	40	40	42	42	352773	4577533	222
1066	Non-participating	39	39	39	41	41	350575	4566210	242
1067	Participating	44	45	45	46	46	352148	4567052	240
1068	Non-participating	42	42	42	44	44	351670	4563033	241
1069	Non-participating	34	34	34	35	36	345342	4561445	259
1070	Non-participating	35	35	35	37	37	345820	4558760	259
1071	Non-participating	31	32	32	33	35	349120	4546580	294
1072	Non-participating	40	41	41	42	42	358335	4574658	218
1073	Non-participating	39	40	40	41	41	352044	4568916	239
1074	Non-participating	38	38	38	40	40	347642	4570135	238
1075	Non-participating	41	42	42	43	43	347914	4569868	243
1076	Non-participating	38	39	39	40	40	353763	4568752	234
1077	Non-participating	39	40	40	41	41	345885	4560119	258
1078	Non-participating	34	35	34	36	36	353288	4555449	258
1079	Non-participating	37	37	37	39	39	356077	4572844	223

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1080	Participating	37	38	38	39	39	350092	4564453	244
1081	Non-participating	38	38	38	39	39	352770	4565542	238
1082	Participating	43	44	44	45	46	347370	4567520	245
1083	Non-participating	35	35	35	37	37	351284	4558502	251
1084	Non-participating	36	37	37	38	38	351539	4557672	252
1085	Participating	43	44	44	45	45	354254	4553007	263
1086	Non-participating	36	36	36	37	37	355850	4571264	226
1087	Non-participating	43	43	43	45	45	355021	4576211	222
1088	Non-participating	37	38	38	39	39	350416	4572759	228
1089	Non-participating	38	39	39	40	40	355825	4572628	223
1090	Non-participating	39	39	39	41	41	355710	4572466	224
1091	Non-participating	44	45	45	46	47	346439	4567620	242
1092	Participating	36	36	36	37	38	348416	4558915	255
1093	Non-participating	33	33	33	34	35	349910	4548035	283
1094	Non-participating	40	41	41	42	45	346811	4548270	289
1095	Non-participating	35	35	35	37	37	360068	4572915	213
1096	Participating	45	46	46	48	48	359105	4576036	214
1097	Non-participating	39	40	40	41	41	358073	4577203	218
1098	Participating	44	44	44	46	46	350690	4556090	257
1099	Non-participating	36	36	36	38	38	354424	4551354	265
1100	Participating	36	37	37	38	38	356678	4573662	224
1101	Non-participating	40	40	40	42	42	358038	4574686	219
1102	Non-participating	39	40	40	41	41	353054	4577649	223
1103	Non-participating	43	44	44	45	45	350109	4562559	245
1104	Participating	46	47	47	48	48	346516	4545426	295
1105	Non-participating	42	42	42	44	46	345804	4567260	244
1106	Non-participating	44	45	45	46	46	347448	4566657	246
1107	Non-participating	38	39	39	40	40	347733	4570150	239
1108	Participating	39	40	40	41	41	348018	4554207	265
1109	Non-participating	43	44	43	45	45	351472	4549995	269
1110	Non-participating	39	39	39	41	41	355673	4572156	223
1111	Participating	39	40	40	41	41	355507	4571788	226
1112	Non-participating	35	35	35	36	36	356215	4576303	220

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1113	Non-participating	38	38	38	39	40	347292	4565303	246
1114	Non-participating	42	42	42	44	44	350221	4556192	257
1115	Non-participating	38	39	39	40	40	357985	4577207	218
1116	Non-participating	36	36	36	37	37	350921	4572082	235
1117	Non-participating	43	43	43	44	44	349916	4573710	226
1118	Non-participating	42	42	42	44	44	350013	4562364	245
1119	Non-participating	41	41	41	43	45	345792	4566007	249
1120	Non-participating	37	37	37	39	39	354437	4551564	264
1121	Non-participating	33	33	33	35	35	350591	4579172	220
1122	Non-participating	33	33	33	34	34	360220	4578117	212
1123	Non-participating	37	37	37	38	38	348415	4573104	227
1124	Participating	39	39	39	41	41	350315	4566303	244
1125	Non-participating	40	41	41	42	42	352429	4566126	238
1126	Non-participating	37	38	38	39	39	347162	4562920	250
1127	Non-participating	40	40	40	42	46	345882	4567698	242
1128	Non-participating	36	37	37	38	38	350169	4548801	281
1129	Non-participating	34	34	34	36	37	348218	4545360	289
1130	Non-participating	39	40	40	41	41	353192	4577651	220
1131	Participating	45	46	46	47	47	352776	4572423	230
1132	Non-participating	37	38	38	39	39	356988	4574315	221
1133	Non-participating	38	38	38	40	40	352893	4577905	222
1134	Non-participating	36	37	37	38	38	354181	4578116	213
1135	Non-participating	37	37	37	39	39	349998	4564598	245
1136	Non-participating	44	45	45	46	46	352183	4567587	242
1137	Non-participating	43	44	44	46	47	345804	4566473	247
1138	Non-participating	33	34	34	35	35	348312	4578329	219
1139	Non-participating	39	40	40	41	41	349930	4578372	224
1140	Non-participating	39	39	39	41	41	355532	4571761	225
1141	Non-participating	37	37	37	39	39	350624	4572696	227
1142	Non-participating	35	36	36	37	37	349681	4558648	251
1143	Non-participating	44	45	45	46	46	354660	4576156	220
1144	Non-participating	38	39	39	40	40	350034	4569643	242
1145	Non-participating	36	36	36	38	38	352083	4564893	237

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1146	Non-participating	41	42	42	43	43	353375	4569349	233
1147	Non-participating	36	36	36	37	37	352501	4560283	243
1148	Non-participating	43	44	44	45	45	351705	4554548	259
1149	Non-participating	41	41	41	42	42	350089	4554841	261
1150	Non-participating	35	35	35	37	37	347591	4560908	253
1151	Participating	45	46	45	47	47	350135	4557137	257
1152	Participating	36	36	36	37	38	348836	4549074	279
1153	Non-participating	39	39	39	41	41	357250	4574297	221
1154	Non-participating	37	37	37	39	39	350479	4564704	244
1155	Non-participating	40	41	41	42	42	352683	4552800	265
1156	Non-participating	43	43	43	45	45	350050	4567872	242
1157	Non-participating	36	37	36	38	38	349659	4572628	230
1158	Non-participating	44	45	45	46	46	353825	4566506	234
1159	Non-participating	32	32	32	33	33	360482	4578141	210
1160	Non-participating	35	35	35	36	36	356029	4577219	220
1161	Non-participating	37	37	37	39	39	347629	4570372	236
1162	Participating	40	41	40	42	42	352673	4552347	268
1163	Non-participating	29	29	29	31	32	350270	4546389	297
1164	Non-participating	40	41	41	42	42	346137	4562885	259
1165	Non-participating	33	33	33	35	35	359245	4578493	213
1166	Non-participating	38	39	39	40	40	353104	4570939	234
1167	Non-participating	38	38	38	40	40	347680	4570190	238
1168	Non-participating	34	35	35	36	37	345618	4560981	257
1169	Participating	43	44	44	45	45	347251	4554344	269
1170	Non-participating	35	35	35	37	37	351474	4578708	223
1171	Non-participating	44	45	45	46	46	358277	4573337	218
1172	Non-participating	41	42	42	43	43	352783	4577306	222
1173	Non-participating	41	41	41	43	43	348186	4570084	240
1174	Non-participating	44	45	45	46	46	347604	4554855	265
1175	Non-participating	38	39	39	40	40	351258	4554136	261
1176	Non-participating	35	35	35	37	37	356509	4574567	220
1177	Non-participating	42	43	43	45	46	345821	4566197	248
1178	Non-participating	37	37	37	39	39	352046	4549461	272

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1179	Non-participating	46	47	47	48	48	350209	4550467	276
1180	Non-participating	35	35	35	36	37	348467	4561661	250
1181	Non-participating	39	40	40	41	41	351038	4554215	263
1182	Non-participating	35	35	35	37	37	351304	4578706	222
1183	Participating	43	43	43	45	45	347609	4573941	226
1184	Non-participating	35	35	35	37	37	347149	4573210	227
1185	Non-participating	41	42	42	43	43	349348	4576426	223
1186	Non-participating	41	41	41	43	43	349293	4576491	223
1187	Non-participating	35	35	35	36	36	356197	4576086	220
1188	Non-participating	40	40	40	42	42	348161	4570177	241
1189	Non-participating	38	39	39	40	40	347373	4569808	241
1190	Non-participating	41	42	42	43	45	345804	4566058	248
1191	Non-participating	40	41	41	42	46	345520	4566585	246
1192	Non-participating	34	35	35	36	36	355306	4566664	230
1193	Non-participating	40	41	41	42	42	349201	4576494	223
1194	Non-participating	37	38	38	39	39	360020	4575590	213
1195	Non-participating	40	41	41	42	42	358322	4576063	217
1196	Non-participating	38	39	39	40	40	346947	4574899	224
1197	Non-participating	40	40	40	42	42	350779	4566294	243
1198	Participating	37	38	38	39	39	352668	4565517	238
1199	Non-participating	34	35	35	36	37	345595	4561016	258
1200	Non-participating	37	37	37	38	38	352022	4560145	243
1201	Non-participating	36	36	36	37	38	345969	4552596	275
1202	Non-participating	36	36	36	37	37	354195	4578214	212
1203	Non-participating	44	44	44	46	46	349510	4568221	246
1204	Non-participating	44	45	45	46	46	353482	4572366	227
1205	Non-participating	35	35	35	37	37	354808	4568470	230
1206	Non-participating	36	36	36	38	45	345235	4546346	296
1207	Non-participating	35	35	35	36	37	345674	4561056	257
1208	Non-participating	35	35	35	37	37	351773	4559441	244
1209	Non-participating	34	35	35	36	36	353249	4555420	258
1210	Non-participating	40	41	41	42	42	357581	4574470	220
1211	Participating	43	43	43	45	45	353769	4572075	228

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1212	Non-participating	38	39	39	40	40	352705	4553713	265
1213	Non-participating	34	35	35	36	36	354842	4551381	262
1214	Non-participating	34	35	35	36	36	348493	4560883	249
1215	Non-participating	40	40	40	42	42	352458	4576342	224
1216	Non-participating	32	32	32	34	34	360780	4577756	210
1217	Non-participating	36	36	36	37	37	354376	4551272	264
1218	Non-participating	40	41	41	42	42	352005	4569424	240
1219	Non-participating	40	41	41	42	42	355517	4572218	224
1220	Non-participating	36	36	36	38	38	347709	4573124	228
1221	Non-participating	38	38	38	40	40	347627	4570134	238
1222	Non-participating	30	31	30	32	34	349543	4546532	295
1223	Non-participating	35	35	35	36	37	348317	4563513	249
1224	Non-participating	41	42	41	43	45	345826	4565981	249
1225	Non-participating	38	39	39	40	40	347824	4565279	248
1226	Participating	35	36	36	37	37	345682	4561488	257
1227	Non-participating	34	35	34	36	36	345484	4560819	258
1228	Participating	45	46	46	48	48	351481	4556074	256
1229	Participating	43	43	43	45	45	354027	4576192	223
1230	Non-participating	37	38	38	39	39	351085	4569388	242
1231	Participating	45	46	46	47	47	351546	4551216	270
1232	Non-participating	34	34	34	35	35	354175	4561977	240
1233	Participating	36	36	36	37	37	350055	4559074	251
1234	Participating	39	40	39	41	41	345901	4559672	257
1235	Non-participating	37	37	37	39	39	350363	4578401	222
1236	Participating	44	45	45	47	47	358395	4576976	216
1237	Participating	44	45	45	46	46	351379	4574429	224
1238	Non-participating	40	40	40	42	42	352297	4576348	223
1239	Non-participating	42	43	43	45	45	359624	4575927	214
1240	Participating	45	45	45	47	47	352411	4569664	238
1241	Participating	39	39	39	40	41	349338	4549590	278
1242	Non-participating	42	43	43	44	45	347095	4545324	296
1243	Non-participating	33	33	33	35	36	345168	4561610	259
1244	Participating	38	39	39	40	40	349175	4553214	269

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1245	Non-participating	39	39	39	41	41	352136	4551836	270
1246	Non-participating	36	36	36	38	38	346830	4573771	224
1247	Non-participating	32	32	32	34	35	348533	4545220	291
1248	Non-participating	39	39	39	41	41	347479	4569761	243
1249	Non-participating	38	38	38	39	40	346779	4565277	248
1250	Non-participating	35	36	36	37	37	351843	4578681	224
1251	Non-participating	33	34	33	35	35	355877	4577954	220
1252	Non-participating	38	39	39	40	40	353500	4575602	224
1253	Non-participating	41	42	42	43	43	358320	4576267	217
1254	Participating	39	39	39	41	41	358491	4575633	217
1255	Non-participating	34	34	34	36	36	353390	4555274	258
1256	Non-participating	34	34	34	35	35	351797	4578961	224
1257	Non-participating	39	40	40	41	41	353289	4577680	219
1258	Non-participating	37	37	37	39	39	351014	4569530	243
1259	Non-participating	39	39	39	40	41	347739	4570112	240
1260	Non-participating	40	41	41	43	43	345979	4562021	256
1261	Participating	35	35	35	36	36	351359	4558869	248
1262	Non-participating	35	36	36	37	37	354960	4551831	259
1263	Non-participating	37	37	37	39	39	354259	4574893	223
1264	Non-participating	42	43	43	44	45	348206	4565701	245
1265	Participating	43	44	44	45	46	347565	4550586	281
1266	Non-participating	41	42	42	43	44	345992	4545396	291
1267	Non-participating	39	40	40	41	41	351022	4557701	253
1268	Non-participating	37	38	38	39	39	350248	4578439	222
1269	Participating	44	45	45	46	46	352276	4567250	240
1270	Non-participating	37	37	37	38	39	347931	4564830	248
1271	Non-participating	44	44	44	46	46	350227	4562388	245
1272	Non-participating	36	37	37	38	38	354246	4565729	233
1273	Non-participating	38	38	38	40	40	347644	4570172	238
1274	Non-participating	34	35	35	36	37	345485	4560725	257
1275	Non-participating	34	35	35	36	36	353268	4555385	258
1276	Non-participating	40	40	40	42	42	350555	4554570	261
1277	Non-participating	40	41	41	42	42	357398	4574300	220

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1278	Non-participating	38	38	38	40	40	354143	4568427	232
1279	Non-participating	39	39	39	41	41	347098	4562757	252
1280	Non-participating	38	39	39	40	40	347942	4565220	247
1281	Participating	36	37	37	38	38	350116	4559347	250
1282	Non-participating	42	42	42	44	44	350262	4549509	276
1283	Non-participating	40	41	41	42	42	353762	4575943	224
1284	Participating	40	40	40	41	41	352679	4553274	264
1285	Participating	42	42	42	44	44	347633	4549675	279
1286	Participating	38	38	38	40	40	348424	4549694	281
1287	Non-participating	35	35	35	36	36	356203	4576380	221
1288	Non-participating	37	38	38	39	39	357823	4577115	218
1289	Non-participating	38	38	38	39	39	358092	4577540	218
1290	Non-participating	40	40	40	42	42	355541	4572159	224
1291	Non-participating	32	33	32	34	35	348515	4545295	292
1292	Participating	38	38	38	40	40	347989	4565118	247
1293	Non-participating	34	35	35	36	36	348417	4560564	251
1294	Participating	37	37	37	38	39	346798	4558584	259
1295	Participating	37	37	37	39	39	350089	4553966	264
1296	Participating	36	36	36	37	38	350813	4553067	265
1297	Non-participating	36	37	37	38	38	348811	4578313	218
1298	Non-participating	34	34	34	35	35	354581	4551245	262
1299	Non-participating	37	37	37	38	42	346347	4549613	281
1300	Participating	43	44	44	45	45	353356	4551990	269
1301	Participating	45	46	46	47	47	350250	4550020	275
1302	Non-participating	40	41	41	42	46	346513	4548253	291
1303	Participating	39	40	40	41	41	355486	4571825	226
1304	Non-participating	36	37	37	38	38	347837	4573129	227
1305	Non-participating	42	42	42	44	44	352286	4576990	222
1306	Non-participating	44	45	45	46	46	359008	4575963	215
1307	Non-participating	36	37	37	38	38	352051	4565190	241
1308	Non-participating	41	41	41	42	42	351971	4569293	242
1309	Non-participating	43	44	44	45	46	346437	4567694	242
1310	Non-participating	41	41	41	43	43	348471	4556199	260

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1311	Non-participating	36	37	37	38	38	354517	4551519	260
1312	Non-participating	39	40	40	41	41	353092	4577660	222
1313	Non-participating	38	38	38	40	40	355863	4572683	223
1314	Non-participating	44	44	44	45	45	351448	4574421	224
1315	Non-participating	40	40	40	42	42	358097	4574685	219
1316	Non-participating	34	34	34	36	36	353392	4563851	242
1317	Non-participating	40	40	40	41	41	352017	4569146	241
1318	Non-participating	38	38	38	40	42	345917	4565508	249
1319	Non-participating	42	43	42	44	46	345782	4567136	244
1320	Non-participating	35	35	35	37	37	351737	4559381	245
1321	Non-participating	39	39	39	40	40	348422	4558313	254
1322	Non-participating	37	37	37	38	38	351887	4553081	264
1323	Non-participating	37	37	37	38	38	348467	4573099	227
1324	Participating	41	42	42	43	43	348370	4566386	244
1325	Non-participating	38	39	39	40	40	354510	4566408	231
1326	Non-participating	34	34	34	36	36	353357	4555585	258
1327	Non-participating	33	33	33	34	34	359944	4578345	212
1328	Non-participating	38	38	38	40	40	352916	4577908	223
1329	Participating	44	44	44	44	44	352043	4570445	236
1330	Non-participating	39	40	40	41	41	352583	4565914	239
1331	Participating	45	46	46	48	48	346827	4545389	295
1332	Non-participating	36	36	36	37	37	352478	4560286	243
1333	Non-participating	33	33	33	34	34	360184	4578138	211
1334	Non-participating	40	40	40	42	42	349875	4578351	224
1335	Non-participating	38	38	38	40	40	347020	4573915	224
1336	Non-participating	34	35	35	36	39	346046	4569172	241
1337	Non-participating	35	35	35	36	38	348278	4548168	286
1338	Non-participating	38	39	39	40	40	347734	4570178	239
1339	Non-participating	37	38	38	39	39	347578	4570226	237
1340	Non-participating	35	36	36	37	37	349924	4558633	253
1341	Non-participating	41	42	42	43	43	349982	4556205	258
1342	Non-participating	32	32	32	33	34	350268	4547708	284
1343	Non-participating	42	43	43	44	44	355017	4576152	222

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1344	Non-participating	42	42	42	44	44	350010	4562367	245
1345	Non-participating	37	37	37	38	39	347601	4570413	235
1346	Non-participating	35	35	35	37	37	347912	4564258	249
1347	Non-participating	36	36	36	38	38	347999	4564656	249
1348	Non-participating	39	40	40	41	41	348160	4570227	240
1349	Participating	36	36	36	38	38	349066	4558615	253
1350	Non-participating	44	45	44	46	46	347815	4556316	261
1351	Non-participating	37	37	37	39	39	348895	4549403	277
1352	Non-participating	37	37	37	39	39	350610	4572677	227
1353	Non-participating	39	39	39	40	40	357202	4574311	221
1354	Participating	37	38	38	39	39	350137	4564494	244
1355	Non-participating	42	43	43	44	44	346242	4560350	257
1356	Non-participating	41	41	41	43	43	351403	4554329	260
1357	Non-participating	36	36	36	38	38	350567	4572365	228
1358	Non-participating	42	42	42	44	44	354165	4577470	218
1359	Non-participating	37	38	37	39	39	352015	4563908	238
1360	Non-participating	39	40	40	41	41	353587	4569084	234
1361	Non-participating	39	39	39	41	41	347104	4562688	253
1362	Non-participating	44	44	44	46	46	346362	4567630	242
1363	Non-participating	37	37	37	38	39	347494	4570326	236
1364	Non-participating	45	46	46	47	47	348982	4567795	247
1365	Non-participating	31	31	31	32	34	348860	4545191	293
1366	Non-participating	44	45	45	46	46	354611	4576155	220
1367	Non-participating	34	34	34	36	36	345485	4560962	258
1368	Non-participating	36	36	36	37	37	349531	4558586	251
1369	Non-participating	35	35	35	37	37	351771	4559446	244
1370	Non-participating	35	35	35	37	37	351483	4559210	247
1371	Non-participating	44	44	44	46	46	353589	4572370	227
1372	Non-participating	41	42	42	43	44	345992	4545396	291
1373	Participating	35	35	35	37	37	347290	4563408	248
1374	Non-participating	37	37	37	38	43	345885	4568329	241
1375	Non-participating	46	47	47	48	48	350231	4550485	276
1376	Non-participating	35	35	35	37	37	353111	4555290	258

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1377	Non-participating	43	44	44	45	45	348529	4556773	258
1378	Non-participating	35	35	35	37	37	355954	4577216	220
1379	Non-participating	38	38	38	40	40	350006	4565708	244
1380	Non-participating	42	42	42	44	44	354191	4553314	261
1381	Non-participating	36	36	36	37	40	345441	4550912	284
1382	Non-participating	29	29	29	31	32	350262	4546657	293
1383	Non-participating	40	40	40	42	42	357528	4574500	221
1384	Non-participating	40	41	41	42	42	358323	4576107	217
1385	Non-participating	44	44	44	46	46	350095	4562633	245
1386	Participating	37	38	38	39	39	345788	4562902	255
1387	Non-participating	39	40	40	41	41	347869	4570099	241
1388	Non-participating	35	35	35	36	37	345637	4560983	257
1389	Non-participating	43	43	43	45	45	347600	4555737	264
1390	Non-participating	39	40	40	41	41	351061	4554234	262
1391	Non-participating	34	34	34	36	36	351859	4578957	224
1392	Participating	37	37	37	38	38	351473	4571012	237
1393	Non-participating	32	32	32	34	34	360744	4573223	211
1394	Non-participating	36	37	37	38	38	352318	4565228	240
1395	Non-participating	41	42	42	43	45	345808	4566059	248
1396	Non-participating	43	44	44	45	45	347556	4566591	245
1397	Non-participating	37	37	37	39	39	347855	4564935	248
1398	Non-participating	36	37	37	38	39	346597	4565036	248
1399	Non-participating	37	37	37	39	39	354006	4578035	215
1400	Non-participating	38	39	39	40	40	350415	4572952	229
1401	Non-participating	35	35	35	36	36	355990	4571079	226
1402	Non-participating	35	36	35	37	37	347808	4560287	253
1403	Participating	36	36	36	38	38	351506	4552946	264
1404	Non-participating	38	38	38	39	40	351906	4549468	273
1405	Non-participating	36	36	36	37	37	354270	4578207	212
1406	Participating	45	46	46	47	47	354351	4576296	221
1407	Non-participating	35	35	35	36	36	356260	4576428	220
1408	Non-participating	39	40	40	41	41	347569	4569824	242
1409	Participating	38	38	38	39	39	350123	4558015	255

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1410	Non-participating	42	43	43	44	44	347726	4554730	265
1411	Non-participating	41	41	41	43	43	349873	4578274	223
1412	Non-participating	36	36	36	38	38	346676	4575067	226
1413	Participating	36	36	36	38	38	348987	4563790	247
1414	Non-participating	37	38	38	39	39	354785	4566560	231
1415	Non-participating	38	39	39	40	40	348094	4570357	237
1416	Non-participating	35	35	35	36	36	354831	4551465	263
1417	Non-participating	35	36	36	37	38	345548	4562856	257
1418	Non-participating	41	42	42	43	43	348233	4573842	226
1419	Non-participating	32	32	32	34	34	360728	4577857	209
1420	Participating	40	41	41	42	42	350027	4568647	242
1421	Non-participating	38	38	38	40	40	347616	4570171	237
1422	Non-participating	43	44	44	45	45	348378	4557828	256
1423	Non-participating	38	38	38	40	40	352688	4550290	271
1424	Participating	38	39	39	40	40	352566	4574894	225
1425	Non-participating	40	40	40	41	41	355568	4572190	224
1426	Non-participating	42	42	42	44	44	349996	4563528	245
1427	Non-participating	34	35	35	36	36	348240	4563338	248
1428	Non-participating	39	39	39	41	41	351562	4549433	276
1429	Non-participating	36	37	37	38	39	348034	4546569	297
1430	Non-participating	42	43	42	44	44	347148	4545327	296
1431	Participating	44	45	45	46	46	351708	4562154	242
1432	Non-participating	35	36	36	37	37	353029	4555212	259
1433	Non-participating	40	40	40	42	42	352391	4576346	223
1434	Non-participating	41	42	42	43	43	347529	4552120	277
1435	Non-participating	38	39	39	40	40	351829	4549549	273
1436	Participating	39	39	39	40	40	358346	4574917	218
1437	Non-participating	40	40	40	42	42	352220	4576349	223
1438	Non-participating	42	43	43	44	44	353706	4571799	229
1439	Non-participating	38	38	38	40	40	347702	4565289	248
1440	Non-participating	33	33	33	35	36	345249	4561438	259
1441	Participating	41	41	41	43	43	346559	4554245	273
1442	Participating	42	43	43	45	45	348773	4551313	272

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1443	Non-participating	35	36	36	37	37	352974	4578399	225
1444	Non-participating	37	38	38	39	39	350738	4569692	242
1445	Participating	46	47	47	48	48	350004	4574032	225
1446	Non-participating	42	43	43	44	44	349651	4568420	244
1447	Non-participating	31	31	31	33	34	350189	4547374	287
1448	Non-participating	34	34	34	36	38	348423	4548045	287
1449	Non-participating	38	39	39	40	40	353148	4575587	225
1450	Non-participating	35	35	35	37	37	355974	4571123	227
1451	Non-participating	39	39	39	41	41	346608	4561617	254
1452	Participating	40	41	41	42	42	352981	4551903	269
1453	Non-participating	36	36	37	38	38	350155	4552477	266
1454	Non-participating	35	35	35	37	37	351451	4578703	222
1455	Non-participating	39	40	40	41	41	358363	4574803	218
1456	Non-participating	44	45	44	46	46	354464	4576157	220
1457	Non-participating	39	40	40	41	41	347522	4569765	243
1458	Non-participating	42	42	42	44	44	347978	4569873	243
1459	Non-participating	41	41	41	43	43	349959	4562006	245
1460	Non-participating	39	39	39	41	41	351290	4554155	262
1461	Non-participating	42	43	43	44	44	359982	4576414	212
1462	Non-participating	41	41	41	43	43	352961	4576162	223
1463	Non-participating	41	42	42	43	43	351964	4569430	240
1464	Non-participating	31	31	31	32	33	350066	4547569	286
1465	Non-participating	34	34	34	36	36	350257	4548357	280
1466	Non-participating	38	38	38	39	40	346447	4565283	248
1467	Non-participating	39	39	39	41	41	352215	4551836	270
1468	Participating	43	44	44	45	45	350232	4549730	275
1469	Non-participating	35	35	35	37	37	351963	4578755	225
1470	Non-participating	42	42	42	44	44	358325	4576345	216
1471	Participating	54	54	54	54	54	352098	4570229	237
1472	Participating	43	44	44	45	45	351796	4561416	243
1473	Non-participating	46	47	47	48	48	354963	4573041	223
1474	Non-participating	35	35	35	36	36	356239	4576212	221
1475	Non-participating	36	37	37	38	38	357658	4577146	218

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1476	Non-participating	36	37	36	38	38	349677	4572620	230
1477	Non-participating	38	38	38	39	39	352714	4565528	238
1478	Participating	43	44	44	45	46	347145	4549691	283
1479	Non-participating	31	32	32	33	35	348732	4545284	292
1480	Non-participating	36	37	37	38	39	345513	4562343	256
1481	Non-participating	35	36	36	37	40	345336	4551451	281
1482	Non-participating	38	38	38	40	40	355563	4576291	222
1483	Non-participating	40	40	40	41	41	352961	4577593	222
1484	Non-participating	41	42	42	43	43	353535	4576082	224
1485	Non-participating	34	35	35	36	37	347517	4564217	247
1486	Non-participating	40	41	41	42	42	346029	4561917	256
1487	Non-participating	34	34	34	36	36	353381	4555354	258
1488	Participating	42	42	42	44	44	351862	4556118	255
1489	Non-participating	32	33	33	34	34	360085	4578266	212
1490	Non-participating	39	40	40	41	41	355515	4571870	225
1491	Non-participating	39	40	40	41	41	357308	4574297	221
1492	Non-participating	41	41	41	43	43	357529	4574363	220
1493	Non-participating	44	44	44	46	46	351652	4562645	241
1494	Participating	38	39	39	40	41	348015	4565192	247
1495	Participating	45	46	46	48	48	347920	4569295	242
1496	Non-participating	36	37	37	38	44	345809	4568267	242
1497	Non-participating	43	44	44	45	45	351823	4554627	263
1498	Non-participating	35	36	36	37	37	354806	4551589	262
1499	Non-participating	36	36	36	37	37	350117	4558516	252
1500	Non-participating	35	35	35	36	37	345766	4558760	259
1501	Participating	45	45	45	47	47	348400	4557206	258
1502	Non-participating	34	35	35	36	36	353342	4555145	258
1503	Non-participating	33	33	33	35	37	345305	4553044	274
1504	Non-participating	41	42	41	43	43	347839	4569856	242
1505	Non-participating	44	45	45	46	46	351549	4550227	274
1506	Non-participating	30	31	31	32	33	350279	4547229	288
1507	Non-participating	44	45	45	46	46	346604	4545293	293
1508	Non-participating	37	38	37	39	39	350326	4578397	222

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1509	Non-participating	42	42	42	44	44	349023	4566495	244
1510	Non-participating	43	43	43	45	45	350603	4556169	256
1511	Non-participating	36	36	36	37	37	354523	4551436	262
1512	Non-participating	34	35	35	36	39	345249	4551701	281
1513	Non-participating	32	33	33	34	34	360223	4572432	213
1514	Non-participating	35	36	36	37	37	356505	4574446	220
1515	Non-participating	44	44	44	46	46	350210	4562374	245
1516	Non-participating	34	34	34	36	36	353379	4555408	258
1517	Participating	39	39	39	40	40	351907	4551977	270
1518	Participating	44	44	44	46	46	350198	4550943	270
1519	Participating	40	40	40	42	42	353361	4571305	231
1520	Non-participating	36	37	37	38	38	348062	4573114	227
1521	Non-participating	35	36	36	37	37	356496	4574347	219
1522	Non-participating	34	35	35	36	38	348378	4546626	293
1523	Non-participating	38	38	38	40	40	347786	4565267	248
1524	Non-participating	40	41	40	42	42	347961	4570074	241
1525	Non-participating	38	38	38	39	39	351118	4554067	261
1526	Participating	45	46	46	47	47	347715	4553088	273
1527	Non-participating	42	42	42	44	44	349201	4566249	244
1528	Non-participating	37	38	38	39	39	355650	4571521	226
1529	Non-participating	41	42	42	43	44	345976	4545429	291
1530	Non-participating	35	35	35	37	37	347740	4562575	251
1531	Participating	43	44	43	45	45	347665	4568723	242
1532	Participating	44	45	45	46	46	347003	4556299	264
1533	Non-participating	41	41	41	42	42	355392	4571998	226
1534	Non-participating	38	39	39	40	40	350413	4572970	229
1535	Non-participating	37	38	38	39	39	353820	4577911	216
1536	Non-participating	35	36	36	37	37	357403	4576028	220
1537	Non-participating	35	36	36	37	37	349740	4558644	252
1538	Participating	46	47	47	48	48	353183	4572579	229
1539	Non-participating	40	40	40	42	42	357920	4574680	219
1540	Non-participating	39	40	40	41	41	353237	4577669	219
1541	Non-participating	44	44	44	46	46	354750	4576152	220

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1542	Non-participating	40	40	40	42	42	352101	4569081	240
1543	Non-participating	39	39	39	40	40	349717	4569993	241
1544	Non-participating	35	35	35	36	36	356660	4572138	222
1545	Non-participating	41	41	41	42	42	351812	4563164	240
1546	Non-participating	39	39	39	41	41	354625	4567434	232
1547	Non-participating	35	35	35	37	37	345688	4561023	257
1548	Non-participating	40	40	40	41	42	347745	4553886	263
1549	Participating	46	46	46	48	48	350111	4550708	271
1550	Non-participating	39	39	39	41	41	346950	4574335	223
1551	Non-participating	42	43	43	44	44	351766	4562830	242
1552	Participating	45	46	46	47	47	347796	4568881	243
1553	Non-participating	38	38	38	40	40	357113	4574303	221
1554	Participating	42	42	42	44	44	352205	4568182	240
1555	Non-participating	35	35	35	37	37	350853	4572034	236
1556	Non-participating	36	37	37	38	38	350089	4552650	269
1557	Non-participating	36	36	36	38	38	351072	4553128	262
1558	Non-participating	37	37	37	39	39	348818	4573125	227
1559	Non-participating	39	39	39	40	40	353257	4577760	219
1560	Non-participating	34	34	34	36	39	345770	4569014	242
1561	Non-participating	35	35	35	36	37	345647	4560978	257
1562	Non-participating	40	41	41	42	42	352265	4554891	260
1563	Non-participating	32	32	32	34	35	350265	4547744	284
1564	Non-participating	39	40	40	41	41	350683	4554438	260
1565	Non-participating	32	32	32	34	34	360351	4578144	211
1566	Non-participating	37	37	37	38	38	351236	4572336	233
1567	Participating	44	45	44	46	46	358259	4574305	218
1568	Participating	43	44	44	45	45	352194	4567903	238
1569	Non-participating	37	38	38	39	39	347564	4570235	236
1570	Participating	43	43	43	45	45	345571	4555696	266
1571	Non-participating	37	38	38	39	39	355714	4571570	225
1572	Non-participating	36	36	36	38	38	356484	4573462	224
1573	Non-participating	38	38	38	40	40	352895	4577936	222
1574	Non-participating	35	35	35	36	44	345179	4565533	249

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1575	Non-participating	42	43	43	44	44	351460	4549844	274
1576	Non-participating	36	36	36	38	38	347917	4564725	248
1577	Non-participating	40	41	41	42	42	347660	4554179	265
1578	Non-participating	39	39	39	40	40	353536	4577769	217
1579	Non-participating	38	39	39	40	40	350350	4572973	229
1580	Non-participating	41	41	41	43	43	353834	4551732	257
1581	Non-participating	32	32	34	34	34	354557	4551203	260
1582	Non-participating	35	36	36	37	38	348897	4548979	279
1583	Non-participating	44	45	45	46	46	349015	4575139	223
1584	Non-participating	36	36	36	38	38	356566	4573571	224
1585	Non-participating	43	44	44	45	46	347126	4546276	294
1586	Non-participating	41	41	41	43	46	345822	4567489	243
1587	Non-participating	42	43	43	44	44	348381	4570019	241
1588	Non-participating	40	40	40	42	42	352223	4576388	223
1589	Non-participating	37	37	37	39	39	352653	4565430	237
1590	Non-participating	37	37	37	39	39	348093	4570603	236
1591	Non-participating	44	45	45	46	46	351459	4550161	273
1592	Non-participating	42	43	43	44	45	346159	4567667	241
1593	Non-participating	38	38	38	40	40	347696	4570181	238
1594	Non-participating	39	39	39	41	41	352489	4551940	269
1595	Non-participating	40	40	40	42	44	345904	4565792	249
1596	Non-participating	35	35	35	37	37	351576	4578714	224
1597	Non-participating	36	36	36	37	37	352820	4565041	236
1598	Non-participating	37	37	37	38	38	350057	4559456	249
1599	Participating	37	38	37	39	39	350117	4559517	248
1600	Non-participating	33	33	33	35	35	359161	4578525	212
1601	Non-participating	40	40	40	41	41	355603	4572322	224
1602	Non-participating	45	45	45	47	47	354176	4572221	227
1603	Participating	44	44	44	46	46	351451	4574702	224
1604	Non-participating	34	34	34	36	41	345301	4550492	282
1605	Non-participating	35	36	36	37	37	354983	4570382	228
1606	Non-participating	41	42	42	43	43	352263	4568399	240
1607	Non-participating	45	46	46	47	47	349292	4568050	246

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1608	Non-participating	34	34	34	36	38	346038	4569212	241
1609	Non-participating	37	37	37	39	39	347671	4570368	236
1610	Non-participating	37	37	37	39	39	346481	4561034	255
1611	Participating	36	37	36	38	38	350170	4553687	262
1612	Non-participating	36	37	37	38	38	350438	4578472	222
1613	Non-participating	39	40	39	41	41	357522	4574586	220
1614	Non-participating	42	43	43	44	44	358587	4576053	217
1615	Non-participating	37	37	37	38	38	347004	4575457	222
1616	Non-participating	39	39	39	41	41	347798	4570143	240
1617	Non-participating	38	39	39	40	40	348166	4570376	237
1618	Non-participating	40	41	41	42	42	346143	4562882	259
1619	Non-participating	37	38	38	39	39	347129	4562958	250
1620	Non-participating	42	43	43	44	44	350090	4562167	245
1621	Non-participating	36	36	36	37	37	350110	4559140	250
1622	Non-participating	42	43	43	44	44	353821	4576206	224
1623	Participating	34	35	34	36	36	345586	4558867	260
1624	Non-participating	40	41	41	42	42	352066	4556035	257
1625	Non-participating	38	39	39	40	41	346637	4565406	250
1626	Non-participating	35	35	35	37	37	356176	4576461	220
1627	Non-participating	38	38	38	40	40	353593	4570299	231
1628	Non-participating	38	38	38	39	39	354094	4575373	222
1629	Non-participating	41	41	41	43	43	352365	4566198	238
1630	Non-participating	36	36	36	38	38	350058	4553188	268
1631	Non-participating	42	42	42	44	44	350223	4551183	268
1632	Non-participating	34	35	34	36	36	351853	4578865	224
1633	Non-participating	35	35	35	37	37	351347	4578692	222
1634	Non-participating	38	38	38	40	40	346986	4573983	224
1635	Participating	39	40	39	41	41	353984	4575723	222
1636	Non-participating	39	39	39	40	40	349977	4566054	244
1637	Non-participating	41	41	41	43	43	347547	4551757	278
1638	Non-participating	38	39	39	40	41	347364	4569745	242
1639	Participating	41	41	41	43	43	354328	4553297	262
1640	Participating	38	38	38	39	40	346345	4552287	273

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1641	Non-participating	39	40	39	41	41	352125	4573708	226
1642	Non-participating	36	37	36	38	38	356623	4573677	224
1643	Non-participating	41	41	41	42	42	351986	4569424	240
1644	Participating	31	31	31	32	34	349468	4546621	296
1645	Non-participating	35	35	35	37	37	348455	4562789	249
1646	Non-participating	35	35	35	36	37	348393	4562236	250
1647	Non-participating	37	37	37	38	39	346532	4561170	255
1648	Non-participating	43	43	43	45	45	354079	4576189	223
1649	Non-participating	36	36	36	37	37	354500	4551413	263
1650	Non-participating	38	39	39	40	40	347659	4570128	238
1651	Non-participating	39	39	39	41	41	347509	4569819	242
1652	Non-participating	38	39	39	40	40	351122	4557713	253
1653	Participating	46	47	47	48	48	350311	4575995	224
1654	Non-participating	37	37	37	38	41	347394	4548574	286
1655	Non-participating	34	34	34	35	37	348235	4545325	289
1656	Non-participating	41	41	41	42	43	347510	4565937	246
1657	Non-participating	36	36	36	37	37	350678	4558472	254
1658	Non-participating	34	34	34	36	37	347406	4564037	248
1659	Non-participating	35	36	36	37	37	351706	4578667	224
1660	Non-participating	36	37	37	38	38	352320	4565234	240
1661	Non-participating	40	41	41	42	42	345989	4561988	256
1662	Participating	40	41	41	42	42	349989	4561296	247
1663	Participating	39	40	40	41	42	347605	4546711	298
1664	Participating	34	35	35	36	36	360728	4575977	208
1665	Non-participating	41	41	41	42	42	351953	4569321	242
1666	Participating	44	44	44	46	46	351776	4561467	243
1667	Non-participating	36	37	37	38	38	348486	4558724	255
1668	Non-participating	32	33	33	34	34	348467	4578804	218
1669	Non-participating	34	35	35	36	36	351794	4578841	224
1670	Non-participating	35	36	36	37	37	354771	4570239	229
1671	Non-participating	40	41	41	42	42	352602	4576337	224
1672	Participating	43	43	43	45	45	350083	4563534	245
1673	Non-participating	39	40	40	41	41	348613	4555346	264

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1674	Non-participating	42	43	43	44	45	348095	4569885	242
1675	Participating	31	31	31	33	34	344724	4561462	260
1676	Participating	34	35	34	36	36	353527	4554977	259
1677	Participating	32	33	33	34	34	354192	4561226	240
1678	Participating	29	29	29	31	40	343737	4552579	279
1679	Participating	34	34	34	36	36	351037	4548393	280
1680	Participating	32	32	32	33	40	344614	4550951	285
1681	Participating	31	31	31	33	34	344535	4559911	261
1682	Participating	33	33	33	34	34	355602	4552498	264
1683	Participating	30	30	30	32	34	344384	4559931	261
1684	Participating	30	30	30	31	35	343318	4555839	270
1685	Participating	36	36	36	38	38	351999	4564869	240
1686	Participating	31	31	31	33	34	344733	4561456	260
1687	Participating	35	35	35	36	37	344511	4555969	270
1688	Participating	33	33	33	35	36	345110	4559813	260
1689	Participating	34	34	34	36	36	358332	4572043	217
1690	Participating	31	31	31	32	36	344263	4553454	274
1691	Participating	28	28	28	30	31	350957	4546431	293
1692	Participating	35	35	35	36	37	345150	4557462	263
1693	Participating	36	36	36	37	38	344776	4556490	268
1694	Participating	33	33	33	35	35	345062	4559825	259
1695	Participating	35	35	35	36	36	352887	4560425	242
1696	Participating	32	32	32	33	33	360906	4577647	208
1697	Participating	32	32	32	34	34	354181	4561174	240
1698	Participating	32	32	32	34	36	344152	4554784	272
1699	Participating	30	30	30	31	37	343697	4553874	275
1700	Participating	31	31	31	32	34	344523	4559910	261
1701	Participating	31	31	31	33	38	344434	4552574	279
1702	Participating	33	33	33	35	39	344911	4551098	283
1703	Participating	34	35	35	36	36	352908	4560367	241
1704	Participating	28	28	28	30	35	342811	4555847	270
1705	Participating	34	34	34	36	36	358238	4572047	217
1706	Non-participating	30	30	30	32	40	344136	4565266	249

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1707	Non-participating	33	33	33	35	35	351753	4579100	224
1708	Non-participating	30	31	31	32	32	345636	4575233	221
1709	Non-participating	36	36	36	38	38	352364	4549521	274
1710	Non-participating	32	32	32	34	34	353806	4560630	241
1711	Non-participating	31	31	31	33	37	345209	4569780	239
1712	Non-participating	27	27	27	29	31	350157	4545152	297
1713	Non-participating	32	32	32	33	38	345291	4569298	239
1714	Non-participating	34	34	34	36	36	352243	4557669	251
1715	Non-participating	34	34	34	35	35	354587	4551013	262
1716	Non-participating	32	33	33	34	46	345268	4549367	284
1717	Non-participating	32	32	32	33	36	345619	4569829	234
1718	Non-participating	33	33	33	35	36	347084	4571034	232
1719	Non-participating	31	31	31	33	33	361049	4577694	207
1720	Non-participating	30	30	30	32	32	357867	4579023	216
1721	Non-participating	34	35	35	36	36	353118	4564438	240
1722	Non-participating	30	30	30	31	31	354779	4564242	233
1723	Non-participating	33	33	33	34	34	355617	4568346	229
1724	Non-participating	32	32	32	34	34	355036	4551119	260
1725	Non-participating	32	32	32	33	46	344296	4565947	248
1726	Non-participating	29	29	29	31	31	347595	4579234	220
1727	Non-participating	33	34	33	35	36	347260	4571185	232
1728	Non-participating	36	36	36	38	38	347361	4570291	236
1729	Non-participating	34	34	35	36	36	351894	4559282	244
1730	Non-participating	24	25	24	26	44	341795	4552640	282
1731	Non-participating	28	28	28	30	30	361499	4572822	210
1732	Non-participating	31	31	31	33	34	344428	4558275	263
1733	Non-participating	34	34	34	36	41	345301	4550350	283
1734	Non-participating	26	26	27	27	29	349222	4544192	286
1735	Non-participating	35	35	35	36	36	350023	4571624	236
1736	Non-participating	33	33	33	35	37	345874	4569486	240
1737	Non-participating	33	34	34	35	39	345654	4569099	241
1738	Non-participating	31	32	32	33	36	345532	4569861	235
1739	Non-participating	34	34	34	35	35	354189	4550729	267

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1740	Non-participating	31	31	31	33	33	361188	4575163	210
1741	Non-participating	31	32	32	33	44	344177	4566465	247
1742	Non-participating	32	33	33	34	34	348038	4578326	219
1743	Non-participating	30	30	30	31	31	347812	4579061	222
1744	Non-participating	33	34	34	35	35	353497	4578792	223
1745	Non-participating	32	32	32	33	33	346713	4576620	221
1746	Non-participating	35	36	36	37	37	350253	4570838	237
1747	Non-participating	31	31	31	32	32	356594	4569678	225
1748	Non-participating	33	33	33	35	35	355514	4568334	229
1749	Non-participating	33	34	34	35	35	355371	4551905	264
1750	Non-participating	31	31	31	33	43	344047	4566507	247
1751	Non-participating	32	32	32	34	44	344280	4567110	245
1752	Non-participating	28	29	29	30	32	348523	4544023	287
1753	Non-participating	32	33	33	34	37	345814	4569704	235
1754	Non-participating	31	31	31	32	32	356308	4568945	226
1755	Non-participating	33	33	33	35	35	347107	4572396	228
1756	Non-participating	31	31	31	33	43	344104	4565900	247
1757	Non-participating	33	33	33	35	46	344493	4567171	245
1758	Non-participating	30	30	30	31	34	344299	4561543	259
1759	Non-participating	33	33	33	34	37	345750	4569503	238
1760	Non-participating	31	31	31	33	36	345379	4569810	238
1761	Non-participating	35	35	35	37	37	344908	4557028	264
1762	Non-participating	30	31	31	32	46	344237	4568057	238
1763	Non-participating	29	29	29	30	34	343869	4560191	260
1764	Non-participating	37	37	37	38	38	351115	4570752	237
1765	Non-participating	32	32	32	34	36	345725	4569870	234
1766	Non-participating	33	33	33	35	35	355256	4551514	264
1767	Non-participating	33	33	33	35	35	354162	4550495	269
1768	Non-participating	29	29	29	31	32	349359	4545119	295
1769	Non-participating	32	32	32	34	34	353914	4579031	214
1770	Non-participating	35	35	35	36	36	356109	4574977	222
1771	Non-participating	30	31	31	32	32	356297	4567806	227
1772	Non-participating	32	32	32	33	49	344946	4549311	286

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1773	Non-participating	32	32	32	34	36	345866	4570177	233
1774	Non-participating	33	33	33	34	34	355587	4552253	266
1775	Non-participating	33	33	33	34	34	353170	4564146	237
1776	Non-participating	32	33	33	34	34	354147	4564177	237
1777	Non-participating	31	31	31	33	36	345338	4569832	238
1778	Non-participating	34	34	34	36	36	354506	4578465	212
1779	Non-participating	35	36	36	37	37	349117	4571054	236
1780	Non-participating	32	32	32	33	44	344182	4566550	248
1781	Non-participating	33	33	33	34	37	345889	4569671	236
1782	Non-participating	34	34	34	35	36	346998	4570802	233
1783	Non-participating	34	34	34	36	37	347141	4570699	233
1784	Non-participating	35	35	35	37	37	344969	4557199	266
1785	Non-participating	32	32	32	34	34	354031	4550011	270
1786	Non-participating	34	34	34	36	36	357982	4572082	219
1787	Non-participating	30	30	30	32	34	344336	4559840	260
1788	Non-participating	32	32	32	34	34	346949	4572236	228
1789	Non-participating	34	35	35	36	36	352997	4564494	238
1790	Non-participating	36	36	36	37	38	346824	4569817	240
1791	Non-participating	33	33	33	34	35	350883	4547987	282
1792	Non-participating	33	33	33	35	36	345650	4563833	250
1793	Non-participating	31	31	31	33	44	344096	4566529	247
1794	Non-participating	30	31	31	32	32	356310	4567930	227
1795	Non-participating	36	37	37	38	39	347109	4569934	240
1796	Non-participating	33	34	33	35	39	345645	4569107	242
1797	Non-participating	31	32	32	33	35	345988	4570298	232
1798	Non-participating	32	32	32	34	45	344311	4566632	247
1799	Non-participating	32	32	32	34	34	351703	4579299	221
1800	Non-participating	31	31	31	32	34	344610	4561419	261
1801	Non-participating	32	33	32	34	35	346950	4572285	228
1802	Non-participating	32	32	32	34	34	354272	4563938	237
1803	Non-participating	28	29	29	30	30	355043	4561532	238
1804	Non-participating	34	34	34	36	36	354441	4550986	265
1805	Non-participating	31	31	31	33	33	354633	4578972	208

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1806	Non-participating	34	35	35	36	36	350197	4571798	234
1807	Non-participating	29	29	29	31	34	343928	4559308	262
1808	Non-participating	29	29	29	30	30	347969	4579562	220
1809	Non-participating	32	32	32	34	34	353211	4579198	223
1810	Non-participating	34	35	35	36	36	350563	4571781	239
1811	Non-participating	35	35	35	37	37	350033	4571459	239
1812	Non-participating	33	33	33	35	36	346899	4570873	232
1813	Non-participating	32	33	33	34	34	353649	4549783	267
1814	Non-participating	30	31	31	32	34	347815	4544052	291
1815	Non-participating	34	34	34	35	35	354354	4550798	266
1816	Non-participating	32	32	32	33	33	345819	4574673	227
1817	Non-participating	32	32	32	33	36	345754	4570020	234
1818	Non-participating	32	32	32	34	34	352639	4558394	251
1819	Non-participating	31	32	31	33	44	344137	4566412	247
1820	Non-participating	31	31	31	33	36	345448	4569994	237
1821	Non-participating	33	33	33	34	37	345945	4569671	236
1822	Non-participating	28	28	28	30	32	349640	4545118	297
1823	Non-participating	34	34	34	36	37	346935	4570425	236
1824	Non-participating	35	35	35	36	38	346444	4569616	241
1825	Non-participating	31	31	31	33	36	345607	4569986	234
1826	Non-participating	31	31	31	33	33	355488	4551180	266
1827	Non-participating	30	30	30	32	32	345803	4575939	223
1828	Non-participating	32	32	32	33	37	345482	4569716	235
1829	Non-participating	33	33	33	35	35	353394	4556030	256
1830	Non-participating	35	35	35	36	38	345098	4554218	277
1831	Non-participating	33	33	33	35	35	354931	4551092	262
1832	Non-participating	34	35	35	36	36	346902	4575938	219
1833	Non-participating	33	33	33	35	35	354455	4578652	212
1834	Non-participating	24	24	24	26	38	341342	4554332	280
1835	Non-participating	32	32	32	34	45	344275	4566685	247
1836	Non-participating	34	35	35	36	36	356313	4575488	221
1837	Non-participating	31	32	32	33	33	355274	4551104	260
1838	Non-participating	27	27	28	29	30	351029	4546353	291

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1839	Non-participating	28	29	28	30	32	349623	4545227	297
1840	Non-participating	33	33	33	34	34	358865	4578603	213
1841	Non-participating	37	37	37	38	39	349823	4570383	238
1842	Non-participating	30	30	30	32	32	359198	4571240	215
1843	Non-participating	33	34	33	35	36	346917	4570822	233
1844	Non-participating	30	30	30	32	32	349863	4579944	216
1845	Non-participating	35	35	35	37	37	360184	4575053	213
1846	Non-participating	31	32	32	33	44	344155	4566695	246
1847	Non-participating	29	30	30	31	33	344269	4561512	260
1848	Non-participating	33	33	33	35	35	354286	4562440	239
1849	Non-participating	30	31	31	32	32	361363	4574982	210
1850	Non-participating	33	34	34	35	35	351797	4579022	224
1851	Non-participating	29	30	29	31	31	360853	4572226	210
1852	Non-participating	30	30	30	32	32	345458	4575245	224
1853	Non-participating	36	36	36	38	38	348245	4570809	235
1854	Non-participating	31	31	31	32	32	354654	4550301	260
1855	Non-participating	33	33	33	34	34	354114	4550371	269
1856	Non-participating	31	31	31	32	36	345271	4569933	239
1857	Non-participating	34	34	34	36	46	344985	4565583	249
1858	Non-participating	32	32	32	33	44	344210	4566968	245
1859	Non-participating	31	31	31	33	34	344660	4559914	260
1860	Non-participating	31	31	31	32	32	360797	4572663	212
1861	Non-participating	33	33	33	35	35	355413	4568410	229
1862	Non-participating	35	35	35	37	37	350351	4571799	237
1863	Non-participating	36	36	36	37	38	348403	4570955	234
1864	Non-participating	30	30	30	32	32	354738	4564043	231
1865	Non-participating	30	30	30	32	32	354598	4560892	238
1866	Non-participating	32	32	32	34	34	351652	4579359	221
1867	Non-participating	32	32	32	34	34	354312	4578981	212
1868	Non-participating	32	32	32	34	34	358515	4578692	215
1869	Non-participating	29	29	29	31	31	361597	4577501	205
1870	Non-participating	28	29	29	30	33	344036	4561629	258
1871	Non-participating	35	35	35	37	37	350314	4571331	238

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1872	Non-participating	35	36	36	37	37	344796	4556730	266
1873	Non-participating	32	33	33	34	35	346510	4570609	232
1874	Non-participating	31	31	31	32	32	354158	4550300	266
1875	Non-participating	31	32	32	33	33	355043	4550849	259
1876	Non-participating	36	36	36	38	38	352439	4549510	275
1877	Non-participating	30	31	31	32	32	361174	4577648	206
1878	Non-participating	32	32	32	34	34	356467	4570331	226
1879	Non-participating	33	34	34	35	35	360583	4574640	214
1880	Non-participating	35	36	36	37	38	346826	4569899	240
1881	Non-participating	33	33	33	35	38	345735	4569305	242
1882	Non-participating	34	34	34	36	36	351520	4548476	276
1883	Non-participating	32	32	32	33	44	344204	4567043	245
1884	Non-participating	32	32	32	33	44	344177	4566583	248
1885	Non-participating	32	32	32	33	46	344326	4565978	247
1886	Non-participating	31	31	31	33	37	344333	4553201	278
1887	Non-participating	36	36	36	38	38	348409	4570882	235
1888	Non-participating	34	34	34	35	39	345699	4569015	242
1889	Non-participating	27	27	27	29	31	350076	4545146	298
1890	Non-participating	29	29	29	31	31	361122	4572638	211
1891	Non-participating	26	26	26	28	35	342070	4555863	277
1892	Non-participating	32	32	33	34	37	345811	4569611	236
1893	Non-participating	33	33	33	34	34	354021	4550272	269
1894	Non-participating	30	30	31	32	32	354649	4550614	262
1895	Non-participating	33	33	33	35	35	353131	4578975	226
1896	Non-participating	33	34	34	35	35	346840	4576180	220
1897	Non-participating	31	32	32	33	44	344152	4566897	245
1898	Non-participating	33	33	33	34	34	355569	4568345	229
1899	Non-participating	35	35	35	37	37	351507	4548672	274
1900	Non-participating	32	32	32	34	34	352722	4558787	249
1901	Non-participating	30	30	30	31	34	345683	4543769	286
1902	Non-participating	30	30	30	32	37	343981	4553442	277
1903	Non-participating	31	31	31	33	36	345424	4569872	237
1904	Non-participating	30	30	30	31	45	343993	4546367	292

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1905	Non-participating	32	32	32	33	33	353992	4549810	270
1906	Non-participating	36	36	36	38	38	352395	4549468	277
1907	Non-participating	32	32	32	34	34	351422	4548027	280
1908	Non-participating	28	28	28	30	30	361435	4572922	208
1909	Non-participating	34	35	35	36	36	358312	4578214	217
1910	Non-participating	29	29	29	31	34	343928	4559400	262
1911	Non-participating	31	31	31	33	37	345295	4569683	238
1912	Non-participating	33	33	33	35	37	346018	4569683	236
1913	Non-participating	32	33	32	34	35	346358	4570589	231
1914	Non-participating	34	34	34	35	36	347848	4572162	230
1915	Non-participating	34	35	35	36	37	344904	4557277	266
1916	Non-participating	34	34	34	36	36	347249	4570892	232
1917	Non-participating	33	34	34	35	35	360670	4575138	212
1918	Non-participating	33	33	33	35	35	351776	4579101	224
1919	Non-participating	33	33	33	35	35	346544	4573255	225
1920	Non-participating	34	35	35	36	36	350652	4571978	232
1921	Non-participating	32	32	32	34	34	355774	4566642	229
1922	Non-participating	31	31	31	32	32	356551	4569603	226
1923	Non-participating	31	31	31	33	34	346281	4572504	227
1924	Non-participating	32	32	32	34	36	345775	4569882	234
1925	Non-participating	32	32	32	33	37	345532	4569741	235
1926	Non-participating	33	34	34	35	35	354505	4578558	210
1927	Non-participating	33	33	33	35	35	347488	4572137	231
1928	Non-participating	31	31	31	33	33	355859	4553102	259
1929	Non-participating	31	31	31	33	33	354889	4550569	260
1930	Non-participating	33	34	34	35	35	354231	4564925	238
1931	Non-participating	31	31	31	33	33	360913	4573214	209
1932	Non-participating	27	27	27	29	29	361771	4573075	211
1933	Non-participating	32	32	32	33	34	345837	4574510	226
1934	Non-participating	31	31	31	33	36	345389	4569905	238
1935	Non-participating	31	31	31	33	37	345266	4569742	239
1936	Non-participating	33	33	33	35	35	347228	4572554	229
1937	Non-participating	31	31	31	33	43	344065	4566519	247

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1938	Non-participating	31	31	31	33	45	344250	4567714	239
1939	Non-participating	31	31	31	33	33	354420	4555585	257
1940	Non-participating	35	35	35	36	36	353050	4564444	239
1941	Non-participating	31	32	32	33	33	354742	4579079	209
1942	Non-participating	32	32	32	34	46	344314	4566557	247
1943	Non-participating	35	35	35	37	37	349229	4571113	236
1944	Non-participating	33	33	33	35	38	345776	4569454	240
1945	Non-participating	32	32	32	34	36	345708	4569924	233
1946	Non-participating	33	33	33	35	35	355590	4552405	265
1947	Non-participating	27	27	27	29	31	349784	4545094	296
1948	Non-participating	31	31	31	33	43	344066	4566302	246
1949	Non-participating	31	31	31	33	33	345815	4573536	228
1950	Non-participating	26	26	26	28	36	342109	4555049	277
1951	Non-participating	31	31	31	33	38	345180	4569436	237
1952	Non-participating	35	35	35	36	38	346581	4569804	239
1953	Non-participating	36	37	36	38	38	347420	4570356	235
1954	Non-participating	32	32	32	34	34	352642	4558015	251
1955	Non-participating	27	27	27	28	28	361391	4571988	208
1956	Non-participating	28	28	28	29	32	343940	4561381	255
1957	Non-participating	31	31	31	32	32	354647	4550168	260
1958	Non-participating	30	31	31	32	46	344237	4568156	238
1959	Non-participating	29	30	30	31	33	344233	4561509	260
1960	Non-participating	35	35	35	37	37	350273	4571233	238
1961	Non-participating	26	26	26	28	35	342317	4556713	273
1962	Non-participating	28	28	28	30	32	349536	4545109	296
1963	Non-participating	30	30	30	32	32	355500	4554469	260
1964	Non-participating	32	32	32	34	46	344310	4566095	247
1965	Non-participating	35	35	35	37	37	349384	4571198	237
1966	Non-participating	34	35	35	36	36	349432	4571299	235
1967	Non-participating	34	35	35	36	36	356043	4571100	225
1968	Non-participating	34	34	34	36	37	346340	4569627	240
1969	Non-participating	33	33	33	35	36	346498	4570448	234
1970	Non-participating	34	34	34	36	36	345540	4558534	260

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
1971	Non-participating	34	34	34	36	36	354188	4550857	266
1972	Non-participating	31	32	32	33	43	344142	4566961	245
1973	Non-participating	31	31	31	33	35	343772	4555809	271
1974	Non-participating	29	29	29	31	34	344087	4559909	259
1975	Non-participating	28	29	29	30	32	350256	4546114	299
1976	Non-participating	31	31	31	33	34	344640	4561461	260
1977	Non-participating	30	30	30	31	31	354821	4564259	233
1978	Non-participating	31	32	32	33	36	345120	4563858	250
1979	Non-participating	36	36	36	38	38	347016	4569924	240
1980	Non-participating	35	35	35	37	37	352643	4549456	276
1981	Non-participating	32	33	33	34	34	353864	4549991	267
1982	Non-participating	32	32	32	33	33	350267	4579529	217
1983	Non-participating	30	30	30	32	32	345802	4576104	224
1984	Non-participating	29	29	29	31	34	343912	4559223	262
1985	Non-participating	35	35	35	36	36	350698	4572003	233
1986	Non-participating	31	31	31	32	32	355630	4551214	269
1987	Non-participating	33	34	34	35	37	345952	4564379	247
1988	Non-participating	32	32	32	33	36	345555	4569812	234
1989	Non-participating	32	32	32	33	33	355638	4553403	255
1990	Non-participating	29	29	29	31	33	344003	4561786	257
1991	Non-participating	32	32	32	33	36	345663	4569934	233
1992	Non-participating	32	32	32	34	34	355251	4551184	263
1993	Non-participating	34	35	35	36	36	354286	4551008	265
1994	Non-participating	31	31	31	33	33	352465	4548126	280
1995	Non-participating	32	32	32	33	44	344209	4567114	245
1996	Non-participating	33	33	33	34	34	351705	4579177	223
1997	Non-participating	34	34	34	36	36	358656	4572047	216
1998	Non-participating	34	34	34	36	38	346003	4569252	241
1999	Non-participating	31	31	31	33	33	345738	4574944	224
2000	Non-participating	30	31	31	32	34	344542	4561417	261
2001	Non-participating	31	32	32	33	36	345748	4570191	233
2002	Non-participating	31	31	31	33	33	354898	4550505	261
2003	Non-participating	33	33	33	35	35	354027	4550350	269

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2004	Non-participating	32	32	32	34	34	354476	4562175	239
2005	Non-participating	34	35	35	36	37	345095	4557520	262
2006	Non-participating	32	32	32	33	33	351655	4579495	221
2007	Non-participating	32	32	32	34	45	344265	4566709	246
2008	Non-participating	30	31	31	32	46	344237	4568182	239
2009	Non-participating	35	35	35	36	37	350070	4571503	238
2010	Non-participating	31	31	31	33	35	343786	4556736	268
2011	Non-participating	32	32	33	34	35	346787	4570979	231
2012	Non-participating	30	31	31	32	32	355350	4551079	264
2013	Non-participating	35	35	35	37	37	350181	4571620	238
2014	Non-participating	35	36	35	37	38	344634	4556139	269
2015	Non-participating	30	30	30	31	46	343984	4546445	292
2016	Non-participating	35	35	35	37	37	352654	4549501	276
2017	Non-participating	32	32	32	33	34	351630	4548001	280
2018	Non-participating	33	33	33	34	34	353333	4578984	226
2019	Non-participating	32	32	32	33	44	344190	4566918	245
2020	Non-participating	32	32	32	34	45	344268	4566648	247
2021	Non-participating	25	26	25	27	37	341917	4554331	280
2022	Non-participating	34	35	35	36	36	356373	4575638	220
2023	Non-participating	33	34	34	35	39	345743	4569172	242
2024	Non-participating	31	32	31	33	33	361327	4575887	207
2025	Non-participating	34	34	34	35	37	344339	4555502	271
2026	Non-participating	31	31	31	33	33	353205	4579443	223
2027	Non-participating	27	27	27	28	47	342628	4552611	284
2028	Non-participating	33	33	33	34	35	346971	4571250	230
2029	Non-participating	32	33	33	34	36	346379	4570539	232
2030	Non-participating	33	33	33	35	36	346678	4570672	234
2031	Non-participating	28	28	28	30	31	351333	4546409	292
2032	Non-participating	35	35	35	37	37	350347	4571739	236
2033	Non-participating	35	35	35	37	37	349555	4571125	239
2034	Non-participating	35	35	35	36	36	347546	4576471	222
2035	Non-participating	31	31	31	32	32	354391	4563913	234
2036	Non-participating	30	30	30	32	32	361326	4577622	206

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2037	Non-participating	32	32	32	33	44	344185	4566628	248
2038	Non-participating	26	26	26	28	37	342050	4554316	279
2039	Non-participating	34	34	34	35	36	345310	4558255	259
2040	Non-participating	33	33	33	35	35	360690	4574554	214
2041	Non-participating	36	36	36	37	38	348092	4572941	228
2042	Non-participating	27	27	27	29	47	342734	4552603	283
2043	Non-participating	32	32	32	33	33	354371	4550493	267
2044	Non-participating	32	32	32	33	36	345869	4570283	233
2045	Non-participating	31	31	31	33	37	345303	4569772	239
2046	Non-participating	31	31	31	32	32	354202	4550338	266
2047	Non-participating	33	33	33	35	42	345235	4550070	285
2048	Non-participating	32	32	32	34	45	344312	4566732	246
2049	Non-participating	36	36	36	38	38	348326	4570843	235
2050	Non-participating	26	27	27	28	45	342824	4551519	288
2051	Non-participating	31	31	31	32	32	355206	4550818	261
2052	Non-participating	31	31	31	33	33	358108	4578840	216
2053	Non-participating	37	37	37	39	39	347162	4569789	241
2054	Non-participating	33	33	33	34	34	355576	4568384	229
2055	Non-participating	33	33	33	34	34	354942	4551055	260
2056	Non-participating	30	30	30	32	32	359176	4571212	215
2057	Non-participating	30	30	30	32	34	344127	4558620	263
2058	Non-participating	32	33	33	34	34	354613	4550903	266
2059	Non-participating	26	26	27	28	30	349245	4544188	286
2060	Non-participating	34	34	34	36	39	345739	4568988	242
2061	Non-participating	25	25	25	27	38	341792	4554336	280
2062	Non-participating	32	32	32	34	46	344293	4566214	247
2063	Non-participating	30	30	30	31	31	347963	4579222	221
2064	Non-participating	32	32	32	34	43	344701	4565348	249
2065	Non-participating	33	34	33	35	35	347729	4572067	230
2066	Non-participating	34	34	34	35	36	344991	4557770	262
2067	Non-participating	34	34	34	35	46	344635	4567039	246
2068	Non-participating	34	34	34	36	36	352161	4559274	247
2069	Non-participating	34	34	34	36	36	353938	4550702	268

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2070	Non-participating	29	29	29	31	31	361332	4572872	211
2071	Non-participating	32	32	32	34	45	344309	4566591	247
2072	Non-participating	32	33	33	34	35	346420	4573132	227
2073	Non-participating	25	26	25	27	37	341985	4554307	279
2074	Non-participating	33	34	34	35	35	353320	4560466	242
2075	Non-participating	33	34	34	35	35	354365	4551085	264
2076	Non-participating	30	30	30	32	37	343914	4553457	277
2077	Non-participating	33	34	33	35	39	345696	4569178	242
2078	Non-participating	31	31	31	33	36	345447	4569872	237
2079	Non-participating	31	31	31	33	36	345548	4570051	236
2080	Non-participating	32	32	32	34	34	353907	4549874	270
2081	Non-participating	30	30	31	32	32	354964	4550827	260
2082	Non-participating	30	30	30	32	32	355066	4563622	235
2083	Non-participating	30	30	30	32	34	344439	4561568	260
2084	Non-participating	31	31	31	33	36	345408	4569937	237
2085	Non-participating	31	31	31	32	32	356538	4569647	226
2086	Non-participating	34	34	34	36	36	354470	4578504	211
2087	Non-participating	32	32	32	33	44	344201	4566780	247
2088	Non-participating	26	26	26	28	35	342045	4555921	276
2089	Non-participating	31	31	31	33	36	345496	4569921	236
2090	Non-participating	36	37	37	38	38	351490	4564965	240
2091	Non-participating	34	34	34	35	37	346433	4569977	236
2092	Non-participating	33	34	33	35	35	354206	4550624	268
2093	Non-participating	35	35	35	37	37	351575	4548699	276
2094	Non-participating	30	31	31	32	34	348518	4544585	293
2095	Non-participating	28	28	28	30	34	343575	4559849	260
2096	Non-participating	31	31	31	33	37	345262	4569755	239
2097	Non-participating	33	34	34	35	36	346916	4570807	233
2098	Non-participating	34	34	34	36	36	352099	4557776	251
2099	Non-participating	33	33	33	34	46	345272	4549388	285
2100	Non-participating	32	32	32	33	33	353722	4579052	216
2101	Non-participating	32	32	32	33	37	345565	4569772	234
2102	Non-participating	33	33	33	34	35	350946	4548037	281

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2103	Non-participating	35	36	36	37	38	346869	4569936	240
2104	Non-participating	36	36	36	38	38	350019	4570612	238
2105	Non-participating	31	31	31	33	33	345749	4573849	227
2106	Non-participating	26	26	26	28	36	342111	4555062	277
2107	Non-participating	36	36	36	38	38	347390	4570352	235
2108	Non-participating	33	34	33	35	35	347267	4572622	229
2109	Non-participating	33	34	34	35	42	345337	4568688	240
2110	Non-participating	31	32	32	33	38	345164	4569283	238
2111	Non-participating	32	32	32	34	36	345811	4570089	234
2112	Non-participating	31	31	31	33	33	355790	4551811	267
2113	Non-participating	32	32	32	33	44	344212	4567185	245
2114	Non-participating	27	27	27	29	31	349785	4545097	296
2115	Non-participating	31	31	31	33	44	344112	4566316	246
2116	Non-participating	33	33	33	34	34	354032	4564040	237
2117	Non-participating	32	33	32	34	46	344343	4566518	248
2118	Non-participating	35	35	35	37	37	350306	4571420	239
2119	Non-participating	31	31	31	33	49	344466	4547863	288
2120	Non-participating	30	30	30	31	31	351653	4580074	217
2121	Non-participating	32	32	32	34	36	344110	4554912	271
2122	Non-participating	35	35	35	37	37	350275	4571281	238
2123	Non-participating	34	34	34	36	36	357937	4572077	220
2124	Non-participating	26	26	26	28	35	342297	4556716	273
2125	Non-participating	31	32	32	33	36	345116	4563862	250
2126	Non-participating	33	33	33	35	35	353458	4555854	257
2127	Non-participating	30	31	31	32	32	354594	4550185	259
2128	Non-participating	26	26	26	28	28	361252	4571955	212
2129	Non-participating	35	35	35	37	37	349337	4571165	237
2130	Non-participating	35	35	35	36	37	350114	4571598	238
2131	Non-participating	31	32	31	33	37	345405	4569749	237
2132	Non-participating	33	33	33	35	36	346529	4570454	234
2133	Non-participating	30	30	30	32	40	344055	4550950	283
2134	Non-participating	28	28	28	30	32	349657	4545108	297
2135	Non-participating	32	32	32	34	34	356416	4570423	226

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2136	Non-participating	32	32	32	33	44	344197	4566963	245
2137	Non-participating	31	32	31	33	34	344690	4559906	260
2138	Non-participating	35	35	35	36	37	349527	4571260	239
2139	Non-participating	31	31	31	33	36	345267	4569862	239
2140	Non-participating	32	32	32	33	33	355488	4551372	265
2141	Non-participating	27	27	27	29	31	350084	4545214	297
2142	Non-participating	32	32	32	33	36	345740	4569970	233
2143	Non-participating	31	31	31	33	33	353716	4549405	272
2144	Non-participating	32	32	32	33	33	354943	4550722	261
2145	Non-participating	28	28	28	30	30	347952	4579766	221
2146	Non-participating	32	33	33	34	34	350589	4579309	220
2147	Non-participating	36	36	36	37	37	360140	4575179	213
2148	Non-participating	33	33	33	35	37	345928	4564028	249
2149	Non-participating	32	32	32	34	34	355918	4566960	228
2150	Non-participating	34	34	34	36	38	345990	4569207	242
2151	Non-participating	32	32	32	33	37	345549	4569776	234
2152	Non-participating	32	32	32	33	33	355250	4551141	262
2153	Non-participating	24	24	24	26	38	341433	4554262	280
2154	Non-participating	29	30	29	31	31	361472	4573739	213
2155	Non-participating	28	28	28	30	30	347490	4579314	221
2156	Non-participating	32	32	32	33	44	344206	4567080	245
2157	Non-participating	34	34	34	36	37	346341	4569643	240
2158	Non-participating	34	35	35	36	36	355084	4568404	231
2159	Non-participating	33	34	34	35	35	355080	4551446	259
2160	Non-participating	34	34	34	36	36	354319	4550922	261
2161	Non-participating	31	32	32	33	33	353090	4559228	244
2162	Non-participating	35	35	35	37	37	352587	4549460	277
2163	Non-participating	32	33	33	34	34	351704	4579233	221
2164	Non-participating	31	31	31	33	43	344068	4566387	247
2165	Non-participating	33	33	33	34	45	344425	4567159	245
2166	Non-participating	29	30	30	31	33	344262	4561536	259
2167	Non-participating	35	35	35	37	37	350265	4571772	236
2168	Non-participating	33	34	33	35	35	346619	4573185	226

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2169	Non-participating	32	32	32	33	36	345642	4569947	233
2170	Non-participating	33	33	33	35	35	352543	4548897	275
2171	Non-participating	36	37	36	38	39	346995	4569842	240
2172	Non-participating	36	37	36	38	39	347050	4569926	240
2173	Non-participating	32	32	32	33	33	351642	4579461	221
2174	Non-participating	31	32	32	33	43	344141	4566930	245
2175	Non-participating	35	36	36	37	51	345217	4547164	292
2176	Non-participating	31	31	31	33	33	360889	4577789	208
2177	Non-participating	30	30	31	32	32	354609	4564125	234
2178	Non-participating	31	31	31	33	35	343763	4556168	270
2179	Non-participating	33	33	33	35	38	345599	4569244	242
2180	Non-participating	33	33	33	35	36	346782	4570708	234
2181	Non-participating	32	32	32	34	34	351527	4548005	280
2182	Non-participating	33	33	33	35	35	346843	4570934	232
2183	Non-participating	33	33	33	35	35	355684	4578238	218
2184	Non-participating	29	30	30	31	31	361454	4577546	206
2185	Non-participating	32	32	32	33	44	344190	4566657	247
2186	Non-participating	33	33	33	35	35	353075	4578938	226
2187	Non-participating	32	32	32	34	36	345771	4569877	234
2188	Non-participating	32	32	32	33	33	354457	4550551	266
2189	Non-participating	30	30	30	32	32	361259	4577619	206
2190	Non-participating	34	34	34	36	36	352483	4578830	228
2191	Non-participating	32	33	33	34	35	346446	4570563	232
2192	Non-participating	25	26	25	27	37	341942	4554320	280
2193	Non-participating	33	33	33	34	35	351521	4548218	279
2194	Non-participating	34	35	35	36	36	347643	4576682	220
2195	Non-participating	31	32	32	33	45	344224	4566162	247
2196	Non-participating	34	34	34	35	35	347305	4576617	219
2197	Non-participating	32	32	32	33	33	355559	4553811	255
2198	Non-participating	29	29	29	31	32	350351	4546463	295
2199	Non-participating	29	30	30	31	31	361498	4577524	206
2200	Non-participating	35	35	35	37	37	354349	4578345	212
2201	Non-participating	32	32	32	33	44	344203	4566993	245

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2202	Non-participating	28	29	29	30	33	344088	4561448	258
2203	Non-participating	33	33	33	35	36	347196	4571148	232
2204	Non-participating	30	30	30	31	31	347229	4578381	223
2205	Non-participating	30	30	30	32	32	345574	4575241	221
2206	Non-participating	30	30	30	32	32	354927	4563701	235
2207	Non-participating	32	32	32	34	43	344568	4546178	289
2208	Non-participating	35	36	36	37	37	348775	4571046	235
2209	Non-participating	33	33	33	34	34	353737	4560610	241
2210	Non-participating	31	31	31	32	33	345580	4573974	226
2211	Non-participating	32	32	32	33	48	344635	4547887	289
2212	Non-participating	32	32	32	34	34	354180	4564132	238
2213	Non-participating	36	37	37	38	38	347413	4570326	236
2214	Non-participating	32	33	33	34	38	345492	4569326	240
2215	Non-participating	32	32	32	34	36	345815	4569897	234
2216	Non-participating	33	33	33	35	35	347117	4571276	232
2217	Non-participating	32	32	32	34	34	359635	4571867	213
2218	Non-participating	31	31	31	33	44	344098	4566489	247
2219	Non-participating	34	34	34	36	36	344821	4557242	265
2220	Non-participating	36	36	36	38	38	350376	4570491	238
2221	Non-participating	31	32	32	33	36	345559	4569869	234
2222	Non-participating	30	30	30	32	32	361006	4572679	212
2223	Non-participating	32	32	32	33	35	344344	4557484	266
2224	Non-participating	29	29	29	30	34	343820	4559455	262
2225	Non-participating	34	35	35	36	36	353115	4564439	240
2226	Non-participating	30	30	30	31	33	348432	4544285	291
2227	Non-participating	31	31	31	33	44	344112	4566198	246
2228	Non-participating	34	34	34	36	36	352866	4549498	273
2229	Non-participating	34	34	34	35	35	358239	4578320	218
2230	Non-participating	34	35	35	36	36	360362	4574860	214
2231	Non-participating	29	29	29	31	31	347677	4579156	221
2232	Non-participating	32	32	32	34	34	353613	4579053	220
2233	Non-participating	28	28	28	30	31	350580	4546313	296
2234	Non-participating	33	33	33	35	37	345886	4569523	240

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2235	Non-participating	33	33	34	35	35	354400	4551111	263
2236	Non-participating	33	34	34	35	35	353907	4554950	260
2237	Non-participating	34	34	34	36	36	354138	4550731	267
2238	Non-participating	28	28	28	30	30	361687	4573218	212
2239	Non-participating	33	33	33	35	36	346691	4570707	234
2240	Non-participating	31	31	31	33	33	355009	4564616	234
2241	Non-participating	34	35	35	36	36	351589	4548601	276
2242	Non-participating	33	33	33	35	35	355542	4568294	229
2243	Non-participating	33	33	33	34	45	344465	4567160	245
2244	Non-participating	31	32	31	33	43	344134	4567052	245
2245	Non-participating	31	31	31	33	33	354386	4555558	257
2246	Non-participating	29	29	29	31	31	347778	4579233	221
2247	Non-participating	25	26	26	27	36	342105	4554991	277
2248	Non-participating	25	26	26	27	35	342227	4556619	274
2249	Non-participating	32	32	32	34	36	345676	4569853	233
2250	Non-participating	33	33	33	35	35	347150	4572444	228
2251	Non-participating	32	32	32	34	36	345847	4570120	233
2252	Non-participating	36	36	36	38	38	346979	4569920	240
2253	Non-participating	31	31	31	33	36	345414	4569814	237
2254	Non-participating	29	29	29	30	32	348373	4544084	288
2255	Non-participating	33	33	33	34	37	345762	4569505	238
2256	Non-participating	32	33	33	34	34	354234	4550412	269
2257	Non-participating	28	29	29	30	32	348526	4544024	287
2258	Non-participating	31	32	32	33	44	344175	4566436	247
2259	Non-participating	28	29	29	30	34	343833	4560207	260
2260	Non-participating	33	33	33	35	35	346602	4573212	225
2261	Non-participating	35	35	35	36	36	354221	4565274	235
2262	Non-participating	35	35	35	37	37	348942	4571103	235
2263	Non-participating	35	35	35	36	37	344967	4557272	266
2264	Non-participating	33	33	33	35	42	345218	4550029	285
2265	Non-participating	33	33	33	34	35	346437	4573140	227
2266	Non-participating	32	32	32	33	36	345591	4569914	233
2267	Non-participating	33	34	33	35	36	346378	4570120	234

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2268	Non-participating	32	32	32	34	35	344987	4562731	256
2269	Non-participating	33	33	33	34	34	353169	4564151	236
2270	Non-participating	31	31	31	33	33	354598	4564022	235
2271	Non-participating	30	30	30	32	34	344340	4561572	260
2272	Non-participating	31	31	31	33	37	345250	4569707	239
2273	Non-participating	31	31	31	33	36	345350	4569851	238
2274	Non-participating	27	27	29	29	29	354343	4550292	259
2275	Non-participating	30	30	30	32	32	348044	4579138	220
2276	Non-participating	32	32	32	34	34	353958	4579065	214
2277	Non-participating	29	29	29	31	33	343956	4560379	260
2278	Non-participating	35	35	35	37	37	350504	4571667	239
2279	Non-participating	31	31	31	33	35	343767	4556372	270
2280	Non-participating	33	33	33	34	35	350928	4548075	281
2281	Non-participating	33	33	33	34	34	354281	4550465	269
2282	Non-participating	32	32	32	34	34	355762	4578443	217
2283	Non-participating	31	31	31	33	43	344073	4566295	246
2284	Non-participating	31	32	32	33	33	355470	4551281	263
2285	Non-participating	30	31	31	32	48	344656	4549463	288
2286	Non-participating	31	31	31	33	33	353999	4564217	234
2287	Non-participating	31	31	31	33	36	345493	4570070	236
2288	Non-participating	30	31	30	32	32	356352	4567805	226
2289	Non-participating	34	34	34	35	36	347014	4570786	233
2290	Non-participating	31	32	32	33	33	354660	4550677	262
2291	Non-participating	33	34	34	35	35	351517	4548352	277
2292	Non-participating	32	32	32	34	34	350663	4579332	220
2293	Non-participating	32	32	32	34	34	353233	4579252	222
2294	Non-participating	30	30	30	32	32	345418	4574569	225
2295	Non-participating	26	26	26	28	37	342094	4554314	279
2296	Non-participating	33	33	33	34	35	346608	4570636	234
2297	Non-participating	32	32	32	34	35	346879	4572234	228
2298	Non-participating	32	32	32	34	34	354201	4564011	237
2299	Non-participating	31	32	32	33	37	345400	4569707	237
2300	Non-participating	35	35	35	36	37	349991	4571677	235

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2301	Non-participating	34	35	35	36	36	347000	4573166	226
2302	Non-participating	36	37	37	38	39	347137	4569965	239
2303	Non-participating	36	36	36	37	37	352455	4549457	278
2304	Non-participating	31	31	31	33	44	344115	4566638	246
2305	Non-participating	24	24	24	26	43	342026	4552774	281
2306	Non-participating	33	33	33	35	35	355488	4568351	229
2307	Non-participating	32	32	32	33	33	360989	4574333	214
2308	Non-participating	36	37	37	38	38	348048	4576437	220
2309	Non-participating	32	32	32	34	34	354588	4578901	209
2310	Non-participating	35	35	35	37	38	344605	4556035	269
2311	Non-participating	34	35	35	36	36	350225	4571809	234
2312	Non-participating	31	31	31	33	37	345356	4569769	238
2313	Non-participating	31	31	31	32	32	354789	4561814	239
2314	Non-participating	33	34	34	35	35	354295	4554649	261
2315	Non-participating	32	33	32	34	43	344706	4565359	249
2316	Non-participating	30	31	31	32	46	344234	4568079	238
2317	Non-participating	29	30	30	31	34	343375	4556630	271
2318	Non-participating	31	31	31	33	36	345465	4570024	237
2319	Non-participating	33	34	34	35	35	355071	4551553	257
2320	Non-participating	33	33	33	34	36	345607	4563887	249
2321	Non-participating	30	30	30	32	40	344171	4565230	249
2322	Non-participating	33	33	33	35	46	344493	4567157	245
2323	Non-participating	29	29	29	31	33	343955	4560355	260
2324	Non-participating	30	31	31	32	32	345808	4575792	223
2325	Non-participating	26	27	27	28	46	342653	4552674	284
2326	Non-participating	32	32	32	34	36	345756	4570049	234
2327	Non-participating	32	32	32	34	36	345720	4569901	233
2328	Non-participating	31	31	31	33	33	358234	4578790	216
2329	Non-participating	31	32	32	33	45	344180	4566370	246
2330	Non-participating	33	33	33	35	35	351812	4579099	224
2331	Non-participating	30	30	30	32	34	344481	4561497	260
2332	Non-participating	33	33	33	35	35	355461	4568343	229
2333	Non-participating	31	32	32	33	33	355583	4553688	259

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2334	Non-participating	32	32	32	34	34	355310	4551282	260
2335	Non-participating	35	35	35	37	37	347093	4570435	236
2336	Non-participating	33	34	34	35	39	345703	4569103	241
2337	Non-participating	34	35	35	36	37	346465	4569636	241
2338	Non-participating	33	33	33	34	34	354658	4578708	211
2339	Non-participating	29	29	29	31	34	343907	4559211	262
2340	Non-participating	32	33	33	34	36	346309	4570480	232
2341	Non-participating	32	32	32	33	33	358395	4578741	215
2342	Non-participating	27	28	28	29	29	360959	4571639	213
2343	Non-participating	29	29	29	31	33	344125	4561675	259
2344	Non-participating	32	32	32	33	37	345464	4569704	235
2345	Non-participating	36	37	37	38	38	350365	4570283	239
2346	Non-participating	35	35	35	37	37	354240	4551065	264
2347	Non-participating	30	30	31	32	46	344236	4567961	238
2348	Non-participating	32	32	32	33	33	354027	4549909	271
2349	Non-participating	32	33	33	34	34	354057	4550268	269
2350	Non-participating	31	32	32	33	33	355318	4551087	263
2351	Non-participating	33	33	33	34	34	346997	4576622	221
2352	Non-participating	27	29	29	29	29	360809	4572374	197
2353	Non-participating	36	36	36	38	38	348212	4570805	235
2354	Non-participating	31	31	31	33	33	354252	4560722	238
2355	Non-participating	32	32	32	34	34	351722	4579375	221
2356	Non-participating	32	32	32	33	46	344259	4566142	247
2357	Non-participating	30	30	30	32	32	355059	4563002	236
2358	Non-participating	28	28	28	30	43	343233	4552576	282
2359	Non-participating	33	34	34	35	35	351798	4579047	224
2360	Non-participating	29	30	29	31	31	349850	4580087	216
2361	Non-participating	32	33	33	34	34	354390	4578908	211
2362	Non-participating	29	29	29	31	31	345246	4575277	224
2363	Non-participating	31	31	31	32	32	345735	4575573	222
2364	Non-participating	32	32	32	33	35	344889	4561357	260
2365	Non-participating	30	31	31	32	34	344567	4561409	261
2366	Non-participating	31	32	31	33	33	355160	4550846	260

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2367	Non-participating	29	29	29	31	31	361633	4577488	205
2368	Non-participating	35	35	35	37	37	350147	4571386	239
2369	Non-participating	25	25	25	26	47	342383	4552609	284
2370	Non-participating	31	31	31	33	37	344368	4553265	277
2371	Non-participating	35	35	35	37	37	350368	4571817	238
2372	Non-participating	33	33	33	35	38	345681	4569269	242
2373	Non-participating	32	32	32	33	33	354431	4564037	236
2374	Non-participating	32	32	32	33	38	345401	4569368	239
2375	Non-participating	31	31	31	32	32	361127	4577668	207
2376	Non-participating	31	31	31	33	33	359412	4571505	214
2377	Non-participating	28	28	28	29	33	343934	4561327	255
2378	Non-participating	31	32	32	33	33	356543	4570347	225
2379	Non-participating	31	31	31	32	32	354823	4563800	235
2380	Non-participating	34	34	34	36	39	345709	4568974	242
2381	Non-participating	33	33	33	35	38	345713	4569322	241
2382	Non-participating	34	34	34	36	36	353655	4554967	258
2383	Non-participating	33	34	34	35	35	353488	4555498	257
2384	Non-participating	32	32	32	33	44	344195	4566891	245
2385	Non-participating	31	31	31	32	32	354782	4579155	208
2386	Non-participating	33	33	33	34	35	347010	4571278	230
2387	Non-participating	31	32	32	33	33	354079	4563944	234
2388	Non-participating	36	36	36	38	38	347344	4570260	236
2389	Non-participating	32	32	32	34	36	345808	4569951	234
2390	Non-participating	35	35	35	37	37	344999	4557254	267
2391	Non-participating	32	32	32	33	44	344181	4566494	248
2392	Non-participating	36	36	36	38	38	350005	4570555	238
2393	Non-participating	35	35	35	37	38	346824	4569951	239
2394	Non-participating	32	32	32	34	34	358605	4578673	214
2395	Non-participating	31	31	31	33	35	343782	4556415	269
2396	Non-participating	29	30	30	31	31	354501	4550558	264
2397	Non-participating	30	30	30	31	33	348431	4544291	291
2398	Non-participating	29	29	29	31	31	354790	4560679	239
2399	Non-participating	31	32	31	33	37	345387	4569697	237

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2400	Non-participating	32	33	33	34	37	345808	4569641	235
2401	Non-participating	31	32	32	33	33	355629	4578685	216
2402	Non-participating	31	31	31	33	44	344126	4566586	247
2403	Non-participating	30	31	30	32	34	344499	4561562	260
2404	Non-participating	32	32	32	34	34	354106	4550286	268
2405	Non-participating	32	32	32	34	45	344312	4566688	247
2406	Non-participating	32	32	32	33	44	344187	4566722	247
2407	Non-participating	35	35	35	37	37	350205	4571010	238
2408	Non-participating	27	27	28	29	29	361531	4572930	207
2409	Non-participating	34	34	34	36	36	358249	4578240	218
2410	Non-participating	32	33	33	34	35	346488	4570647	232
2411	Non-participating	34	34	34	35	36	347837	4572124	230
2412	Non-participating	26	27	27	28	28	355939	4553202	256
2413	Non-participating	35	35	35	36	36	350620	4571959	232
2414	Non-participating	31	31	31	33	37	345362	4569749	238
2415	Non-participating	31	32	32	33	34	346360	4572631	227
2416	Non-participating	32	33	33	34	41	345054	4568715	241
2417	Non-participating	31	31	31	32	32	355652	4578957	216
2418	Non-participating	33	33	33	35	35	346543	4573217	225
2419	Non-participating	34	35	35	36	36	356371	4575163	221
2420	Non-participating	34	35	35	36	37	344895	4557278	266
2421	Non-participating	32	32	32	33	36	345625	4569844	233
2422	Non-participating	34	34	34	35	36	347244	4570987	232
2423	Non-participating	27	28	27	29	37	342796	4554288	278
2424	Non-participating	31	31	31	33	34	350402	4547520	286
2425	Non-participating	32	32	32	33	44	344193	4566767	247
2426	Non-participating	32	32	33	34	34	353551	4579052	221
2427	Non-participating	31	32	32	33	36	345575	4569924	233
2428	Non-participating	31	32	32	33	33	354910	4550634	261
2429	Non-participating	27	27	27	29	30	350327	4545140	296
2430	Non-participating	31	31	31	33	45	344222	4567716	239
2431	Non-participating	30	30	30	32	34	343777	4557408	265
2432	Non-participating	35	35	35	37	37	349111	4571153	234

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2433	Non-participating	31	31	31	33	36	345374	4569876	238
2434	Non-participating	33	34	34	35	36	347012	4570874	233
2435	Non-participating	32	32	32	33	33	354232	4550127	265
2436	Non-participating	31	31	32	32	32	354644	4550784	263
2437	Non-participating	31	31	31	33	33	345821	4573502	228
2438	Non-participating	35	35	35	37	37	350452	4571571	238
2439	Non-participating	34	35	35	36	37	346550	4569852	240
2440	Non-participating	33	33	33	34	34	354287	4550534	269
2441	Non-participating	30	30	30	32	32	354354	4563897	233
2442	Non-participating	31	31	31	33	34	344659	4561470	260
2443	Non-participating	32	32	32	34	35	344981	4562732	255
2444	Non-participating	30	30	30	32	32	356549	4569427	227
2445	Non-participating	32	32	32	33	33	355343	4551285	260
2446	Non-participating	32	32	32	34	34	354043	4579108	213
2447	Non-participating	32	33	33	34	34	354169	4564304	237
2448	Non-participating	31	31	31	33	34	347586	4544070	290
2449	Non-participating	35	36	35	37	37	349191	4571097	236
2450	Non-participating	26	26	26	28	42	342766	4550995	289
2451	Non-participating	32	32	32	34	34	354163	4563942	235
2452	Non-participating	36	37	37	38	38	347418	4570343	235
2453	Non-participating	31	31	31	33	37	345255	4569717	239
2454	Non-participating	31	32	32	33	38	345418	4569438	237
2455	Non-participating	33	33	33	34	38	345749	4569459	239
2456	Non-participating	32	32	32	34	34	355561	4553586	262
2457	Non-participating	32	32	32	34	34	355271	4551257	261
2458	Non-participating	32	32	32	33	45	344250	4566096	247
2459	Non-participating	31	31	31	33	45	344135	4567484	237
2460	Non-participating	36	36	36	37	37	347961	4576579	221
2461	Non-participating	31	31	31	33	33	355185	4550830	261
2462	Non-participating	32	32	32	33	45	344249	4566211	247
2463	Non-participating	34	35	35	36	36	346968	4573171	226
2464	Non-participating	29	29	29	31	33	344179	4562237	255
2465	Non-participating	31	31	31	33	33	355623	4551325	269

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2466	Non-participating	29	29	29	30	30	347633	4579297	221
2467	Non-participating	30	30	30	32	34	344442	4561505	260
2468	Non-participating	32	32	32	34	34	360854	4574330	214
2469	Non-participating	32	32	32	33	37	344645	4552644	278
2470	Non-participating	34	35	35	36	37	344482	4555449	270
2471	Non-participating	37	38	38	39	39	350788	4569696	242
2472	Non-participating	32	32	32	34	34	355860	4568212	228
2473	Non-participating	31	31	31	33	37	345263	4569809	239
2474	Non-participating	34	34	34	35	36	345454	4558531	260
2475	Non-participating	34	34	34	35	35	356145	4570802	227
2476	Non-participating	30	31	31	32	32	356328	4567825	227
2477	Non-participating	32	32	32	33	49	344955	4549319	285
2478	Non-participating	30	30	30	32	32	349862	4579913	216
2479	Non-participating	33	33	33	35	45	344868	4565460	249
2480	Non-participating	35	35	35	37	37	350816	4572011	236
2481	Non-participating	33	33	33	34	36	346327	4570448	233
2482	Non-participating	33	34	34	35	37	345954	4564382	247
2483	Non-participating	31	31	31	33	37	345357	4569780	238
2484	Non-participating	30	31	31	32	46	344237	4568117	238
2485	Non-participating	29	29	29	31	34	343300	4556693	271
2486	Non-participating	29	29	29	31	34	343943	4559364	262
2487	Non-participating	29	29	29	31	33	343987	4561120	255
2488	Non-participating	34	34	34	35	35	355097	4551556	257
2489	Non-participating	30	30	30	32	32	356340	4567019	226
2490	Non-participating	30	30	30	32	40	344173	4565236	249
2491	Non-participating	32	32	32	34	44	344329	4567115	245
2492	Non-participating	35	35	35	36	37	350117	4571715	237
2493	Non-participating	30	30	30	32	32	345802	4576033	223
2494	Non-participating	34	34	34	35	39	345749	4569143	242
2495	Non-participating	36	36	36	38	38	346992	4569923	240
2496	Non-participating	31	31	31	33	33	358147	4578796	216
2497	Non-participating	33	33	33	35	35	351710	4579119	224
2498	Non-participating	34	35	34	36	38	346090	4569246	241

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2499	Non-participating	33	33	33	35	35	355481	4568339	229
2500	Non-participating	32	32	32	34	34	352932	4557576	249
2501	Non-participating	30	30	30	32	46	344187	4568266	241
2502	Non-participating	32	32	32	33	37	345539	4569748	235
2503	Non-participating	27	28	27	29	31	350167	4545353	297
2504	Non-participating	31	32	32	33	33	354272	4550177	264
2505	Non-participating	27	27	28	29	29	354555	4550552	262
2506	Non-participating	35	35	35	36	37	350123	4571668	237
2507	Non-participating	32	32	33	34	35	346765	4570989	230
2508	Non-participating	32	33	33	34	36	346325	4570499	232
2509	Non-participating	32	32	32	34	34	353953	4549933	271
2510	Non-participating	28	29	29	30	30	354651	4550585	260
2511	Non-participating	32	32	32	34	34	358539	4578682	215
2512	Non-participating	33	33	33	34	34	347042	4576632	221
2513	Non-participating	30	30	30	32	32	345750	4575820	224
2514	Non-participating	30	30	31	32	46	344236	4567992	237
2515	Non-participating	35	35	35	36	37	350060	4571502	238
2516	Non-participating	36	36	36	38	38	348155	4570784	235
2517	Non-participating	31	31	31	32	32	355431	4551032	262
2518	Non-participating	32	33	33	34	34	354606	4578717	210
2519	Non-participating	31	32	32	33	33	345812	4574841	224
2520	Non-participating	29	30	30	31	34	344129	4559890	259
2521	Non-participating	30	30	30	32	34	344427	4561558	260
2522	Non-participating	33	33	33	34	34	354261	4561570	240
2523	Non-participating	33	33	33	35	35	353408	4578924	225
2524	Non-participating	32	33	32	34	34	354452	4578908	211
2525	Non-participating	35	35	35	37	37	350408	4571815	237
2526	Non-participating	33	34	34	35	38	345741	4569207	242
2527	Non-participating	33	33	33	35	38	345654	4569219	242
2528	Non-participating	31	31	31	32	32	355530	4554145	256
2529	Non-participating	30	30	30	31	31	361672	4575824	206
2530	Non-participating	31	31	31	32	32	351659	4579728	219
2531	Non-participating	34	34	34	36	36	351518	4548498	275

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2532	Non-participating	31	31	31	32	33	345723	4575494	222
2533	Non-participating	32	32	32	33	35	344867	4561358	260
2534	Non-participating	29	29	29	31	33	344121	4561522	259
2535	Non-participating	33	34	34	35	37	344310	4555497	271
2536	Non-participating	31	31	32	33	38	345456	4569390	239
2537	Non-participating	33	33	33	35	35	353685	4550121	268
2538	Non-participating	33	33	33	35	37	345082	4552493	276
2539	Non-participating	33	34	34	35	35	354853	4551294	260
2540	Non-participating	33	34	33	35	35	351572	4548351	278
2541	Non-participating	32	32	32	34	45	344264	4566626	247
2542	Non-participating	27	28	27	29	37	342788	4554302	278
2543	Non-participating	33	34	34	35	35	354001	4554893	261
2544	Non-participating	35	35	35	37	37	350297	4571382	239
2545	Non-participating	31	31	31	33	37	345208	4569695	239
2546	Non-participating	33	33	33	34	34	354609	4550930	266
2547	Non-participating	30	31	31	32	32	355266	4550754	263
2548	Non-participating	27	28	28	29	34	343432	4559864	261
2549	Non-participating	31	31	31	33	36	345323	4569814	238
2550	Non-participating	36	36	36	37	38	348452	4570955	234
2551	Non-participating	33	33	33	35	36	347145	4571096	232
2552	Non-participating	26	27	27	28	30	349331	4544207	286
2553	Non-participating	27	27	27	29	31	350159	4545148	297
2554	Non-participating	37	38	38	39	40	347195	4569783	241
2555	Non-participating	32	32	32	34	36	345651	4569872	233
2556	Non-participating	36	36	36	38	38	352322	4549473	275
2557	Non-participating	33	34	34	35	35	351716	4579052	224
2558	Non-participating	32	32	32	34	45	344264	4566733	246
2559	Non-participating	29	29	29	30	33	344085	4561535	259
2560	Non-participating	33	33	33	35	35	355404	4568375	229
2561	Non-participating	36	36	36	38	38	348293	4570841	235
2562	Non-participating	30	31	31	32	32	357994	4578934	216
2563	Non-participating	31	31	31	33	44	344101	4566572	247
2564	Non-participating	33	33	33	35	37	345931	4564024	249

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2565	Non-participating	34	34	34	35	43	345304	4568538	240
2566	Non-participating	32	32	32	33	36	345866	4570239	233
2567	Non-participating	33	33	33	35	35	345042	4558276	262
2568	Non-participating	31	31	31	33	33	361012	4577716	207
2569	Non-participating	33	33	33	35	39	345653	4569136	242
2570	Non-participating	30	31	31	32	32	356548	4569511	227
2571	Non-participating	34	34	34	36	36	352165	4559277	247
2572	Non-participating	33	33	33	34	34	355070	4551171	260
2573	Non-participating	32	32	32	33	45	344237	4566163	247
2574	Non-participating	32	32	32	34	36	344068	4554773	272
2575	Non-participating	33	34	33	35	36	346881	4570776	233
2576	Non-participating	33	34	34	35	35	353371	4560468	243
2577	Non-participating	32	32	32	34	45	344258	4566478	247
2578	Non-participating	34	34	34	35	35	353547	4578673	224
2579	Non-participating	33	33	33	34	34	346931	4576603	221
2580	Non-participating	36	36	36	37	37	350277	4570792	237
2581	Non-participating	33	33	33	35	35	359641	4572125	213
2582	Non-participating	27	27	27	29	47	342668	4552626	284
2583	Non-participating	31	31	31	32	32	354481	4560840	239
2584	Non-participating	35	35	35	36	36	352748	4549515	275
2585	Non-participating	29	30	29	31	31	347845	4579205	221
2586	Non-participating	35	35	35	37	37	360301	4575237	213
2587	Non-participating	30	30	30	32	34	344402	4561567	260
2588	Non-participating	35	35	35	36	36	349993	4571610	235
2589	Non-participating	33	33	33	35	36	347258	4571261	232
2590	Non-participating	34	35	35	36	36	351513	4548569	275
2591	Non-participating	32	33	33	34	34	353914	4550045	267
2592	Non-participating	24	24	24	26	36	341532	4555965	275
2593	Non-participating	32	32	32	34	34	346345	4572993	228
2594	Non-participating	33	34	34	35	37	346402	4570012	235
2595	Non-participating	32	32	32	34	37	345813	4569736	235
2596	Non-participating	33	33	33	35	35	355193	4551450	261
2597	Non-participating	33	33	33	34	34	355246	4551388	263

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2598	Non-participating	27	27	27	29	31	350263	4545123	296
2599	Non-participating	30	30	30	32	34	343787	4557445	265
2600	Non-participating	35	36	35	37	38	346670	4569682	241
2601	Non-participating	36	36	36	37	37	349049	4571037	236
2602	Non-participating	29	30	30	31	33	348199	4544029	289
2603	Non-participating	34	34	34	36	36	352097	4557781	251
2604	Non-participating	32	32	32	33	33	353785	4579027	215
2605	Non-participating	29	29	29	31	33	343956	4560368	260
2606	Non-participating	36	36	36	37	38	346911	4569932	240
2607	Non-participating	34	35	34	36	36	352763	4549407	275
2608	Non-participating	33	33	33	35	35	354184	4550570	269
2609	Non-participating	30	30	30	32	46	344228	4568018	237
2610	Non-participating	31	32	32	33	44	344153	4566806	246
2611	Non-participating	31	31	31	32	32	354820	4563866	235
2612	Non-participating	36	37	37	38	39	347374	4570273	236
2613	Non-participating	32	32	32	33	36	345789	4570138	233
2614	Non-participating	33	33	33	35	35	355565	4552666	262
2615	Non-participating	31	31	31	33	44	344108	4566136	246
2616	Non-participating	34	34	34	35	35	357881	4571986	219
2617	Non-participating	31	31	31	32	49	344658	4549376	289
2618	Non-participating	28	28	28	30	38	343496	4553219	279
2619	Non-participating	36	36	36	38	38	347383	4570344	235
2620	Non-participating	35	35	35	36	37	347225	4570647	234
2621	Non-participating	31	31	31	33	33	355714	4551685	266
2622	Non-participating	32	33	33	34	34	354109	4564177	237
2623	Non-participating	35	36	36	37	38	346824	4569846	240
2624	Non-participating	31	31	31	33	36	345436	4569920	237
2625	Non-participating	35	35	35	36	37	345010	4557295	266
2626	Non-participating	34	35	35	36	36	354535	4578410	213
2627	Non-participating	32	32	32	33	33	355638	4578641	216
2628	Non-participating	32	32	32	34	36	345861	4570162	233
2629	Non-participating	30	30	30	32	32	354834	4561553	238
2630	Non-participating	32	32	32	33	33	354018	4555848	255

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2631	Non-participating	31	31	31	33	37	345393	4569748	237
2632	Non-participating	34	34	34	36	37	346853	4570395	234
2633	Non-participating	31	32	32	33	44	344140	4566633	247
2634	Non-participating	28	28	28	29	32	343940	4561429	256
2635	Non-participating	33	33	33	34	37	345919	4569675	236
2636	Non-participating	30	31	30	32	32	356332	4567928	227
2637	Non-participating	32	32	32	33	33	355685	4551819	268
2638	Non-participating	30	30	30	31	31	361379	4573941	213
2639	Non-participating	35	35	35	37	37	350060	4571457	239
2640	Non-participating	31	31	31	33	36	345266	4569878	239
2641	Non-participating	27	28	27	29	37	342744	4554242	277
2642	Non-participating	25	25	25	27	44	342179	4552724	281
2643	Non-participating	29	29	29	31	34	343925	4559331	262
2644	Non-participating	33	34	34	35	35	354527	4550885	267
2645	Non-participating	35	35	35	36	36	355158	4551917	260
2646	Non-participating	31	31	31	32	34	344210	4557546	263
2647	Non-participating	35	35	35	37	37	350635	4571821	241
2648	Non-participating	33	33	33	35	35	346579	4573188	225
2649	Non-participating	30	30	30	31	31	355304	4551370	261
2650	Non-participating	32	32	32	33	33	355270	4551114	260
2651	Non-participating	27	28	27	29	31	350172	4545382	297
2652	Non-participating	31	31	31	33	33	356028	4566823	227
2653	Non-participating	31	31	31	33	44	344130	4566357	246
2654	Non-participating	32	32	32	33	34	345820	4574626	227
2655	Non-participating	31	31	31	33	36	345572	4570012	235
2656	Non-participating	28	28	28	30	30	347434	4579311	221
2657	Non-participating	30	31	30	32	32	345807	4575881	223
2658	Non-participating	32	32	32	34	44	344306	4567109	245
2659	Non-participating	36	37	37	38	39	347085	4569933	240
2660	Non-participating	32	32	32	34	36	345971	4570319	232
2661	Non-participating	31	31	31	33	33	355495	4551146	266
2662	Non-participating	33	33	33	35	39	345593	4569109	242
2663	Non-participating	32	32	32	33	33	353070	4559237	243

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2664	Non-participating	30	30	30	31	34	343390	4556604	271
2665	Non-participating	31	31	31	33	34	344206	4557545	263
2666	Non-participating	34	34	34	36	36	354311	4550851	264
2667	Non-participating	29	29	29	30	32	349413	4545125	296
2668	Non-participating	31	31	31	33	36	345023	4564123	251
2669	Non-participating	30	30	30	32	35	344503	4563942	250
2670	Non-participating	30	30	30	31	31	349859	4580004	216
2671	Non-participating	32	32	32	34	34	354393	4578971	211
2672	Non-participating	34	35	35	36	36	356391	4575540	221
2673	Non-participating	35	35	35	37	37	350298	4571796	237
2674	Non-participating	33	33	33	35	39	345604	4569205	242
2675	Non-participating	34	34	34	35	42	345295	4550180	283
2676	Non-participating	32	32	32	34	34	358297	4578654	216
2677	Non-participating	28	29	29	30	39	343960	4552539	280
2678	Non-participating	31	31	31	33	33	353782	4559914	244
2679	Non-participating	32	32	32	33	44	344189	4566695	247
2680	Non-participating	27	27	28	29	32	343730	4561458	254
2681	Non-participating	34	34	34	36	36	346984	4576099	219
2682	Non-participating	29	29	29	31	31	361511	4573694	213
2683	Non-participating	33	34	34	35	36	347025	4570906	232
2684	Non-participating	33	33	33	35	36	346861	4570908	232
2685	Non-participating	31	31	31	33	44	344104	4566151	246
2686	Non-participating	32	32	32	34	46	344295	4566170	247
2687	Non-participating	34	34	34	36	36	349674	4571305	238
2688	Non-participating	30	30	30	32	32	359225	4571258	215
2689	Non-participating	34	35	35	36	36	347700	4576774	220
2690	Non-participating	35	36	36	37	37	344796	4556731	266
2691	Non-participating	34	34	34	35	35	352962	4549486	271
2692	Non-participating	33	33	33	35	35	351520	4548293	278
2693	Non-participating	28	28	28	30	31	351092	4546355	292
2694	Non-participating	35	35	35	36	36	354380	4578379	212
2695	Non-participating	33	33	33	35	35	356192	4570770	227
2696	Non-participating	31	31	31	33	33	360726	4572647	212

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2697	Non-participating	26	26	26	28	37	342178	4554317	278
2698	Non-participating	32	32	32	34	34	358479	4578703	215
2699	Non-participating	34	34	34	36	36	347297	4576527	219
2700	Non-participating	33	33	33	35	35	355414	4568433	229
2701	Non-participating	31	31	31	33	33	354770	4550313	263
2702	Non-participating	29	29	29	31	31	361550	4577515	205
2703	Non-participating	32	32	32	34	34	351648	4579409	221
2704	Non-participating	34	34	34	36	36	360782	4575905	210
2705	Non-participating	32	33	33	34	35	346459	4570581	232
2706	Non-participating	35	36	36	37	37	352469	4549417	278
2707	Non-participating	31	31	31	32	32	355297	4550763	263
2708	Non-participating	34	34	34	35	36	351601	4548457	277
2709	Non-participating	32	32	32	33	46	344301	4565974	248
2710	Non-participating	31	31	31	33	44	344110	4566584	247
2711	Non-participating	32	32	32	33	35	344354	4557481	266
2712	Non-participating	31	31	31	33	49	344701	4549380	289
2713	Non-participating	32	32	32	34	36	345690	4569904	233
2714	Non-participating	36	36	36	37	38	348366	4570936	234
2715	Non-participating	33	33	33	35	36	347184	4571139	232
2716	Non-participating	35	35	35	37	37	344989	4557230	266
2717	Non-participating	36	36	36	37	38	350388	4570588	237
2718	Non-participating	31	31	31	33	43	344068	4566490	247
2719	Non-participating	35	36	36	37	38	346826	4569872	239
2720	Non-participating	32	32	32	34	34	353505	4579058	222
2721	Non-participating	29	29	29	31	33	344013	4561865	257
2722	Non-participating	32	32	32	34	34	353741	4560485	242
2723	Non-participating	33	34	34	35	35	353958	4554926	261
2724	Non-participating	29	30	30	31	31	361078	4572664	212
2725	Non-participating	31	31	31	33	44	344132	4567107	245
2726	Non-participating	32	32	33	34	37	345786	4569571	237
2727	Non-participating	27	27	27	29	47	342733	4552594	283
2728	Non-participating	34	34	34	36	36	356555	4576147	219
2729	Non-participating	30	30	30	32	34	344336	4559819	260

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2730	Non-participating	36	36	36	37	37	350806	4571812	239
2731	Non-participating	33	33	33	35	36	346767	4570734	234
2732	Non-participating	26	26	26	28	35	342245	4556618	274
2733	Non-participating	28	28	28	30	31	351071	4546314	292
2734	Non-participating	33	33	33	35	35	353030	4578926	226
2735	Non-participating	34	35	35	36	36	353548	4578537	224
2736	Non-participating	34	34	34	35	35	360514	4574703	214
2737	Non-participating	33	34	34	35	35	346904	4576263	221
2738	Non-participating	32	32	32	33	33	356528	4570264	226
2739	Non-participating	27	27	29	29	29	359622	4571627	207
2740	Non-participating	33	33	33	35	35	355544	4568316	229
2741	Non-participating	33	33	33	35	35	354358	4550689	268
2742	Non-participating	32	32	32	34	34	355060	4551134	259
2743	Non-participating	34	34	34	35	35	358243	4578278	218
2744	Non-participating	32	32	32	34	46	344285	4566163	247
2745	Non-participating	33	33	33	35	35	347224	4571271	232
2746	Non-participating	31	32	32	33	44	344154	4566718	246
2747	Non-participating	34	34	34	36	36	358698	4572050	215
2748	Non-participating	31	31	31	33	37	345220	4569685	239
2749	Non-participating	32	32	32	34	34	355607	4578564	217
2750	Non-participating	32	32	32	33	44	344221	4567070	245
2751	Non-participating	31	31	31	33	44	344098	4566556	247
2752	Non-participating	32	32	32	33	37	345509	4569731	235
2753	Non-participating	35	35	35	37	37	349051	4571112	235
2754	Non-participating	27	27	27	29	31	350101	4545134	298
2755	Non-participating	33	33	33	34	37	345788	4569515	238
2756	Non-participating	35	35	35	37	37	344918	4557070	265
2757	Non-participating	33	33	33	35	35	355127	4551432	259
2758	Non-participating	35	35	35	37	37	350585	4572045	230
2759	Non-participating	36	36	36	37	38	346939	4569927	240
2760	Non-participating	31	31	31	32	32	354595	4550582	264
2761	Non-participating	35	35	35	37	49	345125	4546946	293
2762	Non-participating	29	29	29	30	32	348376	4544084	288

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2763	Non-participating	35	35	35	37	37	345062	4557271	265
2764	Non-participating	31	32	32	33	44	344151	4566828	246
2765	Non-participating	35	35	35	36	37	347280	4570715	233
2766	Non-participating	31	31	31	33	33	354776	4563972	233
2767	Non-participating	32	33	33	34	34	355668	4552806	259
2768	Non-participating	27	28	28	29	29	361795	4573010	211
2769	Non-participating	34	34	34	35	35	357973	4571996	218
2770	Non-participating	32	33	33	34	35	346429	4573105	227
2771	Non-participating	34	34	34	35	35	354159	4564908	238
2772	Non-participating	33	34	34	35	37	346393	4570038	234
2773	Non-participating	33	33	33	35	35	347196	4572499	228
2774	Non-participating	28	29	29	30	32	350260	4546112	299
2775	Non-participating	30	30	30	32	34	347846	4544043	291
2776	Non-participating	33	33	33	34	34	354575	4578697	209
2777	Non-participating	34	35	35	36	36	354479	4578401	213
2778	Non-participating	35	35	35	36	37	349434	4571213	237
2779	Non-participating	35	35	35	36	37	347260	4570634	234
2780	Non-participating	33	33	33	35	35	347606	4572169	232
2781	Non-participating	32	33	33	34	35	351245	4548049	279
2782	Non-participating	31	32	32	33	44	344139	4566443	247
2783	Non-participating	34	34	34	36	47	344730	4567147	245
2784	Non-participating	30	30	30	32	35	344479	4563930	250
2785	Non-participating	28	28	28	30	33	343946	4561594	257
2786	Non-participating	30	30	30	32	46	344249	4568000	238
2787	Non-participating	30	30	30	31	40	344043	4550954	283
2788	Non-participating	34	34	34	35	36	344801	4557319	263
2789	Non-participating	35	35	35	37	38	346601	4569675	241
2790	Non-participating	32	32	32	34	36	345849	4570132	233
2791	Non-participating	30	31	30	32	32	356353	4567748	226
2792	Non-participating	31	31	31	33	33	348493	4579221	218
2793	Non-participating	26	26	26	28	36	342112	4555002	277
2794	Non-participating	30	30	30	32	33	345519	4573627	228
2795	Non-participating	32	33	33	34	34	354096	4564133	237

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2796	Non-participating	28	29	29	30	33	343916	4560985	258
2797	Non-participating	31	31	31	33	36	345469	4570032	237
2798	Non-participating	28	28	28	30	30	360869	4571807	213
2799	Non-participating	34	34	34	36	36	347120	4570718	233
2800	Non-participating	33	33	33	35	35	355491	4568381	229
2801	Non-participating	33	33	33	35	35	354517	4550786	268
2802	Non-participating	31	31	31	33	33	354358	4550436	267
2803	Non-participating	31	31	31	33	33	352146	4547992	280
2804	Non-participating	28	28	28	30	31	351336	4546408	292
2805	Non-participating	31	31	31	33	33	353284	4579417	222
2806	Non-participating	31	31	31	33	33	350591	4579611	218
2807	Non-participating	33	33	33	35	45	344877	4565457	249
2808	Non-participating	29	29	29	31	33	344200	4561507	260
2809	Non-participating	35	35	35	36	37	350064	4571709	236
2810	Non-participating	34	34	35	36	36	350572	4571939	232
2811	Non-participating	33	33	33	35	36	346633	4570645	234
2812	Non-participating	28	28	28	30	32	349542	4545104	296
2813	Non-participating	29	30	30	31	33	348209	4544050	289
2814	Non-participating	31	31	31	33	37	345214	4569767	239
2815	Non-participating	31	32	32	33	44	344131	4566546	247
2816	Non-participating	29	29	29	31	40	343833	4551025	283
2817	Non-participating	37	37	37	39	39	347130	4569792	240
2818	Non-participating	29	29	29	31	31	356607	4569500	225
2819	Non-participating	30	30	30	32	32	361358	4573837	212
2820	Non-participating	37	38	38	39	39	348450	4576551	221
2821	Non-participating	27	27	27	29	48	342986	4551880	285
2822	Non-participating	31	31	31	33	37	345332	4569750	239
2823	Non-participating	31	31	31	33	33	354097	4549889	270
2824	Non-participating	29	29	29	30	32	349416	4545127	296
2825	Non-participating	32	32	32	33	36	345681	4569924	233
2826	Non-participating	35	35	35	37	37	350175	4571702	236
2827	Non-participating	31	31	31	33	36	345568	4570018	235
2828	Non-participating	35	35	35	37	37	347251	4570489	234

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2829	Non-participating	29	29	29	30	36	343168	4554280	279
2830	Non-participating	31	31	31	32	32	355559	4551142	268
2831	Non-participating	30	30	30	32	32	353197	4579724	221
2832	Non-participating	30	30	30	32	32	345802	4576200	224
2833	Non-participating	30	31	31	32	32	345806	4575837	223
2834	Non-participating	35	35	35	37	37	350699	4571854	240
2835	Non-participating	35	35	35	37	37	347088	4573178	226
2836	Non-participating	31	31	31	33	37	344590	4552627	280
2837	Non-participating	29	29	29	31	33	343970	4560847	258
2838	Non-participating	32	32	32	33	34	345820	4574566	227
2839	Non-participating	32	32	32	33	36	345740	4570125	234
2840	Non-participating	29	30	31	31	31	354728	4550718	260
2841	Non-participating	30	31	31	32	32	355655	4553867	257
2842	Non-participating	32	33	33	34	34	355368	4551472	264
2843	Non-participating	32	32	32	33	44	344227	4567113	245
2844	Non-participating	36	36	36	38	38	347589	4570498	235
2845	Non-participating	34	34	34	35	35	354309	4551024	262
2846	Non-participating	30	30	30	32	32	361103	4573124	211
2847	Non-participating	32	32	32	33	33	358241	4578722	216
2848	Non-participating	35	35	35	37	37	347303	4573094	227
2849	Non-participating	32	32	32	33	46	344295	4566020	248
2850	Non-participating	36	36	36	38	38	349920	4570561	238
2851	Non-participating	33	33	33	35	37	345922	4569502	240
2852	Non-participating	28	29	28	30	32	349626	4545230	297
2853	Non-participating	29	29	29	31	31	361595	4577402	206
2854	Non-participating	29	30	30	31	31	349858	4580044	216
2855	Non-participating	32	32	32	34	34	354464	4578993	211
2856	Non-participating	32	32	32	33	33	358449	4578722	215
2857	Non-participating	35	35	35	37	37	350076	4571482	238
2858	Non-participating	32	33	33	34	34	353917	4550292	267
2859	Non-participating	28	28	28	30	33	344031	4561421	259
2860	Non-participating	35	35	35	36	36	354189	4551015	264
2861	Non-participating	34	35	35	36	36	356390	4575604	221

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2862	Non-participating	34	34	34	36	36	347000	4576199	221
2863	Non-participating	34	34	34	36	38	346036	4569244	241
2864	Non-participating	32	33	33	34	34	353660	4555963	256
2865	Non-participating	34	34	34	36	49	345023	4547351	293
2866	Non-participating	32	32	32	33	33	356323	4578309	218
2867	Non-participating	29	29	28	30	32	350583	4546380	296
2868	Non-participating	33	34	33	35	36	347061	4570974	232
2869	Non-participating	32	32	32	34	34	354312	4563955	237
2870	Non-participating	31	32	32	33	33	354001	4560637	237
2871	Non-participating	28	28	28	29	33	343937	4561299	255
2872	Non-participating	30	30	30	31	31	354768	4550271	266
2873	Non-participating	32	32	32	34	38	345418	4569306	241
2874	Non-participating	33	33	33	35	38	345700	4569283	242
2875	Non-participating	31	31	31	33	33	354857	4579073	210
2876	Non-participating	33	33	33	35	35	355574	4552543	263
2877	Non-participating	36	36	36	38	38	348373	4570864	235
2878	Non-participating	32	32	32	33	46	344291	4565980	248
2879	Non-participating	32	32	32	34	36	345810	4570035	235
2880	Non-participating	36	37	37	38	39	347368	4570247	236
2881	Non-participating	32	32	32	33	35	345878	4570306	233
2882	Non-participating	31	32	32	33	33	355019	4551083	261
2883	Non-participating	32	32	32	33	33	354376	4550507	267
2884	Non-participating	32	33	33	34	34	354173	4550391	269
2885	Non-participating	31	31	31	32	32	361091	4577683	207
2886	Non-participating	32	32	32	34	34	354514	4578972	211
2887	Non-participating	28	29	29	30	30	359405	4571274	212
2888	Non-participating	31	32	32	33	44	344133	4566496	247
2889	Non-participating	32	32	32	34	35	344855	4559922	260
2890	Non-participating	36	36	36	38	38	349984	4570511	238
2891	Non-participating	35	35	35	36	37	346816	4570014	238
2892	Non-participating	33	33	33	34	34	355606	4568374	229
2893	Non-participating	31	31	32	33	33	354630	4550849	264
2894	Non-participating	33	33	33	34	34	358801	4578606	214

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2895	Non-participating	31	31	31	33	43	344098	4566593	247
2896	Non-participating	31	31	31	32	34	344134	4557510	263
2897	Non-participating	35	35	35	37	37	349197	4571184	234
2898	Non-participating	31	31	31	33	36	345483	4569875	236
2899	Non-participating	36	36	36	38	38	352366	4549470	276
2900	Non-participating	28	28	28	29	29	361551	4572832	209
2901	Non-participating	25	25	25	27	38	341805	4554339	280
2902	Non-participating	34	34	34	35	46	344975	4565530	249
2903	Non-participating	30	31	31	32	46	344251	4567947	238
2904	Non-participating	28	29	29	30	34	343001	4555898	271
2905	Non-participating	31	32	32	33	37	345413	4569699	236
2906	Non-participating	32	33	33	34	37	345810	4569672	235
2907	Non-participating	31	31	31	32	36	345207	4569821	239
2908	Non-participating	32	32	32	33	45	344241	4566211	246
2909	Non-participating	31	32	32	33	44	344153	4566850	245
2910	Non-participating	33	34	34	35	36	347249	4571103	232
2911	Non-participating	32	33	33	34	35	351522	4548145	279
2912	Non-participating	31	31	31	33	36	345526	4570084	237
2913	Non-participating	31	32	32	33	33	355447	4551225	263
2914	Non-participating	34	34	34	35	35	354220	4550769	266
2915	Non-participating	33	33	33	35	35	353471	4578842	224
2916	Non-participating	32	33	33	34	34	360813	4574503	214
2917	Non-participating	31	32	32	33	33	346675	4576628	221
2918	Non-participating	31	32	32	33	44	344141	4566465	247
2919	Non-participating	35	36	35	37	37	350248	4570906	238
2920	Non-participating	33	33	33	35	39	345632	4569179	242
2921	Non-participating	30	30	30	32	32	356601	4569618	225
2922	Non-participating	32	32	32	34	34	346351	4572960	228
2923	Non-participating	35	35	35	37	37	352469	4549365	278
2924	Non-participating	34	34	34	35	35	354569	4578538	211
2925	Non-participating	30	30	30	31	34	344258	4560019	260
2926	Non-participating	33	34	33	35	36	346961	4570863	233
2927	Non-participating	26	26	26	28	37	342181	4554302	278

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2928	Non-participating	24	24	24	26	38	341364	4554372	280
2929	Non-participating	32	32	32	34	34	353867	4549898	270
2930	Non-participating	31	31	31	33	36	345434	4569978	237
2931	Non-participating	31	32	32	33	36	345542	4569923	234
2932	Non-participating	31	31	31	33	37	345262	4569787	239
2933	Non-participating	35	35	35	36	36	356402	4575087	221
2934	Non-participating	32	32	32	34	41	345144	4568790	238
2935	Non-participating	32	32	32	34	34	353666	4579043	218
2936	Non-participating	33	33	33	35	35	354300	4550585	268
2937	Non-participating	31	31	31	32	32	358042	4578888	217
2938	Non-participating	35	36	36	37	37	349154	4571080	236
2939	Non-participating	31	32	32	33	44	344132	4566563	247
2940	Non-participating	32	32	32	34	44	344277	4567185	246
2941	Non-participating	33	33	33	34	38	345730	4569457	239
2942	Non-participating	32	32	32	33	37	345594	4569799	234
2943	Non-participating	33	33	33	35	36	346911	4570857	232
2944	Non-participating	31	31	31	32	32	355876	4551798	268
2945	Non-participating	35	35	35	37	37	350281	4571177	238
2946	Non-participating	31	31	31	32	33	345768	4573145	228
2947	Non-participating	33	33	33	34	34	354236	4564639	237
2948	Non-participating	32	32	32	34	34	354272	4564154	238
2949	Non-participating	32	32	32	33	33	354054	4563981	235
2950	Non-participating	34	34	34	36	37	346510	4569903	238
2951	Non-participating	34	34	34	35	36	347289	4572656	229
2952	Non-participating	31	32	32	33	38	345243	4569318	238
2953	Non-participating	31	32	31	33	37	345337	4569623	237
2954	Non-participating	35	35	35	37	37	345063	4557281	265
2955	Non-participating	32	32	32	34	44	344227	4566783	246
2956	Non-participating	32	32	32	33	36	345866	4570209	233
2957	Non-participating	31	31	31	33	37	345293	4569759	239
2958	Non-participating	35	35	35	37	37	344953	4557158	266
2959	Non-participating	32	32	32	33	33	354123	4550137	268
2960	Non-participating	31	31	31	33	44	344112	4566312	246

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2961	Non-participating	35	35	35	37	37	350401	4571630	237
2962	Non-participating	36	36	36	37	38	346829	4569787	240
2963	Non-participating	32	32	32	34	34	346849	4572286	228
2964	Non-participating	34	35	35	36	51	345235	4547905	293
2965	Non-participating	31	32	32	33	36	345626	4569963	233
2966	Non-participating	31	31	31	33	43	344042	4566383	247
2967	Non-participating	32	32	32	34	45	344335	4567189	245
2968	Non-participating	35	35	35	37	37	350556	4572058	230
2969	Non-participating	35	35	35	37	37	349278	4571147	236
2970	Non-participating	32	33	33	34	34	356293	4570728	225
2971	Non-participating	33	33	33	34	34	351642	4579134	223
2972	Non-participating	36	36	36	38	38	347810	4576359	221
2973	Non-participating	32	32	32	34	44	344258	4567119	245
2974	Non-participating	37	38	38	39	39	350422	4569724	243
2975	Non-participating	34	34	34	36	36	357823	4572083	219
2976	Non-participating	33	33	33	35	35	354306	4554704	261
2977	Non-participating	32	32	32	33	33	354936	4550697	262
2978	Non-participating	33	33	33	35	35	355224	4551531	262
2979	Non-participating	28	29	29	30	30	360882	4571933	213
2980	Non-participating	35	35	35	36	36	360368	4575226	213
2981	Non-participating	28	28	29	30	33	343950	4561475	257
2982	Non-participating	33	34	34	35	37	345925	4563813	249
2983	Non-participating	32	32	32	33	36	345748	4569991	234
2984	Non-participating	32	32	32	34	34	353431	4549483	270
2985	Non-participating	31	32	31	33	33	355533	4551347	266
2986	Non-participating	29	29	29	31	32	349360	4545118	295
2987	Non-participating	28	28	28	30	30	347966	4579837	221
2988	Non-participating	32	33	33	34	34	354250	4578918	211
2989	Non-participating	35	35	35	37	37	350332	4571155	238
2990	Non-participating	34	35	35	36	37	344502	4555450	270
2991	Non-participating	28	29	29	30	34	343288	4556725	270
2992	Non-participating	35	35	35	37	37	344880	4556946	264
2993	Non-participating	29	29	29	31	33	344156	4561514	259

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
2994	Non-participating	32	32	32	33	36	345580	4569873	233
2995	Non-participating	31	31	31	33	36	345268	4569842	239
2996	Non-participating	31	31	31	32	43	344098	4565898	247
2997	Non-participating	34	34	35	36	37	346412	4569683	240
2998	Non-participating	34	34	34	36	36	354415	4550976	263
2999	Non-participating	27	27	27	29	31	350084	4545214	297
3000	Non-participating	29	29	29	30	30	347505	4579217	221
3001	Non-participating	27	27	27	29	37	342758	4554223	277
3002	Non-participating	32	32	32	34	34	355815	4568095	228
3003	Non-participating	32	32	32	34	34	355760	4566867	227
3004	Non-participating	29	29	30	31	31	354382	4550152	262
3005	Non-participating	35	35	35	37	37	350246	4571772	236
3006	Non-participating	30	30	30	32	32	345802	4576153	224
3007	Non-participating	35	36	36	37	37	352512	4549465	278
3008	Non-participating	32	32	32	34	37	345811	4569749	235
3009	Non-participating	32	32	32	33	36	345583	4569819	234
3010	Non-participating	27	27	28	29	30	351028	4546351	291
3011	Non-participating	33	33	33	34	34	355813	4578217	218
3012	Non-participating	31	32	32	33	44	344144	4566600	247
3013	Non-participating	35	35	35	36	36	350079	4571552	238
3014	Non-participating	33	34	34	35	36	346878	4570754	233
3015	Non-participating	31	31	31	33	33	354576	4564096	235
3016	Non-participating	31	32	32	33	33	353953	4549745	270
3017	Non-participating	31	32	32	33	44	344153	4566668	247
3018	Non-participating	31	31	32	32	32	354432	4550550	266
3019	Non-participating	31	32	32	33	33	345816	4574772	224
3020	Non-participating	35	35	35	36	36	346918	4575861	221
3021	Non-participating	35	36	36	37	37	352567	4549530	276
3022	Non-participating	35	36	36	37	51	345218	4547164	292
3023	Non-participating	30	30	30	31	31	361371	4577574	206
3024	Non-participating	30	30	30	32	32	349860	4579878	216
3025	Non-participating	29	30	29	31	31	345597	4576054	224
3026	Non-participating	34	34	34	35	45	344979	4565470	249

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3027	Non-participating	30	30	30	32	45	344254	4568362	242
3028	Non-participating	35	35	35	36	37	350034	4571496	238
3029	Non-participating	29	29	29	30	33	343901	4560706	260
3030	Non-participating	29	29	29	30	33	344002	4561716	257
3031	Non-participating	30	30	30	31	34	344323	4561534	260
3032	Non-participating	32	32	32	34	36	345627	4569836	233
3033	Non-participating	31	31	31	33	33	352898	4559134	245
3034	Non-participating	30	30	30	31	31	355646	4554157	251
3035	Non-participating	31	31	31	33	33	355384	4550951	261
3036	Non-participating	29	29	29	31	32	350354	4546463	295
3037	Non-participating	36	36	36	37	38	348613	4571006	235
3038	Non-participating	29	29	28	30	32	350580	4546382	296
3039	Non-participating	30	31	31	32	32	361219	4577640	206
3040	Non-participating	24	24	24	26	38	341421	4554274	280
3041	Non-participating	32	32	32	34	35	344877	4559908	260
3042	Non-participating	33	33	33	35	35	347198	4576626	218
3043	Non-participating	33	33	33	35	38	345731	4569244	242
3044	Non-participating	33	33	33	35	35	355408	4568392	229
3045	Non-participating	31	31	31	33	33	354544	4550251	259
3046	Non-participating	31	31	31	32	32	361288	4574988	210
3047	Non-participating	30	30	30	32	32	345497	4575243	223
3048	Non-participating	29	30	30	31	31	354828	4560787	238
3049	Non-participating	32	33	33	34	34	354315	4578922	211
3050	Non-participating	30	30	30	31	31	357825	4579087	216
3051	Non-participating	29	29	29	31	33	343971	4560759	259
3052	Non-participating	30	31	31	32	34	344525	4561516	260
3053	Non-participating	30	30	30	32	32	355075	4563619	235
3054	Non-Participating	36	36	36	38	38	347892	4570768	235
3055	Non-Participating	36	36	36	37	38	347830	4570737	235
3056	Non-Participating	36	36	36	38	38	347953	4570791	234
3057	Non-Participating	36	36	36	38	38	347995	4570802	234
3058	Non-Participating	36	36	36	37	38	348032	4570818	234
3059	Non-Participating	36	36	36	38	38	348096	4570846	234

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3060	Non-Participating	36	37	37	38	38	347941	4570660	235
3061	Non-Participating	36	36	36	38	38	348043	4570740	236
3062	Non-Participating	36	36	36	38	38	347788	4570650	235
3063	Non-Participating	36	36	36	38	38	347761	4570638	236
3064	Non-Participating	36	36	36	38	38	347714	4570620	236
3065	Non-Participating	36	36	36	38	38	347826	4570664	236
3066	Non-Participating	36	36	36	38	38	347852	4570674	236
3067	Non-Participating	36	36	36	38	38	347881	4570685	236
3068	Non-Participating	36	36	36	38	38	347681	4570610	236
3069	Non-Participating	36	36	36	37	38	347684	4570679	236
3070	Non-Participating	36	36	36	37	38	347723	4570694	236
3071	Non-Participating	36	36	36	37	38	347782	4570717	235
3072	Non-Participating	37	37	37	38	39	348188	4570681	236
3073	Non-Participating	36	36	36	38	38	348450	4570885	235
3074	Non-Participating	36	36	36	37	38	347640	4570667	236
3075	Non-Participating	36	36	36	37	38	347611	4570655	235
3076	Non-Participating	36	36	36	37	38	347581	4570645	235
3077	Non-Participating	35	36	36	37	38	347553	4570636	235
3078	Non-Participating	35	36	36	37	38	347520	4570626	235
3079	Non-Participating	35	36	36	37	38	347490	4570617	235
3080	Non-Participating	35	36	36	37	38	347458	4570612	235
3081	Non-Participating	36	36	36	38	38	347534	4570552	235
3082	Non-Participating	36	36	36	38	38	347585	4570564	236
3083	Non-Participating	36	36	36	38	38	347622	4570586	236
3084	Non-Participating	36	36	36	37	38	347429	4570528	235
3085	Non-Participating	36	36	36	37	38	347473	4570531	235
3086	Non-Participating	36	36	36	37	38	347505	4570547	235
3087	Non-Participating	35	35	35	37	37	347394	4570637	234
3088	Non-Participating	35	35	35	36	37	347328	4570669	234
3089	Non-Participating	35	35	35	37	37	347315	4570614	235
3090	Non-Participating	35	35	35	37	37	347249	4570596	235
3091	Non-Participating	35	35	35	37	37	347234	4570592	235
3092	Non-Participating	35	35	35	36	37	347204	4570595	235

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3093	Non-Participating	35	35	35	36	37	347163	4570601	235
3094	Non-Participating	34	35	35	36	37	347122	4570606	235
3095	Non-Participating	34	35	34	36	37	347089	4570612	235
3096	Non-Participating	35	35	35	37	37	347263	4570593	235
3097	Church	38	38	38	40	40	347293	4569805	241
3098	Non-Participating	37	38	38	39	40	347227	4569792	241
3099	Church	37	38	38	39	39	351250	4569492	242
3100	Non-Participating	37	37	37	38	39	348707	4573071	227
3101	Non-Participating	36	37	37	38	38	348599	4573018	228
3102	Non-Participating	37	37	37	38	39	348584	4573096	227
3103	Non-Participating	37	37	37	38	39	348537	4573102	227
3104	Non-Participating	37	37	37	39	39	348859	4573095	227
3105	Non-Participating	36	37	37	38	38	348113	4573107	227
3106	Non-Participating	36	37	37	38	38	347985	4573110	227
3107	Non-Participating	36	36	36	38	38	347828	4573066	227
3108	Non-Participating	34	34	34	36	36	346905	4573171	226
3109	Non-Participating	34	35	35	36	36	346936	4573169	226
3110	Non-Participating	34	34	34	36	36	346874	4573172	226
3111	Non-Participating	34	34	34	36	36	346843	4573177	226
3112	Non-Participating	34	34	34	36	36	346818	4573179	226
3113	Non-Participating	34	34	34	36	36	346786	4573176	225
3114	Non-Participating	34	34	34	35	36	346755	4573178	226
3115	Non-Participating	34	34	34	35	36	346722	4573183	226
3116	Non-Participating	34	34	34	35	36	346685	4573185	226
3117	Non-Participating	33	33	33	35	35	346535	4573184	225
3118	Non-Participating	33	34	33	35	35	346568	4573241	225
3119	Non-Participating	33	34	34	35	35	346578	4573273	225
3120	Non-Participating	34	34	34	35	36	346596	4573314	225
3121	School	32	33	33	34	35	346526	4572970	226
3122	Non-Participating	36	37	37	38	38	346832	4573838	224
3123	Non-Participating	37	37	37	38	39	346865	4573867	225
3124	Non-Participating	35	36	36	37	37	346684	4573818	225
3125	Non-Participating	35	36	36	37	37	346756	4573680	223

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3126	Non-Participating	35	36	35	37	37	346743	4573653	223
3127	Non-Participating	35	35	35	37	37	346732	4573625	223
3128	Non-Participating	35	35	35	37	37	346719	4573595	224
3129	Non-Participating	35	35	35	36	37	346707	4573571	224
3130	Non-Participating	35	35	35	36	37	346693	4573537	224
3131	Non-Participating	34	35	35	36	36	346678	4573496	225
3132	Non-Participating	34	35	34	36	36	346662	4573467	225
3133	Non-Participating	34	34	34	36	36	346651	4573441	225
3134	Non-Participating	34	34	34	36	36	346641	4573411	225
3135	Non-Participating	34	34	34	36	36	346628	4573380	225
3136	Non-Participating	34	34	34	35	36	346614	4573355	225
3137	Non-Participating	39	39	39	40	40	346935	4574288	222
3138	Non-Participating	37	38	38	39	39	346842	4574171	222
3139	Non-Participating	37	37	37	38	38	346900	4575303	223
3140	Non-Participating	36	37	37	38	38	346899	4575368	222
3141	Non-Participating	36	37	37	38	38	346901	4575396	222
3142	Non-Participating	36	36	36	38	38	346936	4575565	220
3143	Non-Participating	34	34	34	36	36	346837	4575964	219
3144	Non-Participating	34	35	35	36	36	346900	4575963	219
3145	Non-Participating	34	35	35	36	36	346922	4575910	220
3146	Church	42	42	42	44	44	353856	4576137	224
3147	Non-Participating	40	41	41	42	42	353831	4575960	225
3148	Church	35	36	36	37	37	349685	4558551	251
3149	Non-Participating	36	37	37	38	38	354727	4551718	251
3150	Church	33	33	33	35	35	360129	4578147	213
3151	Non-participating	36	36	36	37	38	347393	4570512	235
3152	Non-participating	36	37	37	38	38	350486	4578382	222
3153	Non-participating	36	36	36	38	38	350490	4578431	222
3154	Non-participating	36	36	36	37	37	351036	4578518	224
3155	Non-participating	35	36	36	37	37	351155	4578584	223
3156	Non-participating	35	35	35	37	37	344940	4557115	265
3157	Non-participating	41	41	41	42	42	351894	4569312	242
3158	Non-participating	41	41	41	42	42	352127	4569261	240

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3159	Church	34	35	35	36	36	351921	4578819	225
3160	Non-participating	35	36	35	37	37	347430	4570609	235
3161	Non-participating	35	36	35	37	37	354378	4578283	213
3162	Participating	35	35	35	37	37	356086	4576568	220
3163	Non-participating	35	35	35	37	37	354323	4578324	211
3164	Non-participating	36	36	36	37	40	345904	4565110	249
3165	Non-participating	36	36	36	38	39	346866	4569672	241
3166	Non-participating	36	36	36	38	39	346921	4569760	241
3167	Non-participating	36	36	36	38	39	346948	4569769	240
3168	Non-participating	36	37	37	38	39	346997	4569765	241
3169	Non-participating	36	37	37	38	39	346991	4569814	240
3170	Non-participating	36	37	36	38	39	347010	4569870	240
3171	Non-participating	36	37	37	38	39	347038	4569876	240
3172	Non-participating	37	37	37	38	39	347063	4569842	240
3173	Non-participating	37	37	37	38	39	347056	4569792	240
3174	Non-participating	37	37	37	39	39	347098	4569780	241
3175	Participating	44	44	44	44	44	352011	4570555	237
3176	Participating	45	45	45	45	45	352029	4570499	237
3177	Non-participating	40	40	40	42	42	350000	4573310	226
3178	Non-participating	36	37	37	38	38	348429	4573022	227
3179	Non-participating	37	37	37	39	39	346853	4573929	225
3180	Non-participating	35	36	36	37	37	347453	4576215	223
3181	Non-participating	33	34	34	35	35	348227	4578259	218
3182	Non-participating	33	33	33	35	35	358072	4578394	219
3183	Non-participating	35	35	35	36	36	354819	4551411	261
3184	Non-participating	34	34	34	36	36	354820	4551314	261
3185	Non-participating	33	34	34	35	35	354582	4551225	261
3186	Non-participating	35	35	35	37	37	354461	4551233	265
3187	Non-participating	35	35	35	37	37	354444	4551196	264
3188	Non-participating	36	36	36	38	38	354404	4551321	265
3189	Non-participating	40	40	40	41	41	353827	4551619	262
3190	Non-participating	39	39	39	41	41	353902	4551593	261
3191	Non-participating	38	38	38	39	39	353992	4551475	259

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3192	Non-participating	39	39	39	40	40	353840	4551519	261
3193	Non-participating	38	39	39	40	40	353864	4551464	263
3194	Non-participating	38	38	38	40	40	353856	4551415	262
3195	Non-participating	37	37	37	38	38	354207	4551370	259
3196	Non-participating	36	37	36	38	38	354215	4551312	262
3197	Non-participating	36	37	37	38	38	354195	4551269	264
3198	Non-participating	37	38	38	39	39	354011	4551376	262
3199	Non-participating	36	37	37	38	38	354085	4551351	261
3200	Non-participating	37	37	37	39	39	354031	4551325	265
3201	Non-participating	36	36	36	38	38	354119	4551195	266
3202	Non-participating	36	37	37	38	38	354006	4551218	266
3203	Non-participating	33	33	35	35	35	354080	4551115	262
3204	Non-participating	36	36	36	38	38	353980	4551145	267
3205	Non-participating	37	37	37	38	38	353888	4551216	263
3206	Non-participating	36	36	36	38	38	353921	4551111	267
3207	Non-participating	36	36	36	38	38	353874	4551088	267
3208	Non-participating	35	35	35	37	37	353882	4550961	267
3209	Non-participating	36	36	36	38	38	353753	4551013	266
3210	Non-participating	36	36	36	37	37	353747	4550967	267
3211	Non-participating	36	36	36	38	38	353593	4550962	267
3212	Participating	36	37	37	38	38	353595	4551130	266
3213	Non-participating	37	37	37	38	38	353740	4551191	261
3214	Non-participating	37	37	37	39	39	353744	4551242	261
3215	Non-participating	36	36	36	37	37	353512	4550843	269
3216	Non-participating	34	35	35	36	36	354082	4550944	265
3217	Non-participating	35	35	35	36	36	354057	4550945	266
3218	Non-participating	35	35	35	37	37	354032	4550969	265
3219	Non-participating	35	35	35	36	36	353992	4550987	263
3220	Non-participating	35	35	35	36	36	353967	4550876	266
3221	Non-participating	34	34	34	36	36	354069	4550827	266
3222	Non-participating	34	35	35	36	36	354029	4550807	267
3223	Non-participating	35	35	35	36	36	353663	4550676	269
3224	Non-participating	35	35	35	37	37	352559	4549465	278

ID	Receiver Status	Sound Pressure Level (dBA) by Model Run					Coordinates (WGS 84, UTM 17N)		Elevation + Receiver Height (m)
		V150	N149 at 109 m	N149 at 125 m	SG 4.5-145	Cumulative (Emerson w/SG4.5-145, Republic, and Seneca)	X (m)	Y (m)	
3225	Non-participating	34	35	35	36	43	345800	4549403	280
3226	Non-participating	35	35	35	36	42	345686	4549937	284
3227	Non-participating	37	37	37	38	39	346460	4553376	271
3228	Non-participating	35	36	36	37	37	351681	4557772	251
3229	Non-participating	36	36	36	38	38	354527	4551468	260
3230	Non-participating	43	44	44	45	45	348185	4569886	242
3231	Non-participating	38	38	38	40	40	348165	4570467	237
3232	Non-participating	39	39	39	41	41	348094	4570265	239
3233	Non-participating	39	39	39	40	40	353082	4570453	235
3234	Participating	42	43	42	44	44	350657	4573439	226
3235	Non-participating	37	37	37	38	39	348180	4573148	227
3236	Non-participating	38	39	39	40	40	358255	4577595	219

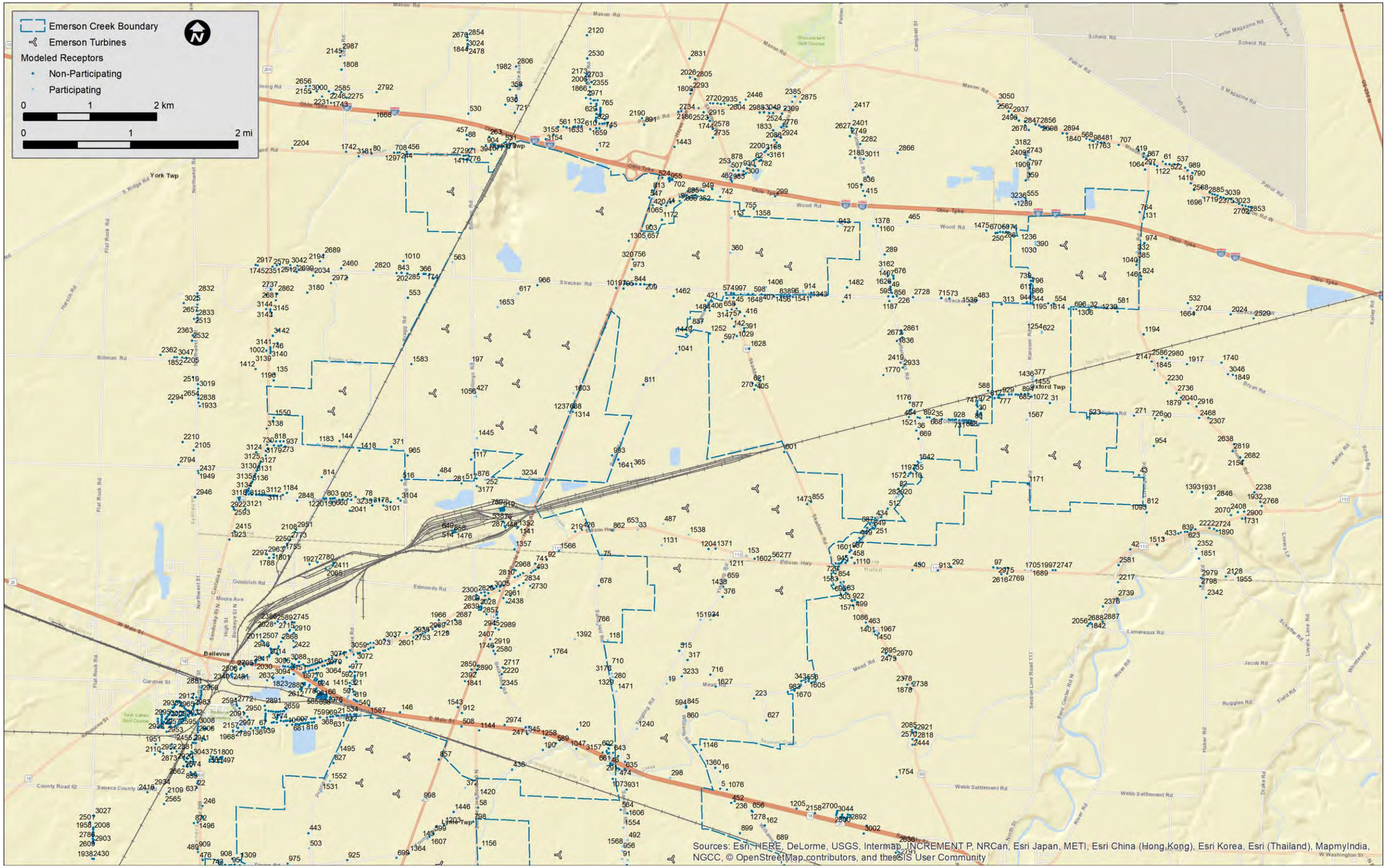


FIGURE 60: MODELED RECEPTOR MAP (NORTHERN AREA)

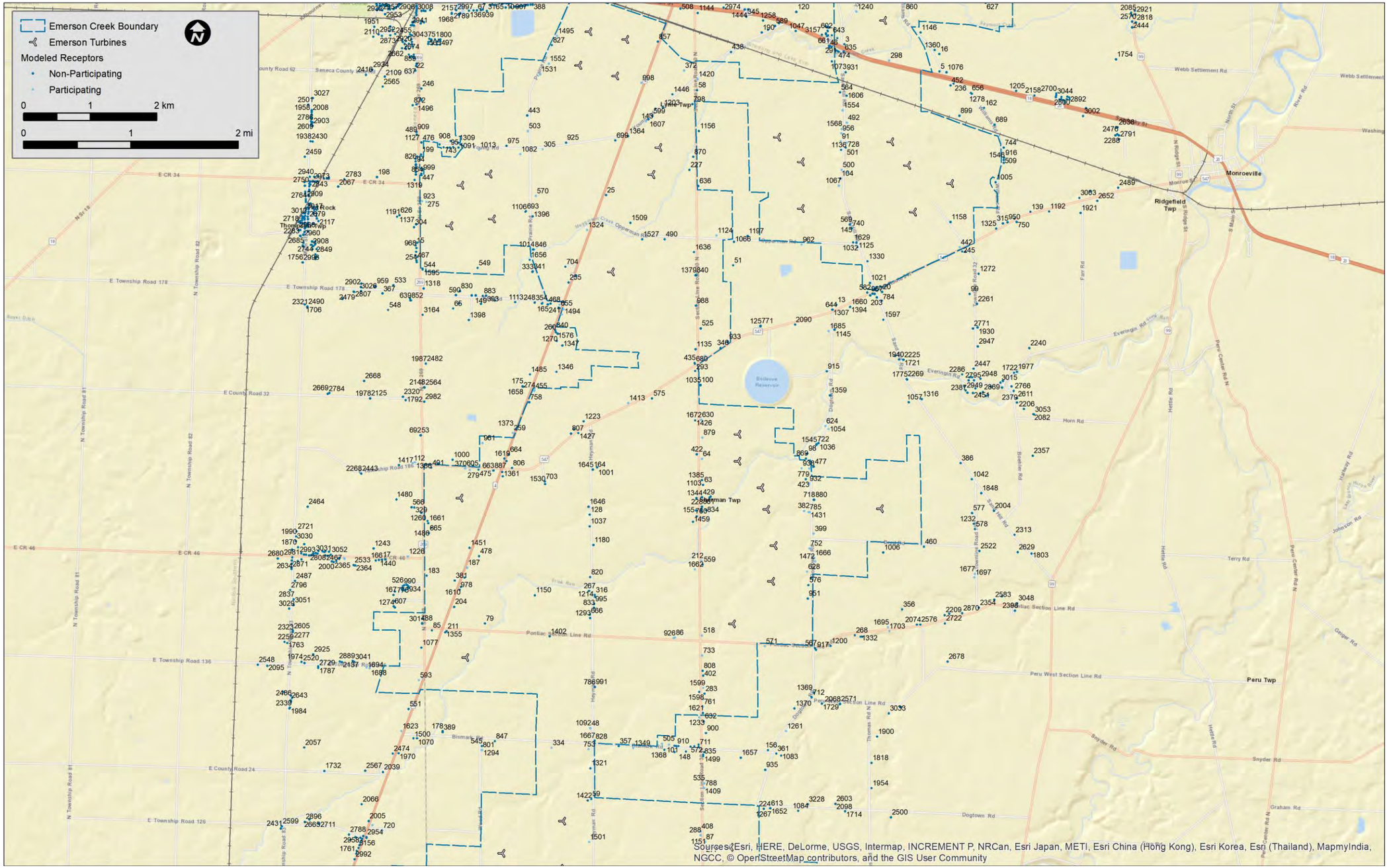


FIGURE 61: MODELED RECEPTOR MAP (MIDDLE AREA)

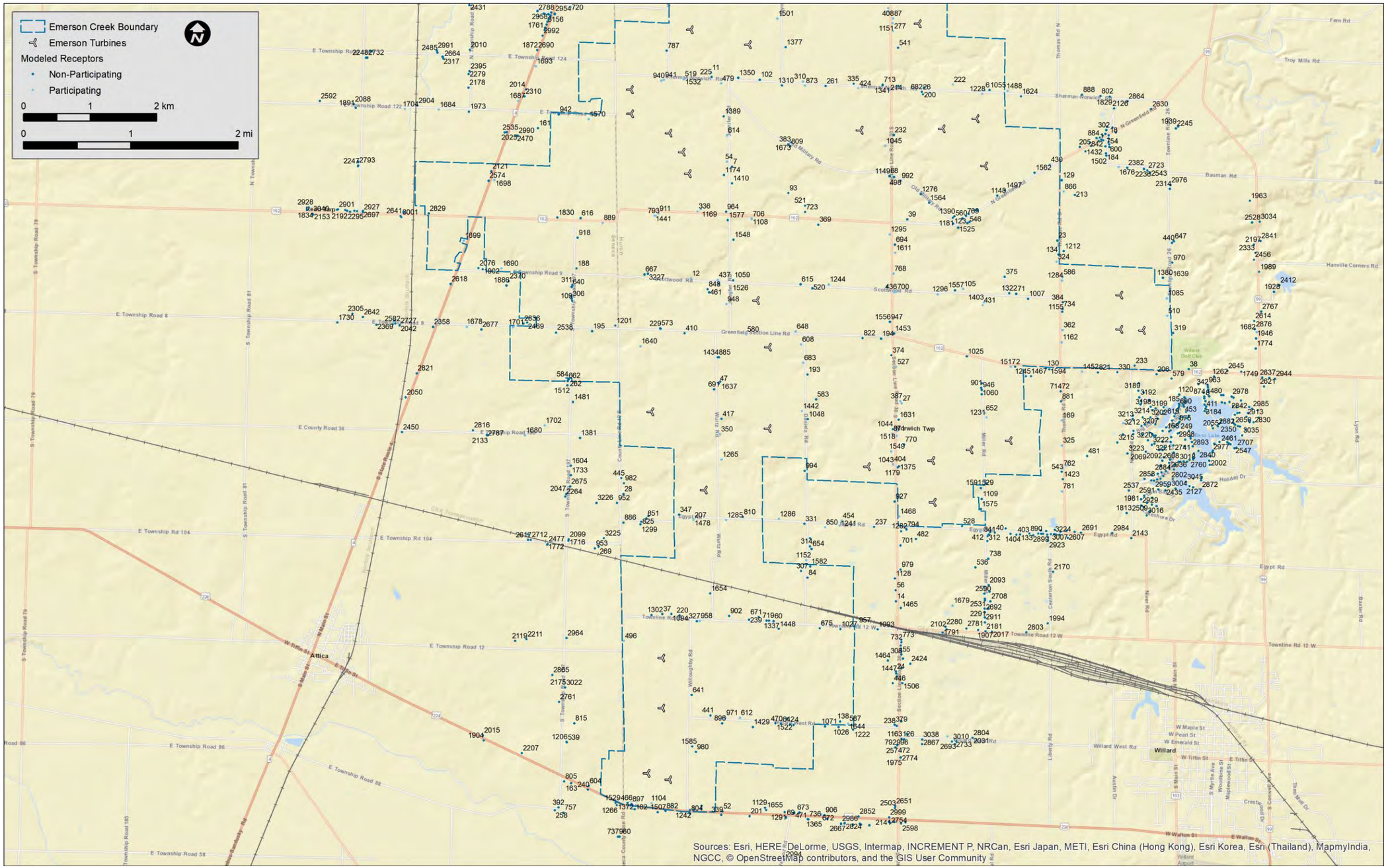


FIGURE 62: MODELED RECEPTOR MAP (SOUTHERN AREA)

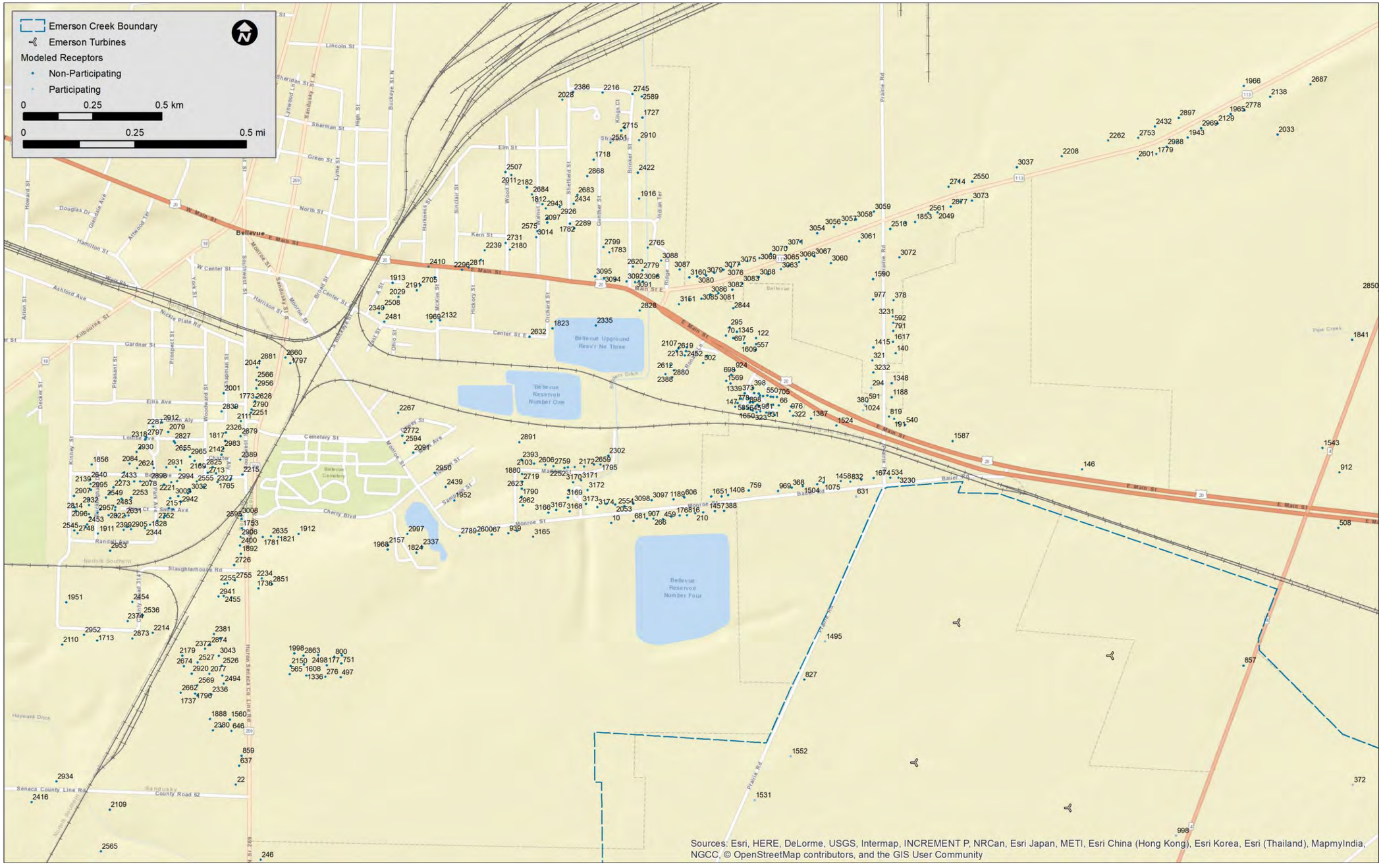


FIGURE 63: MODELED RECEPTOR MAP (BELLEVUE AREA)

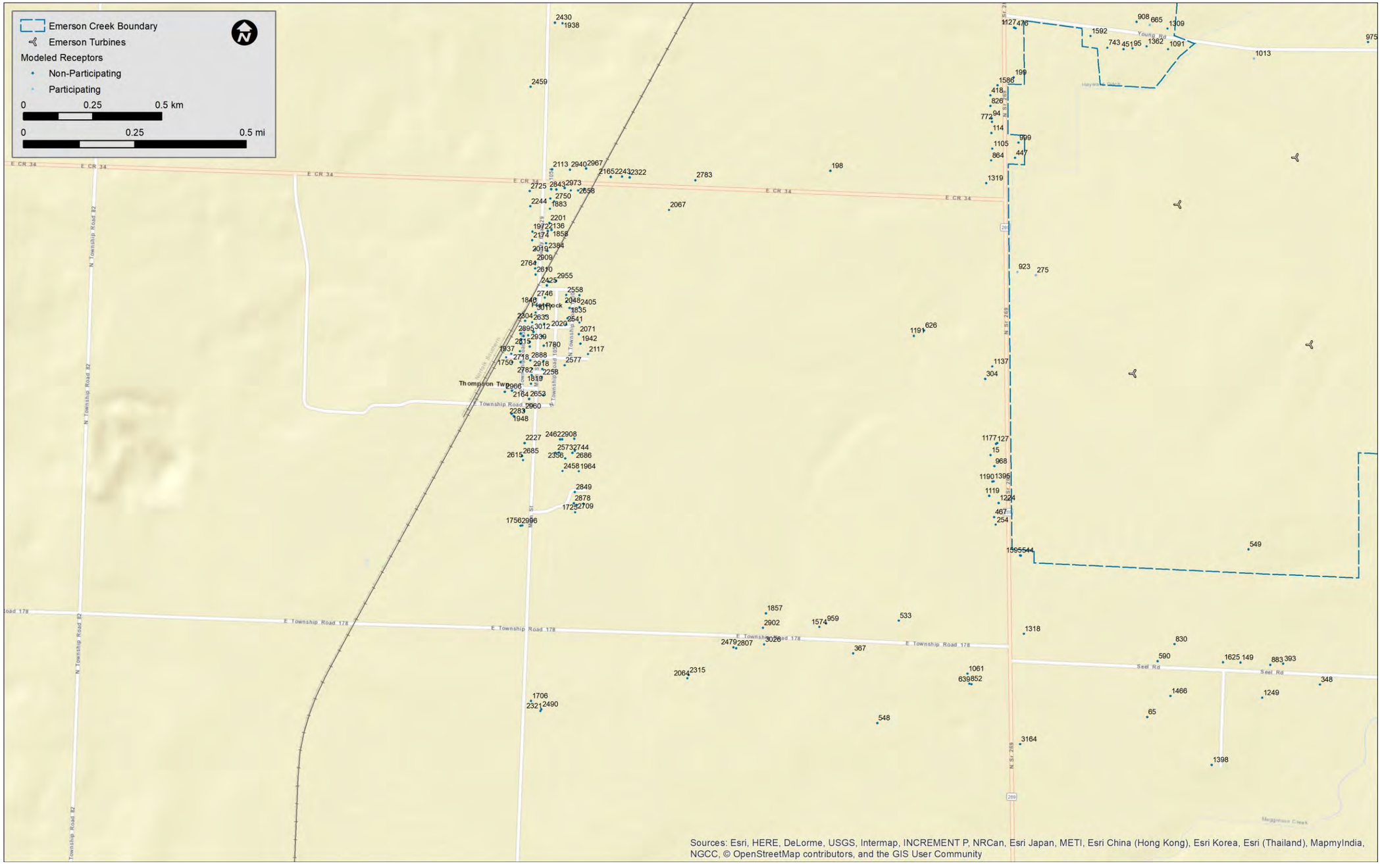


FIGURE 64: MODELED RECEPTOR MAP (FLAT ROCK AREA)

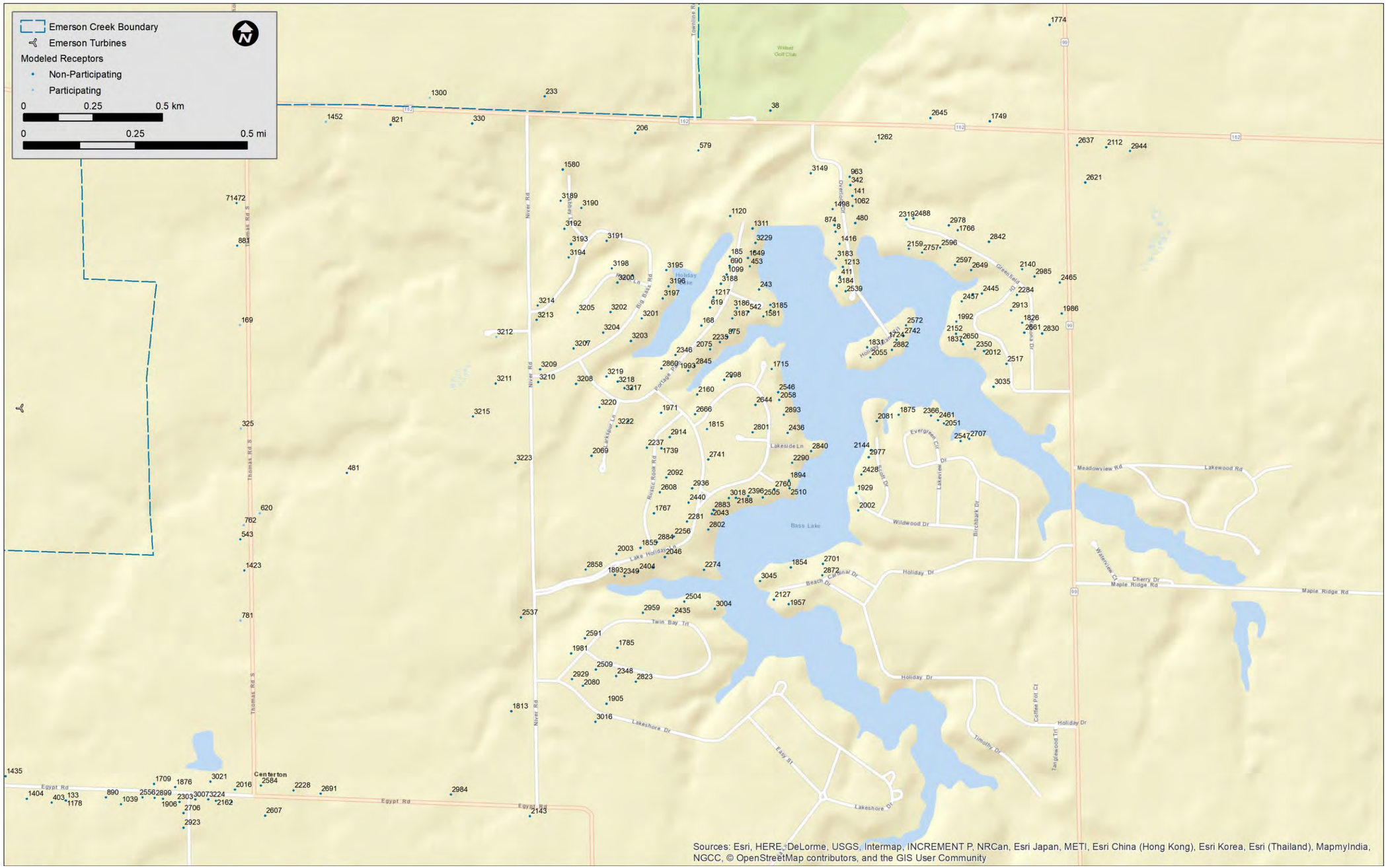


FIGURE 65: MODELED RECEPTOR MAP (HOLIDAY LAKE AREA)

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Firelands Wind, LLC
Case No. 18-1607-EL-BGN

Exhibit H
Shadow Flicker Report

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Shadow Flicker Report

Emerson Creek Wind

Groton and Oxford Townships, Erie County,
Reed and Venice Townships, Seneca County, and
Lyme, Ridgefield, Sherman, Norwich, and Richmond Townships, Huron County, Ohio

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Attachment C: Cumulative Impact Analysis Overview Reports and Calendars

1.0 PROJECT OVERVIEW

Apex Clean Energy, Inc. (the Applicant), is proposing to construct a wind energy generation facility, permitting 87 turbine locations[1] and associated necessary project infrastructure with the Ohio Power Siting Board (OPSB), in Groton and Oxford Township, Erie County and Lyme, Ridgefield, Sherman, Norwich and Richmond Townships, Huron County, with associated setbacks extending into Reed and Venice Townships, Seneca County, Ohio (hereafter referred to as the Project) (see Figure 1). The proposed Project will have an anticipated output capacity of 297.66 megawatts (MW). The Project is located in Erie, Huron, and Seneca Counties, Ohio, approximately 6 miles south of Lake Erie, immediately south and east of the City of Bellevue, and 4 miles west of the City of Norwalk. Land cover within the Project area is dominated by agriculture with pockets of forest land and single family residences generally occurring along the road frontage.

Several wind turbine generators are being considered for this Project. Each wind turbine consists of three major mechanical components: the tower, nacelle, and rotor with blades. The model with the largest rotor diameter is the Vestas V150 4.2 MW wind turbine, with a rotor diameter of 150 meters (492 feet) and a hub height (height from the foundation to the center of the rotor) of 105 meters (344 feet). These dimensions result in a total maximum height of 180 meters (591 feet). The Nordex N149 4.5 MW turbine, also under consideration for the Project, has a rotor diameter of 149 meters (489 feet) and a hub height of 125 meters (410 feet)[2]. This results in a total maximum height of 199.5 meters (655 feet). The Nordex N149 has a similar rotor diameter to the Vestas V150 but has a larger hub height; therefore, this model was selected for this analysis since it is the overall largest turbine and would produce the greatest amount of shadow flicker[3]. The current Project turbine layout is depicted in Figure 2.

2.0 INTRODUCTION

Shadow flicker refers to the moving shadows that an operating wind turbine casts at times of the day when the turbine rotor is between the sun and a receptor's position. Shadow flicker is most pronounced in northern latitudes during winter months because of the lower angle of the sun in the winter sky. However, it is possible to encounter shadow flicker anywhere for brief periods after sunrise and before sunset (U.S. Department of the Interior, 2005). During intervals of sunshine, wind turbine generators will cast a shadow on surrounding areas as the rotor blades pass in front

[1] Although 87 proposed turbine sites are being evaluated, the total generating capacity will not exceed 297.66 MW. Therefore, depending on the model of turbine selected, all 87 turbine sites may not actually be utilized. However, to allow for flexibility on final site selection (e.g., selecting one turbine site over another based on additional site-specific wind data and/or if a cultural resource is discovered upon excavation), the Applicant is studying all 87 turbine sites discussed herein.

[2] The Nordex N149 turbine model is also being considered for use with a 109 meter hub height.

[3] Due to required regulatory setbacks, the Nordex N149 turbine is not a feasible turbine model to use at three proposed turbine locations (T67, T70, and T82). If the N149 turbine at a 125 meter hub height model is selected as the final turbine model for the Project, turbines would not be built at those three locations. However, if a different turbine model is selected, turbines could potentially be built at those locations. Therefore, the Vestas V150 turbine model was used for the shadow flicker analysis at these three locations as it would produce the most shadow flicker after the N149 turbine at 125 meter hub height.

of the sun, causing a flickering effect while the rotor is in motion. Shadow flicker does not occur when fog or clouds obscure the sun, or when turbines are not operating.

The distance between a wind turbine and a potential shadow-flicker receptor affects the amount of the shadows cast by the blades, and therefore the intensity of flickering. Shadows cast close to a turbine will be more intense, distinct, and focused. This is because a greater proportion of the sun's disc is intermittently blocked by the turbine (BERR, 2009). Obstacles such as terrain, vegetation, and/or buildings occurring between receptors and wind turbines may significantly reduce or eliminate shadow-flicker effects. At distances beyond roughly 10 rotor diameters (approximately 1,500 meters based to cover both the Nordex N149 and Vestas V150 turbine models used in the shadow flicker analysis) shadow-flicker effects are generally considered negligible (BERR, 2009; DECC, 2011; DOER, 2011).

Although shadow flicker has been alleged to cause or contribute to health effects, blade pass frequencies for modern commercial scale wind turbines are very low. According to the Epilepsy Society, approximately five percent of individuals with epilepsy have sensitivity to light (Epilepsy Society, 2012). Most people with photosensitive epilepsy are sensitive to flickering around 16-25 Hz (Hertz or Hz = 1 flash per second), although some people may be sensitive to rates as low as 3 Hz and as high as 60 Hz. Modern wind turbines (including the proposed Vestas V150 and Nordex N149 models) typically operate at a frequency of 1 Hz or less, and there is no evidence that wind turbines can trigger seizures (British Epilepsy Association, 2007; Ellenbogen et al., 2012; NHMRC, 2010; DECC, 2011).

The location and duration of shadow flicker can be predicted using computer modeling programs and input data regarding turbine characteristics and weather conditions. A "worst-case" shadow-flicker scenario could be predicted based on the assumptions that there are no clouds or fog, wind conditions allow continuous turbine operation, the turbine rotor is continuously perpendicular to the sun, and the turbine rotor is positioned between the receptor and the sun. However, this "worst–case" scenario is not realistic because turbines do not operate continuously, are not always aligned perpendicular to the sun, and are not always positioned between the receptor and the sun. In addition, sunlight intensity and duration vary daily and seasonally, and obstacles that block shadows (terrain, vegetation, and buildings) exist in the landscape.

This report provides an assessment of the potential shadow flicker that could be experienced at sensitive receptors located in the vicinity of the proposed Project. Sensitive receptors include any known residential structures (both participating and non-participating), schools, office buildings, store fronts, or high-use public recreation areas that are located within a 10-rotor diameter area (1,500 meters) around the proposed turbines (Study Area).

3.0 METHODS

3.1 Shadow Flicker Analysis

The OPSB requires Applicants to evaluate and describe the potential cumulative impact from shadow flicker at the property boundary and sensitive receptors within a distance of 10 rotor diameters or at least one-half mile, whichever is greater, of a turbine, including its plans to minimize potential impacts (Ohio Administrative Code [OAC] 4906-4-08(A)(9)). This shadow flicker analysis evaluated the potential impact of 84 Nordex N149 turbines, each with a rotor diameter of 149 meters and a hub height of 125 meters, and three Vestas V150 turbines, each with a rotor diameter of 150 meters and a hub height of 105 meters. Prior to conducting the shadow-flicker analysis, the Applicant identified potential receptors in the vicinity of the Project. A maximum distance of potential effect of 1,500 meters (10 rotor diameters) was used for this analysis to ensure that all potentially impacted receptors were identified and assessed.

The shadow flicker analysis for the proposed Project used *WindPRO 3.2.737* software and associated Shadow module. *WindPRO* is a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. Input variables and assumptions used for shadow flicker modeling calculations for the proposed Project include:

- The latitude and longitude coordinates of 87 proposed wind turbine sites (provided by the Applicant).
- The latitude and longitude coordinates of 1,495 potential sensitive receptors located within the 10-rotor diameter (1,500 meter) Study Area (provided by the Applicant).
- U.S. Geological Survey (USGS) 1:24,000 topographic mapping and USGS 10-meter resolution digital elevation model (DEM) data.
- The rotor diameter (150 meters) and hub height (105 meters) for the Vestas V150 turbine model.
- The rotor diameter (149 meters) and hub height (125 meters) for the Nordex N149 turbine model.
- Annual wind rose data (provided by the Applicant), which is depicted in Table A1 of Attachment A (to determine the approximate directional frequency of rotor orientation throughout the year).
- To account for the occurrence of cloudy conditions, the average monthly percent of available sunshine for the nearest National Oceanic and Atmospheric Administration (NOAA) weather station in Cleveland, Ohio was used. Data were obtained from NOAA's "Comparative Climatic Data for the United States through 2015" (see Table A2 of Attachment A) (http://www.ncdc.noaa.gov).
- No allowance was made for wind being below or above generation speeds. Blades are assumed to be moving during all daylight hours when the sun's elevation is more than 3 degrees above the horizon. Shadow flicker is generally considered imperceptible when the sun is less than 3 degrees above the horizon (due to the scattering effect of the atmosphere on low angle sunlight) (States Committee for Pollution Control, 2002).

- The possible screening effect of all existing trees and buildings adjacent to the receptors was not taken into consideration in the modeling.

Shadow-flicker effects on receptors are expressed in terms of predicted frequency (hours per year). Shadow isolines (i.e., contours indicating total number of hours of shadowing per average year) were calculated based on the data and assumptions outlined above. These isolines define the theoretical number of hours per year that shadow flicker would occur at any given location within a 1,500-meter radius of all proposed turbine locations (see Figure 3).

The model calculations include the cumulative sum of shadow flicker hours for all Project turbines. This omni-directional approach reports total shadow flicker results at a receptor regardless of the presence or orientation of windows at that particular residence (i.e., it assumes shadows from all directions can be perceived at a residence, which may or may not be true). A receptor in this "greenhouse" model is defined as a one square meter area located one meter above ground; actual house dimensions are not taken into consideration.

Because the shadow flicker analysis conducted for the proposed Project was based on the conservative assumptions that 1) all 87 turbines will be built, 2) the turbines are in continuous operation during daylight hours, and 3) that shadow flicker can be perceived at a receptor structure regardless of the presence or orientation of windows or the screening effects of all surrounding trees and buildings, the analysis presented herein is a conservative projection of the shadow-flicker effects at ground level.

Output from the model includes the following information: calculated shadow-flicker time (days per year, maximum hours per day, and total hours per year when shadow flicker is expected) at each of the 1,495 receptors located in the Study Area; tabulated and plotted time of day that structures are predicted to receive shadow flicker; and shadow isolines, which are used to create maps showing turbine locations, receptors, and projected shadow-flicker duration (hours per year) without taking into consideration the effect of screening provided by vegetation and structures (see Figure 3).

3.2 Cumulative Shadow Flicker Impacts

Because the proposed Project is located adjacent to the proposed Republic Wind Farm and the proposed Seneca Wind Farm, the potential for cumulative shadow flicker impacts exists at certain receptors (i.e., those receptors located within a 10-rotor diameter distance of Emerson Creek Wind turbines that are also within a 10-rotor diameter distance of turbines in one or more of the proposed wind farms). To evaluate the potential for cumulative shadow flicker impacts from the other proposed wind farms, a second shadow flicker analysis was run for selected turbines. The largest turbine models proposed for each project are:

- Republic Wind Farm – Vestas V150 turbines with a rotor diameter of 150 meters,
- Seneca Wind – GE 2.5-127 turbines with a rotor diameter of 127 meters

To determine receptors that would be potentially affected by turbines from all three projects, a buffer defining the maximum distance of potential effect was applied to the proposed turbines (1,500 meters for Republic Wind Farm turbines, 1,270 meters for Seneca Wind turbines, and 1,500 meters for Emerson Creek Wind turbines). Sixty-eight receptors are located within the area where the other proposed wind farms buffers and the proposed Project buffer overlap. Therefore, these receptors have the potential for cumulative shadow flicker impacts (Figure 4).

The analysis was run using the same software and methodology as described in Section 3.1, along with latitude and longitude coordinates for the 68 receptors that were located in the area of potential cumulative impact and the latitude and longitude coordinates for the other proposed turbines

3.3 Shadow Flicker Threshold

Section 4906-4-09(E)(1) of the OAC requires that, "*The Facility shall be designed to avoid unreasonable adverse shadow flicker effect at any non-participating sensitive receptor within one thousand meters of any turbine. At a minimum, the facility shall be operated so that shadow flicker levels do not exceed thirty hours per year at any such receptor."* The OPSB has used this threshold of acceptability (i.e., 30 annual hours of shadow flicker) in certifying all commercial wind power projects to date in Ohio (OPSB, 2011a, 2011b, 2012, 2013, 2014).

4.0 RESULTS

4.1 Shadow Flicker Analysis

A summary of the projected shadow flicker at each of the 1,495 receptors is presented below:

- 642 (43%) of the receptors are not expected to experience any shadow flicker,
- 17 (1%) of the receptors may be affected 0-1 hour/year,
- 432 (29%) of the receptors may be affected 1-10 hours/year,
- 204 (14%) of the receptors may be affected 10-20 hours/year,
- 88 (6%) of the receptors may be affected 20-30 hours/year,
- 112 (7%) of the receptors may be affected for more than 30 hours/year.

As these results indicate, 93% of the 1,495 receptors are predicted to receive less than 30 hours of shadow flicker per year, with 73% of the receptors predicted to receive less than 10 hours of shadow flicker per year. At most receptor locations, shadow flicker will occur primarily in the early morning or late afternoon. The maximum daily duration of shadow flicker predicted at any receptor is 2 hours and 25 minutes (at receptor 1043, see Attachment B).

Attachment B provides the results of the predicted shadow flicker at each structure. The times of day and duration of shadow flicker experienced by each structure will vary throughout the calendar year based on the position of the sun in the sky and the direction of prevailing winds. See Attachment B for a table indicating the amount of shadow flicker expected at each receptor and for receptors over 30 hours detailed calendars that illustrate the specific times of year and day that shadow flicker may occur.

As outlined above, results of the shadow flicker analysis for the Facility indicate that up to 112 receptors could exceed the 30-hour per year threshold. However, 57 of these receptors (51%) are located on properties owned by Project participants. The details regarding anticipated shadow flicker at all receptors predicted to receive in excess of 30 hours are summarized below in Table 1. The Applicant will implement the necessary mitigation measures through operational design to reach shadow flicker compliance (all non-participating residences and businesses below 30 hours per year) following the shadow flicker analysis using the specific turbine array for construction.

Table 1. Receptors Predicted to Exceed 30 Hours of Shadow Flicker Annually

Receptor ID	Receptor Type	Project Status	Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker (hh:mm/day)	Predicted Shadow Flicker (days/year)
1422	House	Non-Participating	30:28	1:12	128
1204	House	Non-Participating	30:42	1:29	147
824	House	Non-Participating	30:45	1:02	149
986	House	Non-Participating	31:06	0:47	118
304	House	Non-Participating	31:14	1:18	95
861	House	Non-Participating	31:14	0:39	199
1137	House	Non-Participating	31:17	1:29	92
1583	House	Non-Participating	31:35	1:12	233
228	House	Non-Participating	32:21	0:39	197
1620	House	Non-Participating	32:23	0:39	177
1022	House	Non-Participating	32:31	0:39	188
869	House	Non-Participating	32:32	1:10	219
1438	House	Non-Participating	33:00	0:49	147
328	House	Non-Participating	33:06	0:59	88
385	House	Non-Participating	33:45	1:26	138

Receptor ID	Receptor Type	Project Status	Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker (hh:mm/day)	Predicted Shadow Flicker (days/year)
145	House	Non-Participating	33:58	1:13	136
1314	House	Non-Participating	34:10	1:00	163
477	House	Non-Participating	34:14	0:41	278
344	House	Non-Participating	34:21	0:47	125
834	Business	Non-Participating	34:23	0:42	181
569	House	Non-Participating	34:26	1:12	136
1253	House	Non-Participating	34:28	0:47	140
1174	House	Non-Participating	34:39	1:02	141
1264	House	Non-Participating	34:49	1:04	112
1396	House	Non-Participating	34:52	0:56	250
1040	House	Non-Participating	34:58	1:25	135
1551	House	Non-Participating	35:29	0:41	277
740	House	Non-Participating	35:32	1:14	120
1461	House	Non-Participating	35:37	0:59	172
611	House	Non-Participating	35:45	0:47	132
1146	House	Non-Participating	35:54	1:01	114
255	House	Non-Participating	36:47	0:54	122
422	House	Non-Participating	36:55	0:54	239
1158	House	Non-Participating	37:19	1:01	126
855	House	Non-Participating	39:13	1:02	192
596	House	Non-Participating	39:37	0:51	203
319	House	Non-Participating	39:45	1:12	122
423	House	Non-Participating	39:50	0:49	255
693	House	Non-Participating	39:50	1:11	181
880	House	Non-Participating	40:02	1:18	203
1493	House	Non-Participating	40:16	0:50	253
718	House	Non-Participating	40:29	1:18	204
1106	House	Non-Participating	41:14	1:11	179
7	House	Non-Participating	41:28	0:51	189
770	House	Non-Participating	42:52	1:58	171
501	House	Non-Participating	44:47	1:25	148
1136	House	Non-Participating	47:11	1:27	183
1473	House	Non-Participating	53:04	1:10	233
857	House	Non-Participating	53:34	1:25	229
104	House	Non-Participating	53:54	0:57	262

Receptor ID	Receptor Type	Project Status	Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker (hh:mm/day)	Predicted Shadow Flicker (days/year)
232	House	Non-Participating	56:33	2:06	154
870	House	Non-Participating	61:49	1:24	199
827	House	Non-Participating	64:02	1:41	273
1375	House	Non-Participating	92:01	2:08	255
1179	House	Non-Participating	94:40	2:14	256
580	House	Participating	30:50	1:27	121
1468	House	Participating	30:53	1:03	79
1067	House	Participating	30:54	0:58	179
614	House	Participating	31:02	0:48	195
653	House	Participating	31:32	0:49	133
64	House	Participating	31:43	1:02	206
1568	House	Participating	32:32	1:17	177
1085	House	Participating	33:48	1:13	171
1526	House	Participating	33:50	1:23	110
332	House	Participating	34:52	1:19	186
938	House	Participating	35:18	1:14	207
1237	House	Participating	35:28	1:03	168
688	House	Participating	35:50	1:02	170
1603	House	Participating	36:31	0:46	262
956	House	Participating	37:25	1:19	187
87	House	Participating	37:27	1:24	114
779	House	Participating	37:40	0:53	266
137	House	Participating	37:57	0:48	235
932	House	Participating	38:32	0:48	238
518	House	Participating	39:20	1:13	88
860	House	Participating	39:56	1:23	144
91	House	Participating	40:05	1:22	149
570	House	Participating	40:39	1:06	197
728	House	Participating	41:06	1:24	138
752	House	Participating	41:37	1:03	202
1472	House	Participating	41:51	0:55	170
275	House	Participating	42:47	1:11	228
941	House	Participating	43:39	1:04	231
879	House	Participating	45:22	1:04	234
1236	House	Participating	45:34	1:16	227

Receptor ID	Receptor Type	Project Status	Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker (hh:mm/day)	Predicted Shadow Flicker (days/year)
940	House	Participating	46:20	1:09	236
382	House	Participating	46:37	1:27	195
1666	House	Participating	47:24	0:57	196
1552	House	Participating	47:27	1:14	171
399	House	Participating	48:20	1:09	163
54	House	Participating	49:42	0:56	213
923	House	Participating	49:42	1:04	239
785	House	Participating	49:57	1:24	214
1431	House	Participating	50:26	1:25	216
500	House	Participating	52:48	1:13	268
1269	House	Participating	53:32	1:19	257
1549	House	Participating	53:36	1:29	187
1030	House	Participating	53:40	1:18	230
1151	House	Participating	53:41	1:25	141
277	House	Participating	59:21	1:29	108
1531	House	Participating	59:37	1:22	166
948	House	Participating	61:23	1:15	200
998	House	Participating	61:40	1:32	129
427	House	Participating	64:40	0:56	295
510	House	Participating	66:47	1:55	206
1056	House	Participating	68:36	1:08	288
1495	House	Participating	72:11	1:23	283
360	House	Participating	74:43	2:12	176
390	House	Participating	75:27	1:19	236
404	House	Participating	77:40	2:22	208
1043	House	Participating	81:27	2:25	215
197	House	Participating	89:22	1:38	319

Details regarding shadow flicker effects predicted at the remaining 55 non-participating receptors are presented in Table 2 below. Results of predicted shadow flicker at each receptor (participating and non-participating) is provided in Attachment B.

Table 2. Daily Effect to Non-Participating Receptors Predicted to Exceed 30 Hours of Shadow Flicker

Receptor ID	Predicted Annual Shadow Flicker (hh:mm/year)	Turbine Contributing to Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker[1]
1422	30:28	T48	3:00 PM – 5:15 PM
1204	30:42	T20, T21, T22	7:00 AM – 9:00 AM 3:30 PM – 5:45 PM
824	30:45	T3, T4, T5	6:15 PM – 7:30 PM 7:45 PM – 8:30 PM
986	31:06	T4, T5	6:30 AM – 7:30 AM
304	31:14	T37, T38	7:15 AM – 8:45 AM
861	31:14	T42, T44, T77	6:30 AM – 9:00 AM
1137	31:17	T37, T38	7:15 AM – 8:45 AM
1583	31:35	T9, T11, T72, T73, T74	6:30 AM – 8:00 AM 9:00 AM – 10:30 AM 4:15 PM – 6:15 PM
228	32:21	T42, T44, T77	6:30 AM – 9:00 AM
1620	32:23	T42, T44, T77	6:30 AM – 8:45 AM
1022	32:31	T42, T44, T77	6:30 AM – 9:00 AM
869	32:32	T40, T41, T42, T76	8:00 AM – 8:45 AM 4:00 PM – 5:30 PM 6:30 PM – 8:30 PM
1438	33:00	T21, T22	7:30 AM – 8:30 AM 7:30 PM – 8:30 PM
328	33:06	T43	6:30 AM – 7:45 AM
385	33:45	T3, T4, T5	4:00 PM – 7:00 PM 7:15 PM – 8:00 PM
145	33:58	T35, T36	7:00 AM – 7:45 AM 7:15 PM – 8:15 PM
1314	34:10	T10, T12, T13	4:15 PM – 7:15 PM 7:45 PM – 8:45 PM
477	34:14	T40, T41, T42, T76, T77	7:45 AM – 8:45 AM 3:30 PM – 4:45 PM 5:00 PM – 6:15 PM 7:00 PM – 8:30 PM
344	34:21	T4, T5	6:30 AM – 7:30 AM
834	34:23	T42, T44, T77	6:30 AM – 9:00 AM
569	34:26	T35, T36	7:00 AM – 7:45 AM 7:15 PM – 8:15 PM
1253	34:28	T4, T5	6:45 AM – 7:45 AM
1174	34:39	T59, T78	6:30 PM – 7:30 PM 7:45 PM – 8:30 PM
1264	34:49	T39	7:15 AM – 8:30 AM

Receptor ID	Predicted Annual Shadow Flicker (hh:mm/year)	Turbine Contributing to Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker[1]
1396	34:52	T34, T37, T38, T39	8:00 AM – 8:45 AM 6:00 PM – 7:15 PM 8:00 PM – 8:45 PM
1040	34:58	T3, T4, T5	4:30 PM – 7:15 PM 7:30 PM – 8:15 PM
1551	35:29	T40, T41, T42, T76, T77	7:45 AM – 8:45 AM 3:30 PM – 6:15 PM 7:00 PM – 8:30 PM
740	35:32	T35, T36	6:45 AM – 7:30 AM 7:30 PM – 8:30 PM
1461	35:37	T3, T4, T5	6:30 PM – 8:30 PM
611	35:45	T4, T5	6:30 AM – 7:30 AM
1146	35:54	T23	7:00 PM – 8:15 PM
255	36:47	T39	6:45 AM – 8:00 AM
422	36:55	T40, T41, T42, T77	6:15 AM – 7:15 AM 7:30 AM – 9:00 AM
1158	37:19	T36	7:00 PM – 8:00 PM
855	39:13	T17, T19, T20	2:30 PM – 3:30 PM 5:00 PM – 7:00 PM 7:15 PM – 8:15 PM
596	39:37	T9, T10, T12, T13	4:00 PM – 7:00 PM 7:45 PM – 8:45 PM
319	39:45	T62, T79	6:15 PM – 7:45 PM
423	39:50	T42, T41, T76, T77	7:45 AM – 8:45 AM 3:30 PM – 4:45 PM 5:00 PM – 7:15 JPM 7:30 PM – 8:15 PM
693	39:50	T34, T37, T38	5:00 PM – 7:15 PM 7:45 PM – 8:30 PM
880	40:02	T41, T42, T76, T77	7:45 AM – 8:45 AM 5:15 PM – 8:45 PM
1493	40:16	T41, T42, T76, T77	7:45 AM – 8:45 AM 3:30 PM – 5:00 PM 5:30 PM – 7:15 PM 7:30 PM – 8:15 PM
718	40:29	T41, T42, T76, T77	7:45 AM – 8:30 AM 5:15 PM – 8:45 PM
1106	41:14	T34, T37, T38	5:00 PM – 7:15 PM 7:45 PM – 8:30 PM
7	41:28	T57, T59, T78	5:30 PM – 8:45 PM
770	42:52	T67, T68, T69	7:30 AM – 10:00 AM 3:45 PM – 5:45 PM
501	44:47	T27, T28, T30, T31	7:00 AM – 9:00 AM 5:00 PM – 6:45 PM 7:15 PM – 7:45 PM

Receptor ID	Predicted Annual Shadow Flicker (hh:mm/year)	Turbine Contributing to Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker[1]
1136	47:11	T27, T28, T30, T31, T36	7:00 AM – 9:00 AM 5:00 PM – 6:45 PM 7:15 PM – 8:00 PM
1473	53:04	T17, T19, T20,	2:00 PM – 3:15 PM 5:00 PM – 7:00 PM 7:15 PM – 8:15 PM
857	53:34	T24, T25, T26, T75	3:30 PM – 4:45 PM 5:30 PM – 7:45 PM
104	53:54	T30, T31, T35, T36	7:00 AM – 9:00 AM 3:30 PM – 5:00 PM 7:30 PM – 8:30 PM
232	56:33	T54, T55, T56, T58	7:00 AM – 8:30 AM 6:30 PM – 7:45 PM
870	61:49	T27, T29, T32	6:45 AM – 7:30 AM 4:15 PM – 6:15 PM 6:45 PM – 8:00 PM
827	64:02	T24, T25, T26, T75	6:30 AM – 10:15 AM
1375	92:01	T67, T68, T69, T71	6:45 AM – 8:30 AM 8:45 AM – 9:45 AM 6:00 PM – 7:15 PM
1179	94:40	T67, T68, T69, T71	6:45 AM – 8:15 AM 8:30 AM – 9:30 AM

[1] The times of day represent the range of times during which each structure could potentially experience shadow flicker throughout the year; however, no structures will experience shadow flicker every day during all those hours. See Attachment B for detailed calendars that illustrate the specific time of year and day that each structure may experience shadow flicker.

4.2 Cumulative Shadow Flicker

The receptors predicted to receive cumulative shadow flicker are presented in Table 3, below, with the "predicted" columns representing shadow flicker from the Project only, and the "cumulative predicted" columns representing the combined shadow flicker impacts from both Emerson Creek Wind and one or more of the other proposed projects. Only receptors that were originally predicted to have shadow flicker from Emerson Creek Wind are included in Table 3. Results from the cumulative shadow flicker analysis at each receptor in the cumulative impact area are included in Attachment C.

Table 3. Daily Effect to Structures with Potential Cumulative Shadow Flicker

Receptor ID	Receptor Status	Predicted Annual Shadow Flicker – Emerson Creek Wind Only (hh:mm/year)	Cumulative Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker – Emerson Creek Wind Only (hh:mm/day)	Cumulative Predicted Max Daily Shadow Flicker (hh:mm/day)
254	Non-Participating	0:26	13:56	0:05	0:33

Receptor ID	Receptor Status	Predicted Annual Shadow Flicker – Emerson Creek Wind Only (hh:mm/year)	Cumulative Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker – Emerson Creek Wind Only (hh:mm/day)	Cumulative Predicted Max Daily Shadow Flicker (hh:mm/day)
2175	Non-Participating	2:08	22:53	0:23	1:27
3022	Non-Participating	2:08	22:59	0:23	1:27
2964	Non-Participating	2:12	19:51	0:23	1:16
1206	Non-Participating	2:22	2:22	0:24	0:24
539	Non-Participating	2:24	2:24	0:24	0:24
909	Non-Participating	2:58	37:10:00	0:28	1:09
467	Non-Participating	3:05	18:56	0:15	0:47
489	Non-Participating	3:09	38:37:00	0:29	1:09
198	Non-Participating	6:41	6:41	0:27	0:27
1592	Non-Participating	6:49	19:43	0:42	0:42
1127	Non-Participating	6:51	40:26:00	0:35	1:02
476	Non-Participating	6:56	40:03:00	0:35	1:01
815	Non-Participating	7:10	11:04	0:26	0:26
1224	Non-Participating	7:21	26:48:00	0:24	0:54
743	Non-Participating	8:07	19:26	0:45	0:45
451	Non-Participating	9:22	19:03	0:48	0:48
908	Non-Participating	9:35	17:35	0:49	0:49
1309	Non-Participating	9:59	14:34	0:56	0:56
15	Non-Participating	10:03	24:26:00	0:30	0:55
95	Non-Participating	10:13	19:00	0:50	0:50
1119	Non-Participating	11:17	32:18:00	0:30	1:01
1362	Non-Participating	12:51	20:32	0:53	0:53

Receptor ID	Receptor Status	Predicted Annual Shadow Flicker – Emerson Creek Wind Only (hh:mm/year)	Cumulative Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker – Emerson Creek Wind Only (hh:mm/day)	Cumulative Predicted Max Daily Shadow Flicker (hh:mm/day)
1190	Non-Participating	14:19	32:18:00	0:30	0:58
1395	Non-Participating	14:21	31:50:00	0:30	0:57
1586	Non-Participating	14:24	22:58	0:46	0:46
968	Non-Participating	14:44	29:26:00	0:30	0:55
1091	Non-Participating	14:44	19:27	0:59	0:59
199	Non-Participating	14:58	38:00:00	0:48	0:54
418	Non-Participating	15:02	22:24	0:45	0:45
826	Non-Participating	16:04	23:39	0:46	0:46
94	Non-Participating	17:07	24:47:00	0:47	0:47
772	Non-Participating	17:25	25:07:00	0:47	0:47
114	Non-Participating	17:31	25:38:00	0:48	0:48
1105	Non-Participating	18:32	27:27:00	0:49	0:49
864	Non-Participating	19:18	31:25:00	0:49	0:49
127	Non-Participating	19:45	32:29:00	0:40	0:50
1177	Non-Participating	20:18	32:50:00	0:41	0:49
1319	Non-Participating	21:26	43:21:00	1:01	1:01
1191	Non-Participating	21:56	42:19:00	0:54	1:26
999	Non-Participating	23:17	31:06:00	0:55	0:55
447	Non-Participating	23:36	34:18:00	0:55	0:55
626	Non-Participating	23:50	42:25:00	0:54	1:25
304	Non-Participating	31:14:00	44:12:00	1:18	1:31
1137	Non-Participating	31:17:00	43:12:00	1:29	1:37

Receptor ID	Receptor Status	Predicted Annual Shadow Flicker – Emerson Creek Wind Only (hh:mm/year)	Cumulative Predicted Annual Shadow Flicker (hh:mm/year)	Predicted Max Daily Shadow Flicker – Emerson Creek Wind Only (hh:mm/day)	Cumulative Predicted Max Daily Shadow Flicker (hh:mm/day)
665	Participating	9:52	15:15	0:52	0:52
496	Participating	12:52	33:54:00	0:55	1:12
1013	Participating	14:43	17:12	1:27	1:27
275	Participating	42:47:00	51:12:00	1:11	1:35
923	Participating	49:42:00	58:01:00	1:04	1:20

Of the 68 receptors located in the potential cumulative impact area described above, 18 were not originally predicted to receive any shadow flicker from Emerson Creek Wind turbines (and hence, will not experience cumulative impacts and are not included above in Table 3). An additional three receptors were not predicted to receive any additional shadow flicker from the other proposed turbines; these receptors will also not experience cumulative shadow flicker impacts from the proposed Project. As indicated in Table 3, the cumulative shadow flicker analysis results indicate that a total of 47 receptors will experience cumulative shadow flicker from Emerson Creek Wind turbines and the other proposed wind turbines in the area. Sixteen non-participating receptors and one participating receptor that are not predicted to exceed the 30-hour threshold from the Emerson Creek Wind turbines are predicted to receive over 30 hours due to the cumulative impact from the other proposed turbines.

5.0 CONCLUSIONS

In summary, *WindPRO* predicted that 112 receptors will receive more than 30 hours/year of shadow flicker from the Project wind turbines. Of the 112 receptors, 57 are located on properties owned by Project participants, while the remaining 55 receptors are non-participating. The shadow flicker analysis also included numerous more general underlying assumptions that contribute to worst-case predicted shadow flicker results. The analysis does not take into account important real-world factors, including the actual location and orientation of windows and the screening effects associated with existing, site-specific conditions and obstacles such as trees and/or buildings. Also, the analysis assumes turbine rotors are in continuous motion. Given these assumptions, the predicted shadow-flicker frequency represents a conservative scenario and likely overstates the actual frequency of shadow flicker that would be experienced at any given receptor location. In addition, many of the modeled shadow flicker hours are expected to be low intensity because they would occur during the early morning or late afternoon hours when the sun is low in the sky. As the sun sinks below the horizon, more of its light is scattered by the atmosphere, which has the effect of dampening its brightness and therefore reducing its ability to cast dark shadows (EMD, 2013).

Furthermore, to provide a worst-case scenario results, this analysis evaluated the potential impact of 87 turbines, when in fact this layout would never be implemented. The Vestas V150 and Nordex N149 turbines were used in this analysis

because they were the largest rotor diameter and total height of any turbine model under consideration and would therefore produce the greatest amount of shadow flicker. The actual shadow flicker to be produced will be dependent on the turbine model selected, the number of turbines constructed, and the turbine sites selected for the Facility. The Nordex N149 turbine is being considered with a nameplate capacity of 4.5 MW. If this model is selected, only 66 turbines would be required to achieve the 298.2 MW interconnection. Narrowing the pool of turbine sites from the 87 total sites analyzed herein will provide the opportunity for reducing and minimizing shadow-flicker impacts.

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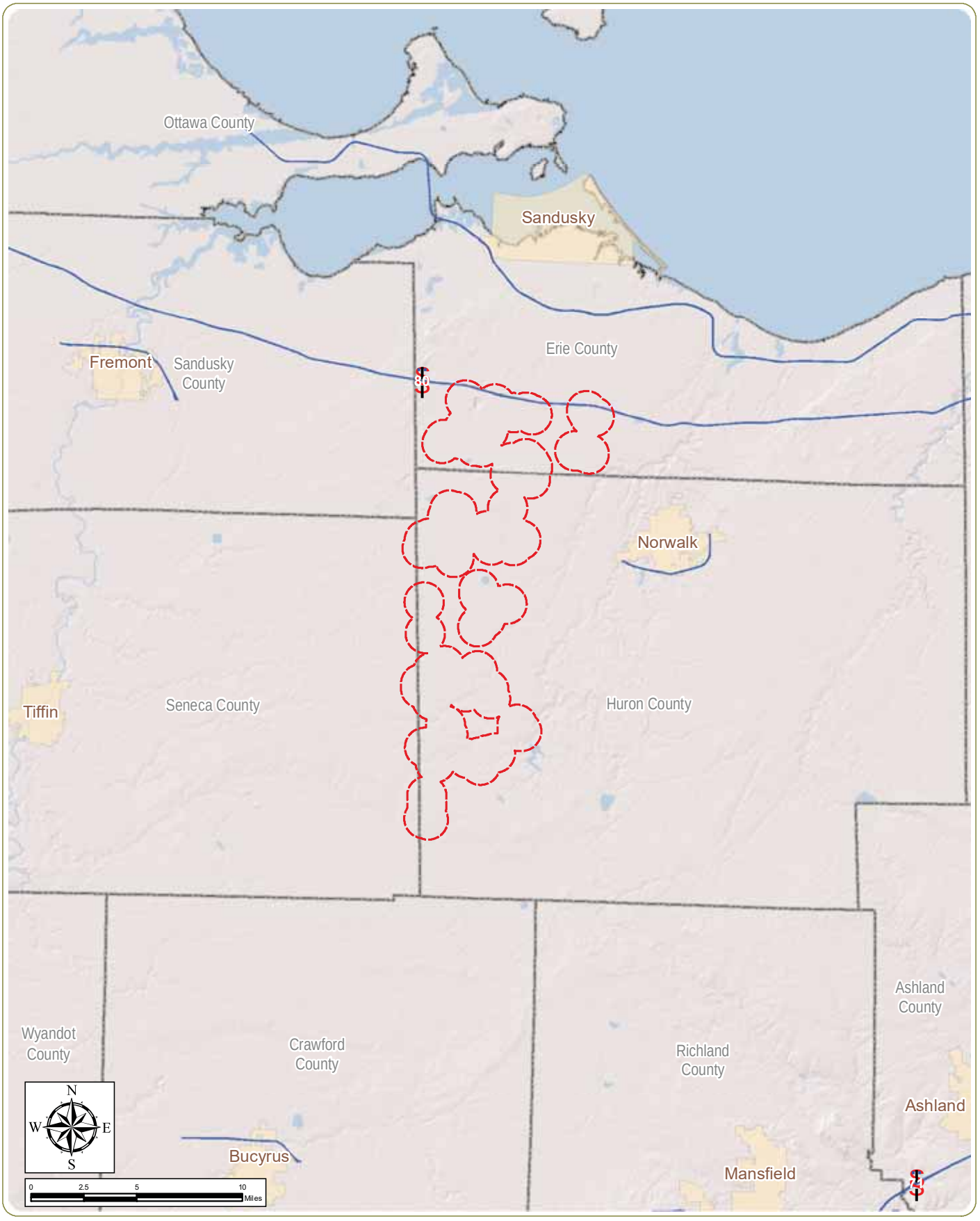
Figures



Emerson Creek Wind

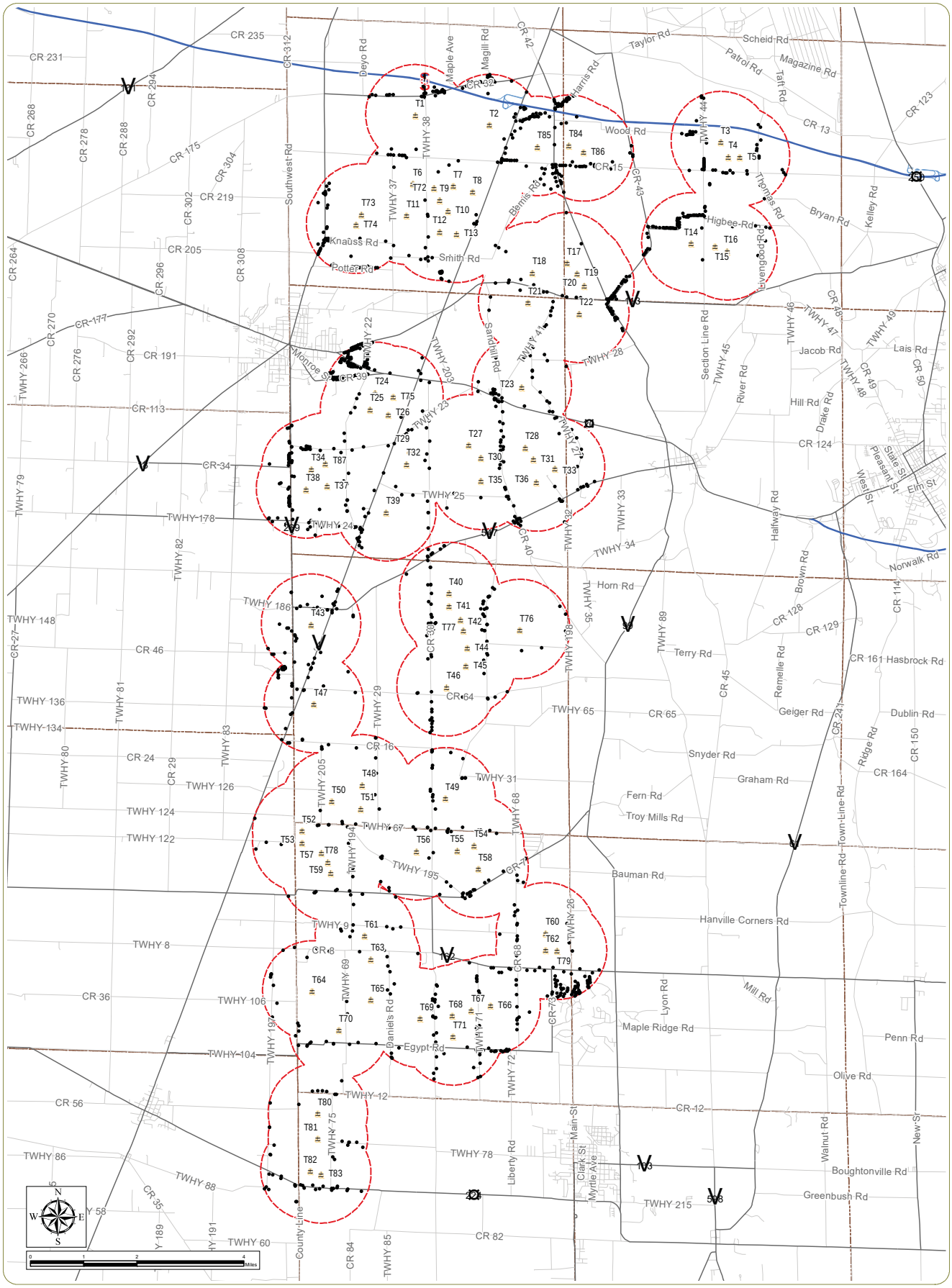
Erie, Huron, and Seneca Counties, Ohio

Figure 1: Regional Project Location

1,500-meter Study Area

County Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on January 8, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



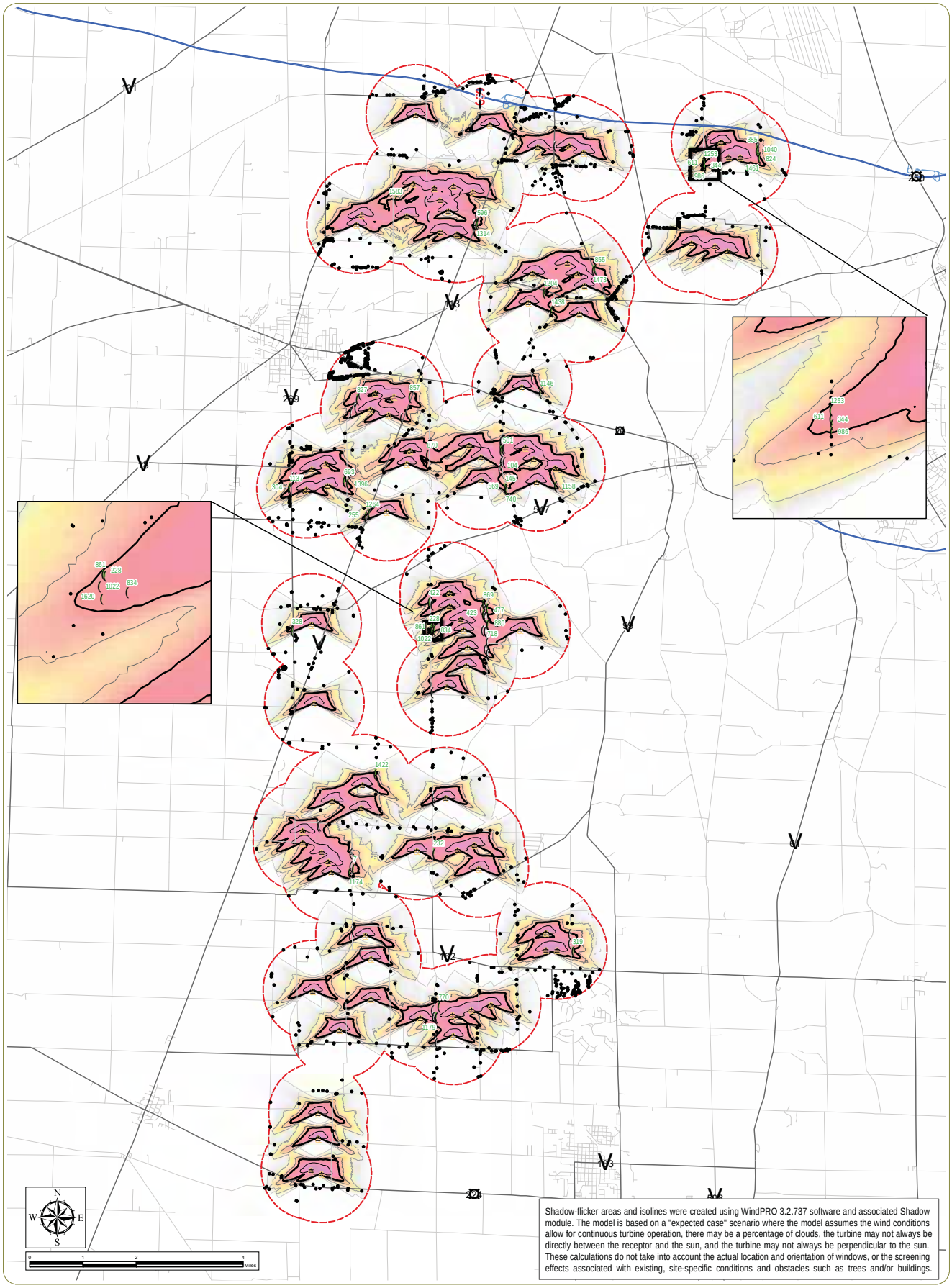
Emerson Creek Wind

Erie, Seneca, and Huron Counties, Ohio

Figure 2: Proposed Turbine Layout

- Receptor
- Wind Turbine
- 1,500-meter Study Area
- Township Boundary

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on January 8, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Emerson Creek Wind

Erie, Seneca, and Huron Counties, Ohio

Figure 3: Projected Shadow Flicker

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on January 8, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

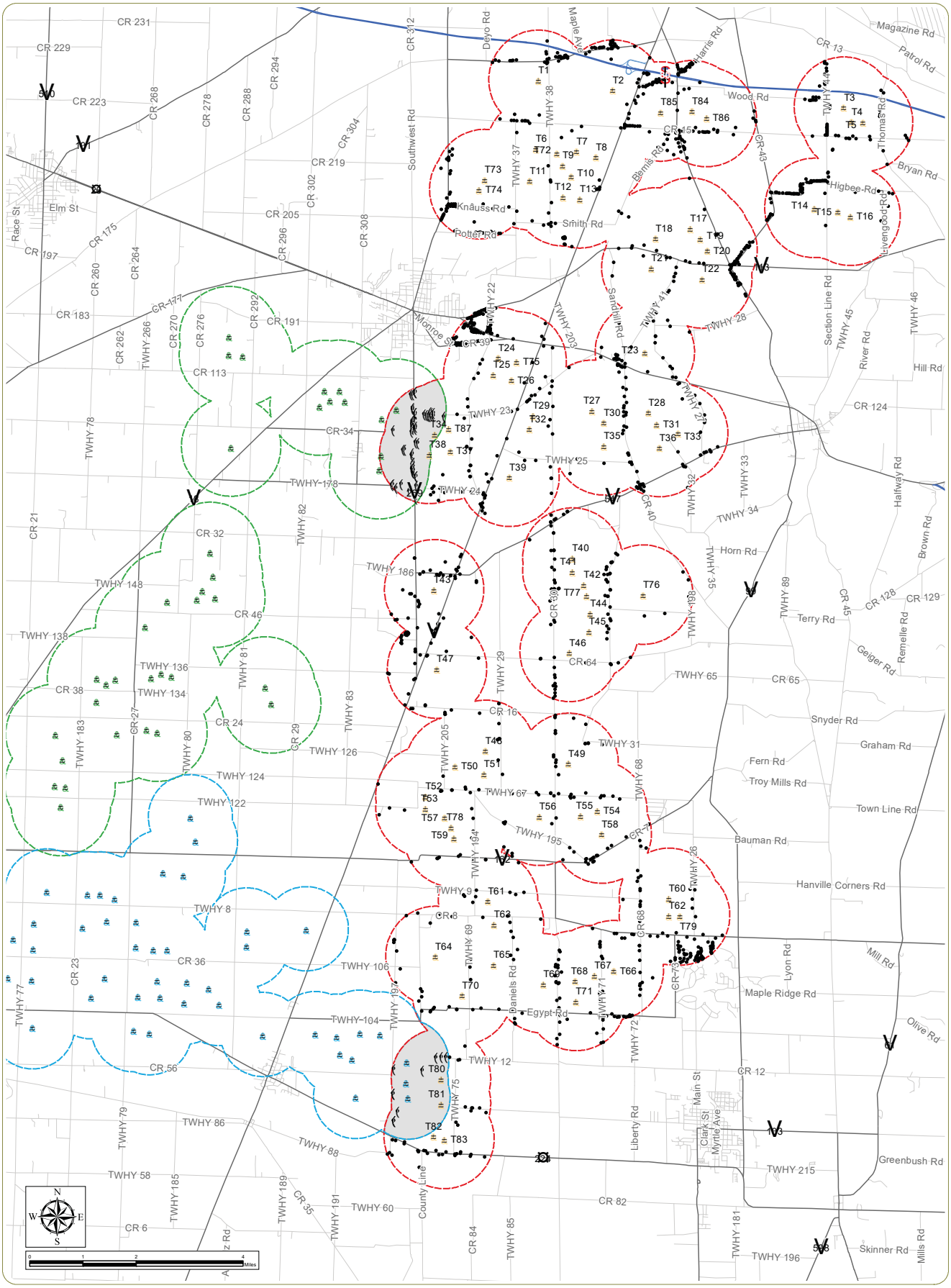
- Non-participant > 30 hours/year
- Participant > 30 hours/year
- Receptor < 30 hours/year
- Wind Turbine
- 1,500-meter Study Area

Shadow Flicker Isolines
- 0 hours/year
- 10 hours/year
- 20 hours/year
- 30 hours/year
- 100 hours/year

Shadow Flicker (hours/year)
- < 1
- 1 - 10
- 10 - 20
- 20 - 30
- 30 - 100
- > 100

EMERSON CREEK

edr



Emerson Creek Wind

Erie, Seneca, and Huron Counties, Ohio

Figure 4: Cumulative Impact Area

Notes: 1. Basemap:ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on January 8, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Receptor
- Receptor in Cumulative Impact Area
- Seneca Wind Turbines
- Republic Wind Turbine
- Wind Turbine
- Seneca Wind 1,270-meter Study Area
- Republic Wind 1,500-meter Study Area
- 1,500-meter Study Area
- Cumulative Impact Area

Attachment A

Wind Rose and Sunshine Data

Table A1. Wind Rose Data

SECTOR	N	NNE	NE	ENE	E	ESE	SE	SSE
Frequency	3.43	3.44	6.36	7.66	3.71	3.36	3.02	4.22
Hours of Operation	300	301	557	671	325	294	265	370

SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW
Frequency	5.65	12.21	12.78	12.18	8.42	6.36	4.20	3.01
Hours of Operation	495	1,070	1,120	1,067	738	557	368	264

Source: Wind rose data provided by Apex Clean Energy, Inc.

Table A2. Sunshine Probability Data[1]

Month	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Sunshine Probability[2]	0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

[1]Source: NOAA Comparative Climatic Data for the United States through 2015 – Cleveland, Ohio Weather Station.
[2]Defined by NOAA as the total time that sunshine reaches the surface of the earth, expressed as the percentage of the maximum amount possible from sunrise to sunset with clear sky conditions.

Attachment B

WindPro Overview Reports and Calendars

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

Assumptions for shadow calculations

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

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067

W	WNW	NW	NNW	Sum
738	557	368	264	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_2018-10-16_Emerson SFA_2.wpo (5)
Obstacles not used in calculation
Eye height for map: 1.5 m
Grid resolution: 10.0 m

All coordinates are in
UTM (north)-NAD83 (US+CA) Zone: 17

WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
T1	349,610	4,577,737	217.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T10	350,596	4,574,852	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T11	349,346	4,574,706	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T12	350,350	4,574,226	220.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T13	350,857	4,574,161	220.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T14	357,937	4,573,872	214.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T15	358,653	4,573,775	212.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T16	359,025	4,573,635	210.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T17	354,188	4,573,276	218.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T18	353,140	4,572,979	220.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T19	354,497	4,572,964	218.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T2	351,853	4,577,442	218.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T20	354,709	4,572,600	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T21	353,014	4,572,078	226.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T22	354,553	4,571,744	222.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T23	352,819	4,569,529	230.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T24	348,396	4,569,363	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T25	348,244	4,568,858	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T26	348,798	4,568,694	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T27	351,228	4,567,779	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T28	352,926	4,567,712	231.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T29	349,444	4,567,624	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T3	358,825	4,576,927	210.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T30	351,584	4,567,411	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T31	353,180	4,567,359	230.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T32	349,341	4,567,218	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T33	353,823	4,567,087	229.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T34	346,474	4,567,059	239.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T35	351,585	4,566,709	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T36	353,266	4,566,658	230.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T37	346,951	4,566,553	241.9	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T38	346,312	4,566,449	244.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T39	348,733	4,565,759	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T4	359,059	4,576,484	209.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T40	350,634	4,563,323	239.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7

To be continued on next page...

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
T41	350,633	4,562,919	238.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T42	350,980	4,562,522	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T43	346,461	4,562,366	252.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T44	351,176	4,561,655	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T45	351,138	4,561,116	241.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T46	350,550	4,560,477	242.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T47	346,548	4,559,973	249.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T48	348,005	4,557,521	254.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T49	350,518	4,557,129	252.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T5	359,405	4,576,468	208.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T50	347,093	4,557,038	257.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T51	347,967	4,556,813	256.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T52	346,198	4,556,139	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T53	346,199	4,555,776	263.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T54	351,385	4,555,703	254.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T55	350,877	4,555,552	254.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T56	349,645	4,555,532	258.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T57	346,776	4,555,489	261.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T58	351,517	4,554,997	256.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T59	347,062	4,554,879	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T6	349,536	4,575,674	218.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T60	353,545	4,553,056	260.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T61	348,088	4,552,977	268.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T62	353,545	4,552,541	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T63	348,267	4,552,275	270.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T64	346,500	4,551,303	274.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T65	348,263	4,551,051	272.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T66	351,881	4,550,874	267.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T67	351,296	4,550,732	266.7	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 ...Yes		VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T68	350,723	4,550,571	269.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T69	349,753	4,550,478	270.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T7	350,758	4,575,598	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T70	347,305	4,550,131	275.5	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 ...Yes		VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T71	350,744	4,549,945	268.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T72	350,171	4,575,540	218.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T73	347,988	4,574,744	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T74	347,821	4,574,437	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T75	348,951	4,569,244	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T76	352,771	4,562,205	239.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T77	351,065	4,562,197	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T78	346,973	4,555,202	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T79	353,883	4,552,527	261.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T8	351,344	4,575,426	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T80	346,667	4,547,606	290.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T81	346,668	4,546,855	291.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T82	346,447	4,545,876	284.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 ...Yes		VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T83	346,772	4,545,781	287.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T84	354,248	4,576,820	216.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T85	353,297	4,576,782	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T86	354,685	4,576,614	216.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T87	346,898	4,567,229	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T9	350,345	4,575,175	219.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 1...Yes		NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
2	351,971	4,551,976	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3	352,230	4,569,172	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
5	353,658	4,568,766	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
6	351,513	4,556,129	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
7	347,724	4,554,982	261.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
8	354,816	4,551,509	259.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0

To be continued on next page...

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z [m]	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
9	353,048	4,577,587	217.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
10	347,147	4,569,722	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
11	347,408	4,556,393	259.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
12	347,106	4,553,301	263.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
15	345,797	4,566,154	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
16	353,657	4,569,026	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
17	345,291	4,561,441	254.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
19	352,856	4,570,343	233.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
20	352,798	4,565,458	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
21	347,892	4,569,862	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
23	352,606	4,553,875	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
25	348,655	4,566,909	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
26	350,575	4,556,102	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
27	350,270	4,551,427	265.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
28	346,094	4,550,068	278.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
29	357,524	4,574,391	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
30	357,523	4,574,412	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
31	358,610	4,574,557	212.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
32	359,196	4,575,959	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
33	352,420	4,572,652	229.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
34	353,513	4,571,307	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
35	356,876	4,574,320	216.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
36	356,604	4,574,142	216.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
37	346,674	4,548,267	286.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
38	354,582	4,551,944	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
39	350,352	4,554,193	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
40	351,670	4,549,484	270.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
41	355,503	4,576,077	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
43	359,948	4,573,474	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
44	352,845	4,577,517	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
45	353,876	4,576,036	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
46	352,002	4,569,123	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
47	347,527	4,551,727	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
48	348,421	4,558,912	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
50	357,955	4,577,125	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
51	350,566	4,565,854	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
52	347,575	4,545,306	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
53	345,869	4,563,307	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
54	347,645	4,555,057	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
56	350,180	4,548,624	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
57	353,835	4,575,824	219.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
58	350,022	4,568,482	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
59	348,436	4,557,851	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
62	354,167	4,578,198	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
63	350,113	4,562,562	241.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
64	350,095	4,562,953	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
65	346,363	4,565,208	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
66	347,752	4,570,146	235.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
68	350,087	4,554,842	256.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
70	347,562	4,570,399	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
72	352,661	4,551,610	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
74	357,991	4,577,122	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
75	351,886	4,572,221	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
76	350,397	4,572,776	224.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
77	354,598	4,572,195	221.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
78	348,304	4,573,128	223.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
79	346,838	4,560,484	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
80	348,422	4,578,302	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
83	355,544	4,571,708	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
85	346,043	4,560,379	252.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
86	349,686	4,560,271	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
87	350,142	4,557,205	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
88	349,856	4,578,512	218.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
89	357,466	4,574,287	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
90	360,302	4,574,299	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

To be continued on next page...

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
91	352,181	4,567,715	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
93	348,569	4,554,584	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
94	345,801	4,567,370	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
95	346,311	4,567,623	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
96	354,709	4,576,167	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
98	351,676	4,563,037	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
99	354,114	4,565,428	230.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
100	350,070	4,564,063	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
102	348,139	4,556,289	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
103	355,457	4,572,148	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
104	352,174	4,567,157	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
106	347,924	4,564,968	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
107	354,055	4,566,057	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
110	356,502	4,573,493	219.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
111	357,296	4,574,297	216.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
112	345,753	4,562,890	250.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
113	353,826	4,577,333	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
114	345,801	4,567,317	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
115	347,685	4,570,183	233.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
116	351,846	4,578,748	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
120	351,512	4,569,660	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
122	347,671	4,570,389	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
123	351,043	4,554,129	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
124	353,404	4,577,741	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
127	345,817	4,566,194	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
129	352,674	4,554,779	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
130	352,437	4,551,955	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
131	360,024	4,577,342	209.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
132	351,530	4,578,710	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
133	352,046	4,549,462	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
134	352,624	4,553,662	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
135	346,967	4,574,989	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
137	351,700	4,562,581	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
139	355,024	4,566,656	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
140	348,175	4,570,335	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
141	354,876	4,551,637	258.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
142	354,016	4,575,678	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
143	349,258	4,568,017	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
144	347,943	4,573,987	221.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
145	352,318	4,566,469	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
146	348,848	4,569,916	237.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
147	347,596	4,570,141	233.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
149	346,701	4,565,405	245.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
150	347,798	4,573,124	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
151	350,383	4,572,986	224.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
152	353,894	4,577,969	210.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
153	354,049	4,572,266	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
154	345,664	4,561,060	253.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
155	350,006	4,562,178	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
157	357,719	4,574,646	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
158	357,851	4,574,638	215.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
159	351,996	4,569,421	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
160	356,588	4,573,619	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
161	344,808	4,555,561	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
162	354,329	4,568,216	228.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
163	345,306	4,545,729	285.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
165	347,693	4,565,281	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
167	345,464	4,560,913	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
168	354,333	4,551,170	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
169	352,673	4,551,172	265.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
170	346,468	4,549,738	280.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
171	358,318	4,576,290	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
172	351,808	4,578,358	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
173	352,713	4,565,517	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
174	349,233	4,576,495	219.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
176	347,395	4,569,750	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
178	346,203	4,558,869	253.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
179	350,401	4,578,410	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
180	355,544	4,572,258	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
181	355,665	4,572,405	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
182	346,259	4,545,337	290.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
183	345,964	4,561,199	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
185	354,436	4,551,418	260.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
186	353,969	4,576,188	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
187	346,571	4,561,321	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
189	352,257	4,576,347	219.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
191	348,169	4,570,098	236.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
192	347,724	4,570,118	235.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
193	348,855	4,551,861	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
195	345,622	4,552,512	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
196	354,235	4,578,242	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
197	349,904	4,575,140	219.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
198	345,218	4,567,181	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
199	345,881	4,567,518	238.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
200	350,589	4,556,069	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
201	347,989	4,545,233	284.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
202	348,870	4,576,511	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
203	352,717	4,565,375	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
204	346,375	4,560,736	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
205	352,943	4,555,276	255.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
206	354,095	4,551,863	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
207	347,145	4,549,677	278.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
209	352,520	4,576,339	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
210	347,452	4,569,757	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
211	346,262	4,560,367	252.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
212	350,086	4,561,425	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
213	352,869	4,554,555	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
214	350,084	4,556,125	253.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
215	356,654	4,574,331	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
216	357,357	4,574,299	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
217	357,572	4,574,389	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
218	358,235	4,574,692	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
220	346,936	4,548,248	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
221	351,732	4,561,166	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
222	351,041	4,556,215	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
223	354,169	4,570,124	226.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
224	351,028	4,557,704	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
225	347,418	4,556,330	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
227	349,910	4,567,290	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
228	350,100	4,562,231	240.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
229	346,647	4,552,551	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
230	352,864	4,577,559	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
231	353,959	4,575,917	219.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
232	350,152	4,555,457	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
233	353,769	4,551,995	261.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
234	351,988	4,569,306	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
235	347,681	4,570,145	234.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
236	353,873	4,568,579	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
237	349,858	4,549,572	272.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
239	347,980	4,548,181	282.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
240	345,557	4,545,630	283.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
241	347,959	4,565,262	243.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
242	345,899	4,560,556	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
243	354,541	4,551,300	259.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
244	348,842	4,578,319	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
245	354,001	4,566,061	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
248	347,591	4,565,296	243.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
249	354,445	4,551,153	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
250	357,794	4,577,110	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
251	355,981	4,572,718	219.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
252	350,125	4,573,402	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
253	353,814	4,578,116	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
254	345,816	4,565,902	244.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
255	348,095	4,565,598	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
258	345,058	4,545,318	282.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
259	347,256	4,563,342	244.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
260	347,905	4,564,854	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
261	349,127	4,556,190	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
262	345,273	4,551,786	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
263	350,188	4,578,550	218.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
264	352,613	4,577,227	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
265	352,044	4,569,134	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
266	347,300	4,569,738	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
268	352,390	4,560,308	238.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
270	354,171	4,574,759	218.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
271	359,876	4,574,368	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
272	349,837	4,578,271	219.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
273	347,060	4,573,920	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
275	345,961	4,566,804	241.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
277	350,140	4,557,015	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
278	347,266	4,545,387	291.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
279	346,614	4,562,783	248.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
280	352,048	4,570,388	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
281	349,773	4,573,347	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
283	350,133	4,559,428	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
284	355,437	4,572,104	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
285	348,957	4,576,500	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
286	357,907	4,577,123	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
288	350,071	4,557,308	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
289	356,127	4,576,785	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
291	352,144	4,569,061	234.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
293	349,992	4,564,270	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
294	348,087	4,570,209	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
295	347,576	4,570,429	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
298	352,907	4,568,928	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
299	354,483	4,577,656	212.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
300	354,048	4,578,008	210.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
301	345,895	4,560,480	252.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
303	355,639	4,571,586	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
304	345,777	4,566,429	242.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
305	347,708	4,567,596	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
310	348,787	4,556,261	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
312	351,558	4,549,360	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
313	357,884	4,576,036	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
314	348,896	4,549,284	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
315	354,609	4,566,484	226.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
317	353,167	4,570,701	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
319	354,350	4,552,485	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
320	352,345	4,576,711	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
321	348,092	4,570,309	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
322	347,805	4,570,109	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
323	347,673	4,570,121	234.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
324	352,600	4,553,553	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
325	352,676	4,550,799	264.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
327	347,192	4,548,158	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
328	345,881	4,562,145	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
329	345,780	4,562,224	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
330	353,508	4,551,897	262.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
331	348,807	4,549,619	273.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
332	359,914	4,576,818	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
333	347,552	4,565,759	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
334	347,837	4,558,618	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
335	349,549	4,556,225	254.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
336	347,205	4,554,311	264.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
337	354,012	4,577,983	211.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
338	345,885	4,568,343	236.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
339	347,559	4,545,255	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
340	347,894	4,564,883	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
341	347,556	4,565,765	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
342	354,869	4,551,676	257.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
343	354,878	4,570,381	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
344	358,324	4,576,201	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
346	350,374	4,564,617	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
347	346,924	4,549,759	280.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
348	346,988	4,565,325	242.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
349	345,596	4,561,006	253.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
350	347,544	4,550,966	271.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
351	346,663	4,562,849	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
352	353,322	4,577,656	214.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
353	351,983	4,569,366	236.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
354	347,584	4,565,292	243.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
355	347,723	4,570,179	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
357	348,847	4,558,644	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
359	358,247	4,577,901	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
360	353,807	4,576,810	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
362	352,684	4,552,529	262.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
364	350,394	4,572,944	224.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
365	352,339	4,573,592	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
366	349,125	4,576,496	219.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
367	345,301	4,565,438	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
368	347,800	4,569,850	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
369	349,018	4,554,113	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
370	346,541	4,562,806	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
371	348,720	4,573,901	221.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
372	349,827	4,568,777	238.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
373	347,630	4,570,191	233.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
376	353,695	4,571,653	225.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
377	358,358	4,574,946	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
378	348,168	4,570,526	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
380	348,063	4,570,148	236.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
381	346,386	4,561,128	250.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
382	351,627	4,562,173	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
383	348,565	4,555,317	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
384	352,691	4,552,943	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
385	359,920	4,576,696	209.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
386	353,974	4,562,887	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
387	350,248	4,551,465	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
388	347,555	4,569,766	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
389	346,202	4,558,849	253.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
390	358,397	4,576,871	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
391	354,018	4,575,635	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
392	345,116	4,545,363	282.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
393	346,855	4,565,400	243.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
394	350,220	4,578,295	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
395	351,856	4,578,925	220.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
396	349,397	4,568,206	241.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
397	352,789	4,577,937	219.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
398	347,660	4,570,210	233.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
399	351,771	4,561,830	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
400	351,952	4,569,438	236.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
401	346,036	4,562,819	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
402	350,114	4,559,700	242.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
403	351,996	4,549,454	268.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
404	350,142	4,550,519	270.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
406	353,503	4,575,941	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
407	354,282	4,576,189	216.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
408	350,070	4,557,364	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
410	347,011	4,552,480	273.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
412	351,450	4,549,498	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
413	352,008	4,578,698	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
416	354,024	4,575,861	218.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
417	347,565	4,551,197	273.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
418	345,797	4,567,453	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
420	352,645	4,577,524	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
421	353,437	4,576,097	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
422	350,017	4,563,022	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
423	351,657	4,562,647	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
424	349,619	4,556,157	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
425	358,284	4,574,699	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
427	349,978	4,574,706	219.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
428	357,582	4,574,324	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
429	350,093	4,562,379	241.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
430	352,497	4,555,013	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
432	350,293	4,578,380	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
434	355,984	4,572,830	219.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
435	349,987	4,564,393	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
437	347,510	4,553,283	262.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
438	350,531	4,569,056	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
439	347,651	4,570,131	234.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
440	354,332	4,553,838	258.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
441	347,401	4,546,746	294.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
442	353,964	4,566,128	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
443	347,472	4,568,103	238.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
444	355,571	4,571,787	221.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
445	346,062	4,550,304	278.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
447	345,885	4,567,227	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
449	355,749	4,572,534	219.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
451	346,278	4,567,619	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
452	353,823	4,568,555	233.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
453	354,508	4,551,383	260.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
454	349,368	4,549,669	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
456	348,946	4,578,328	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
457	349,849	4,578,580	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
458	355,632	4,572,237	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
459	347,334	4,569,736	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
460	353,426	4,561,634	236.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
461	347,380	4,553,095	264.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
462	353,851	4,578,050	211.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
463	355,870	4,571,208	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
464	356,623	4,574,339	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
466	346,153	4,545,432	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
467	345,810	4,565,930	244.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
468	347,779	4,565,267	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
469	347,714	4,570,152	234.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
474	352,129	4,569,071	235.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
475	346,741	4,562,791	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
476	345,887	4,567,695	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
477	351,774	4,562,837	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
478	346,753	4,561,495	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
479	347,562	4,556,232	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
480	354,887	4,551,539	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
481	353,057	4,550,640	259.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
482	350,482	4,549,391	272.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
484	349,426	4,573,471	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
485	357,997	4,574,685	214.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
486	353,261	4,577,671	214.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
487	352,803	4,572,744	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
488	345,898	4,560,486	252.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
489	345,814	4,567,816	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
490	349,535	4,566,246	239.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
491	357,902	4,577,210	214.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
492	352,270	4,567,998	234.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
494	355,427	4,572,058	220.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
495	357,092	4,574,309	217.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
496	346,100	4,547,861	290.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
498	350,157	4,554,825	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
499	355,679	4,571,604	221.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
500	352,193	4,567,289	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
501	352,253	4,567,621	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
502	347,479	4,570,300	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
503	347,480	4,567,871	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
504	345,632	4,560,981	253.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
507	353,932	4,578,049	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
508	349,773	4,569,705	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
509	354,625	4,567,394	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
510	354,258	4,552,740	260.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
513	353,169	4,577,735	216.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
515	353,042	4,570,841	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
516	348,871	4,573,395	222.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
517	349,922	4,573,377	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
518	350,097	4,560,304	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
519	346,998	4,556,297	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
520	348,931	4,553,155	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
521	348,820	4,554,397	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
523	359,180	4,574,345	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
524	352,880	4,577,931	218.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
526	345,628	4,561,056	253.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
528	351,177	4,549,585	270.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
529	351,459	4,550,162	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
530	349,876	4,578,899	215.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
531	350,411	4,578,458	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
532	360,683	4,576,054	204.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
533	345,465	4,565,556	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
534	348,156	4,569,886	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
535	350,129	4,558,088	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
536	351,377	4,548,969	270.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
538	350,359	4,572,943	224.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
539	345,241	4,546,338	292.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
540	348,209	4,570,076	236.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
541	350,217	4,556,764	252.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
542	354,503	4,551,220	259.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
543	352,674	4,550,401	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
544	345,907	4,565,791	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
545	346,793	4,558,645	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
546	351,275	4,554,269	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
547	352,590	4,577,641	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
549	346,730	4,565,814	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
550	347,711	4,570,182	233.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
551	345,695	4,559,201	252.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
552	357,589	4,574,590	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
553	348,963	4,576,139	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
554	358,665	4,576,046	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
555	358,247	4,577,626	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
556	354,941	4,570,369	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
557	347,670	4,570,347	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
558	345,685	4,561,006	252.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
559	350,106	4,561,367	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
560	351,184	4,554,207	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
561	351,222	4,578,701	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
562	354,467	4,572,202	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
563	349,640	4,576,668	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
564	352,166	4,568,451	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
566	345,738	4,562,229	252.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
567	351,790	4,560,113	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
569	352,313	4,566,468	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
570	347,602	4,566,895	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
571	351,039	4,560,143	243.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
572	350,127	4,558,552	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
573	346,646	4,552,558	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
574	353,743	4,576,210	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
575	349,349	4,563,858	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
576	351,691	4,561,059	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
577	354,146	4,562,143	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
578	354,189	4,561,900	235.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
579	354,323	4,551,800	251.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
580	347,938	4,552,465	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
581	359,611	4,576,021	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
582	352,574	4,565,450	232.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
583	348,983	4,551,490	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
584	345,263	4,551,791	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
585	347,648	4,570,158	233.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
586	352,685	4,553,323	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
588	357,682	4,574,744	215.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
590	346,401	4,565,410	244.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
591	348,074	4,570,160	236.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
592	348,167	4,570,444	232.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
593	345,851	4,559,631	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
594	353,143	4,569,988	228.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
596	351,467	4,574,491	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
597	353,699	4,575,477	219.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
598	354,146	4,576,189	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
599	349,349	4,568,095	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
601	354,621	4,573,824	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
602	351,979	4,569,374	236.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
604	345,568	4,545,687	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
605	346,550	4,562,812	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
606	347,411	4,569,815	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
607	345,468	4,560,743	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
608	348,758	4,552,313	269.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
609	351,597	4,549,496	271.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
610	351,794	4,578,679	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
611	358,321	4,576,229	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
612	347,842	4,546,710	292.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
613	351,116	4,557,711	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
614	347,647	4,555,453	260.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
615	348,752	4,553,216	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
617	350,625	4,576,196	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
618	346,904	4,573,988	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
619	354,364	4,551,235	261.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
620	352,744	4,550,496	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
622	358,491	4,575,609	212.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
624	351,945	4,563,446	235.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
625	347,256	4,545,343	290.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
626	345,557	4,566,604	241.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
628	351,675	4,561,259	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
629	351,796	4,578,897	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
630	350,079	4,563,539	241.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
631	348,032	4,569,818	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
634	355,466	4,571,860	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
635	352,223	4,569,064	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
636	350,040	4,567,048	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
639	345,728	4,565,326	245.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
641	347,114	4,547,050	295.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
643	352,046	4,569,307	237.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
645	347,659	4,570,157	233.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
647	354,357	4,553,863	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
648	348,676	4,552,509	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
650	352,901	4,570,406	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
652	351,520	4,551,282	266.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
653	352,439	4,572,720	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
654	348,917	4,549,246	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
655	347,961	4,565,210	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
656	354,130	4,568,440	228.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
657	352,549	4,577,023	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
658	353,903	4,575,974	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
659	353,749	4,571,891	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
660	347,869	4,573,129	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
661	352,003	4,569,150	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
662	345,252	4,551,767	276.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
663	346,961	4,562,776	248.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
664	347,202	4,563,018	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
665	346,372	4,567,707	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
668	356,804	4,574,343	216.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
669	356,639	4,574,023	217.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
670	357,864	4,577,126	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
677	350,216	4,578,420	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
678	351,836	4,571,816	230.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
679	355,494	4,572,184	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
680	349,988	4,564,379	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
681	347,228	4,569,729	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
682	350,572	4,556,104	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
683	348,790	4,552,039	266.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
684	357,523	4,574,436	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
685	358,134	4,574,682	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
686	353,119	4,577,664	216.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
687	355,907	4,572,735	219.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
688	351,382	4,574,432	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
689	354,486	4,567,965	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
690	354,434	4,551,385	261.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
691	347,450	4,551,641	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
692	345,873	4,563,308	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
693	347,455	4,566,665	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
695	355,574	4,571,691	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
696	358,967	4,575,963	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
697	347,588	4,570,390	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
698	347,581	4,570,257	232.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
699	348,796	4,567,729	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
701	350,255	4,549,296	273.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
702	352,940	4,577,907	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
703	347,736	4,562,612	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
704	348,047	4,565,834	241.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
705	347,747	4,570,178	234.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
706	348,019	4,554,197	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
708	348,755	4,578,314	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
710	352,013	4,570,611	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
713	349,986	4,556,214	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
714	352,661	4,551,611	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
716	353,512	4,570,481	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
717	354,102	4,578,129	209.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
718	351,772	4,562,341	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
722	351,812	4,563,174	234.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
723	348,823	4,554,301	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
724	351,366	4,554,327	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
725	357,423	4,574,294	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
726	360,189	4,574,323	206.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
727	355,489	4,577,244	216.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
728	352,266	4,567,695	236.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
729	355,432	4,572,149	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
730	346,951	4,573,920	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
731	357,180	4,574,303	216.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
733	350,097	4,560,005	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
734	352,687	4,552,846	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
735	356,521	4,573,514	219.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
737	346,035	4,544,924	284.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
738	351,573	4,549,097	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
739	358,324	4,576,393	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
740	352,339	4,566,412	235.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
742	353,657	4,577,655	213.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
743	346,219	4,567,625	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
744	354,622	4,567,620	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
745	351,916	4,578,753	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
746	346,907	4,575,336	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
747	357,511	4,574,526	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
748	358,323	4,576,143	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
749	352,680	4,565,496	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
750	354,818	4,566,508	226.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
752	351,708	4,561,611	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
753	348,394	4,558,597	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
755	354,014	4,577,451	214.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
756	352,344	4,576,714	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
757	345,192	4,545,287	282.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
759	347,644	4,569,840	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
760	350,014	4,562,092	240.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
761	350,112	4,559,235	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
762	352,686	4,550,451	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
764	359,958	4,577,418	209.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
766	351,805	4,571,238	231.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
767	345,595	4,560,990	253.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
769	351,240	4,554,240	258.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
770	350,305	4,550,810	266.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
772	345,803	4,567,357	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
774	345,689	4,561,039	253.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
775	345,658	4,561,062	253.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
776	349,866	4,578,224	219.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
777	357,834	4,574,637	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
778	347,604	4,570,156	233.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
779	351,702	4,562,804	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
780	351,470	4,551,732	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
781	352,675	4,550,109	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
782	354,246	4,578,189	208.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
783	353,943	4,577,980	210.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
784	352,790	4,565,323	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
785	351,697	4,562,153	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
787	346,742	4,556,724	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
788	350,126	4,558,014	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
789	350,409	4,572,991	224.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
791	348,167	4,570,415	232.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
793	346,580	4,554,244	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
794	350,342	4,549,535	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
795	352,204	4,576,277	219.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
796	358,321	4,576,318	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
797	358,304	4,578,085	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
798	349,949	4,568,273	238.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
799	357,840	4,574,680	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
801	346,788	4,558,585	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
803	347,732	4,573,126	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
804	347,095	4,545,273	292.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
805	345,200	4,545,754	284.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
806	347,245	4,562,813	246.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
808	350,107	4,559,776	243.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
809	348,596	4,555,286	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
810	347,885	4,549,723	276.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
811	352,500	4,574,832	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
812	360,051	4,573,010	209.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
813	352,633	4,577,746	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
814	347,671	4,573,443	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
815	345,355	4,546,628	292.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
816	347,422	4,569,751	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
817	357,784	4,574,631	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
818	347,101	4,573,981	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
819	348,151	4,570,106	236.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
821	353,214	4,551,893	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
822	349,687	4,552,409	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
823	350,203	4,551,016	265.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
824	359,982	4,576,463	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
825	346,359	4,549,648	278.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
826	345,797	4,567,414	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
827	347,844	4,569,157	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
828	348,483	4,558,714	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
829	351,792	4,578,780	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
830	346,461	4,565,471	245.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
831	347,707	4,570,121	235.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
832	348,011	4,569,871	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
834	350,160	4,562,184	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
835	350,115	4,558,492	248.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
837	353,220	4,575,704	221.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
838	354,569	4,576,160	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
840	349,999	4,565,708	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
841	351,578	4,549,458	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
843	348,796	4,576,511	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
844	352,351	4,576,345	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
845	353,144	4,570,004	228.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
846	347,570	4,566,093	241.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
847	346,990	4,558,715	252.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
848	347,355	4,553,143	264.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
849	355,951	4,572,682	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
850	349,117	4,549,568	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
851	346,438	4,549,702	280.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
852	345,721	4,565,328	245.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
853	355,477	4,572,161	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
854	355,417	4,571,916	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
855	355,022	4,573,074	218.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
857	349,431	4,569,208	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
860	353,139	4,569,793	229.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
861	350,095	4,562,235	241.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
862	352,036	4,572,642	229.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
863	352,909	4,577,564	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
864	345,799	4,567,218	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
865	345,996	4,561,840	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
866	352,704	4,554,608	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
868	357,332	4,574,297	216.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
869	351,656	4,562,959	236.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
870	349,964	4,567,481	238.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
871	350,129	4,550,974	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
872	345,753	4,568,254	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
873	348,818	4,556,197	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
874	354,812	4,551,533	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
875	354,426	4,551,131	260.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
876	349,995	4,573,422	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
878	353,805	4,578,177	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
879	350,101	4,563,273	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
880	351,782	4,562,341	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
881	352,663	4,551,458	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
882	346,721	4,545,308	290.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
883	346,809	4,565,397	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
885	347,510	4,552,119	273.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
886	346,091	4,549,639	275.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
887	346,965	4,562,776	248.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
889	345,780	4,554,139	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
890	352,190	4,549,472	270.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
891	352,515	4,578,738	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
892	356,767	4,574,339	216.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
893	357,575	4,574,410	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
894	358,181	4,574,696	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
895	353,149	4,577,675	216.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
896	347,575	4,546,627	294.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
897	346,214	4,545,413	289.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
898	347,675	4,570,149	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
899	353,957	4,568,099	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
901	351,464	4,551,664	266.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
902	347,679	4,548,237	283.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
903	352,520	4,577,112	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
904	350,139	4,578,425	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
905	347,938	4,573,106	223.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
907	347,277	4,569,738	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
908	346,325	4,567,718	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
909	345,809	4,567,858	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
911	346,620	4,554,278	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
912	349,778	4,569,906	237.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
914	354,903	4,576,237	217.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
916	354,630	4,567,471	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
917	351,808	4,560,091	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
919	350,381	4,572,964	224.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
921	349,801	4,578,266	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
922	355,631	4,571,598	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
923	345,895	4,566,816	240.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
924	347,593	4,570,274	232.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
925	348,055	4,567,696	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
926	349,672	4,560,262	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
927	350,163	4,549,957	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
928	357,148	4,574,305	217.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
929	357,881	4,574,678	215.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
930	354,060	4,578,082	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
931	352,252	4,568,752	234.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
932	351,695	4,562,580	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
933	350,487	4,564,709	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
934	345,683	4,561,023	253.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
935	351,045	4,558,290	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
937	347,123	4,573,906	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
938	351,593	4,562,809	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
940	346,662	4,556,274	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
941	346,699	4,556,285	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
942	345,119	4,555,767	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
943	355,419	4,577,211	216.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
944	358,264	4,576,067	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
945	355,392	4,572,153	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
946	351,472	4,551,632	267.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
948	347,638	4,552,918	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
949	353,368	4,577,748	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
950	354,680	4,566,505	227.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
951	351,682	4,560,860	241.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
952	345,999	4,549,935	278.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
954	360,174	4,573,916	206.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
955	352,895	4,577,886	218.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
956	352,186	4,567,835	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
958	347,235	4,548,163	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
959	345,203	4,565,546	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
960	346,011	4,544,926	284.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
961	346,802	4,563,189	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
962	351,590	4,566,165	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
963	354,867	4,551,706	256.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
964	347,633	4,554,303	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
965	348,961	4,573,771	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
966	350,914	4,576,328	221.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
967	352,685	4,565,427	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
968	345,811	4,566,113	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
969	347,751	4,569,838	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
970	354,336	4,553,542	256.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
971	347,619	4,546,710	294.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
972	357,519	4,574,552	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
973	352,326	4,576,558	218.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
974	360,032	4,576,959	208.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
975	347,161	4,567,645	239.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
976	347,793	4,570,125	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
977	348,093	4,570,528	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
978	346,459	4,560,988	251.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
979	350,253	4,548,933	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
980	347,182	4,546,195	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
981	347,687	4,570,125	234.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
982	346,100	4,550,230	275.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
985	353,836	4,577,882	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
986	358,324	4,576,168	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
987	355,624	4,572,345	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
988	350,003	4,565,251	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
990	345,606	4,561,043	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
992	350,254	4,554,770	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
993	352,037	4,573,772	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
994	348,814	4,550,416	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
997	353,860	4,576,204	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
998	349,188	4,568,594	238.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
999	345,898	4,567,282	239.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1000	346,353	4,562,940	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1002	346,842	4,575,344	218.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1003	349,887	4,578,256	219.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1004	358,897	4,575,970	210.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1005	354,501	4,567,102	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1006	352,816	4,561,551	239.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1007	352,167	4,552,998	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1008	347,527	4,553,226	265.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1009	347,050	4,573,981	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1010	348,894	4,576,687	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1011	353,865	4,575,707	219.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1012	347,547	4,569,819	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1013	346,750	4,567,586	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1014	347,558	4,566,094	241.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1016	356,170	4,576,511	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1017	358,312	4,577,993	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1018	353,559	4,571,374	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1019	352,094	4,576,282	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1020	353,758	4,576,127	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1021	352,615	4,565,593	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1022	350,084	4,562,200	241.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1023	351,855	4,578,894	220.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1024	348,058	4,570,129	236.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1025	351,248	4,552,131	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1028	347,018	4,575,643	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1029	353,909	4,575,563	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1030	358,398	4,576,931	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1031	347,664	4,570,192	233.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1032	352,414	4,566,196	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1033	352,669	4,576,334	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1034	351,887	4,578,752	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1035	350,072	4,564,060	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1036	351,844	4,563,189	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1038	350,094	4,562,068	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1039	352,245	4,549,448	270.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1040	359,913	4,576,629	208.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1042	354,143	4,562,647	235.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1043	350,142	4,550,503	271.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1044	350,138	4,551,042	264.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1045	350,020	4,555,293	255.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1046	351,791	4,578,807	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1047	351,500	4,569,368	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1048	348,862	4,551,191	268.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1049	348,050	4,569,879	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1052	353,392	4,575,782	220.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1053	351,953	4,569,336	237.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1054	351,997	4,563,400	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1055	351,589	4,556,129	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1056	349,990	4,574,656	219.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1058	352,618	4,565,404	232.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1059	347,742	4,553,279	267.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1060	351,470	4,551,566	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1061	345,713	4,565,364	245.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1062	354,877	4,551,600	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1063	350,278	4,578,437	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1065	352,773	4,577,533	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1066	350,575	4,566,210	238.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1067	352,148	4,567,052	235.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1068	351,670	4,563,033	236.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1069	345,342	4,561,445	254.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1070	345,820	4,558,760	254.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1072	358,335	4,574,658	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1073	352,044	4,568,916	235.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1074	347,642	4,570,135	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1075	347,914	4,569,868	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1076	353,763	4,568,752	230.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1077	345,885	4,560,119	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1079	356,077	4,572,844	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1080	350,092	4,564,453	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1081	352,770	4,565,542	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1082	347,370	4,567,520	240.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1084	351,539	4,557,672	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1085	354,254	4,553,007	259.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1086	355,850	4,571,264	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1087	355,021	4,576,211	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1088	350,416	4,572,759	225.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1089	355,825	4,572,628	219.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1090	355,710	4,572,466	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1091	346,439	4,567,620	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1092	348,416	4,558,915	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1094	346,811	4,548,270	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1095	360,068	4,572,915	209.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1096	359,105	4,576,036	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1097	358,073	4,577,202	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1098	350,690	4,556,090	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1099	354,424	4,551,354	261.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1100	356,678	4,573,662	219.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1101	358,038	4,574,686	214.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1102	353,054	4,577,649	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1103	350,109	4,562,559	241.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1104	346,516	4,545,426	290.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1105	345,804	4,567,260	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1106	347,448	4,566,657	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1107	347,733	4,570,150	234.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1108	348,018	4,554,207	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1109	351,472	4,549,995	265.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1110	355,673	4,572,156	219.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1111	355,507	4,571,788	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1113	347,292	4,565,303	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1114	350,221	4,556,192	252.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1115	357,985	4,577,207	214.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1117	349,916	4,573,710	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1118	350,013	4,562,364	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1119	345,792	4,566,007	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1120	354,437	4,551,564	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1123	348,415	4,573,104	223.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1124	350,315	4,566,303	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1125	352,429	4,566,126	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1126	347,162	4,562,920	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1127	345,882	4,567,698	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1128	350,169	4,548,801	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1130	353,192	4,577,651	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1131	352,776	4,572,423	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1132	356,988	4,574,315	217.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1133	352,893	4,577,905	218.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1134	354,181	4,578,116	209.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1135	349,998	4,564,598	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1136	352,183	4,567,587	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1137	345,804	4,566,473	242.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1138	348,312	4,578,328	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1139	349,930	4,578,372	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1140	355,532	4,571,761	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1141	350,624	4,572,696	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1143	354,660	4,576,156	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1144	350,034	4,569,643	238.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1146	353,375	4,569,349	229.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1148	351,705	4,554,548	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1149	350,089	4,554,841	256.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1150	347,591	4,560,908	248.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1151	350,135	4,557,137	252.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1153	357,250	4,574,297	216.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1154	350,479	4,564,704	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1155	352,683	4,552,800	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1156	350,050	4,567,872	238.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1158	353,825	4,566,506	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1160	356,029	4,577,219	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1161	347,628	4,570,372	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1162	352,673	4,552,347	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1164	346,137	4,562,885	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1166	353,104	4,570,939	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1167	347,680	4,570,190	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1168	345,618	4,560,981	253.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1169	347,251	4,554,344	264.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1170	351,474	4,578,708	218.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1171	358,277	4,573,337	214.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1172	352,783	4,577,306	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1173	348,186	4,570,084	236.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1174	347,604	4,554,855	261.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1175	351,258	4,554,136	258.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1177	345,821	4,566,197	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1178	352,046	4,549,461	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1179	350,209	4,550,467	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1181	351,038	4,554,215	258.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1182	351,304	4,578,706	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1183	347,609	4,573,941	221.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1184	347,149	4,573,210	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1185	349,348	4,576,426	219.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1186	349,293	4,576,490	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1188	348,161	4,570,177	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1189	347,373	4,569,808	237.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1190	345,804	4,566,058	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1191	345,520	4,566,585	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1193	349,201	4,576,494	219.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1194	360,020	4,575,590	209.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1195	358,322	4,576,063	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1196	346,947	4,574,899	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1197	350,779	4,566,294	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1198	352,668	4,565,517	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1199	345,595	4,561,016	253.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1200	352,022	4,560,145	239.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1201	345,969	4,552,596	271.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1202	354,195	4,578,214	208.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1203	349,510	4,568,221	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1204	353,482	4,572,366	223.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1206	345,235	4,546,346	292.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1207	345,674	4,561,056	253.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1210	357,581	4,574,470	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1211	353,769	4,572,075	225.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1212	352,705	4,553,713	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1213	354,842	4,551,381	257.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1215	352,458	4,576,342	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1217	354,376	4,551,272	261.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1218	352,005	4,569,424	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1219	355,517	4,572,218	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1220	347,709	4,573,124	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1221	347,627	4,570,134	234.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1224	345,826	4,565,981	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1225	347,824	4,565,279	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1226	345,682	4,561,488	252.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1227	345,484	4,560,819	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1228	351,481	4,556,074	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1229	354,027	4,576,192	219.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1231	351,546	4,551,216	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1232	354,175	4,561,977	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1233	350,055	4,559,074	246.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1234	345,901	4,559,672	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1235	350,363	4,578,401	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1236	358,395	4,576,976	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1237	351,379	4,574,429	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1238	352,297	4,576,348	219.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1239	359,624	4,575,927	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1240	352,411	4,569,664	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1241	349,338	4,549,590	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1242	347,095	4,545,324	292.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1243	345,168	4,561,610	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1244	349,175	4,553,214	265.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1245	352,136	4,551,836	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1246	346,830	4,573,771	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1248	347,479	4,569,761	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1249	346,779	4,565,277	243.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1250	351,843	4,578,681	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1252	353,500	4,575,602	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1253	358,320	4,576,267	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1254	358,491	4,575,633	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1257	353,289	4,577,680	214.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1259	347,739	4,570,112	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1260	345,979	4,562,021	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1262	354,960	4,551,831	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1264	348,206	4,565,701	240.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1265	347,565	4,550,586	276.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1266	345,992	4,545,396	287.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1267	351,022	4,557,701	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1268	350,248	4,578,439	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1269	352,276	4,567,249	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1270	347,931	4,564,830	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1271	350,227	4,562,388	240.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1272	354,246	4,565,729	228.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1273	347,644	4,570,172	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1274	345,485	4,560,725	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1276	350,555	4,554,570	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1277	357,398	4,574,300	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1278	354,143	4,568,427	228.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1279	347,098	4,562,757	248.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1280	347,942	4,565,220	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1281	350,116	4,559,347	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1282	350,262	4,549,509	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1283	353,762	4,575,943	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1284	352,679	4,553,274	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1285	347,633	4,549,675	276.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1286	348,424	4,549,694	276.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1288	357,823	4,577,115	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1289	358,092	4,577,540	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1290	355,541	4,572,159	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1292	347,989	4,565,118	243.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1294	346,798	4,558,584	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1297	348,811	4,578,313	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1298	354,581	4,551,245	258.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1299	346,347	4,549,613	278.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1300	353,356	4,551,990	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1301	350,250	4,550,020	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1302	346,513	4,548,253	287.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1303	355,486	4,571,825	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1304	347,837	4,573,129	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1305	352,286	4,576,990	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1306	359,008	4,575,963	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1308	351,971	4,569,293	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1309	346,437	4,567,694	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1310	348,471	4,556,199	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1311	354,517	4,551,519	257.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1312	353,092	4,577,660	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1313	355,863	4,572,683	219.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1314	351,448	4,574,421	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1315	358,097	4,574,685	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1317	352,017	4,569,146	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1318	345,917	4,565,508	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1319	345,782	4,567,136	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1321	348,422	4,558,313	250.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1323	348,467	4,573,099	223.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1324	348,370	4,566,386	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1325	354,510	4,566,408	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1328	352,916	4,577,908	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1329	352,043	4,570,445	233.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1330	352,583	4,565,914	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1331	346,827	4,545,389	291.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1334	349,875	4,578,351	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1335	347,020	4,573,915	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1338	347,734	4,570,178	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1339	347,578	4,570,226	232.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1341	349,982	4,556,205	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1343	355,017	4,576,152	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1344	350,010	4,562,367	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1345	347,601	4,570,413	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1347	347,999	4,564,656	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1348	348,160	4,570,227	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1350	347,815	4,556,316	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1351	348,895	4,549,403	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1353	357,202	4,574,311	216.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1354	350,137	4,564,494	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1355	346,242	4,560,350	252.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1356	351,403	4,554,329	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1358	354,165	4,577,470	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1360	353,587	4,569,083	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1361	347,104	4,562,688	249.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1362	346,362	4,567,630	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1363	347,494	4,570,326	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1364	348,982	4,567,795	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1366	354,611	4,576,155	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1367	345,485	4,560,962	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1371	353,589	4,572,370	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1372	345,992	4,545,396	287.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1373	347,290	4,563,408	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1374	345,885	4,568,329	236.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1375	350,231	4,550,485	271.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1377	348,529	4,556,773	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1378	355,954	4,577,216	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1379	350,006	4,565,708	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1380	354,191	4,553,314	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1381	345,441	4,550,912	280.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1383	357,528	4,574,500	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1384	358,323	4,576,107	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1385	350,095	4,562,633	241.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1386	345,788	4,562,902	250.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1387	347,869	4,570,099	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1388	345,637	4,560,983	253.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1389	347,600	4,555,737	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1390	351,061	4,554,234	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1395	345,808	4,566,059	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1396	347,556	4,566,591	241.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1397	347,855	4,564,935	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1398	346,597	4,565,036	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1399	354,006	4,578,035	210.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1400	350,415	4,572,952	224.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1402	347,808	4,560,287	248.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1404	351,906	4,549,468	269.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1405	354,270	4,578,207	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1406	354,351	4,576,296	216.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1408	347,569	4,569,824	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1409	350,123	4,558,015	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1410	347,726	4,554,730	261.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1411	349,873	4,578,274	219.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1412	346,676	4,575,067	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1414	354,785	4,566,560	226.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1415	348,094	4,570,357	233.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1416	354,831	4,551,465	259.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1417	345,548	4,562,856	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1418	348,233	4,573,842	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1420	350,027	4,568,647	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1421	347,616	4,570,171	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1422	348,378	4,557,828	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1423	352,688	4,550,290	267.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1424	352,566	4,574,894	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1425	355,568	4,572,190	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1426	349,996	4,563,528	241.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1428	351,562	4,549,433	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1429	348,034	4,546,569	294.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1430	347,148	4,545,327	292.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1431	351,708	4,562,154	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1433	352,391	4,576,346	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1434	347,529	4,552,120	272.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1435	351,829	4,549,549	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1436	358,346	4,574,917	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1437	352,220	4,576,349	218.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1438	353,706	4,571,799	224.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1439	347,702	4,565,289	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1441	346,559	4,554,245	268.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1442	348,773	4,551,313	268.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1443	352,974	4,578,399	221.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1445	350,004	4,574,032	221.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1446	349,651	4,568,420	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1449	353,148	4,575,587	221.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1451	346,608	4,561,617	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1452	352,981	4,551,903	264.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1454	351,451	4,578,703	218.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1455	358,363	4,574,803	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1456	354,464	4,576,157	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1457	347,522	4,569,765	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1458	347,978	4,569,873	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1459	349,959	4,562,006	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1460	351,290	4,554,155	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1461	359,982	4,576,414	207.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1462	352,961	4,576,162	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1463	351,964	4,569,430	236.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1466	346,447	4,565,283	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1467	352,215	4,551,836	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1468	350,232	4,549,730	271.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1469	351,963	4,578,755	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1470	358,325	4,576,345	212.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1471	352,098	4,570,229	233.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1472	351,796	4,561,416	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1473	354,963	4,573,041	218.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1475	357,658	4,577,146	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1477	352,714	4,565,528	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1478	347,145	4,549,691	278.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1480	345,513	4,562,343	252.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1481	345,336	4,551,451	276.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1482	355,563	4,576,291	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1483	352,961	4,577,593	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1484	353,535	4,576,082	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1486	346,029	4,561,917	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1488	351,862	4,556,118	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1490	355,515	4,571,870	221.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1491	357,308	4,574,297	216.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1492	357,529	4,574,363	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1493	351,652	4,562,645	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1494	348,015	4,565,192	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1495	347,920	4,569,295	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1496	345,809	4,568,267	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1497	351,823	4,554,627	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1498	354,806	4,551,589	259.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1499	350,117	4,558,516	248.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1500	345,766	4,558,760	255.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1501	348,400	4,557,206	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1504	347,839	4,569,856	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1505	351,549	4,550,227	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1507	346,604	4,545,293	289.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1508	350,326	4,578,397	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1509	349,023	4,566,495	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1510	350,603	4,556,169	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1511	354,523	4,551,436	258.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1512	345,249	4,551,701	277.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1515	350,210	4,562,374	240.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1517	351,907	4,551,977	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1518	350,198	4,550,943	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1519	353,361	4,571,305	227.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1520	348,062	4,573,114	223.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1523	347,786	4,565,267	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1524	347,961	4,570,074	236.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1525	351,118	4,554,067	259.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1526	347,715	4,553,088	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1527	349,201	4,566,249	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1528	355,650	4,571,521	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1529	345,976	4,545,429	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1530	347,740	4,562,575	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1531	347,665	4,568,723	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1532	347,003	4,556,299	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1533	355,392	4,571,998	221.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1534	350,413	4,572,970	224.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1535	353,820	4,577,911	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1538	353,183	4,572,579	226.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1539	357,920	4,574,680	215.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1540	353,237	4,577,669	215.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1541	354,750	4,576,152	216.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1542	352,101	4,569,081	235.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1543	349,717	4,569,993	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1545	351,812	4,563,164	234.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1546	354,625	4,567,434	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1547	345,688	4,561,023	253.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1548	347,745	4,553,886	258.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1549	350,111	4,550,708	267.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1550	346,950	4,574,335	218.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1551	351,766	4,562,830	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1552	347,796	4,568,881	239.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1553	357,113	4,574,303	217.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1554	352,205	4,568,182	235.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1559	353,257	4,577,760	215.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1561	345,647	4,560,978	252.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1562	352,265	4,554,891	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1564	350,683	4,554,438	256.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1567	358,259	4,574,305	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1568	352,194	4,567,903	235.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1569	347,564	4,570,235	232.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1570	345,571	4,555,696	262.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1571	355,714	4,571,570	221.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1573	352,895	4,577,936	218.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1574	345,179	4,565,533	245.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1575	351,460	4,549,844	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1576	347,917	4,564,725	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1577	347,660	4,554,179	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1578	353,536	4,577,769	212.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1579	350,350	4,572,973	224.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1580	353,834	4,551,732	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1581	354,557	4,551,203	259.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1583	349,015	4,575,139	219.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1584	356,566	4,573,571	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1585	347,126	4,546,276	290.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1586	345,822	4,567,489	239.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1587	348,381	4,570,019	237.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1588	352,223	4,576,388	219.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1589	352,653	4,565,430	233.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1590	348,093	4,570,603	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1591	351,459	4,550,161	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1592	346,159	4,567,667	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1593	347,696	4,570,181	233.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1594	352,489	4,551,940	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1595	345,904	4,565,792	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1596	351,576	4,578,714	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1598	350,057	4,559,456	244.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1599	350,117	4,559,517	244.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1601	355,603	4,572,322	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1602	354,176	4,572,221	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1603	351,451	4,574,702	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1604	345,301	4,550,492	278.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1605	354,983	4,570,382	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1606	352,263	4,568,399	235.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1607	349,292	4,568,050	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1609	347,671	4,570,368	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1610	346,481	4,561,034	251.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1612	350,438	4,578,472	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1613	357,522	4,574,586	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1614	358,587	4,576,053	212.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1615	347,004	4,575,457	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1616	347,798	4,570,143	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1617	348,166	4,570,376	233.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1618	346,143	4,562,882	254.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1619	347,129	4,562,958	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1620	350,090	4,562,167	240.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1621	350,110	4,559,140	246.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1622	353,821	4,576,206	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1623	345,586	4,558,867	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1624	352,066	4,556,035	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1625	346,637	4,565,406	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1626	356,176	4,576,461	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1627	353,593	4,570,299	228.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1628	354,094	4,575,373	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1629	352,365	4,566,198	233.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1631	350,223	4,551,183	266.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1632	351,853	4,578,864	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1633	351,347	4,578,692	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1634	346,986	4,573,983	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1635	353,984	4,575,723	218.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1636	349,977	4,566,054	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1637	347,547	4,551,757	274.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1638	347,364	4,569,745	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1639	354,328	4,553,297	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1640	346,345	4,552,287	270.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1641	352,125	4,573,708	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1642	356,623	4,573,677	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1643	351,986	4,569,424	236.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1647	346,532	4,561,170	250.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1648	354,079	4,576,189	218.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1649	354,500	4,551,413	260.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1650	347,659	4,570,128	234.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1651	347,509	4,569,818	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1652	351,122	4,557,713	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1653	350,311	4,575,995	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1654	347,394	4,548,574	282.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1656	347,510	4,565,937	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1657	350,678	4,558,472	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1659	351,706	4,578,667	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1661	345,989	4,561,988	252.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1662	349,989	4,561,296	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1663	347,605	4,546,711	294.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1664	360,728	4,575,977	204.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1665	351,953	4,569,321	237.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1666	351,776	4,561,467	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1667	348,486	4,558,724	250.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1669	351,794	4,578,841	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1671	352,602	4,576,337	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1672	350,083	4,563,534	241.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1673	348,613	4,555,346	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1674	348,095	4,569,885	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1688	345,110	4,559,813	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1693	344,776	4,556,490	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1694	345,062	4,559,825	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1709	352,364	4,549,521	270.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1728	347,361	4,570,291	231.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1795	347,109	4,569,934	235.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1841	349,823	4,570,383	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1853	348,245	4,570,809	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1876	352,439	4,549,510	272.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1899	351,507	4,548,672	270.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1906	352,395	4,549,468	272.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1909	358,312	4,578,214	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1953	347,420	4,570,356	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1979	347,016	4,569,924	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2049	348,326	4,570,843	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2053	347,162	4,569,789	237.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2093	351,575	4,548,699	272.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2107	347,390	4,570,352	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2147	360,140	4,575,179	210.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2171	346,995	4,569,842	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2172	347,050	4,569,926	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2175	345,217	4,547,164	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2213	347,413	4,570,326	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2302	347,137	4,569,965	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2353	348,212	4,570,805	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2388	347,344	4,570,260	231.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2409	358,249	4,578,240	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2452	347,418	4,570,343	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z [m]	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
2516	348,155	4,570,784	231.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2554	347,195	4,569,783	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2556	352,322	4,549,473	271.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2561	348,293	4,570,841	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2612	347,374	4,570,273	231.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2619	347,383	4,570,344	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2645	355,158	4,551,917	255.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2659	347,085	4,569,933	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2704	360,782	4,575,905	205.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2743	358,243	4,578,278	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2817	347,130	4,569,792	236.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2820	348,450	4,576,551	216.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2835	347,088	4,573,178	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2844	347,589	4,570,498	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2848	347,303	4,573,094	222.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2880	347,368	4,570,247	231.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2899	352,366	4,549,470	272.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2964	345,235	4,547,905	288.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3022	345,218	4,547,164	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3054	347,892	4,570,768	230.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3055	347,830	4,570,737	231.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3056	347,953	4,570,791	230.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3057	347,995	4,570,802	230.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3058	348,032	4,570,818	230.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3060	347,941	4,570,660	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3061	348,043	4,570,740	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3062	347,788	4,570,650	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3063	347,761	4,570,638	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3064	347,714	4,570,620	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3065	347,826	4,570,664	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3066	347,852	4,570,674	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3067	347,881	4,570,685	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3068	347,681	4,570,610	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3069	347,684	4,570,679	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3070	347,723	4,570,694	231.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3071	347,782	4,570,717	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3072	348,188	4,570,681	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3081	347,534	4,570,552	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3082	347,585	4,570,564	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3083	347,622	4,570,586	232.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3085	347,473	4,570,531	231.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3086	347,505	4,570,547	231.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3097	347,293	4,569,805	237.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3098	347,227	4,569,792	237.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3105	348,113	4,573,107	223.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3106	347,985	4,573,110	223.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3107	347,828	4,573,066	224.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3122	346,832	4,573,838	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3123	346,865	4,573,867	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3124	346,684	4,573,818	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3125	346,756	4,573,680	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3126	346,743	4,573,653	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3127	346,732	4,573,625	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3128	346,719	4,573,595	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3129	346,707	4,573,571	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3130	346,693	4,573,537	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3131	346,678	4,573,496	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3137	346,935	4,574,288	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3138	346,842	4,574,171	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3139	346,900	4,575,303	218.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3140	346,899	4,575,368	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3141	346,901	4,575,396	218.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3142	346,936	4,575,565	215.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3146	353,856	4,576,137	221.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3147	353,831	4,575,960	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
3149	354,727	4,551,718	245.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3152	350,486	4,578,382	218.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3153	350,490	4,578,431	218.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3154	351,036	4,578,518	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3155	351,155	4,578,584	219.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3157	351,894	4,569,312	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3158	352,127	4,569,261	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3159	351,921	4,578,819	220.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3161	354,378	4,578,283	208.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3162	356,086	4,576,568	216.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3164	345,904	4,565,110	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3168	346,997	4,569,765	237.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3169	346,991	4,569,814	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3170	347,010	4,569,870	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3171	347,038	4,569,876	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3172	347,063	4,569,842	235.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3173	347,056	4,569,792	236.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3174	347,098	4,569,780	236.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3175	352,011	4,570,555	233.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3176	352,029	4,570,499	234.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3177	350,000	4,573,310	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3179	346,853	4,573,929	220.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3181	348,227	4,578,259	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3183	354,819	4,551,411	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3185	354,582	4,551,225	258.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3186	354,461	4,551,233	260.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3187	354,444	4,551,196	260.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3188	354,404	4,551,321	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3189	353,827	4,551,619	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3190	353,902	4,551,593	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3191	353,992	4,551,475	256.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3192	353,840	4,551,519	261.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3193	353,864	4,551,464	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3194	353,856	4,551,415	258.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3195	354,207	4,551,370	256.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3196	354,215	4,551,312	259.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3197	354,195	4,551,269	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3198	354,011	4,551,376	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3199	354,085	4,551,351	256.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3200	354,031	4,551,325	260.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3201	354,119	4,551,195	262.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3202	354,006	4,551,218	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3203	354,080	4,551,115	263.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3204	353,980	4,551,145	263.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3205	353,888	4,551,216	259.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3206	353,921	4,551,111	263.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3207	353,874	4,551,088	264.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3212	353,595	4,551,129	262.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3213	353,740	4,551,191	258.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3214	353,744	4,551,242	258.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3228	351,681	4,557,772	248.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3229	354,527	4,551,468	256.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3230	348,185	4,569,886	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3231	348,165	4,570,467	232.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3232	348,094	4,570,265	234.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3233	353,082	4,570,453	231.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3234	350,657	4,573,439	222.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3235	348,180	4,573,148	223.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3236	358,255	4,577,595	214.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

Calculation Results

Shadow receptor

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
2	0:00	0	0:00	0:00
3	0:00	0	0:00	0:00
5	0:00	0	0:00	0:00
6	49:23	62	1:17	9:02
7	121:15	189	0:51	41:28
8	0:00	0	0:00	0:00
9	28:07	93	0:29	6:25
10	34:18	95	0:27	5:54
11	26:40	82	0:28	7:16
12	19:13	45	0:34	4:53
15	23:29	66	0:30	10:03
16	9:03	31	0:21	3:03
17	0:00	0	0:00	0:00
19	0:00	0	0:00	0:00
20	0:00	0	0:00	0:00
21	78:18	104	0:57	11:40
23	18:39	48	0:28	2:24
25	45:10	69	0:47	20:35
26	59:09	114	0:52	13:22
27	24:40	82	0:29	3:37
28	11:24	38	0:26	4:04
29	50:21	102	0:47	7:25
30	40:07	94	0:41	5:51
31	7:18	26	0:21	1:13
32	0:00	0	0:00	0:00
33	88:01	140	0:46	25:13
34	37:35	81	0:33	16:57
35	16:09	44	0:30	3:50
36	9:32	33	0:25	2:36
37	0:00	0	0:00	0:00
38	12:00	40	0:22	4:06
39	0:00	0	0:00	0:00
40	35:58	71	0:36	12:25
41	6:49	39	0:14	2:19
43	31:23	55	0:46	10:20
44	19:27	44	0:35	6:30
45	0:00	0	0:00	0:00
46	27:23	56	0:36	12:38
47	47:25	104	0:36	8:56
48	0:00	0	0:00	0:00
50	40:57	100	0:38	9:33
51	0:00	0	0:00	0:00
52	25:53	74	0:28	8:52
53	0:00	0	0:00	0:00
54	146:48	213	0:56	49:42
56	0:00	0	0:00	0:00
57	0:00	0	0:00	0:00
58	27:05	86	0:28	6:40
59	111:33	124	1:05	25:33
62	0:00	0	0:00	0:00
63	61:03	140	0:40	15:19
64	122:08	206	1:02	31:43
65	0:00	0	0:00	0:00
66	0:00	0	0:00	0:00
68	9:06	32	0:23	3:21
70	0:00	0	0:00	0:00
72	8:39	30	0:22	1:29
74	44:40	105	0:40	10:20
75	14:22	39	0:30	4:23
76	0:00	0	0:00	0:00
77	0:00	0	0:00	0:00
78	0:00	0	0:00	0:00
79	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
80	13:06	40	0:27	2:51
83	20:14	45	0:35	6:51
85	86:28	110	0:55	13:19
86	35:57	70	0:40	14:22
87	122:30	114	1:24	37:27
88	0:00	0	0:00	0:00
89	100:00	129	0:58	16:01
90	12:26	44	0:25	2:55
91	129:28	149	1:22	40:05
93	0:00	0	0:00	0:00
94	78:09	179	0:47	17:07
95	58:22	93	0:50	10:13
96	0:00	0	0:00	0:00
98	120:18	186	1:09	28:19
99	0:00	0	0:00	0:00
100	0:00	0	0:00	0:00
102	0:00	0	0:00	0:00
103	31:59	79	0:36	9:49
104	179:34	262	0:57	53:54
106	0:00	0	0:00	0:00
107	0:00	0	0:00	0:00
110	10:04	39	0:23	4:00
111	60:53	107	0:47	11:02
112	54:38	98	0:41	8:08
113	106:45	64	2:08	16:15
114	73:23	167	0:48	17:31
115	0:00	0	0:00	0:00
116	0:00	0	0:00	0:00
120	9:52	34	0:25	3:04
122	0:00	0	0:00	0:00
123	0:00	0	0:00	0:00
124	0:00	0	0:00	0:00
127	44:36	102	0:40	19:45
129	15:22	42	0:29	5:01
130	11:15	43	0:20	5:14
131	16:19	58	0:28	4:31
132	0:00	0	0:00	0:00
133	14:55	49	0:26	5:02
134	28:39	71	0:33	4:32
135	48:55	114	0:36	9:48
137	128:18	235	0:48	37:57
139	18:37	55	0:28	6:18
140	0:00	0	0:00	0:00
141	0:00	0	0:00	0:00
142	0:00	0	0:00	0:00
143	65:16	68	1:12	9:30
144	0:00	0	0:00	0:00
145	94:36	136	1:13	33:58
146	14:56	36	0:32	2:36
147	14:04	40	0:27	1:46
149	0:00	0	0:00	0:00
150	0:00	0	0:00	0:00
151	0:00	0	0:00	0:00
152	0:00	0	0:00	0:00
153	94:30	163	0:51	23:24
154	0:00	0	0:00	0:00
155	74:04	181	0:36	27:47
157	7:31	29	0:20	0:54
158	0:00	0	0:00	0:00
159	33:31	62	0:42	12:33
160	10:50	38	0:25	4:05
161	10:08	36	0:24	3:47
162	28:16	86	0:26	6:18
163	21:06	60	0:29	7:41

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SHADOW - Main Result

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
165	30:34	69	0:33	13:58
167	10:26	36	0:22	1:17
168	0:00	0	0:00	0:00
169	33:22	57	0:52	10:16
170	34:43	73	0:38	15:52
171	71:14	132	0:47	29:04
172	0:00	0	0:00	0:00
173	0:00	0	0:00	0:00
174	0:00	0	0:00	0:00
176	18:20	44	0:33	4:32
178	0:00	0	0:00	0:00
179	25:52	54	0:35	4:49
180	77:08	148	0:41	25:28
181	74:49	194	0:36	23:44
182	0:00	0	0:00	0:00
183	0:00	0	0:00	0:00
185	0:00	0	0:00	0:00
186	0:00	0	0:00	0:00
187	0:00	0	0:00	0:00
189	37:54	80	0:33	17:05
191	0:00	0	0:00	0:00
192	0:00	0	0:00	0:00
193	0:00	0	0:00	0:00
195	0:00	0	0:00	0:00
196	0:00	0	0:00	0:00
197	274:04	319	1:38	89:22
198	32:40	103	0:27	6:41
199	87:14	146	0:48	14:58
200	60:12	120	0:53	13:37
201	29:08	84	0:28	10:06
202	0:00	0	0:00	0:00
203	0:00	0	0:00	0:00
204	0:00	0	0:00	0:00
205	8:10	30	0:23	2:30
206	0:00	0	0:00	0:00
207	0:00	0	0:00	0:00
209	14:23	52	0:24	2:50
210	20:51	47	0:34	5:01
211	86:21	85	1:14	12:12
212	36:00	90	0:32	11:40
213	12:03	42	0:25	4:00
214	56:20	127	0:37	9:18
215	10:23	36	0:26	2:34
216	82:30	132	0:50	13:44
217	41:20	94	0:41	6:04
218	0:00	0	0:00	0:00
220	0:00	0	0:00	0:00
221	70:41	132	0:57	22:36
222	24:25	44	0:42	3:04
223	10:04	36	0:24	2:44
224	17:33	40	0:34	3:06
225	25:09	76	0:28	7:24
227	74:42	136	0:59	27:07
228	90:06	197	0:39	32:21
229	0:00	0	0:00	0:00
230	18:23	42	0:34	6:04
231	0:00	0	0:00	0:00
232	160:17	154	2:06	56:33
233	0:00	0	0:00	0:00
234	42:09	80	0:41	17:16
235	0:00	0	0:00	0:00
236	0:00	0	0:00	0:00
237	44:56	80	0:39	20:17
239	11:11	38	0:25	3:04

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
240	47:59	103	0:39	19:06
241	0:00	0	0:00	0:00
242	44:37	72	0:43	6:12
243	0:00	0	0:00	0:00
244	47:59	90	0:38	6:58
245	0:00	0	0:00	0:00
248	33:37	85	0:30	15:04
249	0:00	0	0:00	0:00
250	28:11	81	0:33	7:09
251	10:55	34	0:27	3:37
252	0:00	0	0:00	0:00
253	0:00	0	0:00	0:00
254	0:56	14	0:05	0:26
255	87:59	122	0:54	36:47
258	15:01	61	0:22	6:37
259	0:00	0	0:00	0:00
260	0:00	0	0:00	0:00
261	20:21	60	0:27	6:59
262	11:34	38	0:27	2:49
263	0:00	0	0:00	0:00
264	93:32	167	0:45	24:04
265	24:58	52	0:36	11:34
266	23:03	70	0:30	4:42
268	0:00	0	0:00	0:00
270	0:00	0	0:00	0:00
271	32:20	90	0:30	6:50
272	0:00	0	0:00	0:00
273	0:00	0	0:00	0:00
275	184:42	228	1:11	42:47
277	137:12	108	1:29	59:21
278	13:39	49	0:22	4:37
279	30:19	44	0:52	5:13
280	0:00	0	0:00	0:00
281	0:00	0	0:00	0:00
283	0:00	0	0:00	0:00
284	24:38	52	0:37	7:22
285	0:00	0	0:00	0:00
286	36:27	93	0:37	8:41
288	81:09	92	1:09	21:13
289	8:02	30	0:23	2:37
291	0:00	0	0:00	0:00
293	0:00	0	0:00	0:00
294	0:00	0	0:00	0:00
295	0:00	0	0:00	0:00
298	0:00	0	0:00	0:00
299	20:25	56	0:26	3:47
300	0:00	0	0:00	0:00
301	60:10	95	0:44	8:50
303	17:27	43	0:32	5:49
304	85:32	95	1:18	31:14
305	30:39	59	0:42	8:43
310	29:30	62	0:34	3:59
312	0:00	0	0:00	0:00
313	27:22	86	0:29	12:03
314	0:00	0	0:00	0:00
315	10:34	34	0:25	3:32
317	0:00	0	0:00	0:00
319	113:07	122	1:12	39:45
320	23:25	50	0:36	8:32
321	0:00	0	0:00	0:00
322	23:26	66	0:26	3:13
323	7:29	28	0:21	0:54
324	21:56	52	0:33	4:25
325	41:02	91	0:43	13:56

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SHADOW - Main Result

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No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
327	30:55	54	0:43	5:45
328	74:12	88	0:59	33:06
329	61:41	97	0:51	24:35
330	0:00	0	0:00	0:00
331	0:00	0	0:00	0:00
332	133:03	186	1:19	34:52
333	28:19	91	0:29	9:46
334	0:00	0	0:00	0:00
335	10:06	38	0:24	1:58
336	0:00	0	0:00	0:00
337	0:00	0	0:00	0:00
338	0:00	0	0:00	0:00
339	15:10	58	0:22	5:11
340	0:00	0	0:00	0:00
341	29:49	93	0:29	10:16
342	0:00	0	0:00	0:00
343	0:00	0	0:00	0:00
344	79:11	125	0:47	34:21
346	0:00	0	0:00	0:00
347	0:00	0	0:00	0:00
348	0:00	0	0:00	0:00
349	0:00	0	0:00	0:00
350	68:53	95	1:09	24:57
351	0:00	0	0:00	0:00
352	23:22	74	0:27	4:16
353	35:23	67	0:42	13:40
354	33:10	84	0:30	14:52
355	0:00	0	0:00	0:00
357	0:00	0	0:00	0:00
359	0:00	0	0:00	0:00
360	213:07	176	2:12	74:43
362	28:47	57	0:40	10:03
364	0:00	0	0:00	0:00
365	44:05	84	0:37	6:17
366	5:15	24	0:16	0:37
367	0:00	0	0:00	0:00
368	80:17	112	0:57	12:28
369	0:00	0	0:00	0:00
370	0:00	0	0:00	0:00
371	10:10	35	0:22	3:27
372	47:08	103	0:36	16:10
373	0:00	0	0:00	0:00
376	29:51	58	0:40	11:02
377	0:00	0	0:00	0:00
378	0:00	0	0:00	0:00
380	0:00	0	0:00	0:00
381	0:00	0	0:00	0:00
382	145:24	195	1:27	46:37
383	19:50	50	0:32	7:35
384	67:19	121	0:51	19:51
385	106:53	138	1:26	33:45
386	15:28	53	0:27	3:30
387	24:54	78	0:28	3:35
388	33:10	54	0:51	7:35
389	0:00	0	0:00	0:00
390	221:15	236	1:19	75:27
391	0:00	0	0:00	0:00
392	15:42	59	0:24	6:50
393	0:00	0	0:00	0:00
394	39:17	64	0:44	7:33
395	0:00	0	0:00	0:00
396	13:48	51	0:22	4:43
397	24:34	58	0:34	6:04
398	0:00	0	0:00	0:00

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SHADOW - Main Result

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
399	129:48	163	1:09	48:20
400	28:59	57	0:40	10:42
401	70:19	84	0:59	10:01
402	0:00	0	0:00	0:00
403	17:47	56	0:27	6:02
404	243:27	208	2:22	77:40
406	2:09	22	0:08	1:00
407	7:01	30	0:18	2:22
408	80:25	94	1:07	18:32
410	40:02	103	0:32	16:19
412	0:00	0	0:00	0:00
413	0:00	0	0:00	0:00
416	0:00	0	0:00	0:00
417	55:20	101	0:48	16:43
418	77:50	168	0:45	15:02
420	30:28	55	0:43	10:14
421	28:16	83	0:27	12:42
422	128:40	239	0:54	36:55
423	147:06	255	0:49	39:50
424	11:13	39	0:25	2:22
425	0:00	0	0:00	0:00
427	219:08	295	0:56	64:40
428	76:32	117	1:01	11:36
429	71:12	177	0:39	19:42
430	22:35	67	0:35	7:38
432	21:18	46	0:34	3:51
434	18:33	65	0:27	6:00
435	0:00	0	0:00	0:00
437	51:48	77	0:53	11:29
438	0:00	0	0:00	0:00
439	8:32	30	0:21	1:02
440	0:00	0	0:00	0:00
441	41:28	69	0:47	13:56
442	0:00	0	0:00	0:00
443	24:32	73	0:25	11:10
444	18:35	43	0:34	6:14
445	9:52	35	0:26	2:57
447	89:54	161	0:55	23:36
449	56:33	164	0:33	16:32
451	50:31	82	0:48	9:22
452	0:00	0	0:00	0:00
453	0:00	0	0:00	0:00
454	10:24	37	0:24	3:56
456	45:51	76	0:42	6:25
457	0:00	0	0:00	0:00
458	64:34	145	0:37	21:40
459	20:18	64	0:31	4:30
460	0:00	0	0:00	0:00
461	51:56	102	0:47	12:49
462	0:00	0	0:00	0:00
463	16:09	55	0:25	5:29
464	9:45	34	0:25	2:25
466	0:06	3	0:02	0:02
467	6:38	35	0:15	3:05
468	17:15	48	0:27	8:00
469	0:00	0	0:00	0:00
474	0:00	0	0:00	0:00
475	55:45	66	1:03	10:34
476	40:18	93	0:35	6:56
477	124:47	278	0:41	34:14
478	0:00	0	0:00	0:00
479	26:35	94	0:25	7:31
480	0:00	0	0:00	0:00
481	15:45	42	0:30	5:07

To be continued on next page...

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
482	0:00	0	0:00	0:00
484	0:00	0	0:00	0:00
485	0:00	0	0:00	0:00
486	27:00	79	0:28	4:54
487	14:56	56	0:23	6:30
488	59:19	93	0:44	8:39
489	16:40	48	0:29	3:09
490	38:08	79	0:39	8:42
491	37:18	101	0:36	8:01
492	132:21	169	1:09	28:19
494	24:59	52	0:38	7:45
495	27:00	58	0:37	5:37
496	53:13	75	0:55	12:52
498	10:26	34	0:26	3:52
499	16:01	42	0:31	5:23
500	172:24	268	1:13	52:48
501	133:42	148	1:25	44:47
502	0:00	0	0:00	0:00
503	18:40	44	0:40	3:17
504	0:00	0	0:00	0:00
507	0:00	0	0:00	0:00
508	41:23	99	0:38	10:41
509	37:27	85	0:40	11:44
510	207:02	206	1:55	66:47
513	25:23	78	0:25	4:50
515	0:00	0	0:00	0:00
516	0:00	0	0:00	0:00
517	0:00	0	0:00	0:00
518	88:03	88	1:13	39:20
519	88:23	190	0:42	25:12
520	26:11	51	0:40	8:22
521	0:00	0	0:00	0:00
523	36:25	86	0:39	8:06
524	19:03	50	0:31	5:03
526	0:00	0	0:00	0:00
528	0:00	0	0:00	0:00
529	60:30	111	0:46	20:12
530	0:00	0	0:00	0:00
531	14:43	40	0:27	2:36
532	14:45	46	0:27	4:55
533	0:00	0	0:00	0:00
534	40:57	76	0:37	5:44
535	0:00	0	0:00	0:00
536	0:00	0	0:00	0:00
538	0:00	0	0:00	0:00
539	9:50	36	0:24	2:24
540	0:00	0	0:00	0:00
541	0:00	0	0:00	0:00
542	0:00	0	0:00	0:00
543	18:44	68	0:24	6:14
544	0:00	0	0:00	0:00
545	0:00	0	0:00	0:00
546	0:00	0	0:00	0:00
547	33:56	59	0:45	10:48
549	0:00	0	0:00	0:00
550	0:00	0	0:00	0:00
551	0:00	0	0:00	0:00
552	25:32	66	0:28	3:30
553	83:27	116	0:55	13:08
554	2:19	15	0:12	1:04
555	0:00	0	0:00	0:00
556	0:00	0	0:00	0:00
557	0:00	0	0:00	0:00
558	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
559	39:57	99	0:33	13:43
560	0:00	0	0:00	0:00
561	0:00	0	0:00	0:00
562	8:07	30	0:23	2:41
563	0:00	0	0:00	0:00
564	49:14	73	0:57	8:31
566	49:52	81	0:48	19:29
567	14:43	45	0:27	4:51
569	95:54	136	1:12	34:26
570	125:30	197	1:06	40:39
571	0:00	0	0:00	0:00
572	0:00	0	0:00	0:00
573	0:00	0	0:00	0:00
574	40:54	78	0:36	18:30
575	10:19	36	0:25	2:27
576	89:01	141	1:01	29:32
577	9:36	33	0:25	3:13
578	9:48	36	0:24	3:10
579	0:00	0	0:00	0:00
580	133:33	121	1:27	30:50
581	0:00	0	0:00	0:00
582	0:00	0	0:00	0:00
583	44:53	85	0:43	10:33
584	11:21	37	0:27	2:46
585	2:01	14	0:11	0:14
586	61:13	132	0:38	11:23
588	0:00	0	0:00	0:00
590	0:00	0	0:00	0:00
591	0:00	0	0:00	0:00
592	0:00	0	0:00	0:00
593	31:34	56	0:41	14:33
594	38:38	55	0:53	7:07
596	123:31	203	0:51	39:37
597	0:00	0	0:00	0:00
598	0:00	0	0:00	0:00
599	0:00	0	0:00	0:00
601	12:57	32	0:30	2:14
602	34:14	65	0:41	13:08
604	43:03	89	0:39	16:25
605	0:00	0	0:00	0:00
606	19:21	46	0:32	4:24
607	25:45	76	0:28	3:41
608	78:05	90	1:07	27:26
609	31:49	63	0:38	10:56
610	0:00	0	0:00	0:00
611	83:31	132	0:47	35:45
612	14:19	40	0:29	4:48
613	29:53	54	0:41	5:34
614	106:37	195	0:48	31:02
615	40:59	65	0:49	12:54
617	19:20	64	0:30	4:36
618	26:03	57	0:35	12:00
619	0:00	0	0:00	0:00
620	57:16	117	0:39	19:49
622	0:00	0	0:00	0:00
624	21:04	71	0:26	6:36
625	0:33	13	0:04	0:10
626	67:23	134	0:54	23:50
628	86:10	146	1:00	25:10
629	0:00	0	0:00	0:00
630	74:58	118	0:57	16:37
631	88:15	104	1:08	13:01
634	22:48	47	0:37	7:31
635	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
636	54:25	88	0:49	18:22
639	0:00	0	0:00	0:00
641	84:23	95	1:09	26:33
643	60:12	116	0:45	25:25
645	0:06	3	0:02	0:00
647	0:00	0	0:00	0:00
648	99:10	109	1:12	28:37
650	0:00	0	0:00	0:00
652	105:14	92	1:36	15:57
653	84:43	133	0:49	31:32
654	0:00	0	0:00	0:00
655	0:00	0	0:00	0:00
656	17:34	62	0:26	3:49
657	40:29	85	0:43	11:15
658	0:00	0	0:00	0:00
659	78:25	138	0:47	25:08
660	0:00	0	0:00	0:00
661	37:58	68	0:41	17:21
662	11:01	36	0:26	2:43
663	83:21	102	0:56	17:32
664	27:44	56	0:36	5:11
665	68:11	90	0:52	9:52
668	13:57	40	0:29	3:20
669	10:14	34	0:26	3:09
670	33:00	89	0:35	7:56
677	0:00	0	0:00	0:00
678	16:09	45	0:30	6:16
679	55:02	112	0:39	17:59
680	0:00	0	0:00	0:00
681	30:10	85	0:29	5:27
682	59:36	115	0:51	13:26
683	67:54	80	1:01	23:40
684	28:05	82	0:30	4:10
685	0:00	0	0:00	0:00
686	34:54	102	0:27	6:32
687	22:01	70	0:28	7:17
688	113:18	170	1:02	35:50
689	10:57	38	0:24	2:50
690	0:00	0	0:00	0:00
691	65:02	137	0:37	12:30
692	0:00	0	0:00	0:00
693	116:38	181	1:11	39:50
695	19:02	44	0:34	6:27
696	0:00	0	0:00	0:00
697	0:00	0	0:00	0:00
698	0:00	0	0:00	0:00
699	101:39	147	0:52	21:07
701	0:00	0	0:00	0:00
702	16:07	45	0:30	4:36
703	11:04	34	0:27	3:25
704	40:29	63	0:49	12:57
705	0:00	0	0:00	0:00
706	0:00	0	0:00	0:00
708	33:48	78	0:35	5:20
710	0:00	0	0:00	0:00
713	46:08	114	0:33	7:24
714	8:33	30	0:22	1:27
716	0:00	0	0:00	0:00
717	0:00	0	0:00	0:00
718	122:02	204	1:18	40:29
722	62:20	146	0:36	16:06
723	0:00	0	0:00	0:00
724	0:00	0	0:00	0:00
725	94:08	130	0:54	15:11

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
726	17:53	59	0:27	3:58
727	48:30	108	0:37	10:48
728	128:14	138	1:24	41:06
729	26:01	59	0:37	7:20
730	0:00	0	0:00	0:00
731	34:34	66	0:41	6:40
733	0:00	0	0:00	0:00
734	69:44	126	0:50	23:00
735	10:16	38	0:24	4:03
737	0:00	0	0:00	0:00
738	0:00	0	0:00	0:00
739	48:14	84	0:47	17:59
740	96:14	120	1:14	35:32
742	0:00	0	0:00	0:00
743	41:34	72	0:45	8:07
744	55:19	125	0:38	12:22
745	0:00	0	0:00	0:00
746	17:57	58	0:29	3:16
747	18:17	65	0:27	2:49
748	62:40	112	0:44	27:40
749	0:00	0	0:00	0:00
750	11:54	40	0:22	4:03
752	138:55	202	1:03	41:37
753	0:00	0	0:00	0:00
755	20:40	46	0:33	3:44
756	23:29	50	0:36	8:33
757	21:07	68	0:25	9:40
759	47:51	83	0:53	8:47
760	78:03	191	0:36	27:16
761	0:00	0	0:00	0:00
762	40:53	95	0:39	13:56
764	14:56	43	0:29	4:14
766	0:00	0	0:00	0:00
767	0:00	0	0:00	0:00
769	0:00	0	0:00	0:00
770	172:14	171	1:58	42:52
772	78:06	184	0:47	17:25
774	0:00	0	0:00	0:00
775	0:00	0	0:00	0:00
776	0:00	0	0:00	0:00
777	0:00	0	0:00	0:00
778	9:17	32	0:22	1:08
779	130:56	266	0:53	37:40
780	0:00	0	0:00	0:00
781	0:00	0	0:00	0:00
782	0:00	0	0:00	0:00
783	0:00	0	0:00	0:00
784	0:00	0	0:00	0:00
785	161:07	214	1:24	49:57
787	32:26	80	0:35	8:23
788	0:00	0	0:00	0:00
789	0:00	0	0:00	0:00
791	0:00	0	0:00	0:00
793	0:00	0	0:00	0:00
794	0:00	0	0:00	0:00
795	28:45	67	0:31	13:08
796	61:04	108	0:47	24:07
797	0:00	0	0:00	0:00
798	31:04	93	0:29	9:33
799	0:00	0	0:00	0:00
801	0:00	0	0:00	0:00
803	0:00	0	0:00	0:00
804	0:00	0	0:00	0:00
805	11:07	38	0:26	4:04

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
806	35:25	70	0:40	8:42
808	0:00	0	0:00	0:00
809	22:29	55	0:33	8:51
810	0:00	0	0:00	0:00
811	25:46	67	0:29	8:53
812	5:01	27	0:14	1:41
813	30:57	57	0:42	9:28
814	0:00	0	0:00	0:00
815	32:37	113	0:26	7:10
816	19:29	46	0:34	4:47
817	2:03	15	0:10	0:14
818	0:00	0	0:00	0:00
819	0:00	0	0:00	0:00
821	0:00	0	0:00	0:00
822	8:38	31	0:24	2:51
823	114:17	140	1:26	19:26
824	88:44	149	1:02	30:45
825	19:07	58	0:27	8:50
826	78:19	173	0:46	16:04
827	234:18	273	1:41	64:02
828	0:00	0	0:00	0:00
829	0:00	0	0:00	0:00
830	0:00	0	0:00	0:00
831	1:37	12	0:10	0:11
832	64:26	94	0:57	9:12
834	93:39	181	0:42	34:23
835	0:00	0	0:00	0:00
837	0:00	0	0:00	0:00
838	26:01	74	0:26	9:00
840	11:29	34	0:27	3:51
841	14:41	41	0:26	5:00
843	0:00	0	0:00	0:00
844	33:27	67	0:36	15:17
845	28:18	46	0:46	5:03
846	27:17	81	0:29	8:03
847	0:00	0	0:00	0:00
848	41:21	86	0:45	10:23
849	20:25	68	0:28	6:45
850	0:00	0	0:00	0:00
851	26:09	65	0:32	12:02
852	0:00	0	0:00	0:00
853	42:12	96	0:35	13:33
854	25:06	49	0:39	8:02
855	127:52	192	1:02	39:13
857	174:20	229	1:25	53:34
860	163:27	144	1:23	39:56
861	87:33	199	0:39	31:14
862	42:50	112	0:32	12:19
863	16:44	41	0:32	5:31
864	71:19	140	0:49	19:18
865	0:00	0	0:00	0:00
866	17:06	50	0:29	5:43
868	74:52	132	0:48	12:48
869	126:24	219	1:10	32:32
870	178:06	199	1:24	61:49
871	98:35	158	0:53	18:55
872	0:00	0	0:00	0:00
873	38:29	74	0:35	5:22
874	0:00	0	0:00	0:00
875	0:00	0	0:00	0:00
876	0:00	0	0:00	0:00
878	0:00	0	0:00	0:00
879	172:23	234	1:04	45:22
880	120:49	203	1:18	40:02

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
881	44:30	80	0:38	8:50
882	0:00	0	0:00	0:00
883	0:00	0	0:00	0:00
885	61:12	123	0:45	21:04
886	26:11	88	0:27	11:42
887	83:09	102	0:56	17:30
889	0:21	12	0:02	0:09
890	0:00	0	0:00	0:00
891	0:00	0	0:00	0:00
892	12:56	38	0:28	3:08
893	29:27	84	0:30	4:25
894	0:00	0	0:00	0:00
895	34:21	96	0:27	6:17
896	49:47	128	0:38	14:21
897	0:00	0	0:00	0:00
898	0:00	0	0:00	0:00
899	23:01	68	0:32	6:18
901	0:00	0	0:00	0:00
902	27:49	79	0:30	5:59
903	77:04	128	0:48	23:34
904	0:00	0	0:00	0:00
905	0:00	0	0:00	0:00
907	25:16	76	0:30	4:55
908	65:49	92	0:49	9:35
909	17:05	50	0:28	2:58
911	0:00	0	0:00	0:00
912	40:50	99	0:36	8:47
914	0:00	0	0:00	0:00
916	38:34	90	0:40	11:15
917	14:21	44	0:27	4:45
919	0:00	0	0:00	0:00
921	0:00	0	0:00	0:00
922	17:38	45	0:32	5:54
923	191:57	239	1:04	49:42
924	0:00	0	0:00	0:00
925	33:30	85	0:46	9:39
926	35:07	71	0:40	14:06
927	60:02	80	0:58	20:50
928	31:24	61	0:39	6:15
929	0:00	0	0:00	0:00
930	0:00	0	0:00	0:00
931	0:00	0	0:00	0:00
932	130:07	238	0:48	38:32
933	0:00	0	0:00	0:00
934	0:00	0	0:00	0:00
935	0:00	0	0:00	0:00
937	0:00	0	0:00	0:00
938	116:29	207	1:14	35:18
940	147:45	236	1:09	46:20
941	139:49	231	1:04	43:39
942	45:58	118	0:32	18:19
943	52:48	109	0:40	11:51
944	42:56	100	0:31	19:07
945	28:43	58	0:38	7:50
946	0:00	0	0:00	0:00
948	173:47	200	1:15	61:23
949	0:00	0	0:00	0:00
950	9:09	34	0:24	3:05
951	76:37	117	0:59	26:24
952	9:55	37	0:24	3:42
954	13:59	38	0:30	4:18
955	17:47	47	0:31	5:07
956	145:23	187	1:19	37:25
958	35:34	60	0:44	6:45

To be continued on next page...

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EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
959	0:00	0	0:00	0:00
960	0:00	0	0:00	0:00
961	0:00	0	0:00	0:00
962	0:00	0	0:00	0:00
963	0:00	0	0:00	0:00
964	0:00	0	0:00	0:00
965	22:50	89	0:24	8:51
966	0:00	0	0:00	0:00
967	0:00	0	0:00	0:00
968	33:13	90	0:30	14:44
969	74:55	117	0:57	12:04
970	39:12	81	0:39	8:55
971	40:02	102	0:36	11:19
972	21:49	80	0:26	3:12
973	27:19	60	0:36	10:47
974	94:28	154	0:55	22:24
975	92:11	66	1:44	17:33
976	22:43	64	0:26	3:06
977	0:00	0	0:00	0:00
978	0:00	0	0:00	0:00
979	0:00	0	0:00	0:00
980	112:49	137	1:03	25:51
981	4:12	20	0:16	0:29
982	11:07	35	0:27	3:30
985	0:00	0	0:00	0:00
986	70:52	118	0:47	31:06
987	68:37	176	0:38	21:46
988	17:25	57	0:27	5:54
990	0:00	0	0:00	0:00
992	13:21	40	0:27	5:02
993	42:33	125	0:29	9:16
994	23:54	50	0:37	8:40
997	27:18	56	0:37	12:36
998	176:13	129	1:32	61:40
999	97:52	197	0:55	23:17
1000	0:00	0	0:00	0:00
1002	22:14	74	0:28	3:46
1003	0:00	0	0:00	0:00
1004	0:00	0	0:00	0:00
1005	66:10	121	0:54	22:15
1006	0:00	0	0:00	0:00
1007	18:22	67	0:25	5:33
1008	53:48	75	0:55	13:09
1009	0:00	0	0:00	0:00
1010	0:00	0	0:00	0:00
1011	0:00	0	0:00	0:00
1012	27:04	56	0:37	5:28
1013	96:20	82	1:27	14:43
1014	27:25	81	0:29	8:07
1016	7:44	30	0:22	2:36
1017	0:00	0	0:00	0:00
1018	42:41	94	0:35	18:51
1019	30:58	82	0:29	13:55
1020	15:44	45	0:26	7:19
1021	0:00	0	0:00	0:00
1022	87:54	188	0:39	32:31
1023	0:00	0	0:00	0:00
1024	0:56	10	0:07	0:06
1025	0:00	0	0:00	0:00
1028	8:41	32	0:21	1:03
1029	0:00	0	0:00	0:00
1030	186:54	230	1:18	53:40
1031	0:00	0	0:00	0:00
1032	13:41	36	0:35	6:07

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1033	0:00	0	0:00	0:00
1034	0:00	0	0:00	0:00
1035	0:00	0	0:00	0:00
1036	58:54	140	0:34	15:08
1038	64:27	168	0:36	22:00
1039	0:00	0	0:00	0:00
1040	105:51	135	1:25	34:58
1042	9:14	33	0:24	2:50
1043	255:00	215	2:25	81:27
1044	80:59	137	0:48	13:18
1045	48:46	103	0:41	20:42
1046	0:00	0	0:00	0:00
1047	10:28	36	0:26	3:52
1048	83:36	141	0:55	20:26
1049	58:31	89	0:55	8:07
1052	0:00	0	0:00	0:00
1053	34:03	68	0:40	13:24
1054	23:42	89	0:25	6:55
1055	75:44	72	1:34	14:12
1056	241:10	288	1:08	68:36
1058	0:00	0	0:00	0:00
1059	141:39	134	1:15	23:52
1060	0:00	0	0:00	0:00
1061	0:00	0	0:00	0:00
1062	0:00	0	0:00	0:00
1063	0:05	3	0:02	0:00
1065	22:38	47	0:37	7:32
1066	22:31	57	0:30	10:23
1067	104:29	179	0:58	30:54
1068	121:56	187	1:09	28:50
1069	0:00	0	0:00	0:00
1070	0:00	0	0:00	0:00
1072	0:00	0	0:00	0:00
1073	0:00	0	0:00	0:00
1074	8:55	30	0:22	1:05
1075	74:36	102	0:56	11:01
1076	0:00	0	0:00	0:00
1077	41:25	64	0:50	11:45
1079	9:04	32	0:24	2:49
1080	0:00	0	0:00	0:00
1081	0:00	0	0:00	0:00
1082	97:49	110	1:17	25:32
1084	20:58	54	0:31	5:03
1085	132:59	171	1:13	33:48
1086	15:00	50	0:26	5:04
1087	0:00	0	0:00	0:00
1088	0:00	0	0:00	0:00
1089	26:47	79	0:31	8:52
1090	63:19	195	0:35	19:21
1091	95:12	112	0:59	14:44
1092	0:00	0	0:00	0:00
1094	0:00	0	0:00	0:00
1095	0:00	0	0:00	0:00
1096	0:00	0	0:00	0:00
1097	62:55	135	0:43	12:21
1098	59:08	78	1:11	12:53
1099	0:00	0	0:00	0:00
1100	12:44	40	0:27	4:46
1101	0:00	0	0:00	0:00
1102	32:47	113	0:28	6:40
1103	61:35	144	0:39	15:23
1104	0:00	0	0:00	0:00
1105	72:04	149	0:49	18:32
1106	120:20	179	1:11	41:14

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1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1107	0:00	0	0:00	0:00
1108	0:00	0	0:00	0:00
1109	36:09	61	0:46	12:22
1110	56:16	123	0:35	19:15
1111	21:22	47	0:36	7:12
1113	0:00	0	0:00	0:00
1114	44:07	97	0:39	7:15
1115	48:17	136	0:39	9:51
1117	28:58	62	0:35	13:18
1118	56:36	146	0:36	16:24
1119	24:37	65	0:30	11:17
1120	0:00	0	0:00	0:00
1123	0:00	0	0:00	0:00
1124	15:57	51	0:27	6:41
1125	0:00	0	0:00	0:00
1126	48:34	80	0:42	9:39
1127	39:56	92	0:35	6:51
1128	0:00	0	0:00	0:00
1130	34:54	95	0:28	6:16
1131	124:27	102	1:26	18:16
1132	20:52	50	0:34	4:41
1133	18:06	48	0:31	5:03
1134	0:00	0	0:00	0:00
1135	0:00	0	0:00	0:00
1136	148:00	183	1:27	47:11
1137	90:18	92	1:29	31:17
1138	10:35	36	0:25	2:22
1139	0:00	0	0:00	0:00
1140	20:11	44	0:35	6:48
1141	0:00	0	0:00	0:00
1143	22:17	82	0:24	7:42
1144	15:59	43	0:30	4:52
1146	102:19	114	1:01	35:54
1148	0:00	0	0:00	0:00
1149	9:10	32	0:24	3:22
1150	0:00	0	0:00	0:00
1151	149:08	141	1:25	53:41
1153	50:55	91	0:45	9:46
1154	0:00	0	0:00	0:00
1155	76:03	143	0:49	26:52
1156	83:33	158	0:52	23:28
1158	106:44	126	1:01	37:19
1160	10:00	38	0:24	2:39
1161	0:00	0	0:00	0:00
1162	41:12	85	0:40	16:05
1164	10:59	28	0:29	1:20
1166	0:00	0	0:00	0:00
1167	0:00	0	0:00	0:00
1168	0:00	0	0:00	0:00
1169	0:00	0	0:00	0:00
1170	0:00	0	0:00	0:00
1171	58:16	86	0:46	26:05
1172	77:19	126	0:51	15:19
1173	0:00	0	0:00	0:00
1174	99:24	141	1:02	34:39
1175	0:00	0	0:00	0:00
1177	45:51	103	0:41	20:18
1178	14:58	50	0:26	5:03
1179	284:08	256	2:14	94:40
1181	0:00	0	0:00	0:00
1182	0:00	0	0:00	0:00
1183	0:00	0	0:00	0:00
1184	0:00	0	0:00	0:00
1185	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Shadow, worst case			Shadow, expected values
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1186	0:00	0	0:00	0:00
1188	0:00	0	0:00	0:00
1189	17:50	46	0:32	4:11
1190	31:37	77	0:30	14:19
1191	61:16	117	0:54	21:56
1193	0:00	0	0:00	0:00
1194	0:00	0	0:00	0:00
1195	36:52	94	0:32	16:17
1196	42:37	97	0:36	10:16
1197	21:01	47	0:33	9:46
1198	0:00	0	0:00	0:00
1199	0:00	0	0:00	0:00
1200	0:00	0	0:00	0:00
1201	0:00	0	0:00	0:00
1202	0:00	0	0:00	0:00
1203	24:09	71	0:26	8:20
1204	114:51	147	1:29	30:42
1206	9:44	37	0:24	2:22
1207	0:00	0	0:00	0:00
1210	20:15	64	0:29	3:11
1211	71:13	145	0:45	21:56
1212	39:21	77	0:35	5:31
1213	0:00	0	0:00	0:00
1215	24:54	73	0:30	9:20
1217	0:00	0	0:00	0:00
1218	34:14	62	0:42	12:48
1219	68:40	129	0:42	22:39
1220	0:00	0	0:00	0:00
1221	11:36	35	0:25	1:26
1224	15:52	51	0:24	7:21
1225	14:46	43	0:26	6:53
1226	0:00	0	0:00	0:00
1227	22:59	58	0:28	3:03
1228	114:00	76	2:03	21:17
1229	0:00	0	0:00	0:00
1231	160:38	116	1:48	26:39
1232	9:28	34	0:24	3:07
1233	0:00	0	0:00	0:00
1234	41:46	64	0:47	19:07
1235	24:03	52	0:35	4:26
1236	180:48	227	1:16	45:34
1237	112:11	168	1:03	35:28
1238	37:14	76	0:34	16:52
1239	0:00	0	0:00	0:00
1240	98:14	101	1:16	27:14
1241	10:27	39	0:24	4:07
1242	0:00	0	0:00	0:00
1243	0:00	0	0:00	0:00
1244	15:44	41	0:31	4:53
1245	0:00	0	0:00	0:00
1246	0:00	0	0:00	0:00
1248	22:07	49	0:35	5:13
1249	0:00	0	0:00	0:00
1250	0:00	0	0:00	0:00
1252	0:00	0	0:00	0:00
1253	82:27	140	0:47	34:28
1254	0:00	0	0:00	0:00
1257	22:20	72	0:25	4:10
1259	21:10	72	0:25	3:00
1260	0:00	0	0:00	0:00
1262	0:00	0	0:00	0:00
1264	90:52	112	1:04	34:49
1265	0:00	0	0:00	0:00
1266	27:00	54	0:37	12:29

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1267	17:25	40	0:34	3:04
1268	0:00	0	0:00	0:00
1269	181:45	257	1:19	53:32
1270	0:00	0	0:00	0:00
1271	102:48	198	0:46	28:04
1272	0:00	0	0:00	0:00
1273	0:00	0	0:00	0:00
1274	26:13	78	0:28	3:46
1276	36:37	73	0:36	16:39
1277	90:07	130	0:52	14:36
1278	15:58	56	0:25	3:32
1279	53:16	90	0:48	13:03
1280	0:00	0	0:00	0:00
1281	0:00	0	0:00	0:00
1282	0:00	0	0:00	0:00
1283	0:00	0	0:00	0:00
1284	68:37	141	0:38	12:52
1285	0:00	0	0:00	0:00
1286	20:20	62	0:29	6:54
1288	30:04	83	0:34	7:30
1289	43:15	76	0:39	6:03
1290	51:04	108	0:38	17:01
1292	0:00	0	0:00	0:00
1294	0:00	0	0:00	0:00
1297	45:22	94	0:37	6:44
1298	0:00	0	0:00	0:00
1299	11:18	46	0:20	5:16
1300	0:00	0	0:00	0:00
1301	75:10	88	1:06	23:33
1302	0:00	0	0:00	0:00
1303	21:57	48	0:36	7:20
1304	0:00	0	0:00	0:00
1305	18:11	42	0:33	5:04
1306	0:00	0	0:00	0:00
1308	41:16	81	0:41	17:02
1309	69:39	86	0:56	9:59
1310	14:31	47	0:27	2:32
1311	0:00	0	0:00	0:00
1312	34:32	106	0:27	6:39
1313	24:10	75	0:30	7:59
1314	103:59	163	1:00	34:10
1315	0:00	0	0:00	0:00
1317	34:30	63	0:40	15:50
1318	0:00	0	0:00	0:00
1319	70:04	125	1:01	21:26
1321	0:00	0	0:00	0:00
1323	0:00	0	0:00	0:00
1324	8:57	33	0:24	3:00
1325	13:19	40	0:27	4:19
1328	17:02	46	0:31	4:48
1329	0:00	0	0:00	0:00
1330	0:00	0	0:00	0:00
1331	0:00	0	0:00	0:00
1334	0:00	0	0:00	0:00
1335	0:00	0	0:00	0:00
1338	0:00	0	0:00	0:00
1339	0:00	0	0:00	0:00
1341	45:57	116	0:33	7:26
1343	0:00	0	0:00	0:00
1344	56:08	148	0:36	16:13
1345	0:00	0	0:00	0:00
1347	0:00	0	0:00	0:00
1348	0:00	0	0:00	0:00
1350	16:41	46	0:27	2:59

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1351	0:00	0	0:00	0:00
1353	37:27	70	0:42	6:56
1354	0:00	0	0:00	0:00
1355	101:30	96	1:15	14:49
1356	0:00	0	0:00	0:00
1358	30:39	64	0:34	5:51
1360	16:17	41	0:30	5:33
1361	45:38	74	0:49	12:54
1362	80:22	116	0:53	12:51
1363	0:00	0	0:00	0:00
1364	77:31	89	1:08	20:35
1366	25:24	77	0:25	8:47
1367	0:00	0	0:00	0:00
1371	98:19	166	1:08	26:30
1372	27:03	54	0:37	12:30
1373	0:00	0	0:00	0:00
1374	0:00	0	0:00	0:00
1375	271:07	255	2:08	92:01
1377	76:33	88	1:21	26:24
1378	11:50	42	0:26	3:01
1379	11:19	34	0:27	3:48
1380	43:12	67	0:49	13:24
1381	36:43	95	0:33	16:10
1383	18:00	60	0:27	2:50
1384	50:23	104	0:37	22:21
1385	64:46	156	0:39	19:41
1386	55:53	90	0:43	8:06
1387	23:50	60	0:27	3:12
1388	0:00	0	0:00	0:00
1389	95:19	197	0:45	25:11
1390	0:00	0	0:00	0:00
1395	31:42	77	0:30	14:21
1396	114:32	250	0:56	34:52
1397	0:00	0	0:00	0:00
1398	0:00	0	0:00	0:00
1399	0:00	0	0:00	0:00
1400	0:00	0	0:00	0:00
1402	11:08	35	0:27	3:25
1404	24:14	72	0:29	8:18
1405	0:00	0	0:00	0:00
1406	36:46	81	0:32	12:45
1408	37:29	65	0:51	7:40
1409	0:00	0	0:00	0:00
1410	59:23	91	0:52	20:02
1411	0:00	0	0:00	0:00
1412	24:30	79	0:28	5:13
1414	22:02	54	0:31	7:33
1415	0:00	0	0:00	0:00
1416	0:00	0	0:00	0:00
1417	23:35	54	0:34	4:40
1418	0:00	0	0:00	0:00
1420	51:29	158	0:28	13:09
1421	3:40	20	0:15	0:25
1422	131:19	128	1:12	30:28
1423	9:02	38	0:21	2:58
1424	25:05	86	0:27	8:39
1425	62:30	124	0:39	21:00
1426	79:36	129	0:51	16:17
1428	2:05	14	0:11	0:41
1429	27:44	111	0:25	7:12
1430	0:00	0	0:00	0:00
1431	162:39	216	1:25	50:26
1433	29:12	60	0:36	13:25
1434	66:36	129	0:47	23:02

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1435	24:24	63	0:31	8:17
1436	0:00	0	0:00	0:00
1437	37:35	84	0:32	16:50
1438	95:47	147	0:49	33:00
1439	31:34	70	0:33	14:24
1441	0:00	0	0:00	0:00
1442	87:11	138	1:00	21:50
1443	0:04	2	0:02	0:00
1445	31:56	61	0:41	12:04
1446	40:49	83	0:40	13:52
1449	0:00	0	0:00	0:00
1451	0:00	0	0:00	0:00
1452	0:00	0	0:00	0:00
1454	0:00	0	0:00	0:00
1455	0:00	0	0:00	0:00
1456	20:56	59	0:28	7:11
1457	24:38	52	0:37	5:38
1458	67:15	96	0:56	9:43
1459	71:00	197	0:32	20:51
1460	0:00	0	0:00	0:00
1461	102:47	172	0:59	35:37
1462	13:08	52	0:20	6:05
1463	30:18	58	0:41	11:14
1466	0:00	0	0:00	0:00
1467	0:00	0	0:00	0:00
1468	68:22	79	1:03	30:53
1469	0:00	0	0:00	0:00
1470	55:46	98	0:47	21:31
1471	20:37	48	0:32	2:39
1472	123:33	170	0:55	41:51
1473	167:50	233	1:10	53:04
1475	13:04	37	0:29	3:40
1477	0:00	0	0:00	0:00
1478	0:00	0	0:00	0:00
1480	22:50	48	0:37	8:03
1481	13:15	37	0:29	4:02
1482	51:45	106	0:45	17:55
1483	15:04	39	0:31	4:54
1484	26:51	68	0:30	12:17
1486	0:00	0	0:00	0:00
1488	105:57	100	1:24	22:32
1490	20:28	45	0:36	6:44
1491	64:14	113	0:47	11:29
1492	63:45	111	0:54	9:34
1493	148:23	253	0:50	40:16
1494	0:00	0	0:00	0:00
1495	255:08	283	1:23	72:11
1496	0:00	0	0:00	0:00
1497	0:00	0	0:00	0:00
1498	0:00	0	0:00	0:00
1499	0:00	0	0:00	0:00
1500	0:00	0	0:00	0:00
1501	101:00	133	1:02	22:29
1504	80:56	109	0:57	12:19
1505	84:40	148	0:41	28:57
1507	0:00	0	0:00	0:00
1508	20:37	46	0:33	3:44
1509	0:00	0	0:00	0:00
1510	68:42	118	1:00	13:32
1511	0:00	0	0:00	0:00
1512	10:53	35	0:26	2:45
1515	100:49	201	0:45	27:38
1517	0:00	0	0:00	0:00
1518	146:19	164	1:30	28:48

To be continued on next page...

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1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1519	23:02	70	0:29	10:00
1520	0:00	0	0:00	0:00
1523	16:13	47	0:26	7:32
1524	22:01	54	0:29	2:54
1525	0:00	0	0:00	0:00
1526	117:16	110	1:23	33:50
1527	48:08	68	0:52	9:20
1528	18:00	46	0:31	5:52
1529	42:59	72	0:43	19:32
1530	11:02	35	0:27	3:29
1531	144:41	166	1:22	59:37
1532	87:32	190	0:42	24:59
1533	26:33	52	0:39	8:16
1534	0:00	0	0:00	0:00
1535	0:00	0	0:00	0:00
1538	13:12	45	0:26	5:23
1539	0:00	0	0:00	0:00
1540	29:30	84	0:28	5:18
1541	0:00	0	0:00	0:00
1542	0:00	0	0:00	0:00
1543	12:35	53	0:24	2:59
1545	64:07	147	0:36	16:31
1546	38:06	87	0:40	11:35
1547	0:00	0	0:00	0:00
1548	0:00	0	0:00	0:00
1549	184:35	187	1:29	53:36
1550	69:46	144	0:40	28:53
1551	127:57	277	0:41	35:29
1552	136:16	171	1:14	47:27
1553	28:26	58	0:38	5:53
1554	81:43	133	1:01	15:13
1559	10:54	48	0:24	2:52
1561	0:00	0	0:00	0:00
1562	39:35	68	0:46	13:20
1564	0:00	0	0:00	0:00
1567	113:57	68	2:20	18:21
1568	134:08	177	1:17	32:32
1569	0:00	0	0:00	0:00
1570	82:10	156	0:55	28:55
1571	15:07	42	0:30	5:01
1573	18:28	50	0:31	4:54
1574	0:00	0	0:00	0:00
1575	43:27	70	0:48	14:39
1576	0:00	0	0:00	0:00
1577	0:00	0	0:00	0:00
1578	0:00	0	0:00	0:00
1579	0:00	0	0:00	0:00
1580	0:00	0	0:00	0:00
1581	0:00	0	0:00	0:00
1583	138:58	233	1:12	31:35
1584	10:46	38	0:24	4:08
1585	70:06	110	0:46	15:00
1586	79:04	159	0:46	14:24
1587	0:00	0	0:00	0:00
1588	36:16	94	0:32	15:56
1589	0:00	0	0:00	0:00
1590	0:00	0	0:00	0:00
1591	60:19	111	0:46	20:08
1592	36:16	68	0:42	6:49
1593	0:00	0	0:00	0:00
1594	2:10	18	0:09	1:00
1595	0:00	0	0:00	0:00
1596	0:00	0	0:00	0:00
1598	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1599	0:00	0	0:00	0:00
1601	66:01	170	0:38	20:57
1602	65:38	105	0:57	11:16
1603	124:02	262	0:46	36:31
1604	0:00	0	0:00	0:00
1605	0:00	0	0:00	0:00
1606	38:33	92	0:30	6:58
1607	24:28	40	0:47	3:22
1609	0:00	0	0:00	0:00
1610	0:00	0	0:00	0:00
1612	14:19	40	0:27	2:31
1613	23:37	72	0:27	3:21
1614	24:15	52	0:35	11:14
1615	31:50	80	0:31	4:34
1616	21:41	60	0:26	2:54
1617	0:00	0	0:00	0:00
1618	11:17	29	0:30	1:22
1619	36:58	64	0:41	7:06
1620	85:46	177	0:39	32:23
1621	0:00	0	0:00	0:00
1622	33:29	64	0:38	15:21
1623	0:00	0	0:00	0:00
1624	47:30	70	0:59	13:32
1625	0:00	0	0:00	0:00
1626	7:49	30	0:22	2:38
1627	0:00	0	0:00	0:00
1628	0:00	0	0:00	0:00
1629	20:45	51	0:31	9:37
1631	27:49	77	0:29	5:01
1632	0:00	0	0:00	0:00
1633	0:00	0	0:00	0:00
1634	9:54	32	0:23	4:36
1635	0:00	0	0:00	0:00
1636	11:22	35	0:27	3:29
1637	36:05	91	0:31	7:07
1638	17:13	43	0:32	4:17
1639	33:51	74	0:42	10:06
1640	0:00	0	0:00	0:00
1641	44:45	129	0:30	9:13
1642	11:10	36	0:26	4:10
1643	32:27	62	0:42	12:07
1647	0:00	0	0:00	0:00
1648	0:00	0	0:00	0:00
1649	0:00	0	0:00	0:00
1650	8:06	28	0:21	0:58
1651	24:33	55	0:36	5:08
1652	29:53	54	0:40	5:35
1653	145:18	144	1:41	26:57
1654	0:00	0	0:00	0:00
1656	37:12	115	0:28	12:18
1657	0:00	0	0:00	0:00
1659	0:00	0	0:00	0:00
1661	0:00	0	0:00	0:00
1662	32:29	92	0:30	11:44
1663	40:25	100	0:37	11:28
1664	14:48	49	0:25	5:00
1665	35:10	70	0:40	14:03
1666	143:30	196	0:57	47:24
1667	0:00	0	0:00	0:00
1669	0:00	0	0:00	0:00
1671	0:00	0	0:00	0:00
1672	77:07	120	0:58	17:04
1673	21:30	50	0:34	8:10
1674	45:42	84	0:47	6:24

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

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	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
1688	8:35	32	0:23	3:09
1693	8:00	30	0:23	2:05
1694	7:48	31	0:22	2:51
1709	0:00	0	0:00	0:00
1728	10:32	36	0:22	1:18
1795	10:44	37	0:25	2:27
1841	0:00	0	0:00	0:00
1853	0:00	0	0:00	0:00
1876	0:00	0	0:00	0:00
1899	0:00	0	0:00	0:00
1906	0:00	0	0:00	0:00
1909	0:00	0	0:00	0:00
1953	0:00	0	0:00	0:00
1979	8:57	34	0:23	2:09
2049	0:00	0	0:00	0:00
2053	24:40	77	0:27	4:29
2093	0:00	0	0:00	0:00
2107	0:00	0	0:00	0:00
2147	0:00	0	0:00	0:00
2171	8:33	32	0:23	2:08
2172	9:32	34	0:24	2:16
2175	7:59	31	0:23	2:08
2213	0:00	0	0:00	0:00
2302	11:23	38	0:25	2:26
2353	0:00	0	0:00	0:00
2388	17:26	48	0:26	2:14
2409	0:00	0	0:00	0:00
2452	0:00	0	0:00	0:00
2516	0:00	0	0:00	0:00
2554	23:07	73	0:28	4:21
2556	0:00	0	0:00	0:00
2561	0:00	0	0:00	0:00
2612	12:34	40	0:23	1:34
2619	0:00	0	0:00	0:00
2645	26:47	76	0:26	9:16
2659	10:14	36	0:24	2:22
2704	14:37	52	0:24	4:57
2743	0:00	0	0:00	0:00
2817	26:26	81	0:26	4:39
2820	21:43	56	0:27	2:52
2835	0:00	0	0:00	0:00
2844	0:00	0	0:00	0:00
2848	0:00	0	0:00	0:00
2880	17:26	48	0:27	2:14
2899	0:00	0	0:00	0:00
2964	8:11	30	0:23	2:12
3022	7:59	30	0:23	2:08
3054	0:00	0	0:00	0:00
3055	0:00	0	0:00	0:00
3056	0:00	0	0:00	0:00
3057	0:00	0	0:00	0:00
3058	0:00	0	0:00	0:00
3060	0:00	0	0:00	0:00
3061	0:00	0	0:00	0:00
3062	0:00	0	0:00	0:00
3063	0:00	0	0:00	0:00
3064	0:00	0	0:00	0:00
3065	0:00	0	0:00	0:00
3066	0:00	0	0:00	0:00
3067	0:00	0	0:00	0:00
3068	0:00	0	0:00	0:00
3069	0:00	0	0:00	0:00
3070	0:00	0	0:00	0:00
3071	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

	Shadow, worst case			Shadow, expected values
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
3072	0:00	0	0:00	0:00
3081	0:00	0	0:00	0:00
3082	0:00	0	0:00	0:00
3083	0:00	0	0:00	0:00
3085	0:00	0	0:00	0:00
3086	0:00	0	0:00	0:00
3097	14:56	41	0:30	3:38
3098	19:10	64	0:28	3:56
3105	0:00	0	0:00	0:00
3106	0:00	0	0:00	0:00
3107	0:00	0	0:00	0:00
3122	0:00	0	0:00	0:00
3123	0:00	0	0:00	0:00
3124	7:14	36	0:16	3:22
3125	0:00	0	0:00	0:00
3126	0:00	0	0:00	0:00
3127	0:00	0	0:00	0:00
3128	0:00	0	0:00	0:00
3129	0:00	0	0:00	0:00
3130	0:00	0	0:00	0:00
3131	0:00	0	0:00	0:00
3137	65:41	135	0:39	27:31
3138	47:15	118	0:36	20:16
3139	25:14	78	0:29	4:22
3140	17:12	50	0:29	3:02
3141	17:49	52	0:29	3:00
3142	26:43	66	0:28	3:39
3146	1:52	13	0:11	0:52
3147	0:00	0	0:00	0:00
3149	0:00	0	0:00	0:00
3152	36:32	72	0:34	7:08
3153	28:32	60	0:33	5:24
3154	0:00	0	0:00	0:00
3155	0:00	0	0:00	0:00
3157	29:24	62	0:37	11:39
3158	65:09	90	0:50	29:04
3159	0:00	0	0:00	0:00
3161	0:00	0	0:00	0:00
3162	8:56	32	0:24	2:59
3164	0:00	0	0:00	0:00
3168	8:30	32	0:24	2:11
3169	8:29	32	0:23	2:08
3170	8:44	32	0:24	2:09
3171	9:15	33	0:24	2:16
3172	9:41	34	0:25	2:24
3173	9:34	33	0:25	2:25
3174	29:16	85	0:26	5:01
3175	0:00	0	0:00	0:00
3176	0:00	0	0:00	0:00
3177	0:00	0	0:00	0:00
3179	14:16	43	0:25	6:39
3181	8:55	33	0:23	2:11
3183	0:00	0	0:00	0:00
3185	0:00	0	0:00	0:00
3186	0:00	0	0:00	0:00
3187	0:00	0	0:00	0:00
3188	0:00	0	0:00	0:00
3189	0:00	0	0:00	0:00
3190	0:00	0	0:00	0:00
3191	0:00	0	0:00	0:00
3192	0:00	0	0:00	0:00
3193	0:00	0	0:00	0:00
3194	0:00	0	0:00	0:00
3195	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
3196	0:00	0	0:00	0:00
3197	0:00	0	0:00	0:00
3198	0:00	0	0:00	0:00
3199	0:00	0	0:00	0:00
3200	0:00	0	0:00	0:00
3201	0:00	0	0:00	0:00
3202	0:00	0	0:00	0:00
3203	0:00	0	0:00	0:00
3204	0:00	0	0:00	0:00
3205	0:00	0	0:00	0:00
3206	0:00	0	0:00	0:00
3207	0:00	0	0:00	0:00
3212	0:00	0	0:00	0:00
3213	0:00	0	0:00	0:00
3214	0:00	0	0:00	0:00
3228	16:27	51	0:27	3:47
3229	0:00	0	0:00	0:00
3230	39:50	72	0:37	5:32
3231	0:00	0	0:00	0:00
3232	0:00	0	0:00	0:00
3233	0:00	0	0:00	0:00
3234	0:00	0	0:00	0:00
3235	0:00	0	0:00	0:00
3236	4:42	20	0:17	0:32

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
T1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (420)	170:02	29:49
T10	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (429)	251:15	91:48
T11	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (430)	215:45	49:54
T12	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (431)	129:29	28:22
T13	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (432)	245:35	71:42
T14	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (433)	323:18	64:07
T15	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (434)	149:14	27:45
T16	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (435)	179:54	54:16
T17	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (436)	89:24	29:36
T18	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (437)	133:43	44:45
T19	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (438)	180:16	62:17
T2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (421)	227:20	73:15
T20	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (439)	250:26	81:57
T21	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (440)	479:12	121:23
T22	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (441)	459:46	129:33
T23	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (442)	586:02	179:43
T24	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (443)	463:22	131:39
T25	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (444)	466:31	131:13
T26	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (445)	396:16	121:07
T27	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (446)	279:33	81:17
T28	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (447)	276:58	75:46
T29	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (448)	357:04	100:33
T3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (422)	463:46	150:26
T30	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (449)	317:22	94:31
T31	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (450)	243:29	65:06
T32	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (451)	293:11	87:35
T33	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (452)	176:50	51:54
T34	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (453)	440:06	121:25
T35	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (454)	246:06	75:20
T36	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (455)	256:37	84:17
T37	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (456)	328:48	102:29
T38	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (457)	408:45	110:35
T39	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (458)	403:11	133:06
T4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (423)	360:49	113:52
T40	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (459)	299:14	103:12

To be continued on next page...

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Emerson SFA

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
T41	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (460)	357:28	101:08
T42	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (461)	484:50	152:59
T43	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (462)	547:10	137:22
T44	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (463)	427:57	124:42
T45	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (464)	404:54	118:19
T46	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (465)	190:05	68:25
T47	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (466)	302:14	67:50
T48	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (467)	143:24	33:11
T49	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (468)	476:32	154:52
T5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (424)	435:02	139:28
T50	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (469)	19:40	6:24
T51	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (470)	224:20	69:01
T52	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (471)	171:51	55:54
T53	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (472)	222:42	62:48
T54	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (473)	337:41	74:20
T55	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (474)	280:23	71:44
T56	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (475)	242:08	67:17
T57	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (476)	130:30	39:21
T58	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (477)	154:32	55:54
T59	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (478)	227:23	71:54
T6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (425)	111:39	21:55
T60	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (479)	394:27	117:20
T61	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (480)	568:17	166:51
T62	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (481)	296:30	84:38
T63	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (482)	476:52	139:38
T64	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (483)	159:57	51:34
T65	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (484)	287:06	77:38
T66	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (485)	311:29	74:12
T67	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (504)	150:41	43:13
T68	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (486)	493:43	140:41
T69	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (487)	431:07	124:37
T7	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (426)	107:24	20:18
T70	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (505)	95:42	37:01
T71	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (488)	447:37	146:40
T72	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (489)	41:28	13:21
T73	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (490)	165:28	47:13
T74	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (491)	175:33	54:19
T75	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (492)	378:58	109:20
T76	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (493)	213:30	62:57
T77	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (494)	408:37	115:24
T78	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (495)	205:04	61:00
T79	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (496)	356:50	106:42
T8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (427)	84:41	23:34
T80	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (497)	141:40	31:58
T81	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (498)	167:21	54:19
T82	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (506)	222:28	69:14
T83	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (499)	209:40	62:43
T84	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (500)	256:11	72:54
T85	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (501)	449:43	128:35
T86	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (502)	230:12	68:13
T87	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (503)	602:17	144:18
T9	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (428)	187:03	70:14

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

Project:
2019-01-07_Emerson SFA

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 7 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6198)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April			May			June		
1	07:57		07:43		07:07		07:16		18:24 (T59)	06:31		19:19 (T78)	06:02		19:30 (T78)
	17:13		17:48		18:22		19:56	28	18:52 (T59)	20:27	42	20:01 (T78)	20:57	46	20:32 (T57)
2	07:57		07:42		07:06		07:15		18:26 (T59)	06:29		19:19 (T78)	06:01		19:32 (T78)
	17:14		17:49		18:23		19:57	24	18:50 (T59)	20:28	42	20:01 (T78)	20:58	45	20:33 (T57)
3	07:57		07:41		07:04		07:13		18:29 (T59)	06:28		19:19 (T78)	06:01		19:34 (T78)
	17:15		17:50		18:24	4	19:58	18	18:47 (T59)	20:29	43	20:02 (T78)	20:58	42	20:34 (T57)
4	07:57		07:40		07:03		07:11		18:34 (T59)	06:27		19:18 (T78)	06:01		19:35 (T78)
	17:16		17:52		18:25	18	19:59	6	18:40 (T59)	20:30	44	20:02 (T78)	20:59	40	20:34 (T57)
5	07:57		07:39		07:01		07:10			06:25		19:17 (T78)	06:00		19:37 (T78)
	17:17		17:53		18:27	25	20:00			20:31	45	20:02 (T78)	21:00	38	20:35 (T57)
6	07:57		07:38		06:59		07:08			06:24		19:17 (T78)	06:00		19:40 (T78)
	17:18		17:54		18:28	30	20:00			20:32	45	20:02 (T78)	21:00	34	20:36 (T57)
7	07:57		07:37		06:58		07:06			06:23		19:17 (T78)	06:00		20:07 (T57)
	17:19		17:55		18:29	33	20:01			20:33	45	20:02 (T78)	21:01	30	20:37 (T57)
8	07:57		07:36		07:56		07:05			06:22		19:17 (T78)	05:59		20:07 (T57)
	17:20		17:57		19:30	36	20:02			20:34	45	20:02 (T78)	21:02	30	20:37 (T57)
9	07:57		07:35		07:55		07:03			06:21		19:17 (T78)	05:59		20:07 (T57)
	17:21		17:58		19:31	39	20:04			20:35	45	20:02 (T78)	21:02	30	20:37 (T57)
10	07:57		07:34		07:53		07:02			06:20		19:17 (T78)	05:59		20:07 (T57)
	17:22		17:59		19:32	42	20:05			20:36	45	20:02 (T78)	21:03	31	20:38 (T57)
11	07:57		07:32		07:51		07:00			06:18		19:17 (T78)	05:59		20:07 (T57)
	17:23		18:00		19:33	44	20:06			20:37	45	20:02 (T78)	21:03	32	20:39 (T57)
12	07:56		07:31		07:50		06:58			06:17		19:18 (T78)	05:59		20:07 (T57)
	17:24		18:02		19:34	45	20:07			20:38	44	20:02 (T78)	21:04	32	20:39 (T57)
13	07:56		07:30		07:48		06:57			06:16		19:18 (T78)	05:59		20:07 (T57)
	17:25		18:03		19:36	46	20:08			20:39	44	20:02 (T78)	21:04	33	20:40 (T57)
14	07:56		07:29		07:46		06:55			06:15		19:18 (T78)	05:59		20:08 (T57)
	17:26		18:04		19:37	48	20:09			20:41	44	20:02 (T78)	21:05	32	20:40 (T57)
15	07:55		07:27		07:45		06:54			06:14		19:18 (T78)	05:59		20:08 (T57)
	17:27		18:05		19:38	49	20:10			20:42	43	20:01 (T78)	21:05	32	20:40 (T57)
16	07:55		07:26		07:43		06:52			06:13		19:18 (T78)	05:59		20:08 (T57)
	17:28		18:06		19:39	49	20:11			20:42	43	20:01 (T78)	21:06	33	20:41 (T57)
17	07:54		07:25		07:41		06:51			06:12		19:19 (T78)	05:59		20:08 (T57)
	17:30		18:08		19:40	50	20:12			20:43	42	20:01 (T78)	21:06	33	20:41 (T57)
18	07:54		07:23		07:40		06:49			06:12		19:19 (T78)	05:59		20:08 (T57)
	17:31		18:09		19:41	50	20:13			20:44	41	20:00 (T78)	21:07	33	20:41 (T57)
19	07:53		07:22		07:38		06:48			06:11		19:19 (T78)	05:59		20:08 (T57)
	17:32		18:10		19:42	51	20:14			20:45	40	19:59 (T78)	21:07	33	20:41 (T57)
20	07:53		07:21		07:36		06:46			06:10		19:21 (T78)	05:59		20:08 (T57)
	17:33		18:11		19:43	50	20:15			20:46	39	20:00 (T78)	21:07	34	20:42 (T57)
21	07:52		07:19		07:35		06:45		19:41 (T78)	06:09		19:21 (T78)	05:59		20:09 (T57)
	17:34		18:13		19:44	49	20:16	2	19:43 (T78)	20:47	38	19:59 (T78)	21:07	34	20:43 (T57)
22	07:52		07:18		07:33		06:43		19:34 (T78)	06:08		19:21 (T78)	05:59		20:09 (T57)
	17:35		18:14		19:45	49	20:17	15	19:49 (T78)	20:48	37	19:58 (T78)	21:08	34	20:43 (T57)
23	07:51		07:16		07:31		06:42		19:31 (T78)	06:07		19:22 (T78)	06:00		20:09 (T57)
	17:37		18:15		19:46	48	20:18	22	19:53 (T78)	20:49	44	20:24 (T57)	21:08	33	20:42 (T57)
24	07:50		07:15		07:30		06:40		19:29 (T78)	06:07		19:23 (T78)	06:00		20:09 (T57)
	17:38		18:16		19:48	47	20:20	26	19:55 (T78)	20:50	48	20:27 (T57)	21:08	33	20:42 (T57)
25	07:49		07:13		07:28		06:39		19:26 (T78)	06:06		19:24 (T78)	06:00		20:10 (T57)
	17:39		18:17		19:49	46	20:21	30	19:56 (T78)	20:51	47	20:27 (T57)	21:08	33	20:43 (T57)
26	07:49		07:12		07:26		06:37		19:25 (T78)	06:05		19:24 (T78)	06:00		20:10 (T57)
	17:40		18:18		19:50	45	20:22	32	19:57 (T78)	20:52	48	20:27 (T57)	21:08	33	20:43 (T57)
27	07:48		07:10		07:25		06:36		19:23 (T78)	06:05		19:26 (T78)	06:01		20:10 (T57)
	17:42		18:20		19:51	43	20:23	35	19:58 (T78)	20:53	48	20:29 (T57)	21:08	33	20:43 (T57)
28	07:47		07:09		07:23		06:35		19:22 (T78)	06:04		19:26 (T78)	06:01		20:11 (T57)
	17:43		18:21		19:52	41	20:24	37	19:59 (T78)	20:54	49	20:29 (T57)	21:08	32	20:43 (T57)
29	07:46				07:21		06:33		19:21 (T78)	06:03		19:28 (T78)	06:02		20:11 (T57)
	17:44				19:53	39	20:25	39	20:00 (T78)	20:54	47	20:30 (T57)	21:08	32	20:43 (T57)
30	07:45				07:20		06:32		19:20 (T78)	06:03		19:28 (T78)	06:02		20:11 (T57)
	17:45				19:54	36	20:26	40	20:00 (T78)	20:55	48	20:31 (T57)	21:08	32	20:43 (T57)
31	07:44				07:18		18:22 (T59)			06:02		19:30 (T78)			
	17:47				19:55	33	18:55 (T59)			20:56	47	20:32 (T57)			
Potential sun hours	297		297		370		399			448			452		
Total, worst case						1185		354			1367			1022	
Sun reduction						0.44		0.52			0.57			0.64	
Oper. time red.						1.00		1.00			1.00			1.00	
Wind dir. red.						0.66		0.59			0.57			0.54	
Total reduction						0.29		0.31			0.33			0.35	
Total, real						349		109			444			356	

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

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

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 7 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6198)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:03	20:11 (T57)	06:27	19:28 (T78)	06:58		07:28	17:59 (T59)	07:02	07:37
	21:08	32 20:43 (T57)	20:50	45 20:13 (T78)	20:07		19:15	46 18:45 (T59)	17:28	07:04
2	06:03	20:12 (T57)	06:28	19:27 (T78)	06:59		07:29	18:00 (T59)	07:03	07:38
	21:08	31 20:43 (T57)	20:49	45 20:12 (T78)	20:06		19:13	44 18:44 (T59)	17:27	07:04
3	06:04	20:12 (T57)	06:29	19:27 (T78)	07:00		07:30	18:01 (T59)	07:04	07:39
	21:08	31 20:43 (T57)	20:48	45 20:12 (T78)	20:04		19:12	43 18:44 (T59)	17:26	07:04
4	06:04	20:13 (T57)	06:30	19:27 (T78)	07:01		07:31	18:02 (T59)	07:06	07:40
	21:08	30 20:43 (T57)	20:47	45 20:12 (T78)	20:02		19:10	40 18:42 (T59)	17:25	07:03
5	06:05	20:12 (T57)	06:31	19:27 (T78)	07:02		07:32	18:03 (T59)	07:07	07:41
	21:08	30 20:42 (T57)	20:46	45 20:12 (T78)	20:01		19:08	38 18:41 (T59)	17:23	07:03
6	06:05	20:13 (T57)	06:32	19:27 (T78)	07:03		07:33	18:04 (T59)	07:08	07:42
	21:08	29 20:42 (T57)	20:44	45 20:12 (T78)	19:57		19:07	35 18:39 (T59)	17:22	07:03
7	06:06	19:44 (T78)	06:33	19:27 (T78)	07:04		07:34	18:05 (T59)	07:09	07:43
	21:07	36 20:41 (T57)	20:43	45 20:12 (T78)	19:56		19:05	32 18:37 (T59)	17:21	07:03
8	06:07	19:43 (T78)	06:34	19:27 (T78)	07:05		18:31 (T59)	07:35	18:07 (T59)	07:10	07:44
	21:07	40 20:42 (T57)	20:42	44 20:11 (T78)	19:54	3	18:34 (T59)	19:03	27 18:34 (T59)	17:20	07:03
9	06:07	19:42 (T78)	06:34	19:27 (T78)	07:06		18:23 (T59)	07:36	18:09 (T59)	07:12	07:45
	21:07	42 20:42 (T57)	20:41	44 20:11 (T78)	19:52	17	18:40 (T59)	19:02	22 18:31 (T59)	17:19	07:03
10	06:08	19:40 (T78)	06:35	19:28 (T78)	07:06		18:20 (T59)	07:37	18:13 (T59)	07:13	07:46
	21:06	43 20:41 (T57)	20:40	42 20:10 (T78)	19:51	23	18:43 (T59)	19:00	13 18:26 (T59)	17:18	07:03
11	06:09	19:39 (T78)	06:36	19:28 (T78)	07:07		18:17 (T59)	07:38		07:14	07:46
	21:06	46 20:41 (T57)	20:38	42 20:10 (T78)	19:49	28	18:45 (T59)	18:59		17:17	07:03
12	06:09	19:38 (T78)	06:37	19:28 (T78)	07:08		18:15 (T59)	07:39		07:15	07:47
	21:05	47 20:40 (T57)	20:37	41 20:09 (T78)	19:47	32	18:47 (T59)	18:57		17:16	07:03
13	06:10	19:37 (T78)	06:38	19:29 (T78)	07:09		18:13 (T59)	07:40		07:16	07:48
	21:05	47 20:39 (T57)	20:36	39 20:08 (T78)	19:46	35	18:48 (T59)	18:55		17:15	07:03
14	06:11	19:36 (T78)	06:39	19:29 (T78)	07:10		18:11 (T59)	07:41		07:18	07:49
	21:04	48 20:39 (T57)	20:34	39 20:08 (T78)	19:44	38	18:49 (T59)	18:54		17:14	07:04
15	06:12	19:36 (T78)	06:40	19:30 (T78)	07:11		18:08 (T59)	07:43		07:19	07:50
	21:04	48 20:39 (T57)	20:33	36 20:06 (T78)	19:42	41	18:49 (T59)	18:52		17:13	07:04
16	06:12	19:35 (T78)	06:41	19:31 (T78)	07:12		18:07 (T59)	07:44		07:20	07:50
	21:03	49 20:38 (T57)	20:32	34 20:05 (T78)	19:40	42	18:49 (T59)	18:51		17:13	07:04
17	06:13	19:34 (T78)	06:43	19:32 (T78)	07:13		18:06 (T59)	07:45		07:21	07:51
	21:03	48 20:37 (T57)	20:30	32 20:04 (T78)	19:39	44	18:50 (T59)	18:49		17:12	07:04
18	06:14	19:33 (T78)	06:44	19:33 (T78)	07:14		18:04 (T59)	07:46		07:22	07:52
	21:02	49 20:37 (T57)	20:29	29 20:02 (T78)	19:37	46	18:50 (T59)	18:48		17:11	07:05
19	06:15	19:33 (T78)	06:45	19:35 (T78)	07:15		18:03 (T59)	07:47		07:23	07:52
	21:01	47 20:36 (T57)	20:27	25 20:00 (T78)	19:35	47	18:50 (T59)	18:46		17:10	07:05
20	06:16	19:33 (T78)	06:46	19:37 (T78)	07:16		18:03 (T59)	07:48		07:25	07:53
	21:01	46 20:36 (T57)	20:26	21 19:58 (T78)	19:34	48	18:51 (T59)	18:45		17:10	07:05
21	06:16	19:32 (T78)	06:47	19:40 (T78)	07:17		18:02 (T59)	07:49		07:26	07:53
	21:00	38 20:32 (T57)	20:24	14 19:54 (T78)	19:32	49	18:51 (T59)	18:43		17:09	07:06
22	06:17	19:32 (T78)	06:48		07:18		18:01 (T59)	07:50		07:27	07:54
	20:59	37 20:09 (T78)	20:23		19:30	50	18:51 (T59)	18:42		17:08	07:06
23	06:18	19:30 (T78)	06:49		07:19		18:00 (T59)	07:52		07:28	07:54
	20:58	39 20:09 (T78)	20:21		19:29	50	18:50 (T59)	18:40		17:08	07:07
24	06:19	19:30 (T78)	06:50		07:20		18:00 (T59)	07:53		07:29	07:55
	20:58	40 20:10 (T78)	20:20		19:27	50	18:50 (T59)	18:39		17:07	07:07
25	06:20	19:30 (T78)	06:51		07:21		17:59 (T59)	07:54		07:30	07:55
	20:57	40 20:10 (T78)	20:18		19:25	51	18:50 (T59)	18:37		17:07	07:08
26	06:21	19:29 (T78)	06:52		07:23		17:59 (T59)	07:55		07:32	07:56
	20:56	42 20:11 (T78)	20:17		19:23	50	18:49 (T59)	18:36		17:06	07:09
27	06:22	19:29 (T78)	06:53		07:24		17:59 (T59)	07:56		07:33	07:56
	20:55	42 20:11 (T78)	20:15		19:22	50	18:49 (T59)	18:35		17:06	07:09
28	06:23	19:29 (T78)	06:54		07:25		17:59 (T59)	07:57		07:34	07:56
	20:54	43 20:12 (T78)	20:14		19:20	49	18:48 (T59)	18:33		17:05	07:10
29	06:24	19:29 (T78)	06:55		07:26		17:59 (T59)	07:58		07:35	07:57
	20:53	43 20:12 (T78)	20:12		19:18	48	18:47 (T59)	18:32		17:05	07:11
30	06:25	19:28 (T78)	06:56		07:27		17:59 (T59)	08:00		07:36	07:57
	20:52	44 20:12 (T78)	20:10		19:17	47	18:46 (T59)	18:31		17:04	07:12
31	06:26	19:28 (T78)	06:57					08:01			07:57
	20:51	45 20:13 (T78)	20:09					18:30			07:12
Potential sun hours	459		428		375			345		297	287
Total, worst case		1272		797		938		340			
Sun reduction		0.66		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.56		0.57		0.66		0.66			
Total reduction		0.37		0.35		0.39		0.32			
Total, real		472		279		370		109			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 54 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6238)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April			May		June		
1	07:57	07:43		07:07		16:55 (T59)	07:16			06:31		19:00 (T78)	06:02		19:56 (T57)
	17:13	17:48		18:22	53	17:48 (T59)	19:56			20:27	51	19:51 (T78)	20:57	36	20:32 (T57)
2	07:57	07:42		07:06		16:54 (T59)	07:15			06:29		19:00 (T78)	06:01		19:56 (T57)
	17:14	17:49		18:23	54	17:48 (T59)	19:57			20:28	51	19:51 (T78)	20:58	37	20:33 (T57)
3	07:57	07:41		07:04		16:54 (T59)	07:13			06:28		19:01 (T78)	06:01		19:57 (T57)
	17:15	17:50		18:24	55	17:49 (T59)	19:58			20:29	50	19:51 (T78)	20:58	36	20:33 (T57)
4	07:57	07:40		07:03		16:53 (T59)	07:11			06:27		19:01 (T78)	06:01		19:56 (T57)
	17:16	17:52		18:25	55	17:48 (T59)	19:59			20:30	50	19:51 (T78)	20:59	37	20:33 (T57)
5	07:57	07:39		07:01		16:53 (T59)	07:10			06:25		19:00 (T78)	06:00		19:56 (T57)
	17:17	17:53		18:27	55	17:48 (T59)	20:00			20:31	50	19:50 (T78)	21:00	38	20:34 (T57)
6	07:57	07:38		06:59		16:53 (T59)	07:08			06:24		19:01 (T78)	06:00		19:57 (T57)
	17:18	17:54		18:28	55	17:48 (T59)	20:00			20:32	48	19:49 (T78)	21:00	37	20:34 (T57)
7	07:57	07:37		06:58		16:53 (T59)	07:06			06:23		19:01 (T78)	06:00		19:57 (T57)
	17:19	17:55		18:29	55	17:48 (T59)	20:01			20:33	48	19:49 (T78)	21:01	38	20:35 (T57)
8	07:57	07:36		07:56		17:52 (T59)	07:05			06:22		19:02 (T78)	05:59		19:56 (T57)
	17:20	17:57		19:30	55	18:47 (T59)	20:02			20:34	47	19:49 (T78)	21:02	38	20:34 (T57)
9	07:57	07:35		07:55		17:53 (T59)	07:03			06:21		19:02 (T78)	05:59		19:57 (T57)
	17:21	17:58		19:31	54	18:47 (T59)	20:04			20:35	46	19:48 (T78)	21:02	37	20:34 (T57)
10	07:57	07:34		07:53		17:53 (T59)	07:02			06:20		19:03 (T78)	05:59		19:57 (T57)
	17:22	17:59		19:32	53	18:46 (T59)	20:05			20:36	45	19:48 (T78)	21:03	38	20:35 (T57)
11	07:57	07:32		07:51		17:54 (T59)	07:00			06:18		19:03 (T78)	05:59		19:57 (T57)
	17:23	18:00		19:33	52	18:46 (T59)	20:06			20:37	44	19:47 (T78)	21:03	38	20:35 (T57)
12	07:56	07:31		07:50		17:54 (T59)	06:58			06:17		19:04 (T78)	05:59		19:58 (T57)
	17:24	18:02		19:34	51	18:45 (T59)	20:07			20:38	43	19:47 (T78)	21:04	38	20:36 (T57)
13	07:56	07:30		07:48		17:54 (T59)	06:57		19:22 (T78)	06:16		19:05 (T78)	05:59		19:58 (T57)
	17:25	18:03		19:36	50	18:44 (T59)	20:08	15	19:37 (T78)	20:40	41	19:46 (T78)	21:04	38	20:36 (T57)
14	07:56	07:29		07:46		17:55 (T59)	06:55		19:17 (T78)	06:15		19:05 (T78)	05:59		19:58 (T57)
	17:26	18:04		19:37	48	18:43 (T59)	20:09	23	19:40 (T78)	20:41	40	19:45 (T78)	21:05	38	20:36 (T57)
15	07:55	07:27		07:45		17:56 (T59)	06:54		19:15 (T78)	06:14		19:06 (T78)	05:59		19:58 (T57)
	17:27	18:05		19:38	46	18:42 (T59)	20:10	28	19:43 (T78)	20:42	38	19:44 (T78)	21:05	38	20:36 (T57)
16	07:55	07:26	17:15 (T59)	07:43		17:56 (T59)	06:52		19:12 (T78)	06:13		19:07 (T78)	05:59		19:58 (T57)
	17:28	18:06	16 17:31 (T59)	19:39	44	18:40 (T59)	20:11	32	19:44 (T78)	20:43	36	19:43 (T78)	21:06	38	20:36 (T57)
17	07:54	07:25	17:10 (T59)	07:41		17:58 (T59)	06:51		19:11 (T78)	06:12		19:08 (T78)	05:59		19:58 (T57)
	17:30	18:08	24 17:34 (T59)	19:40	41	18:39 (T59)	20:12	35	19:46 (T78)	20:43	42	20:17 (T57)	21:06	39	20:37 (T57)
18	07:54	07:23	17:08 (T59)	07:40		17:59 (T59)	06:49		19:09 (T78)	06:12		19:09 (T78)	05:59		19:59 (T57)
	17:31	18:09	29 17:37 (T59)	19:41	38	18:37 (T59)	20:13	38	19:47 (T78)	20:44	46	20:20 (T57)	21:07	38	20:37 (T57)
19	07:53	07:22	17:06 (T59)	07:38		18:00 (T59)	06:48		19:08 (T78)	06:11		19:10 (T78)	05:59		19:59 (T57)
	17:32	18:10	33 17:39 (T59)	19:42	35	18:35 (T59)	20:14	40	19:48 (T78)	20:45	48	20:22 (T57)	21:07	38	20:37 (T57)
20	07:53	07:21	17:04 (T59)	07:36		18:01 (T59)	06:46		19:06 (T78)	06:10		19:12 (T78)	05:59		19:59 (T57)
	17:33	18:11	36 17:40 (T59)	19:43	32	18:33 (T59)	20:15	42	19:48 (T78)	20:46	48	20:23 (T57)	21:07	38	20:37 (T57)
21	07:52	07:19	17:03 (T59)	07:35		18:04 (T59)	06:45		19:05 (T78)	06:09		19:13 (T78)	05:59		20:00 (T57)
	17:34	18:13	39 17:42 (T59)	19:44	27	18:31 (T59)	20:16	44	19:49 (T78)	20:47	47	20:24 (T57)	21:07	38	20:38 (T57)
22	07:52	07:18	17:01 (T59)	07:33		18:07 (T59)	06:43		19:04 (T78)	06:08		19:14 (T78)	05:59		20:00 (T57)
	17:35	18:14	42 17:43 (T59)	19:45	20	18:27 (T59)	20:17	45	19:49 (T78)	20:48	47	20:24 (T57)	21:08	38	20:38 (T57)
23	07:51	07:16	17:00 (T59)	07:31		18:12 (T59)	06:42		19:04 (T78)	06:07		19:16 (T78)	06:00		20:00 (T57)
	17:37	18:15	45 17:45 (T59)	19:46	9	18:21 (T59)	20:18	46	19:50 (T78)	20:49	45	20:25 (T57)	21:08	38	20:38 (T57)
24	07:50	07:15	16:58 (T59)	07:30			06:40		19:03 (T78)	06:07		19:19 (T78)	06:00		20:00 (T57)
	17:38	18:16	47 17:45 (T59)	19:48			20:20	48	19:51 (T78)	20:50	42	20:27 (T57)	21:08	38	20:38 (T57)
25	07:49	07:13	16:58 (T59)	07:28			06:39		19:02 (T78)	06:06		19:22 (T78)	06:00		20:00 (T57)
	17:39	18:17	48 17:46 (T59)	19:49			20:21	49	19:51 (T78)	20:51	37	20:27 (T57)	21:08	39	20:39 (T57)
26	07:49	07:12	16:56 (T59)	07:26			06:37		19:02 (T78)	06:05		19:58 (T57)	06:00		20:00 (T57)
	17:40	18:18	50 17:46 (T59)	19:50			20:22	49	19:51 (T78)	20:52	29	20:27 (T57)	21:08	39	20:39 (T57)
27	07:48	07:10	16:56 (T59)	07:25			06:36		19:01 (T78)	06:05		19:58 (T57)	06:01		20:00 (T57)
	17:42	18:20	51 17:47 (T59)	19:51			20:23	50	19:51 (T78)	20:53	31	20:29 (T57)	21:08	38	20:38 (T57)
28	07:47	07:09	16:55 (T59)	07:23			06:35		19:01 (T78)	06:04		19:57 (T57)	06:01		20:01 (T57)
	17:43	18:21	52 17:47 (T59)	19:52			20:24	50	19:51 (T78)	20:54	32	20:29 (T57)	21:08	38	20:39 (T57)
29	07:46			07:21			06:33		19:01 (T78)	06:03		19:57 (T57)	06:02		20:01 (T57)
	17:44			19:53			20:25	50	19:51 (T78)	20:54	33	20:30 (T57)	21:08	38	20:39 (T57)
30	07:45			07:20			06:32		19:00 (T78)	06:03		19:57 (T57)	06:02		20:02 (T57)
	17:45			19:54			20:26	51	19:51 (T78)	20:55	34	20:31 (T57)	21:08	38	20:40 (T57)
31	07:44			07:18						06:02		19:57 (T57)			
	17:47			19:55						20:56	35	20:32 (T57)			
Potential sun hours	297	297		370			399			448			452		
Total, worst case			512		1037			735			1324			1135	
Sun reduction			0.40		0.44			0.52			0.57			0.64	
Oper. time red.			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.			0.69		0.69			0.57			0.57			0.54	
Total reduction			0.28		0.31			0.30			0.33			0.35	
Total, real			144		321			223			433			400	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 54 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6238)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:03		20:01 (T57)	06:27		19:14 (T78)	06:58		07:28	17:33 (T59)	07:02	07:37
	21:08	38	20:39 (T57)	20:50	44	19:58 (T78)	20:07		19:15	50	18:23 (T59)	17:28	17:04
2	06:03		20:02 (T57)	06:28		19:13 (T78)	06:59		07:29	17:32 (T59)	07:03	07:38
	21:08	38	20:40 (T57)	20:49	44	19:57 (T78)	20:06		19:13	51	18:23 (T59)	17:27	17:04
3	06:04		20:02 (T57)	06:29		19:12 (T78)	07:00		07:30	17:32 (T59)	07:04	07:39
	21:08	38	20:40 (T57)	20:48	46	19:58 (T78)	20:04		19:12	53	18:25 (T59)	17:26	17:04
4	06:04		20:03 (T57)	06:30		19:12 (T78)	07:01		07:31	17:31 (T59)	07:06	07:40
	21:08	37	20:40 (T57)	20:47	46	19:58 (T78)	20:02		19:10	54	18:25 (T59)	17:25	17:03
5	06:05		20:02 (T57)	06:31		19:11 (T78)	07:02		07:32	17:30 (T59)	07:07	07:41
	21:08	38	20:40 (T57)	20:46	48	19:59 (T78)	20:01		19:08	54	18:24 (T59)	17:23	17:03
6	06:05		20:03 (T57)	06:32		19:11 (T78)	07:03		07:33	17:29 (T59)	07:08	07:42
	21:08	37	20:40 (T57)	20:44	48	19:59 (T78)	19:57		19:07	55	18:24 (T59)	17:22	17:03
7	06:06		20:03 (T57)	06:33		19:10 (T78)	07:04		07:34	17:29 (T59)	07:09	07:43
	21:07	37	20:40 (T57)	20:43	49	19:59 (T78)	19:56		19:05	55	18:24 (T59)	17:21	17:03
8	06:07		20:03 (T57)	06:34		19:10 (T78)	07:05		07:35	17:28 (T59)	07:10	07:44
	21:07	37	20:40 (T57)	20:42	49	19:59 (T78)	19:54		19:03	56	18:24 (T59)	17:20	17:03
9	06:07		20:04 (T57)	06:35		19:10 (T78)	07:06		07:36	17:28 (T59)	07:12	07:45
	21:07	37	20:41 (T57)	20:41	49	19:59 (T78)	19:52		19:02	55	18:23 (T59)	17:19	17:03
10	06:08		20:04 (T57)	06:35		19:09 (T78)	07:06		07:37	17:28 (T59)	07:13	07:46
	21:06	36	20:40 (T57)	20:40	51	20:00 (T78)	19:51		19:00	55	18:23 (T59)	17:18	17:03
11	06:09		20:04 (T57)	06:36		19:09 (T78)	07:07		07:38	17:28 (T59)	07:14	07:46
	21:06	36	20:40 (T57)	20:38	50	19:59 (T78)	19:49		18:59	54	18:22 (T59)	17:17	17:03
12	06:09		20:05 (T57)	06:37		19:09 (T78)	07:08		07:39	17:27 (T59)	07:15	07:47
	21:05	35	20:40 (T57)	20:37	50	19:59 (T78)	19:47		18:57	54	18:21 (T59)	17:16	17:03
13	06:10		20:05 (T57)	06:38		19:09 (T78)	07:09		07:40	17:27 (T59)	07:16	07:48
	21:05	34	20:39 (T57)	20:36	50	19:59 (T78)	19:46		18:55	54	18:21 (T59)	17:15	17:03
14	06:11		20:05 (T57)	06:39		19:09 (T78)	07:10		07:41	17:29 (T59)	07:18	07:49
	21:05	34	20:39 (T57)	20:34	50	19:59 (T78)	19:44		18:54	52	18:21 (T59)	17:14	17:04
15	06:12		20:06 (T57)	06:40		19:09 (T78)	07:11		07:43	17:29 (T59)	07:19	07:50
	21:04	33	20:39 (T57)	20:33	50	19:59 (T78)	19:42		18:52	51	18:20 (T59)	17:13	17:04
16	06:12		20:07 (T57)	06:42		19:09 (T78)	07:12		07:44	17:29 (T59)	07:20	07:50
	21:03	31	20:38 (T57)	20:32	49	19:58 (T78)	19:40		18:51	50	18:19 (T59)	17:13	17:04
17	06:13		20:07 (T57)	06:43		19:09 (T78)	07:13		07:45	17:29 (T59)	07:21	07:51
	21:03	30	20:37 (T57)	20:30	49	19:58 (T78)	19:39		18:49	48	18:17 (T59)	17:12	17:04
18	06:14		20:07 (T57)	06:44		19:09 (T78)	07:14		07:46	17:30 (T59)	07:22	07:52
	21:02	30	20:37 (T57)	20:29	48	19:57 (T78)	19:37		18:48	46	18:16 (T59)	17:11	17:05
19	06:15		19:30 (T78)	06:45		19:09 (T78)	07:15		07:47	17:31 (T59)	07:24	07:52
	21:01	39	20:36 (T57)	20:27	48	19:57 (T78)	19:35		18:46	44	18:15 (T59)	17:10	17:05
20	06:16		19:27 (T78)	06:46		19:09 (T78)	07:16		18:02 (T59)	07:48	17:33 (T59)	07:25	07:53
	21:01	44	20:36 (T57)	20:26	47	19:56 (T78)	19:34	2	18:04 (T59)	18:45	41	18:14 (T59)	17:10	17:05
21	06:16		19:26 (T78)	06:47		19:10 (T78)	07:17		17:53 (T59)	07:49	17:34 (T59)	07:26	07:53
	21:00	45	20:35 (T57)	20:24	45	19:55 (T78)	19:32	18	18:11 (T59)	18:43	38	18:12 (T59)	17:09	17:06
22	06:17		19:24 (T78)	06:48		19:10 (T78)	07:18		17:50 (T59)	07:50	17:35 (T59)	07:27	07:54
	20:59	47	20:35 (T57)	20:23	44	19:54 (T78)	19:30	24	18:14 (T59)	18:42	35	18:10 (T59)	17:08	17:06
23	06:18		19:22 (T78)	06:49		19:10 (T78)	07:19		17:47 (T59)	07:52	17:36 (T59)	07:28	07:54
	20:58	48	20:33 (T57)	20:21	42	19:52 (T78)	19:29	29	18:16 (T59)	18:40	32	18:08 (T59)	17:08	17:07
24	06:19		19:21 (T78)	06:50		19:11 (T78)	07:20		17:44 (T59)	07:53	17:38 (T59)	07:29	07:55
	20:58	48	20:32 (T57)	20:20	40	19:51 (T78)	19:27	34	18:18 (T59)	18:39	28	18:06 (T59)	17:07	17:07
25	06:20		19:20 (T78)	06:51		19:12 (T78)	07:22		17:42 (T59)	07:54	17:42 (T59)	07:30	07:55
	20:57	47	20:31 (T57)	20:18	37	19:49 (T78)	19:25	37	18:19 (T59)	18:37	22	18:04 (T59)	17:07	17:08
26	06:21		19:19 (T78)	06:52		19:13 (T78)	07:23		17:40 (T59)	07:55	17:46 (T59)	07:32	07:56
	20:56	44	20:29 (T57)	20:17	35	19:48 (T78)	19:23	40	18:20 (T59)	18:36	13	17:59 (T59)	17:06	17:09
27	06:22		19:18 (T78)	06:53		19:14 (T78)	07:24		17:38 (T59)	07:56			07:33	07:56
	20:55	35	19:53 (T78)	20:15	32	19:46 (T78)	19:22	43	18:21 (T59)	18:35			17:06	17:09
28	06:23		19:17 (T78)	06:54		19:16 (T78)	07:25		17:37 (T59)	07:57			07:34	07:56
	20:54	37	19:54 (T78)	20:14	27	19:43 (T78)	19:20	45	18:22 (T59)	18:33			17:05	17:10
29	06:24		19:16 (T78)	06:55		19:18 (T78)	07:26		17:35 (T59)	07:58			07:35	07:57
	20:53	39	19:55 (T78)	20:12	23	19:41 (T78)	19:18	48	18:23 (T59)	18:32			17:05	17:11
30	06:25		19:16 (T78)	06:56		19:22 (T78)	07:27		17:34 (T59)	08:00			07:36	07:57
	20:52	40	19:56 (T78)	20:10	15	19:37 (T78)	19:17	49	18:23 (T59)	18:31			17:04	17:12
31	06:26		19:15 (T78)	06:57						08:01				07:57
	20:51	42	19:57 (T78)	20:09						18:30				17:12
Potential sun hours	459			428			375			345			297	287
Total, worst case		1191			1305			369			1200			
Sun reduction		0.66			0.61			0.59			0.48			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.55			0.57			0.69			0.69			
Total reduction		0.37			0.36			0.41			0.34			
Total, real		441			463			153			405			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 64 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6245)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June
1	07:57		08:20 (T77)	07:43		08:04 (T42)	07:07			07:16		07:49 (T41)	06:30	06:01
	17:13	30	08:50 (T77)	17:48	18	08:22 (T42)	18:22			19:56	60	08:49 (T41)	20:27	20:57
2	07:57		08:20 (T77)	07:43		08:03 (T42)	07:06			07:15		07:48 (T41)	06:29	06:01
	17:14	30	08:50 (T77)	17:49	21	08:24 (T42)	18:23			19:57	61	08:49 (T41)	20:28	20:58
3	07:57		08:21 (T77)	07:42		08:02 (T42)	07:04			07:13		07:48 (T41)	06:28	06:01
	17:15	30	08:51 (T77)	17:50	23	08:25 (T42)	18:24			19:58	61	08:49 (T41)	20:29	20:58
4	07:58		08:21 (T77)	07:40		08:01 (T42)	07:03			07:11		07:47 (T41)	06:26	06:00
	17:16	30	08:51 (T77)	17:51	26	08:27 (T42)	18:25			19:59	62	08:49 (T41)	20:30	20:59
5	07:58		08:22 (T77)	07:39		08:00 (T42)	07:01			07:10		07:47 (T41)	06:25	06:00
	17:17	30	08:52 (T77)	17:53	28	08:28 (T42)	18:26			20:00	62	08:49 (T41)	20:31	21:00
6	07:57		08:22 (T77)	07:38		07:58 (T42)	06:59			07:08		07:46 (T41)	06:24	06:00
	17:18	31	08:53 (T77)	17:54	30	08:28 (T42)	18:28			20:00	62	08:48 (T41)	20:32	21:01
7	07:57		08:22 (T77)	07:37		07:57 (T42)	06:58			07:06		07:46 (T41)	06:23	05:59
	17:18	30	08:52 (T77)	17:55	32	08:29 (T42)	18:29			20:01	62	08:48 (T41)	20:33	21:01
8	07:57		08:23 (T77)	07:36		07:56 (T42)	07:56			07:05		07:46 (T41)	06:22	05:59
	17:19	30	08:53 (T77)	17:56	34	08:30 (T42)	19:30			20:02	62	08:48 (T41)	20:34	21:02
9	07:57		08:23 (T77)	07:35		07:56 (T42)	07:55			07:03		07:46 (T41)	06:20	05:59
	17:20	30	08:53 (T77)	17:58	34	08:30 (T42)	19:31			20:04	61	08:47 (T41)	20:35	21:02
10	07:57		08:24 (T77)	07:34		07:56 (T42)	07:53			07:01		07:45 (T41)	06:19	05:59
	17:22	30	08:54 (T77)	17:59	35	08:31 (T42)	19:32			20:05	61	08:46 (T41)	20:37	21:03
11	07:57		08:24 (T77)	07:32		07:55 (T42)	07:51			07:00		07:46 (T41)	06:18	05:58
	17:23	29	08:53 (T77)	18:00	35	08:30 (T42)	19:33			20:06	60	08:46 (T41)	20:38	21:04
12	07:56		08:25 (T77)	07:31		07:55 (T42)	07:50			06:58		07:45 (T41)	06:17	05:58
	17:24	29	08:54 (T77)	18:01	36	08:31 (T42)	19:34			20:07	59	08:44 (T41)	20:39	21:04
13	07:56		08:26 (T77)	07:30		07:55 (T42)	07:48			06:57		07:46 (T41)	06:16	05:58
	17:25	28	08:54 (T77)	18:03	36	08:31 (T42)	19:35			20:08	58	08:44 (T41)	20:40	21:05
14	07:56		08:26 (T77)	07:29		07:56 (T42)	07:46			06:55		07:46 (T41)	06:15	05:58
	17:26	28	08:54 (T77)	18:04	35	08:31 (T42)	19:37			20:09	57	08:43 (T41)	20:41	21:05
15	07:55		08:27 (T77)	07:27		07:55 (T42)	07:45			06:53		07:47 (T41)	06:14	05:58
	17:27	27	08:54 (T77)	18:05	35	08:30 (T42)	19:38			20:10	55	08:42 (T41)	20:42	21:06
16	07:55		08:27 (T77)	07:26		07:56 (T42)	07:43			06:52		07:47 (T41)	06:13	05:58
	17:28	27	08:54 (T77)	18:06	34	08:30 (T42)	19:39			20:11	54	08:41 (T41)	20:43	21:06
17	07:54		08:29 (T77)	07:25		07:56 (T42)	07:41			06:50		07:48 (T41)	06:12	05:58
	17:29	25	08:54 (T77)	18:07	33	08:29 (T42)	19:40			20:12	52	08:40 (T41)	20:44	21:06
18	07:54		08:29 (T77)	07:23		07:57 (T42)	07:40		08:15 (T41)	06:49		07:48 (T41)	06:11	05:58
	17:30	24	08:53 (T77)	18:09	32	08:29 (T42)	19:41	18	08:33 (T41)	20:13	50	08:38 (T41)	20:45	21:07
19	07:53		08:31 (T77)	07:22		07:58 (T42)	07:38		08:10 (T41)	06:47		07:49 (T41)	06:10	05:58
	17:32	23	08:54 (T77)	18:10	30	08:28 (T42)	19:42	27	08:37 (T41)	20:14	48	08:37 (T41)	20:46	21:07
20	07:53		08:32 (T77)	07:21		07:58 (T42)	07:36		08:06 (T41)	06:46		07:50 (T41)	06:09	05:59
	17:33	21	08:53 (T77)	18:11	29	08:27 (T42)	19:43	33	08:39 (T41)	20:15	45	08:35 (T41)	20:46	21:07
21	07:52		08:33 (T77)	07:19		08:00 (T42)	07:35		08:04 (T41)	06:44		07:51 (T41)	06:09	05:59
	17:34	19	08:52 (T77)	18:12	26	08:26 (T42)	19:44	38	08:42 (T41)	20:16	43	08:34 (T41)	20:47	21:08
22	07:52		08:35 (T77)	07:18		08:01 (T42)	07:33		08:02 (T41)	06:43		07:52 (T41)	06:08	05:59
	17:35	16	08:51 (T77)	18:14	22	08:23 (T42)	19:45	41	08:43 (T41)	20:17	40	08:32 (T41)	20:48	21:08
23	07:51		08:36 (T77)	07:16		08:03 (T42)	07:31		08:00 (T41)	06:41		07:53 (T41)	06:07	05:59
	17:36	14	08:50 (T77)	18:15	19	08:22 (T42)	19:46	44	08:44 (T41)	20:18	38	08:31 (T41)	20:49	21:08
24	07:50		08:39 (T77)	07:15		08:06 (T42)	07:30		07:59 (T41)	06:40		07:54 (T41)	06:06	05:59
	17:38	8	08:47 (T77)	18:16	12	08:18 (T42)	19:47	47	08:46 (T41)	20:20	34	08:28 (T41)	20:50	21:08
25	07:50			07:13			07:28		07:57 (T41)	06:39		07:57 (T41)	06:06	06:00
	17:39			18:17			19:49	50	08:47 (T41)	20:21	29	08:26 (T41)	20:51	21:08
26	07:49			07:12			07:26		07:55 (T41)	06:37		07:59 (T41)	06:05	06:00
	17:40			18:18			19:50	52	08:47 (T41)	20:22	25	08:24 (T41)	20:52	21:08
27	07:48			07:10			07:25		07:54 (T41)	06:36		08:02 (T41)	06:04	06:00
	17:41			18:19			19:51	54	08:48 (T41)	20:23	17	08:19 (T41)	20:53	21:09
28	07:47			07:09			07:23		07:53 (T41)	06:34		08:08 (T41)	06:04	06:01
	17:43			18:21			19:52	55	08:48 (T41)	20:24	5	08:13 (T41)	20:54	21:09
29	07:46						07:21		07:51 (T41)	06:33			06:03	06:01
	17:44						19:53	58	08:49 (T41)	20:25			20:55	21:09
30	07:45		08:07 (T42)				07:20		07:50 (T41)	06:32			06:02	06:02
	17:45	10	08:17 (T42)				19:54	58	08:48 (T41)	20:26			20:55	21:09
31	07:44		08:05 (T42)				07:18		07:50 (T41)				06:02	
	17:46	15	08:20 (T42)				19:55	59	08:49 (T41)				20:56	
Potential sun hours	297			297			370			399			449	453
Total, worst case		644			695			634			1383			
Sun reduction		0.31			0.40			0.44			0.52			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.52			0.55			0.62			0.62			
Total reduction		0.16			0.21			0.27			0.32			
Total, real		102			149			169			436			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 64 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6245)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August			September			October			November			December		
1	06:02	06:26			06:57		07:45 (T41)	07:28			07:02		07:25 (T42)	07:37		08:06 (T77)
	21:09	20:50			20:07	60	08:45 (T41)	19:15			17:28	35	08:00 (T42)	17:04	29	08:35 (T77)
2	06:03	06:27			06:58		07:44 (T41)	07:29			07:03		07:26 (T42)	07:38		08:07 (T77)
	21:08	20:49			20:06	61	08:45 (T41)	19:13			17:27	34	08:00 (T42)	17:03	30	08:37 (T77)
3	06:03	06:28			06:59		07:44 (T41)	07:30			07:04		07:26 (T42)	07:39		08:07 (T77)
	21:08	20:48			20:04	61	08:45 (T41)	19:11			17:26	33	07:59 (T42)	17:03	30	08:37 (T77)
4	06:04	06:29			07:00		07:43 (T41)	07:31			07:06		07:27 (T42)	07:40		08:08 (T77)
	21:08	20:47			20:02	62	08:45 (T41)	19:10			17:24	31	07:58 (T42)	17:03	30	08:38 (T77)
5	06:04	06:30			07:01		07:43 (T41)	07:32			07:07		07:28 (T42)	07:41		08:08 (T77)
	21:08	20:46			20:01	62	08:45 (T41)	19:08			17:23	30	07:58 (T42)	17:03	30	08:38 (T77)
6	06:05	06:31			07:02		07:42 (T41)	07:33			07:08		07:30 (T42)	07:42		08:08 (T77)
	21:08	20:45			19:57	62	08:44 (T41)	19:06			17:22	28	07:58 (T42)	17:03	31	08:39 (T77)
7	06:06	06:32			07:03		07:42 (T41)	07:34			07:09		07:31 (T42)	07:43		08:09 (T77)
	21:07	20:43			19:56	62	08:44 (T41)	19:05			17:21	25	07:56 (T42)	17:03	30	08:39 (T77)
8	06:06	06:33			07:04		07:42 (T41)	07:35			07:10		07:32 (T42)	07:44		08:08 (T77)
	21:07	20:42			19:54	62	08:44 (T41)	19:03			17:20	23	07:55 (T42)	17:03	31	08:39 (T77)
9	06:07	06:34			07:05		07:42 (T41)	07:36			07:12		07:34 (T42)	07:45		08:09 (T77)
	21:07	20:41			19:52	61	08:43 (T41)	19:02			17:19	21	07:55 (T42)	17:03	30	08:39 (T77)
10	06:08	06:35			07:06		07:42 (T41)	07:37			07:13		07:35 (T42)	07:46		08:09 (T77)
	21:06	20:40			19:51	61	08:43 (T41)	19:00			17:18	18	07:53 (T42)	17:03	31	08:40 (T77)
11	06:08	06:36			07:07		07:42 (T41)	07:38			07:14		07:36 (T42)	07:47		08:10 (T77)
	21:06	20:38			19:49	60	08:42 (T41)	18:58			17:17	15	07:51 (T42)	17:03	30	08:40 (T77)
12	06:09	06:37			07:08		07:41 (T41)	07:39			07:15		07:38 (T42)	07:47		08:11 (T77)
	21:06	20:37			19:47	60	08:41 (T41)	18:57			17:16	10	07:48 (T42)	17:03	30	08:41 (T77)
13	06:10	06:38			07:09		07:41 (T41)	07:40			07:16			07:48		08:12 (T77)
	21:05	20:36			19:46	59	08:40 (T41)	18:55			17:15			17:03	29	08:41 (T77)
14	06:10	06:39			07:10		07:41 (T41)	07:41			07:18			07:49		08:12 (T77)
	21:05	20:34			19:44	58	08:39 (T41)	18:54			17:14			17:03	29	08:41 (T77)
15	06:11	06:40		08:14 (T41)	07:11		07:42 (T41)	07:43			07:19			07:50		08:13 (T77)
	21:04	20:33	9	08:23 (T41)	19:42	56	08:38 (T41)	18:52			17:13			17:03	29	08:42 (T77)
16	06:12	06:41		08:09 (T41)	07:12		07:42 (T41)	07:44			07:20			07:50		08:14 (T77)
	21:04	20:32	19	08:28 (T41)	19:40	55	08:37 (T41)	18:50			17:12			17:04	28	08:42 (T77)
17	06:13	06:42		08:05 (T41)	07:13		07:43 (T41)	07:45		08:41 (T42)	07:21			07:51		08:14 (T77)
	21:03	20:30	26	08:31 (T41)	19:39	52	08:35 (T41)	18:49	5	08:46 (T42)	17:11			17:04	28	08:42 (T77)
18	06:14	06:43		08:02 (T41)	07:14		07:44 (T41)	07:46		08:36 (T42)	07:22		08:13 (T77)	07:52		08:15 (T77)
	21:02	20:29	30	08:32 (T41)	19:37	50	08:34 (T41)	18:47	15	08:51 (T42)	17:11	8	08:21 (T77)	17:04	28	08:43 (T77)
19	06:14	06:44		08:00 (T41)	07:15		07:45 (T41)	07:47		08:33 (T42)	07:24		08:10 (T77)	07:52		08:16 (T77)
	21:02	20:27	34	08:34 (T41)	19:35	48	08:33 (T41)	18:46	20	08:53 (T42)	17:10	14	08:24 (T77)	17:05	28	08:44 (T77)
20	06:15	06:45		07:58 (T41)	07:16		07:46 (T41)	07:48		08:32 (T42)	07:25		08:10 (T77)	07:53		08:16 (T77)
	21:01	20:26	38	08:36 (T41)	19:34	45	08:31 (T41)	18:44	23	08:55 (T42)	17:09	16	08:26 (T77)	17:05	28	08:44 (T77)
21	06:16	06:46		07:56 (T41)	07:17		07:47 (T41)	07:49		08:30 (T42)	07:26		08:09 (T77)	07:53		08:17 (T77)
	21:00	20:24	41	08:37 (T41)	19:32	42	08:29 (T41)	18:43	27	08:57 (T42)	17:09	19	08:28 (T77)	17:06	28	08:45 (T77)
22	06:17	06:47		07:55 (T41)	07:18		07:48 (T41)	07:50		08:29 (T42)	07:27		08:08 (T77)	07:54		08:17 (T77)
	20:59	20:23	43	08:38 (T41)	19:30	39	08:27 (T41)	18:42	28	08:57 (T42)	17:08	21	08:29 (T77)	17:06	28	08:45 (T77)
23	06:18	06:48		07:53 (T41)	07:19		07:50 (T41)	07:52		08:27 (T42)	07:28		08:07 (T77)	07:54		08:18 (T77)
	20:59	20:21	46	08:39 (T41)	19:28	34	08:24 (T41)	18:40	31	08:58 (T42)	17:07	23	08:30 (T77)	17:07	28	08:46 (T77)
24	06:19	06:49		07:52 (T41)	07:20		07:52 (T41)	07:53		08:26 (T42)	07:29		08:06 (T77)	07:55		08:18 (T77)
	20:58	20:20	48	08:40 (T41)	19:27	29	08:21 (T41)	18:39	33	08:59 (T42)	17:07	24	08:30 (T77)	17:07	28	08:46 (T77)
25	06:20	06:50		07:51 (T41)	07:21		07:56 (T41)	07:54		08:26 (T42)	07:31		08:07 (T77)	07:55		08:18 (T77)
	20:57	20:18	50	08:41 (T41)	19:25	21	08:17 (T41)	18:37	34	09:00 (T42)	17:06	25	08:32 (T77)	17:08	28	08:46 (T77)
26	06:21	06:51		07:50 (T41)	07:22		08:01 (T41)	07:55		08:26 (T42)	07:32		08:06 (T77)	07:56		08:19 (T77)
	20:56	20:17	52	08:42 (T41)	19:23	10	08:11 (T41)	18:36	34	09:00 (T42)	17:06	27	08:33 (T77)	17:08	28	08:47 (T77)
27	06:22	06:52		07:49 (T41)	07:23			07:56		08:25 (T42)	07:33		08:06 (T77)	07:56		08:19 (T77)
	20:55	20:15	54	08:43 (T41)	19:22			18:35	35	09:00 (T42)	17:05	27	08:33 (T77)	17:09	28	08:47 (T77)
28	06:23	06:53		07:48 (T41)	07:24			07:57		08:24 (T42)	07:34		08:06 (T77)	07:56		08:19 (T77)
	20:54	20:14	55	08:43 (T41)	19:20			18:33	36	09:00 (T42)	17:05	28	08:34 (T77)	17:10	29	08:48 (T77)
29	06:23	06:54		07:47 (T41)	07:25			07:59		08:25 (T42)	07:35		08:06 (T77)	07:57		08:19 (T77)
	20:53	20:12	57	08:44 (T41)	19:18			18:32	36	09:01 (T42)	17:04	28	08:34 (T77)	17:10	29	08:48 (T77)
30	06:24	06:55		07:46 (T41)	07:27			08:00		08:25 (T42)	07:36		08:06 (T77)	07:57		08:20 (T77)
	20:52	20:10	58	08:44 (T41)	19:16			18:31	35	09:00 (T42)	17:04	29	08:35 (T77)	17:11	29	08:49 (T77)
31	06:25	06:56		07:45 (T41)				08:01		08:25 (T42)				07:57		08:20 (T77)
	20:51	20:09	59	08:44 (T41)				18:29	35	09:00 (T42)				17:12	30	08:50 (T77)
Potential sun hours	460	429			375			345			297			287		
Total, worst case			719			1332			427			592			902	
Sun reduction			0.61			0.59			0.48			0.30			0.22	
Oper. time red.			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.			0.62			0.62			0.55			0.53			0.52	
Total reduction			0.37			0.36			0.26			0.16			0.11	
Total, real			266			477			110			93			102	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 87 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6261)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:43	07:07	07:16	08:13 (T49)	06:30	06:02	06:02	06:26	06:57	08:12 (T49)	07:28	08:10 (T49)	07:02	07:37
	17:13	17:48	18:22	19:56 83	09:36 (T49)	20:27	20:57	21:08	20:50	20:07 75	09:27 (T49)	19:15 62	09:12 (T49)	17:28	17:04
2	07:57	07:42	07:06	07:15	08:12 (T49)	06:29	06:01	06:03	06:27	06:58	08:11 (T49)	07:29	08:11 (T49)	07:03	07:38
	17:14	17:49	18:23	19:57 83	09:35 (T49)	20:28	20:58	21:08	20:49	20:06 76	09:27 (T49)	19:13 59	09:10 (T49)	17:27	17:04
3	07:57	07:41	07:04	07:13	08:13 (T49)	06:28	06:01	06:03	06:28	06:59	08:10 (T49)	07:30	08:12 (T49)	07:04	07:39
	17:15	17:50	18:24	19:58 82	09:35 (T49)	20:29	20:58	21:08	20:48	20:04 78	09:28 (T49)	19:11 56	09:08 (T49)	17:26	17:03
4	07:57	07:40	07:03	08:01 (T49) 07:11	08:12 (T49)	06:27	06:00	06:04	06:29	07:00	08:10 (T49)	07:31	08:15 (T49)	07:06	07:40
	17:16	17:51	18:25 6	08:07 (T49) 19:59 82	09:34 (T49)	20:30	20:59	21:08	20:47	20:02 78	09:28 (T49)	19:10 51	09:06 (T49)	17:24	17:03
5	07:57	07:39	07:01	07:51 (T49) 07:10	08:13 (T49)	06:25	06:00	06:04	06:30	07:01	08:09 (T49)	07:32	08:16 (T49)	07:07	07:41
	17:17	17:53	18:26 24	08:15 (T49) 20:00 81	09:34 (T49)	20:31	21:00	21:08	20:46	20:01 80	09:29 (T49)	19:08 48	09:04 (T49)	17:23	17:03
6	07:57	07:38	06:59	07:47 (T49) 07:08	08:12 (T49)	06:24	06:00	06:05	06:31	07:02	08:08 (T49)	07:33	08:19 (T49)	07:08	07:42
	17:18	17:54	18:28 33	08:20 (T49) 20:00 81	09:33 (T49)	20:32	21:00	21:08	20:44	19:57 81	09:29 (T49)	19:06 42	09:01 (T49)	17:22	17:03
7	07:57	07:37	06:58	07:43 (T49) 07:06	08:12 (T49)	06:23	05:59	06:06	06:32	07:03	08:08 (T49)	07:34	08:21 (T49)	07:09	07:43
	17:19	17:55	18:29 40	08:23 (T49) 20:01 80	09:32 (T49)	20:33	21:01	21:07	20:43	19:56 81	09:29 (T49)	19:05 37	08:58 (T49)	17:21	17:03
8	07:57	07:36	07:56	08:40 (T49) 07:05	08:13 (T49)	06:22	05:59	06:06	06:33	07:04	08:07 (T49)	07:35	08:25 (T49)	07:10	07:44
	17:20	17:56	19:30 45	09:25 (T49) 20:02 78	09:31 (T49)	20:34	21:02	21:07	20:42	19:54 82	09:29 (T49)	19:03 28	08:53 (T49)	17:20	17:03
9	07:57	07:35	07:55	08:38 (T49) 07:03	08:12 (T49)	06:21	05:59	06:07	06:34	07:05	08:07 (T49)	07:36	08:30 (T49)	07:12	07:45
	17:21	17:58	19:31 50	09:28 (T49) 20:03 78	09:30 (T49)	20:35	21:02	21:07	20:41	19:52 82	09:29 (T49)	19:02 18	08:48 (T49)	17:19	17:03
10	07:57	07:34	07:53	08:35 (T49) 07:01	08:12 (T49)	06:19	05:59	06:08	06:35	07:06	08:06 (T49)	07:37		07:13	07:46
	17:22	17:59	19:32 54	09:29 (T49) 20:05 76	09:28 (T49)	20:36	21:03	21:06	20:39	19:51 83	09:29 (T49)	19:00		17:18	17:03
11	07:57	07:32	07:51	08:33 (T49) 07:00	08:13 (T49)	06:18	05:59	06:08	06:36	07:07	08:06 (T49)	07:38		07:14	07:46
	17:23	18:00	19:33 57	09:30 (T49) 20:06 75	09:28 (T49)	20:37	21:03	21:06	20:38	19:49 83	09:29 (T49)	18:58		17:17	17:03
12	07:56	07:31	07:50	08:32 (T49) 06:58	08:13 (T49)	06:17	05:59	06:09	06:37	07:08	08:04 (T49)	07:39		07:15	07:47
	17:24	18:01	19:34 61	09:33 (T49) 20:07 73	09:26 (T49)	20:38	21:04	21:05	20:37	19:47 84	09:28 (T49)	18:57		17:16	17:03
13	07:56	07:30	07:48	08:30 (T49) 06:57	08:14 (T49)	06:16	05:58	06:10	06:38	07:09	08:04 (T49)	07:40		07:16	07:48
	17:25	18:03	19:35 63	09:33 (T49) 20:08 72	09:26 (T49)	20:39	21:04	21:05	20:36	19:45 84	09:28 (T49)	18:55		17:15	17:03
14	07:56	07:29	07:46	08:28 (T49) 06:55	08:14 (T49)	06:15	05:58	06:11	06:39	08:44 (T49) 07:10	08:04 (T49)	07:41		07:18	07:49
	17:26	18:04	19:37 66	09:34 (T49) 20:09 70	09:24 (T49)	20:40	21:05	21:04	20:34 16	09:00 (T49) 19:44 84	09:28 (T49)	18:54		17:14	17:03
15	07:55	07:27	07:45	08:27 (T49) 06:54	08:15 (T49)	06:14	05:58	06:11	06:40	08:40 (T49) 07:11	08:04 (T49)	07:42		07:19	07:49
	17:27	18:05	19:38 69	09:36 (T49) 20:10 68	09:23 (T49)	20:41	21:05	21:04	20:33 24	09:04 (T49) 19:42 83	09:27 (T49)	18:52		17:13	17:04
16	07:55	07:26	07:43	08:25 (T49) 06:52	08:15 (T49)	06:13	05:58	06:12	06:41	08:37 (T49) 07:12	08:04 (T49)	07:44		07:20	07:50
	17:28	18:06	19:39 71	09:36 (T49) 20:11 66	09:21 (T49)	20:42	21:06	21:03	20:31 31	09:08 (T49) 19:40 83	09:27 (T49)	18:51		17:12	17:04
17	07:54	07:25	07:41	08:23 (T49) 06:50	08:16 (T49)	06:12	05:58	06:13	06:42	08:34 (T49) 07:13	08:04 (T49)	07:45		07:21	07:51
	17:29	18:08	19:40 73	09:36 (T49) 20:12 64	09:20 (T49)	20:43	21:06	21:03	20:30 36	09:10 (T49) 19:39 83	09:27 (T49)	18:49		17:12	17:04
18	07:54	07:23	07:40	08:23 (T49) 06:49	08:17 (T49)	06:11	05:58	06:14	06:43	08:32 (T49) 07:14	08:03 (T49)	07:46		07:22	07:52
	17:31	18:09	19:41 75	09:38 (T49) 20:13 61	09:18 (T49)	20:44	21:07	21:02	20:29 40	09:12 (T49) 19:37 83	09:26 (T49)	18:47		17:11	17:04
19	07:53	07:22	07:38	08:21 (T49) 06:47	08:18 (T49)	06:10	05:59	06:15	06:44	08:30 (T49) 07:15	08:04 (T49)	07:47		07:23	07:52
	17:32	18:10	19:42 77	09:38 (T49) 20:14 59	09:17 (T49)	20:45	21:07	21:01	20:27 44	09:14 (T49) 19:35 82	09:26 (T49)	18:46		17:10	17:05
20	07:53	07:20	07:36	08:20 (T49) 06:46	08:18 (T49)	06:10	05:59	06:15	06:45	08:27 (T49) 07:16	08:04 (T49)	07:48		07:25	07:53
	17:33	18:11	19:43 78	09:38 (T49) 20:15 57	09:15 (T49)	20:46	21:07	21:01	20:26 48	09:15 (T49) 19:34 81	09:25 (T49)	18:45		17:09	17:05
21	07:52	07:19	07:35	08:20 (T49) 06:44	08:20 (T49)	06:09	05:59	06:16	06:46	08:25 (T49) 07:17	08:04 (T49)	07:49		07:26	07:53
	17:34	18:12	19:44 79	09:39 (T49) 20:16 54	09:14 (T49)	20:47	21:07	21:00	20:24 51	09:16 (T49) 19:32 80	09:24 (T49)	18:43		17:09	17:06
22	07:52	07:18	07:33	08:19 (T49) 06:43	08:21 (T49)	06:08	05:59	06:17	06:47	08:24 (T49) 07:18	08:04 (T49)	07:50		07:27	07:54
	17:35	18:14	19:45 80	09:39 (T49) 20:17 50	09:11 (T49)	20:48	21:08	20:59	20:23 54	09:18 (T49) 19:30 79	09:23 (T49)	18:42		17:08	17:06
23	07:51	07:16	07:31	08:17 (T49) 06:41	08:22 (T49)	06:07	05:59	06:18	06:48	08:22 (T49) 07:19	08:04 (T49)	07:51		07:28	07:54
	17:36	18:15	19:46 81	09:38 (T49) 20:18 48	09:10 (T49)	20:49	21:08	20:58	20:21 57	09:19 (T49) 19:28 78	09:22 (T49)	18:40		17:07	17:07
24	07:50	07:15	07:30	08:17 (T49) 06:40	08:23 (T49)	06:06	06:00	06:19	06:49	08:21 (T49) 07:20	08:05 (T49)	07:53		07:29	07:55
	17:38	18:16	19:47 82	09:39 (T49) 20:19 44	09:07 (T49)	20:50	21:08	20:58	20:20 59	09:20 (T49) 19:27 76	09:21 (T49)	18:39		17:07	17:07
25	07:49	07:13	07:28	08:16 (T49) 06:39	08:25 (T49)	06:06	06:00	06:20	06:50	08:19 (T49) 07:21	08:05 (T49)	07:54		07:30	07:55
	17:39	18:17	19:48 83	09:39 (T49) 20:21 40	09:05 (T49)	20:51	21:08	20:57	20:18 62	09:21 (T49) 19:25 75	09:20 (T49)	18:37		17:06	17:08
26	07:49	07:12	07:26	08:15 (T49) 06:37	08:28 (T49)	06:05	06:00	06:21	06:51	08:18 (T49) 07:22	08:06 (T49)	07:55		07:31	07:56
	17:40	18:18	19:50 83	09:38 (T49) 20:22 35	09:03 (T49)	20:52	21:08	20:56	20:17 64	09:22 (T49) 19:23 73	09:19 (T49)	18:36		17:06	17:09
27	07:48	07:10	07:25	08:15 (T49) 06:36	08:30 (T49)	06:04	06:01	06:22	06:52	08:17 (T49) 07:23	08:06 (T49)	07:56		07:33	07:56
	17:41	18:19	19:51 84	09:39 (T49) 20:23 29	08:59 (T49)	20:53	21:08	20:55	20:15 66	09:23 (T49) 19:22 72	09:18 (T49)	18:35		17:05	17:09
28	07:47	07:09	07:23	08:15 (T49) 06:34	08:33 (T49)	06:04	06:01	06:23	06:53	08:16 (T49) 07:24	08:07 (T49)	07:57		07:34	07:56
	17:43	18:21	19:52 83	09:38 (T49) 20:24 23	08:56 (T49)	20:54	21:08	20:54	20:14 68	09:24 (T49) 19:20 70	09:17 (T49)	18:33		17:05	17:10
29	07:46		07:21	08:14 (T49) 06:33	08:38 (T49)	06:03	06:01	06:24	06:54	08:15 (T49) 07:25	08:08 (T49)	07:58		07:35	07:56
	17:44		19:53 84	09:38 (T49) 20:25 13	08:51 (T49)	20:54	21:08	20:53	20:12 70	09:25 (T49) 19:18 67	09:15 (T49)	18:32		17:05	17:11
30	07:45		07:20	08:14 (T49) 06:32		06:03	06:02	06:25	06:55	08:14 (T49) 07:27	08:09 (T49)	08:00		07:36	07:57
	17:45		19:54 84	09:38 (T49) 20:26		20:55	21:08	20:52	20:10 72	09:26 (T49) 19:17 64	09:13 (T49)	18:31		17:04	17:11
31	07:44		07:18	08:13 (T49)		06:02		06:26	06:56	08:13 (T49)		08:01			07:57
	17:46		19:55 84	09:37 (T49)		20:56		20:51	20:09 73	09:26 (T49)		18:29			17:12
Potential sun hours	297	297	370	399	448	452	459	428	375	345		297	287
Total, worst case			1849	1805				935	2360	401			
Sun reduction			0.44	0.52				0.61	0.59	0.48			
Oper. time red.			1.00	1.00				1.00	1.00	1.00			
Wind dir. red.			0.58	0.58				0.58	0.58	0.58			
Total reduction			0.25	0.30				0.35	0.34	0.28			
Total, real			468	540				328	801	111			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 91 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6265)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May	June
1	07:57		07:43		16:35 (T30)	07:07	07:38 (T31)	07:16	07:39 (T28)	06:30	06:01
	17:13		17:47	41	17:16 (T30)	18:22	50	17:07 (T30)	19:56	71	19:34 (T27)	20:27	20:57
2	07:57		07:43		16:34 (T30)	07:06	07:38 (T31)	07:14	07:37 (T28)	06:29	06:01
	17:14		17:49	44	17:18 (T30)	18:23	40	17:03 (T30)	19:57	76	19:35 (T27)	20:28	20:58
3	07:58		07:41		16:34 (T30)	07:04	07:39 (T31)	07:13	07:37 (T28)	06:28	06:00
	17:15		17:50	45	17:19 (T30)	18:24	24	08:03 (T31)	19:58	78	19:36 (T27)	20:29	20:58
4	07:58		07:40		16:33 (T30)	07:02	07:41 (T31)	07:11	07:36 (T28)	06:26	06:00
	17:15		17:51	46	17:19 (T30)	18:25	21	08:02 (T31)	19:59	79	19:36 (T27)	20:30	20:59
5	07:58		07:39		16:33 (T30)	07:01	07:42 (T31)	07:09	07:35 (T28)	06:25	06:00
	17:16		17:52	47	17:20 (T30)	18:26	17	07:59 (T31)	20:00	81	19:36 (T27)	20:31	21:00
6	07:58		07:38		16:32 (T30)	06:59	07:45 (T31)	07:08	07:36 (T28)	06:24	05:59
	17:17		17:54	48	17:20 (T30)	18:27	12	07:57 (T31)	20:00	80	19:36 (T27)	20:32	21:01
7	07:57		07:37		16:32 (T30)	06:58			07:06		07:35 (T28)	06:23	05:59
	17:18		17:55	49	17:21 (T30)	18:29			20:01	81	19:36 (T27)	20:33	21:01
8	07:57		07:36		16:31 (T30)	07:56			07:05		07:35 (T28)	06:21	05:59
	17:19		17:56	50	17:21 (T30)	19:30			20:02	82	19:36 (T27)	20:34	21:02
9	07:57		07:35		16:31 (T30)	07:54			07:03		07:35 (T28)	06:20	05:59
	17:20		17:57	51	17:22 (T30)	19:31			20:03	80	19:35 (T27)	20:35	21:02
10	07:57		07:34		16:31 (T30)	07:53			07:01		07:34 (T28)	06:19	05:58
	17:21		17:59	52	17:23 (T30)	19:32			20:05	79	19:34 (T27)	20:37	21:03
11	07:57		07:32		16:31 (T30)	07:51			07:00		07:35 (T28)	06:18	05:58
	17:22		18:00	51	17:22 (T30)	19:33			20:06	78	19:34 (T27)	20:38	21:04
12	07:56		07:31		16:31 (T30)	07:50			06:58		07:35 (T28)	06:17	05:58
	17:23		18:01	52	17:23 (T30)	19:34			20:07	75	19:33 (T27)	20:39	21:04
13	07:56		07:30		07:50 (T31)	07:48			06:56		07:36 (T28)	06:16	05:58
	17:25		18:02	59	17:23 (T30)	19:35			20:08	73	19:33 (T27)	20:40	21:05
14	07:56		07:29		07:49 (T31)	07:46			06:55		07:36 (T28)	06:15	05:58
	17:26		18:04	63	17:23 (T30)	19:36			20:09	69	19:31 (T27)	20:41	21:05
15	07:55		07:27		07:47 (T31)	07:45			06:53		07:36 (T28)	06:14	05:58
	17:27		18:05	67	17:22 (T30)	19:38			20:10	65	19:29 (T27)	20:42	21:06
16	07:55		07:26		07:46 (T31)	07:43			06:52		07:37 (T28)	06:13	05:58
	17:28		18:06	70	17:23 (T30)	19:39			20:11	60	19:28 (T27)	20:43	21:06
17	07:55		07:25		07:44 (T31)	07:41			06:50		07:38 (T28)	06:12	05:58
	17:29		18:07	72	17:22 (T30)	19:40			20:12	54	19:26 (T27)	20:44	21:06
18	07:54		07:23		07:43 (T31)	07:40			06:49		07:39 (T28)	06:11	05:58
	17:30		18:09	74	17:22 (T30)	19:41			20:13	48	19:24 (T27)	20:45	21:07
19	07:53		07:22		07:42 (T31)	07:38			06:47		07:40 (T28)	06:10	05:58
	17:31		18:10	75	17:22 (T30)	19:42			20:14	37	19:20 (T27)	20:46	21:07
20	07:53		07:21		07:40 (T31)	07:36			06:46		07:42 (T28)	06:09	05:58
	17:33		18:11	75	17:20 (T30)	19:43			20:15	24	08:06 (T28)	20:46	21:07
21	07:52		07:19		07:39 (T31)	07:35			06:44		07:44 (T28)	06:08	05:59
	17:34		18:12	76	17:20 (T30)	19:44			20:16	18	08:02 (T28)	20:47	21:08
22	07:52		07:18		07:37 (T31)	07:33			06:43		07:48 (T28)	06:08	05:59
	17:35		18:13	77	17:19 (T30)	19:45			20:17	10	07:58 (T28)	20:48	21:08
23	07:51	16:49 (T30)	07:16		07:37 (T31)	07:31	07:59 (T28)		06:41			06:07	05:59
	17:36	10	16:59 (T30)	18:15	74	17:18 (T30)	19:46	7	08:06 (T28)	20:18			20:49	21:08
24	07:50		16:45 (T30)	07:15		07:36 (T31)	07:30		07:54 (T28)	06:40			06:06	05:59
	17:37	17	17:02 (T30)	18:16	74	17:17 (T30)	19:47	18	08:12 (T28)	20:20			20:50	21:08
25	07:50		16:43 (T30)	07:13		07:36 (T31)	07:28		07:50 (T28)	06:38			06:05	06:00
	17:39	22	17:05 (T30)	18:17	71	17:16 (T30)	19:48	24	08:14 (T28)	20:21			20:51	21:08
26	07:49		16:42 (T30)	07:12		07:36 (T31)	07:26		07:47 (T28)	06:37			06:05	06:00
	17:40	26	17:08 (T30)	18:18	67	17:14 (T30)	19:50	29	08:16 (T28)	20:22			20:52	21:09
27	07:48		16:40 (T30)	07:10		07:37 (T31)	07:24		07:45 (T28)	06:36			06:04	06:00
	17:41	30	17:10 (T30)	18:19	62	17:12 (T30)	19:51	42	19:26 (T27)	20:23			20:53	21:09
28	07:47		16:39 (T30)	07:09		07:37 (T31)	07:23		07:44 (T28)	06:34			06:03	06:01
	17:42	32	17:11 (T30)	18:20	57	17:10 (T30)	19:52	52	19:30 (T27)	20:24			20:54	21:09
29	07:46		16:38 (T30)				07:21		07:42 (T28)	06:33			06:03	06:01
	17:44	35	17:13 (T30)				19:53	58	19:31 (T27)	20:25			20:55	21:09
30	07:45		16:37 (T30)				07:19		07:40 (T28)	06:31			06:02	06:01
	17:45	37	17:14 (T30)				19:54	65	19:32 (T27)	20:26			20:55	21:09
31	07:44		16:36 (T30)				07:18		07:40 (T28)				06:02	
	17:46	39	17:15 (T30)				19:55	69	19:34 (T27)				20:56	
Potential sun hours	297			297			370			399			449	453
Total, worst case		248			1689			528			1398			
Sun reduction		0.31			0.40			0.44			0.52			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.72			0.68			0.62			0.63			
Total reduction		0.23			0.28			0.27			0.33			
Total, real		56			466			145			460			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 91 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6265)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August		September		October		November		December
1	06:02	06:26		06:57		07:34 (T28)	07:27			16:00 (T30)	07:37
	21:09	20:50		20:07	78	19:33 (T27)	19:15			16:51 (T30)	17:04
2	06:02	06:27		06:58		07:33 (T28)	07:29			16:01 (T30)	07:38
	21:08	20:49		20:06	79	19:33 (T27)	19:13			16:52 (T30)	17:03
3	06:03	06:28		06:59		07:33 (T28)	07:30			16:01 (T30)	07:39
	21:08	20:48		20:04	80	19:33 (T27)	19:11			16:51 (T30)	17:03
4	06:04	06:29		07:00		07:32 (T28)	07:31			16:01 (T30)	07:40
	21:08	20:47		20:02	82	19:33 (T27)	19:10			16:51 (T30)	17:03
5	06:04	06:30		07:01		07:32 (T28)	07:32			16:02 (T30)	07:41
	21:08	20:46		20:01	81	19:33 (T27)	19:08			16:50 (T30)	17:03
6	06:05	06:31		07:02		07:32 (T28)	07:33			16:03 (T30)	07:42
	21:08	20:45		19:57	81	19:33 (T27)	19:06			16:50 (T30)	17:03
7	06:05	06:32		07:03		07:31 (T28)	07:34	08:24 (T31)	07:09	16:03 (T30)	07:43
	21:07	20:43		19:56	81	19:32 (T27)	19:05	6 08:30 (T31)	17:21	16:49 (T30)	17:02
8	06:06	06:33		07:04		07:31 (T28)	07:35	08:19 (T31)	07:10	16:04 (T30)	07:44
	21:07	20:42		19:54	79	19:31 (T27)	19:03	15 08:34 (T31)	17:20	16:48 (T30)	17:02
9	06:07	06:34		07:05		07:30 (T28)	07:36	08:16 (T31)	07:12	16:05 (T30)	07:45
	21:07	20:41		19:52	78	19:29 (T27)	19:01	20 08:36 (T31)	17:19	16:48 (T30)	17:02
10	06:07	06:35		07:06		07:30 (T28)	07:37	08:14 (T31)	07:13	16:06 (T30)	07:46
	21:06	20:40		19:51	76	19:28 (T27)	19:00	23 08:37 (T31)	17:18	16:47 (T30)	17:02
11	06:08	06:36		07:07		07:31 (T28)	07:38	08:12 (T31)	07:14	16:07 (T30)	07:47
	21:06	20:38		19:49	72	19:27 (T27)	18:58	26 08:38 (T31)	17:17	16:46 (T30)	17:02
12	06:09	06:37		07:08		07:31 (T28)	07:39	08:11 (T31)	07:15	16:08 (T30)	07:47
	21:06	20:37		19:47	69	19:25 (T27)	18:57	45 17:38 (T30)	17:16	16:45 (T30)	17:03
13	06:09	06:38		07:09		07:31 (T28)	07:40	08:10 (T31)	07:16	16:10 (T30)	07:48
	21:05	20:36		19:45	65	19:23 (T27)	18:55	53 17:41 (T30)	17:15	16:45 (T30)	17:03
14	06:10	06:39		07:10		07:32 (T28)	07:41	08:10 (T31)	07:18	16:11 (T30)	07:49
	21:05	20:34		19:44	60	19:22 (T27)	18:53	60 17:44 (T30)	17:14	16:43 (T30)	17:03
15	06:11	06:40		07:11		07:33 (T28)	07:42	08:09 (T31)	07:19	16:12 (T30)	07:50
	21:04	20:33		19:42	54	19:20 (T27)	18:52	65 17:46 (T30)	17:13	16:42 (T30)	17:03
16	06:12	06:41		07:12		07:34 (T28)	07:44	08:08 (T31)	07:20	16:15 (T30)	07:50
	21:04	20:32		19:40	45	19:16 (T27)	18:50	69 17:47 (T30)	17:12	26 16:41 (T30)	17:03
17	06:13	06:42		07:13		07:35 (T28)	07:45	08:08 (T31)	07:21	16:17 (T30)	07:51
	21:03	20:30		19:39	29	08:04 (T28)	18:49	71 17:48 (T30)	17:11	22 16:39 (T30)	17:04
18	06:13	06:43		07:14		07:37 (T28)	07:46	08:07 (T31)	07:22	16:19 (T30)	07:52
	21:02	20:29		19:37	25	08:02 (T28)	18:47	74 17:48 (T30)	17:11	17 16:36 (T30)	17:04
19	06:14	06:44		07:15		07:39 (T28)	07:47	08:07 (T31)	07:24	16:23 (T30)	07:52
	21:02	20:27		19:35	20	07:59 (T28)	18:46	76 17:49 (T30)	17:10	10 16:33 (T30)	17:04
20	06:15	06:45		07:16		07:43 (T28)	07:48	08:09 (T31)	07:25		07:53
	21:01	20:26		19:33	11	07:54 (T28)	18:44	76 17:51 (T30)	17:09		17:05
21	06:16	06:46	07:52 (T28)	07:17			07:49	08:10 (T31)	07:26		07:53
	21:00	20:24	12 08:04 (T28)	19:32			18:43	75 17:51 (T30)	17:08		17:05
22	06:17	06:47	07:49 (T28)	07:18			07:50	08:11 (T31)	07:27		07:54
	20:59	20:23	18 08:07 (T28)	19:30			18:41	75 17:51 (T30)	17:08		17:06
23	06:18	06:48	07:46 (T28)	07:19			07:51	08:12 (T31)	07:28		07:54
	20:59	20:21	24 08:10 (T28)	19:28			18:40	73 17:51 (T30)	17:07		17:06
24	06:19	06:49	07:44 (T28)	07:20			07:53	08:13 (T31)	07:29		07:55
	20:58	20:20	38 19:24 (T27)	19:27			18:39	72 17:51 (T30)	17:07		17:07
25	06:20	06:50	07:42 (T28)	07:21			07:54	08:15 (T31)	07:31		07:55
	20:57	20:18	48 19:27 (T27)	19:25			18:37	71 17:52 (T30)	17:06		17:07
26	06:20	06:51	07:40 (T28)	07:22			07:55	08:16 (T31)	07:32		07:56
	20:56	20:17	56 19:29 (T27)	19:23			18:36	69 17:52 (T30)	17:05		17:08
27	06:21	06:52	07:39 (T28)	07:23			07:56	08:17 (T31)	07:33		07:56
	20:55	20:15	61 19:30 (T27)	19:21			18:34	66 17:52 (T30)	17:05		17:09
28	06:22	06:53	07:38 (T28)	07:24			07:57	08:18 (T31)	07:34		07:56
	20:54	20:14	65 19:31 (T27)	19:20			18:33	63 17:52 (T30)	17:05		17:09
29	06:23	06:54	07:37 (T28)	07:25			07:58	08:21 (T31)	07:35		07:57
	20:53	20:12	69 19:32 (T27)	19:18			18:32	56 17:53 (T30)	17:04		17:10
30	06:24	06:55	07:36 (T28)	07:26			08:00	17:01 (T30)	07:36		07:57
	20:52	20:10	73 19:33 (T27)	19:16			18:30	51 17:52 (T30)	17:04		17:11
31	06:25	06:56	07:35 (T28)				08:01	17:00 (T30)			07:57
	20:51	20:09	75 19:33 (T27)				18:29	52 17:52 (T30)			17:12
Potential sun hours	460	429		375			345		297		287
Total, worst case			539		1245			1402		719	
Sun reduction			0.61		0.59			0.48		0.30	
Oper. time red.			1.00		1.00			1.00		1.00	
Wind dir. red.			0.63		0.63			0.66		0.72	
Total reduction			0.39		0.37			0.32		0.22	
Total, real			208		465			448		157	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 104 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6275)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March	April			May			June		
1	07:57		15:54 (T35)	07:43		08:04 (T36)	07:07	07:16			06:30		06:58 (T31)	06:01		19:27 (T30)
	17:13	45	16:39 (T35)	17:47	38	16:46 (T35)	18:22	19:56			20:27	32	07:30 (T31)	20:57	55	20:22 (T30)
2	07:57		15:54 (T35)	07:43		08:03 (T36)	07:06	07:14			06:29		06:59 (T31)	06:01		19:27 (T30)
	17:14	46	16:40 (T35)	17:49	41	16:45 (T35)	18:23	19:57			20:28	31	07:30 (T31)	20:58	56	20:23 (T30)
3	07:58		15:54 (T35)	07:41		08:02 (T36)	07:04	07:13			06:28		06:58 (T31)	06:00		19:26 (T30)
	17:15	47	16:41 (T35)	17:50	42	16:44 (T35)	18:24	19:58			20:29	30	07:28 (T31)	20:58	56	20:22 (T30)
4	07:58		15:55 (T35)	07:40		08:01 (T36)	07:02	07:11			06:26		06:59 (T31)	06:00		19:27 (T30)
	17:15	46	16:41 (T35)	17:51	41	16:42 (T35)	18:25	19:59			20:30	28	07:27 (T31)	20:59	56	20:23 (T30)
5	07:58		15:55 (T35)	07:39		08:00 (T36)	07:01	07:09			06:25		07:00 (T31)	06:00		19:27 (T30)
	17:16	47	16:42 (T35)	17:52	41	16:41 (T35)	18:26	20:00			20:31	27	07:27 (T31)	21:00	56	20:23 (T30)
6	07:57		15:56 (T35)	07:38		07:58 (T36)	06:59	07:08			06:24		07:01 (T31)	05:59		19:27 (T30)
	17:17	47	16:43 (T35)	17:54	38	16:38 (T35)	18:27	20:00			20:32	25	07:26 (T31)	21:01	56	20:23 (T30)
7	07:57		15:56 (T35)	07:37		07:57 (T36)	06:58	07:06			06:23		07:03 (T31)	05:59		19:27 (T30)
	17:18	47	16:43 (T35)	17:55	33	16:35 (T35)	18:29	20:01			20:33	21	07:24 (T31)	21:01	56	20:23 (T30)
8	07:57		15:55 (T35)	07:36		07:56 (T36)	07:56	07:05			06:21		07:03 (T31)	05:59		19:27 (T30)
	17:19	48	16:43 (T35)	17:56	22	08:18 (T36)	19:30	20:02			20:34	26	19:56 (T30)	21:02	57	20:24 (T30)
9	07:57		15:56 (T35)	07:35		07:55 (T36)	07:54	07:03			06:20		07:05 (T31)	05:59		19:28 (T30)
	17:20	48	16:44 (T35)	17:57	24	08:19 (T36)	19:31	20:03			20:35	32	20:01 (T30)	21:02	56	20:24 (T30)
10	07:57		15:56 (T35)	07:34		07:54 (T36)	07:53	07:01			06:19		07:08 (T31)	05:58		19:27 (T30)
	17:21	49	16:45 (T35)	17:59	25	08:19 (T36)	19:32	20:05			20:36	32	20:04 (T30)	21:03	57	20:24 (T30)
11	07:57		15:56 (T35)	07:32		07:52 (T36)	07:51	07:00			06:18		19:39 (T30)	05:58		19:27 (T30)
	17:22	48	16:44 (T35)	18:00	27	08:19 (T36)	19:33	20:06			20:38	27	20:06 (T30)	21:04	57	20:24 (T30)
12	07:56		15:57 (T35)	07:31		07:51 (T36)	07:50	06:58			06:17		19:37 (T30)	05:58		19:28 (T30)
	17:23	48	16:45 (T35)	18:01	28	08:19 (T36)	19:34	20:07			20:39	31	20:08 (T30)	21:04	56	20:24 (T30)
13	07:56		15:57 (T35)	07:30		07:50 (T36)	07:48	06:56			06:16		19:35 (T30)	05:58		19:28 (T30)
	17:25	49	16:46 (T35)	18:02	30	08:20 (T36)	19:35	20:08			20:40	34	20:09 (T30)	21:05	57	20:25 (T30)
14	07:56		15:57 (T35)	07:29		07:51 (T36)	07:46	06:55			06:15		19:34 (T30)	05:58		19:28 (T30)
	17:26	49	16:46 (T35)	18:04	29	08:20 (T36)	19:36	20:09			20:41	37	20:11 (T30)	21:05	57	20:25 (T30)
15	07:55		15:58 (T35)	07:27		07:51 (T36)	07:45	06:53		07:12 (T31)	06:14		19:33 (T30)	05:58		19:28 (T30)
	17:27	49	16:47 (T35)	18:05	28	08:19 (T36)	19:38	20:10	11	07:23 (T31)	20:42	39	20:12 (T30)	21:06	57	20:25 (T30)
16	07:55		15:58 (T35)	07:26		07:51 (T36)	07:43	06:52		07:11 (T31)	06:13		19:32 (T30)	05:58		19:28 (T30)
	17:28	49	16:47 (T35)	18:06	28	08:19 (T36)	19:39	20:11	15	07:26 (T31)	20:43	41	20:13 (T30)	21:06	57	20:25 (T30)
17	07:55		15:59 (T35)	07:25		07:51 (T36)	07:41	06:50		07:09 (T31)	06:12		19:32 (T30)	05:58		19:29 (T30)
	17:29	49	16:48 (T35)	18:07	26	08:17 (T36)	19:40	20:12	19	07:28 (T31)	20:44	43	20:15 (T30)	21:06	56	20:25 (T30)
18	07:54		15:59 (T35)	07:23		07:52 (T36)	07:40	06:49		07:08 (T31)	06:11		19:31 (T30)	05:58		19:29 (T30)
	17:30	49	16:48 (T35)	18:09	25	08:17 (T36)	19:41	20:13	21	07:29 (T31)	20:45	44	20:15 (T30)	21:07	57	20:26 (T30)
19	07:53		16:00 (T35)	07:22		07:54 (T36)	07:38	06:47		07:06 (T31)	06:10		19:30 (T30)	05:58		19:30 (T30)
	17:31	48	16:48 (T35)	18:10	22	08:16 (T36)	19:42	20:14	24	07:30 (T31)	20:46	46	20:16 (T30)	21:07	57	20:27 (T30)
20	07:53		16:00 (T35)	07:21		07:55 (T36)	07:36	06:46		07:05 (T31)	06:09		19:29 (T30)	05:58		19:30 (T30)
	17:33	48	16:48 (T35)	18:11	19	08:14 (T36)	19:43	20:15	26	07:31 (T31)	20:46	47	20:16 (T30)	21:07	57	20:27 (T30)
21	07:52		16:00 (T35)	07:19		07:57 (T36)	07:35	06:44		07:03 (T31)	06:08		19:28 (T30)	05:59		19:30 (T30)
	17:34	48	16:48 (T35)	18:12	16	08:13 (T36)	19:44	20:16	28	07:31 (T31)	20:47	49	20:17 (T30)	21:08	57	20:27 (T30)
22	07:52		16:01 (T35)	07:18		07:59 (T36)	07:33	06:43		07:02 (T31)	06:08		19:29 (T30)	05:59		19:30 (T30)
	17:35	48	16:49 (T35)	18:13	10	08:09 (T36)	19:45	20:17	30	07:32 (T31)	20:48	49	20:18 (T30)	21:08	57	20:27 (T30)
23	07:51		16:01 (T35)	07:16			07:31	06:41		07:01 (T31)	06:07		19:28 (T30)	05:59		19:30 (T30)
	17:36	48	16:49 (T35)	18:15			19:46	20:18	31	07:32 (T31)	20:49	50	20:18 (T30)	21:08	57	20:27 (T30)
24	07:50		16:02 (T35)	07:15			07:30	06:40		06:59 (T31)	06:06		19:27 (T30)	05:59		19:31 (T30)
	17:37	46	16:48 (T35)	18:16			19:47	20:20	33	07:32 (T31)	20:50	52	20:19 (T30)	21:08	57	20:28 (T30)
25	07:50		16:02 (T35)	07:13			07:28	06:38		06:58 (T31)	06:05		19:28 (T30)	06:00		19:31 (T30)
	17:39	46	16:48 (T35)	18:17			19:48	20:21	34	07:32 (T31)	20:51	52	20:20 (T30)	21:08	56	20:27 (T30)
26	07:49		16:04 (T35)	07:12			07:26	06:37		06:57 (T31)	06:05		19:27 (T30)	06:00		19:30 (T30)
	17:40	45	16:49 (T35)	18:18			19:50	20:22	34	07:31 (T31)	20:52	53	20:20 (T30)	21:09	57	20:27 (T30)
27	07:48		16:04 (T35)	07:10			07:24	06:36		06:57 (T31)	06:04		19:27 (T30)	06:00		19:31 (T30)
	17:41	45	16:49 (T35)	18:19			19:51	20:23	35	07:32 (T31)	20:53	53	20:20 (T30)	21:09	57	20:28 (T30)
28	07:47		16:05 (T35)	07:09			07:23	06:34		06:58 (T31)	06:03		19:27 (T30)	06:01		19:31 (T30)
	17:42	43	16:48 (T35)	18:20			19:52	20:24	34	07:32 (T31)	20:54	54	20:21 (T30)	21:09	57	20:28 (T30)
29	07:46		16:06 (T35)				07:21	06:33		06:57 (T31)	06:03		19:26 (T30)	06:01		19:32 (T30)
	17:44	42	16:48 (T35)				19:53	20:25	34	07:31 (T31)	20:55	55	20:21 (T30)	21:09	57	20:29 (T30)
30	07:45		16:07 (T35)				07:19	06:31		06:58 (T31)	06:02		19:27 (T30)	06:01		19:32 (T30)
	17:45	40	16:47 (T35)				19:54	20:26	32	07:30 (T31)	20:55	54	20:21 (T30)	21:09	57	20:29 (T30)
31	07:44		16:08 (T35)				07:18				06:02		19:26 (T30)			
	17:46	38	16:46 (T35)				19:55				20:56	55	20:21 (T30)			
Potential sun hours	297			297			370	399			449			453		
Total, worst case		1445			633				441			1249			1698	
Sun reduction		0.31			0.40				0.52			0.57			0.64	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.74			0.61				0.67			0.58			0.55	
Total reduction		0.24			0.25				0.36			0.34			0.37	
Total, real		344			160				160			426			626	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 104 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6275)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September	October			November			December		
1	06:02		19:32 (T30)	06:26		19:48 (T30)	06:57	07:27			07:02		07:23 (T36)	07:37		15:39 (T35)
	21:09	57	20:29 (T30)	20:50	30	20:18 (T30)	20:07	19:15			17:28	25	07:48 (T36)	17:04	49	16:28 (T35)
2	06:02		19:32 (T30)	06:27		19:50 (T30)	06:58	07:29			07:03		07:25 (T36)	07:38		15:40 (T35)
	21:08	57	20:29 (T30)	20:49	26	20:16 (T30)	20:06	19:13			17:27	24	07:49 (T36)	17:03	48	16:28 (T35)
3	06:03		19:33 (T30)	06:28		07:18 (T31)	06:59	07:30			07:04		07:26 (T36)	07:39		15:40 (T35)
	21:08	57	20:30 (T30)	20:48	32	20:14 (T30)	20:04	19:11			17:25	22	07:48 (T36)	17:03	48	16:28 (T35)
4	06:04		19:33 (T30)	06:29		07:15 (T31)	07:00	07:31			07:06		07:27 (T36)	07:40		15:40 (T35)
	21:08	56	20:29 (T30)	20:47	30	20:10 (T30)	20:02	19:10			17:24	34	16:05 (T35)	17:03	48	16:28 (T35)
5	06:04		19:33 (T30)	06:30		07:13 (T31)	07:01	07:32			07:07		07:28 (T36)	07:41		15:41 (T35)
	21:08	57	20:30 (T30)	20:46	20	07:33 (T31)	20:01	19:08			17:23	39	16:08 (T35)	17:03	47	16:28 (T35)
6	06:05		19:33 (T30)	06:31		07:12 (T31)	07:02	07:33			07:08		07:30 (T36)	07:42		15:42 (T35)
	21:08	56	20:29 (T30)	20:45	22	07:34 (T31)	19:57	19:06			17:22	40	16:11 (T35)	17:03	47	16:29 (T35)
7	06:05		19:33 (T30)	06:32		07:11 (T31)	07:03	07:34			07:09		07:31 (T36)	07:43		15:42 (T35)
	21:07	57	20:30 (T30)	20:43	25	07:36 (T31)	19:56	19:05			17:21	42	16:13 (T35)	17:02	47	16:29 (T35)
8	06:06		19:33 (T30)	06:33		07:10 (T31)	07:04	07:35			07:10		07:32 (T36)	07:44		15:43 (T35)
	21:07	56	20:29 (T30)	20:42	27	07:37 (T31)	19:54	19:03			17:20	42	16:14 (T35)	17:02	46	16:29 (T35)
9	06:07		19:34 (T30)	06:34		07:09 (T31)	07:05	07:36			07:12		07:34 (T36)	07:45		15:42 (T35)
	21:07	56	20:30 (T30)	20:41	28	07:37 (T31)	19:52	19:01			17:19	42	16:16 (T35)	17:02	47	16:29 (T35)
10	06:07		19:34 (T30)	06:35		07:08 (T31)	07:06	07:37			07:13		15:40 (T35)	07:46		15:43 (T35)
	21:06	56	20:30 (T30)	20:40	30	07:38 (T31)	19:51	19:00			17:18	37	16:17 (T35)	17:02	46	16:29 (T35)
11	06:08		19:34 (T30)	06:36		07:07 (T31)	07:07	07:38			07:14		15:39 (T35)	07:47		15:44 (T35)
	21:06	55	20:29 (T30)	20:38	32	07:39 (T31)	19:49	18:58			17:17	38	16:17 (T35)	17:03	45	16:29 (T35)
12	06:09		19:34 (T30)	06:37		07:07 (T31)	07:08	07:39			07:15		15:38 (T35)	07:47		15:45 (T35)
	21:06	56	20:30 (T30)	20:37	32	07:39 (T31)	19:47	18:57			17:16	40	16:18 (T35)	17:03	45	16:30 (T35)
13	06:09		19:35 (T30)	06:38		07:06 (T31)	07:09	07:40			07:16		15:38 (T35)	07:48		15:45 (T35)
	21:05	55	20:30 (T30)	20:36	33	07:39 (T31)	19:45	18:55			17:15	42	16:20 (T35)	17:03	45	16:30 (T35)
14	06:10		19:36 (T30)	06:39		07:05 (T31)	07:10	07:41			07:18		15:37 (T35)	07:49		15:45 (T35)
	21:05	54	20:30 (T30)	20:34	33	07:38 (T31)	19:44	18:53			17:14	43	16:20 (T35)	17:03	45	16:30 (T35)
15	06:11		19:35 (T30)	06:40		07:04 (T31)	07:11	07:42			07:19		15:36 (T35)	07:50		15:46 (T35)
	21:04	54	20:29 (T30)	20:33	34	07:38 (T31)	19:42	18:52			17:13	44	16:20 (T35)	17:03	45	16:31 (T35)
16	06:12		19:36 (T30)	06:41		07:04 (T31)	07:12	07:44			07:20		15:37 (T35)	07:50		15:47 (T35)
	21:04	53	20:29 (T30)	20:32	34	07:38 (T31)	19:40	18:50			17:12	45	16:22 (T35)	17:03	44	16:31 (T35)
17	06:13		19:36 (T30)	06:42		07:04 (T31)	07:13	07:45			07:21		15:36 (T35)	07:51		15:48 (T35)
	21:03	53	20:29 (T30)	20:30	34	07:38 (T31)	19:39	18:49			17:11	46	16:22 (T35)	17:04	44	16:32 (T35)
18	06:13		19:37 (T30)	06:43		07:04 (T31)	07:14	07:46			07:22		15:36 (T35)	07:52		15:48 (T35)
	21:02	52	20:29 (T30)	20:29	34	07:38 (T31)	19:37	18:47			17:11	46	16:22 (T35)	17:04	44	16:32 (T35)
19	06:14		19:38 (T30)	06:44		07:05 (T31)	07:15	07:47			07:24		15:35 (T35)	07:52		15:49 (T35)
	21:02	51	20:29 (T30)	20:27	33	07:38 (T31)	19:35	18:46			17:10	48	16:23 (T35)	17:04	44	16:33 (T35)
20	06:15		19:37 (T30)	06:45		07:06 (T31)	07:16	07:48		08:30 (T36)	07:25		15:36 (T35)	07:53		15:49 (T35)
	21:01	51	20:28 (T30)	20:26	31	07:37 (T31)	19:33	18:44	12	08:42 (T36)	17:09	48	16:24 (T35)	17:05	44	16:33 (T35)
21	06:16		19:38 (T30)	06:46		07:07 (T31)	07:17	07:49		08:27 (T36)	07:26		15:36 (T35)	07:53		15:50 (T35)
	21:00	50	20:28 (T30)	20:24	29	07:36 (T31)	19:32	18:43	17	08:44 (T36)	17:08	48	16:24 (T35)	17:05	43	16:33 (T35)
22	06:17		19:39 (T30)	06:47		07:08 (T31)	07:18	07:50		08:25 (T36)	07:27		15:36 (T35)	07:54		15:50 (T35)
	20:59	48	20:27 (T30)	20:23	28	07:36 (T31)	19:30	18:41	20	08:45 (T36)	17:08	48	16:24 (T35)	17:06	43	16:33 (T35)
23	06:18		19:39 (T30)	06:48		07:09 (T31)	07:19	07:51		08:23 (T36)	07:28		15:36 (T35)	07:54		15:51 (T35)
	20:59	48	20:27 (T30)	20:21	26	07:35 (T31)	19:28	18:40	23	08:46 (T36)	17:07	48	16:24 (T35)	17:06	43	16:34 (T35)
24	06:19		19:40 (T30)	06:49		07:10 (T31)	07:20	07:53		08:22 (T36)	07:29		15:36 (T35)	07:55		15:51 (T35)
	20:58	47	20:27 (T30)	20:20	23	07:33 (T31)	19:27	18:39	25	08:47 (T36)	17:07	49	16:25 (T35)	17:07	44	16:35 (T35)
25	06:20		19:41 (T30)	06:50		07:11 (T31)	07:21	07:54		08:22 (T36)	07:31		15:37 (T35)	07:55		15:51 (T35)
	20:57	45	20:26 (T30)	20:18	21	07:32 (T31)	19:25	18:37	26	08:48 (T36)	17:06	49	16:26 (T35)	17:08	44	16:35 (T35)
26	06:20		19:42 (T30)	06:51		07:12 (T31)	07:22	07:55		08:21 (T36)	07:32		15:37 (T35)	07:56		15:52 (T35)
	20:56	43	20:25 (T30)	20:17	18	07:30 (T31)	19:23	18:36	28	08:49 (T36)	17:05	49	16:26 (T35)	17:08	44	16:36 (T35)
27	06:21		19:42 (T30)	06:52		07:13 (T31)	07:23	07:56		08:20 (T36)	07:33		15:37 (T35)	07:56		15:52 (T35)
	20:55	42	20:24 (T30)	20:15	15	07:28 (T31)	19:21	18:34	29	08:49 (T36)	17:05	49	16:26 (T35)	17:09	44	16:36 (T35)
28	06:22		19:43 (T30)	06:53		07:14 (T31)	07:24	07:57		08:20 (T36)	07:34		15:37 (T35)	07:56		15:52 (T35)
	20:54	40	20:23 (T30)	20:14	11	07:25 (T31)	19:20	18:33	29	08:49 (T36)	17:05	49	16:26 (T35)	17:09	45	16:37 (T35)
29	06:23		19:44 (T30)	06:54			07:25	07:58		08:20 (T36)	07:35		15:37 (T35)	07:57		15:52 (T35)
	20:53	38	20:22 (T30)	20:12			19:18	18:32	29	08:49 (T36)	17:04	49	16:26 (T35)	17:10	45	16:37 (T35)
30	06:24		19:45 (T30)	06:55			07:26	08:00		08:21 (T36)	07:36		15:38 (T35)	07:57		15:53 (T35)
	20:52	36	20:21 (T30)	20:10			19:16	18:30	28	08:49 (T36)	17:04	48	16:26 (T35)	17:11	45	16:38 (T35)
31	06:25		19:47 (T30)	06:56				08:01		08:22 (T36)				07:57		15:54 (T35)
	20:51	32	20:19 (T30)	20:09				18:29	27	08:49 (T36)				17:12	45	16:39 (T35)
Potential sun hours	460			429			375	345			297			287		
Total, worst case		1568			771				293			1273			1403	
Sun reduction		0.66			0.61				0.48			0.30			0.22	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.55			0.66				0.55			0.71			0.74	
Total reduction		0.38			0.42				0.27			0.22			0.17	
Total, real		596			321				80			284			237	

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

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

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EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 137 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6297)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57			07:43			16:22 (T77)	07:07		07:38 (T76)	07:16		18:30 (T42)	06:30		19:37 (T41)	06:01	
	17:13			17:47	47		17:09 (T77)	18:22	27	08:05 (T76)	19:56	42	19:12 (T42)	20:27	28	20:05 (T41)	20:57	
2	07:57			07:42			16:22 (T77)	07:06		07:38 (T76)	07:14		18:30 (T42)	06:29		19:37 (T41)	06:01	
	17:14			17:49	48		17:10 (T77)	18:23	25	08:03 (T76)	19:57	40	19:10 (T42)	20:28	29	20:06 (T41)	20:58	
3	07:57			07:41			16:22 (T77)	07:04		07:39 (T76)	07:13		18:31 (T42)	06:28		19:36 (T41)	06:01	
	17:15			17:50	48		17:10 (T77)	18:24	22	08:01 (T76)	19:58	39	19:10 (T42)	20:29	30	20:06 (T41)	20:58	
4	07:57			07:40			16:23 (T77)	07:02		07:41 (T76)	07:11		18:32 (T42)	06:26		19:36 (T41)	06:00	
	17:16			17:51	47		17:10 (T77)	18:25	19	08:00 (T76)	19:59	36	19:08 (T42)	20:30	31	20:07 (T41)	20:59	
5	07:57			07:39			16:23 (T77)	07:01		07:42 (T76)	07:09		18:33 (T42)	06:25		19:36 (T41)	06:00	
	17:17			17:52	47		17:10 (T77)	18:26	15	07:57 (T76)	20:00	33	19:06 (T42)	20:31	31	20:07 (T41)	21:00	
6	07:57			07:38			16:23 (T77)	06:59		07:47 (T76)	07:08		18:35 (T42)	06:24		19:36 (T41)	05:59	
	17:17			17:54	46		17:09 (T77)	18:27	7	07:54 (T76)	20:00	30	19:05 (T42)	20:32	32	20:08 (T41)	21:00	
7	07:57		16:34 (T77)	07:37			16:23 (T77)	06:58			07:06		18:36 (T42)	06:23		19:36 (T41)	05:59	
	17:18	6	16:40 (T77)	17:55	46		17:09 (T77)	18:29			20:01	26	19:02 (T42)	20:33	32	20:08 (T41)	21:01	
8	07:57		16:32 (T77)	07:36			16:24 (T77)	07:56			07:05		18:39 (T42)	06:22		19:36 (T41)	05:59	
	17:19	12	16:44 (T77)	17:56	45		17:09 (T77)	19:30			20:02	21	19:00 (T42)	20:34	32	20:08 (T41)	21:02	
9	07:57		16:31 (T77)	07:35			16:25 (T77)	07:54			07:03		18:42 (T42)	06:20		19:36 (T41)	05:59	
	17:20	15	16:46 (T77)	17:57	44		17:09 (T77)	19:31			20:03	14	18:56 (T42)	20:35	31	20:07 (T41)	21:02	
10	07:57		16:30 (T77)	07:34			16:26 (T77)	07:53			07:01			06:19		19:36 (T41)	05:59	
	17:21	19	16:49 (T77)	17:59	42		17:08 (T77)	19:32			20:05			20:36	30	20:06 (T41)	21:03	
11	07:57		16:28 (T77)	07:32			16:26 (T77)	07:51		18:52 (T42)	07:00			06:18		19:36 (T41)	05:58	
	17:23	22	16:50 (T77)	18:00	41		17:07 (T77)	19:33	9	19:01 (T42)	20:06			20:37	30	20:06 (T41)	21:04	
12	07:56		16:28 (T77)	07:31			16:27 (T77)	07:50		18:47 (T42)	06:58			06:17		19:36 (T41)	05:58	
	17:24	24	16:52 (T77)	18:01	40		17:07 (T77)	19:34	19	19:06 (T42)	20:07			20:38	29	20:05 (T41)	21:04	
13	07:56		16:27 (T77)	07:30			16:28 (T77)	07:48		18:44 (T42)	06:57			06:16		19:37 (T41)	05:58	
	17:25	27	16:54 (T77)	18:02	38		17:06 (T77)	19:35	25	19:09 (T42)	20:08			20:39	28	20:05 (T41)	21:05	
14	07:56		16:26 (T77)	07:29			07:49 (T76)	07:46		18:41 (T42)	06:55			06:15		19:38 (T41)	05:58	
	17:26	28	16:54 (T77)	18:04	41		17:04 (T77)	19:36	29	19:10 (T42)	20:09			20:40	26	20:04 (T41)	21:05	
15	07:55		16:26 (T77)	07:27			07:47 (T76)	07:45		18:39 (T42)	06:53			06:14		19:38 (T41)	05:58	
	17:27	30	16:56 (T77)	18:05	44		17:03 (T77)	19:38	33	19:12 (T42)	20:10			20:42	25	20:03 (T41)	21:05	
16	07:55		16:25 (T77)	07:26			07:46 (T76)	07:43		18:37 (T42)	06:52			06:13		19:40 (T41)	05:58	
	17:28	32	16:57 (T77)	18:06	45		17:02 (T77)	19:39	36	19:13 (T42)	20:11			20:42	23	20:03 (T41)	21:06	
17	07:54		16:25 (T77)	07:25			07:44 (T76)	07:41		18:36 (T42)	06:50			06:12		19:41 (T41)	05:58	
	17:29	34	16:59 (T77)	18:07	44		16:59 (T77)	19:40	38	19:14 (T42)	20:12			20:43	21	20:02 (T41)	21:06	
18	07:54		16:24 (T77)	07:23			07:43 (T76)	07:40		18:35 (T42)	06:49			06:11		19:42 (T41)	05:58	
	17:30	35	16:59 (T77)	18:09	41		16:57 (T77)	19:41	40	19:15 (T42)	20:13			20:44	19	20:01 (T41)	21:07	
19	07:53		16:24 (T77)	07:22			07:42 (T76)	07:38		18:33 (T42)	06:47			06:10		19:43 (T41)	05:58	
	17:32	37	17:01 (T77)	18:10	37		16:54 (T77)	19:42	43	19:16 (T42)	20:14			20:45	17	20:00 (T41)	21:07	
20	07:53		16:23 (T77)	07:20			07:40 (T76)	07:36		18:32 (T42)	06:46			06:09		19:45 (T41)	05:59	
	17:33	39	17:02 (T77)	18:11	26		08:06 (T76)	19:43	44	19:16 (T42)	20:15			20:46	13	19:58 (T41)	21:07	
21	07:52		16:23 (T77)	07:19			07:39 (T76)	07:35		18:32 (T42)	06:44			06:09		19:47 (T41)	05:59	
	17:34	39	17:02 (T77)	18:12	28		08:07 (T76)	19:44	45	19:17 (T42)	20:16			20:47	8	19:55 (T41)	21:08	
22	07:52		16:23 (T77)	07:18			07:37 (T76)	07:33		18:31 (T42)	06:43			06:08			05:59	
	17:35	41	17:04 (T77)	18:13	30		08:07 (T76)	19:45	45	19:16 (T42)	20:17			20:48			21:08	
23	07:51		16:22 (T77)	07:16			07:37 (T76)	07:31		18:30 (T42)	06:41			06:07			05:59	
	17:36	43	17:05 (T77)	18:15	30		08:07 (T76)	19:46	46	19:16 (T42)	20:18			20:49			21:08	
24	07:50		16:22 (T77)	07:15			07:36 (T76)	07:30		18:30 (T42)	06:40		19:48 (T41)	06:06			05:59	
	17:38	43	17:05 (T77)	18:16	31		08:07 (T76)	19:47	47	19:17 (T42)	20:19	10	19:58 (T41)	20:50			21:08	
25	07:49		16:22 (T77)	07:13			07:37 (T76)	07:28		18:30 (T42)	06:38		19:45 (T41)	06:06			06:00	
	17:39	44	17:06 (T77)	18:17	30		08:07 (T76)	19:48	46	19:16 (T42)	20:21	14	19:59 (T41)	20:51			21:08	
26	07:49		16:21 (T77)	07:12			07:36 (T76)	07:26		18:29 (T42)	06:37		19:43 (T41)	06:05			06:00	
	17:40	45	17:06 (T77)	18:18	30		08:06 (T76)	19:50	47	19:16 (T42)	20:22	16	19:59 (T41)	20:52			21:08	
27	07:48		16:22 (T77)	07:10			07:37 (T76)	07:24		18:29 (T42)	06:36		19:41 (T41)	06:04			06:00	
	17:41	46	17:08 (T77)	18:19	29		08:06 (T76)	19:51	46	19:15 (T42)	20:23	20	20:01 (T41)	20:53			21:08	
28	07:47		16:22 (T77)	07:09			07:37 (T76)	07:23		18:29 (T42)	06:34		19:40 (T41)	06:04			06:01	
	17:42	46	17:08 (T77)	18:21	28		08:05 (T76)	19:52	46	19:15 (T42)	20:24	22	20:02 (T41)	20:54			21:09	
29	07:46		16:22 (T77)					07:21		18:29 (T42)	06:33		19:38 (T41)	06:03			06:01	
	17:44	46	17:08 (T77)					19:53	45	19:14 (T42)	20:25	24	20:02 (T41)	20:54			21:09	
30	07:45		16:22 (T77)					07:19		18:29 (T42)	06:32		19:38 (T41)	06:02			06:02	
	17:45	47	17:09 (T77)					19:54	44	19:13 (T42)	20:26	26	20:04 (T41)	20:55			21:08	
31	07:44		16:22 (T77)					07:18		18:30 (T42)				06:02				
	17:46	47	17:09 (T77)					19:55	43	19:13 (T42)				20:56				
Potential sun hours	297			297			370			399			448			453		
Total, worst case		847			1093			931			413			545				
Sun reduction		0.31			0.40			0.44			0.52			0.57				
Oper. time red.		1.00			1.00			1.00			1.00			1.00				
Wind dir. red.		0.73			0.67			0.64			0.62			0.57				
Total reduction		0.23			0.27			0.29			0.33			0.33				
Total, real		195			300			267			137			179				

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

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

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 137 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6297)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		06:26		06:57		07:27		07:02		07:37	
	21:08		20:50	29	20:16 (T41)	20:07		19:15	22	18:46 (T42)	17:28	43	16:37 (T77)	17:04	22	16:32 (T77)
2	06:03		06:27		19:46 (T41)	06:58		07:29		18:28 (T42)	07:03		15:55 (T77)	07:38		16:12 (T77)
	21:08		20:49	31	20:17 (T41)	20:06		19:13	14	18:42 (T42)	17:27	44	16:39 (T77)	17:03	19	16:31 (T77)
3	06:03		06:28		19:46 (T41)	06:59		18:40 (T42)	07:30		07:04		15:54 (T77)	07:39		16:15 (T77)
	21:08		20:48	31	20:17 (T41)	20:04	14	18:54 (T42)	19:11		17:26	45	16:39 (T77)	17:03	16	16:31 (T77)
4	06:04		06:29		19:46 (T41)	07:00		18:36 (T42)	07:31		07:06		15:53 (T77)	07:40		16:17 (T77)
	21:08		20:47	31	20:17 (T41)	20:02	21	18:57 (T42)	19:10		17:24	46	16:39 (T77)	17:03	12	16:29 (T77)
5	06:04		06:30		19:46 (T41)	07:01		18:33 (T42)	07:32		07:07		15:52 (T77)	07:41		16:20 (T77)
	21:08		20:46	31	20:17 (T41)	20:01	26	18:59 (T42)	19:08		17:23	47	16:39 (T77)	17:03	7	16:27 (T77)
6	06:05		06:31		19:45 (T41)	07:02		18:31 (T42)	07:33		07:08		15:53 (T77)	07:42		
	21:08		20:44	32	20:17 (T41)	19:57	30	19:01 (T42)	19:06		17:22	47	16:40 (T77)	17:03		
7	06:05		06:32		19:45 (T41)	07:03		18:29 (T42)	07:34		07:09		15:53 (T77)	07:43		
	21:07		20:43	32	20:17 (T41)	19:56	33	19:02 (T42)	19:05		17:21	47	16:40 (T77)	17:03		
8	06:06		06:33		19:45 (T41)	07:04		18:27 (T42)	07:35	08:20 (T76)	07:10		15:52 (T77)	07:44		
	21:07		20:42	32	20:17 (T41)	19:54	36	19:03 (T42)	19:03	11	08:31 (T76)	17:20	48	16:40 (T77)	17:03	
9	06:07		06:34		19:45 (T41)	07:05		18:26 (T42)	07:36		08:17 (T76)	07:12		15:53 (T77)	07:45	
	21:07		20:41	32	20:17 (T41)	19:52	38	19:04 (T42)	19:01	17	08:34 (T76)	17:19	48	16:41 (T77)	17:03	
10	06:07		06:35		19:46 (T41)	07:06		18:23 (T42)	07:37		08:14 (T76)	07:13		15:53 (T77)	07:46	
	21:06		20:39	30	20:16 (T41)	19:51	40	19:03 (T42)	19:00	21	08:35 (T76)	17:18	47	16:40 (T77)	17:03	
11	06:08		06:36		19:46 (T41)	07:07		18:22 (T42)	07:38		08:13 (T76)	07:14		15:53 (T77)	07:46	
	21:06		20:38	28	20:14 (T41)	19:49	42	19:04 (T42)	18:58	23	08:36 (T76)	17:17	47	16:40 (T77)	17:03	
12	06:09		06:37		19:46 (T41)	07:08		18:21 (T42)	07:39		08:11 (T76)	07:15		15:53 (T77)	07:47	
	21:06		20:37	27	20:13 (T41)	19:47	43	19:04 (T42)	18:57	26	08:37 (T76)	17:16	47	16:40 (T77)	17:03	
13	06:10		06:38		19:47 (T41)	07:09		18:20 (T42)	07:40		08:10 (T76)	07:16		15:54 (T77)	07:48	
	21:05		20:36	25	20:12 (T41)	19:45	44	19:04 (T42)	18:55	28	08:38 (T76)	17:15	46	16:40 (T77)	17:03	
14	06:10		06:39		19:47 (T41)	07:10		18:19 (T42)	07:41		08:09 (T76)	07:18		15:54 (T77)	07:49	
	21:05		20:34	24	20:11 (T41)	19:44	45	19:04 (T42)	18:54	29	08:38 (T76)	17:14	46	16:40 (T77)	17:03	
15	06:11		06:40		19:48 (T41)	07:11		18:19 (T42)	07:42		08:09 (T76)	07:19		15:54 (T77)	07:50	
	21:04		20:33	21	20:09 (T41)	19:42	45	19:04 (T42)	18:52	30	08:39 (T76)	17:13	46	16:40 (T77)	17:03	
16	06:12		06:41		19:48 (T41)	07:12		18:18 (T42)	07:44		08:09 (T76)	07:20		15:54 (T77)	07:50	
	21:03		20:31	19	20:07 (T41)	19:40	46	19:04 (T42)	18:50	30	08:39 (T76)	17:12	45	16:39 (T77)	17:04	
17	06:13		06:42		19:50 (T41)	07:13		18:17 (T42)	07:45		08:08 (T76)	07:21		15:56 (T77)	07:51	
	21:03		20:30	16	20:06 (T41)	19:39	47	19:04 (T42)	18:49	31	08:39 (T76)	17:11	44	16:40 (T77)	17:04	
18	06:14		06:43		19:52 (T41)	07:14		18:17 (T42)	07:46		08:08 (T76)	07:22		15:56 (T77)	07:52	
	21:02		20:29	12	20:04 (T41)	19:37	47	19:04 (T42)	18:47	30	08:38 (T76)	17:11	43	16:39 (T77)	17:04	
19	06:14		06:44		19:55 (T41)	07:15		18:17 (T42)	07:47		08:08 (T76)	07:23		15:56 (T77)	07:52	
	21:02		20:27	7	20:02 (T41)	19:35	46	19:03 (T42)	18:46	30	08:38 (T76)	17:10	43	16:39 (T77)	17:05	
20	06:15		06:45			07:16		18:16 (T42)	07:48		08:08 (T76)	07:25		15:58 (T77)	07:53	
	21:01		20:26			19:33	47	19:03 (T42)	18:44	29	08:37 (T76)	17:09	41	16:39 (T77)	17:05	
21	06:16		06:46			07:17		18:16 (T42)	07:49		08:10 (T76)	07:26		15:59 (T77)	07:53	
	21:00		20:24			19:32	46	19:02 (T42)	18:43	27	08:37 (T76)	17:08	39	16:38 (T77)	17:05	
22	06:17		19:59 (T41)	06:47		07:18		18:16 (T42)	07:50		08:11 (T76)	07:27		15:59 (T77)	07:54	
	20:59	5	20:04 (T41)	20:23		19:30	45	19:01 (T42)	18:41	25	08:36 (T76)	17:08	39	16:38 (T77)	17:06	
23	06:18		19:56 (T41)	06:48		07:19		18:16 (T42)	07:51		08:12 (T76)	07:28		16:00 (T77)	07:54	
	20:59	11	20:07 (T41)	20:21		19:28	44	19:00 (T42)	18:40	39	17:25 (T77)	17:07	37	16:37 (T77)	17:07	
24	06:19		19:54 (T41)	06:49		07:20		18:17 (T42)	07:53		08:13 (T76)	07:29		16:01 (T77)	07:55	
	20:58	15	20:09 (T41)	20:20		19:27	42	18:59 (T42)	18:39	43	17:28 (T77)	17:07	36	16:37 (T77)	17:07	
25	06:20		19:53 (T41)	06:50		07:21		18:17 (T42)	07:54		08:15 (T76)	07:30		16:03 (T77)	07:55	
	20:57	18	20:11 (T41)	20:18		19:25	41	18:58 (T42)	18:37	45	17:31 (T77)	17:06	34	16:37 (T77)	17:08	
26	06:21		19:52 (T41)	06:51		07:22		18:18 (T42)	07:55		08:16 (T76)	07:32		16:04 (T77)	07:56	
	20:56	20	20:12 (T41)	20:17		19:23	39	18:57 (T42)	18:36	45	17:32 (T77)	17:06	32	16:36 (T77)	17:08	
27	06:22		19:51 (T41)	06:52		07:23		18:18 (T42)	07:56		08:17 (T76)	07:33		16:05 (T77)	07:56	
	20:55	22	20:13 (T41)	20:15		19:22	37	18:55 (T42)	18:34	44	17:33 (T77)	17:05	30	16:35 (T77)	17:09	
28	06:22		19:50 (T41)	06:53		07:24		18:19 (T42)	07:57		16:58 (T77)	07:34		16:06 (T77)	07:56	
	20:54	24	20:14 (T41)	20:14		19:20	34	18:53 (T42)	18:33	36	17:34 (T77)	17:05	29	16:35 (T77)	17:10	
29	06:23		19:49 (T41)	06:54		07:25		18:21 (T42)	07:58		16:57 (T77)	07:35		16:07 (T77)	07:57	
	20:53	25	20:14 (T41)	20:12		19:18	30	18:51 (T42)	18:32	38	17:35 (T77)	17:04	27	16:34 (T77)	17:10	
30	06:24		19:48 (T41)	06:55		07:26		18:22 (T42)	08:00		16:57 (T77)	07:36		16:08 (T77)	07:57	
	20:52	27	20:15 (T41)	20:10		19:16	27	18:49 (T42)	18:30	39	17:36 (T77)	17:04	25	16:33 (T77)	17:11	
31	06:25		19:47 (T41)	06:56					08:01		16:55 (T77)				07:57	
	20:51	29	20:16 (T41)	20:09					18:29	42	17:37 (T77)				17:12	
Potential sun hours	460			429		375			345			297			287	
Total, worst case		196			490			1075			794			1238			76
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00
Wind dir. red.		0.57			0.57			0.65			0.63			0.73			0.73
Total reduction		0.38			0.35			0.39			0.31			0.22			0.16
Total, real		75			173			421			243			275			12

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 145 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6304)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April		May		June		July		August		September	October	November	December
1	07:57	07:43	07:07	07:16		06:30		06:58 (T36)	06:01	19:28 (T35)	06:02	19:39 (T35)	06:26	07:18 (T36)	06:57	07:27	07:02	07:37
	17:13	17:47	18:22	19:56		20:27	69	20:02 (T35)	20:57	36	20:04 (T35)	21:09	27	20:06 (T35)	20:50	59	20:17 (T35)	20:07	19:15	17:28	17:04
2	07:57	07:42	07:06	07:14		06:29		06:59 (T36)	06:01		19:29 (T35)	06:02		19:38 (T35)	06:27		07:16 (T36)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57		20:28	70	20:03 (T35)	20:58	35	20:04 (T35)	21:08	28	20:06 (T35)	20:49	63	20:17 (T35)	20:06	19:13	17:27	17:03
3	07:57	07:41	07:04	07:13		06:28		06:58 (T36)	06:00		19:28 (T35)	06:03		19:38 (T35)	06:28		07:15 (T36)	06:59	07:30	07:04	07:39
	17:15	17:50	18:24	19:58		20:29	72	20:03 (T35)	20:58	35	20:03 (T35)	21:08	29	20:07 (T35)	20:48	65	20:17 (T35)	20:04	19:11	17:25	17:03
4	07:58	07:40	07:02	07:11		06:26		06:59 (T36)	06:00		19:29 (T35)	06:04		19:37 (T35)	06:29		07:13 (T36)	07:00	07:31	07:06	07:40
	17:15	17:51	18:25	19:59		20:30	72	20:04 (T35)	20:59	34	20:03 (T35)	21:08	30	20:07 (T35)	20:47	69	20:17 (T35)	20:02	19:10	17:24	17:03
5	07:58	07:39	07:01	07:09		06:25		07:00 (T36)	06:00		19:30 (T35)	06:04		19:38 (T35)	06:30		07:12 (T36)	07:01	07:32	07:07	07:41
	17:16	17:52	18:26	20:00		20:31	72	20:05 (T35)	21:00	33	20:03 (T35)	21:08	30	20:08 (T35)	20:46	70	20:16 (T35)	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08		06:24		07:01 (T36)	05:59		19:30 (T35)	06:05		19:37 (T35)	06:31		07:11 (T36)	07:02	07:33	07:08	07:42
	17:17	17:54	18:27	20:00		20:32	72	20:06 (T35)	21:01	32	20:02 (T35)	21:08	31	20:08 (T35)	20:44	71	20:16 (T35)	19:57	19:06	17:22	17:03
7	07:57	07:37	06:58	07:06		06:23		07:02 (T36)	05:59		19:31 (T35)	06:05		19:37 (T35)	06:32		07:10 (T36)	07:03	07:34	07:09	07:43
	17:18	17:55	18:29	20:01		20:33	70	20:06 (T35)	21:01	31	20:02 (T35)	21:07	32	20:09 (T35)	20:43	72	20:15 (T35)	19:56	19:05	17:21	17:02
8	07:57	07:36	07:56	07:05		06:21		07:03 (T36)	05:59		19:32 (T35)	06:06		19:36 (T35)	06:33		07:09 (T36)	07:04	07:35	07:10	07:44
	17:19	17:56	19:30	20:02		20:34	69	20:07 (T35)	21:02	30	20:02 (T35)	21:07	33	20:09 (T35)	20:42	71	20:14 (T35)	19:54	19:03	17:20	17:02
9	07:57	07:35	07:54	07:03		06:20		07:03 (T36)	05:59		19:33 (T35)	06:07		19:36 (T35)	06:34		07:08 (T36)	07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03		20:35	68	20:06 (T35)	21:02	29	20:02 (T35)	21:08	34	20:10 (T35)	20:41	73	20:14 (T35)	19:52	19:01	17:19	17:02
10	07:57	07:34	07:53	07:01		06:19		07:04 (T36)	05:58		19:33 (T35)	06:07		19:36 (T35)	06:35		07:08 (T36)	07:06	07:37	07:13	07:46
	17:21	17:59	19:32	20:05		20:36	65	20:06 (T35)	21:03	28	20:01 (T35)	21:06	35	20:11 (T35)	20:40	71	20:13 (T35)	19:51	19:00	17:18	17:02
11	07:57	07:32	07:51	07:00		06:18		07:06 (T36)	05:58		19:33 (T35)	06:08		19:35 (T35)	06:36		07:07 (T36)	07:07	07:38	07:14	07:47
	17:22	18:00	19:33	20:06		20:38	62	20:07 (T35)	21:04	28	20:01 (T35)	21:06	36	20:11 (T35)	20:38	71	20:12 (T35)	19:49	18:58	17:17	17:03
12	07:56	07:31	07:50	06:58		06:17		07:09 (T36)	05:58		19:34 (T35)	06:09		19:35 (T35)	06:37		07:07 (T36)	07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:07		20:39	57	20:07 (T35)	21:04	27	20:01 (T35)	21:06	37	20:12 (T35)	20:37	69	20:11 (T35)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:56		06:16		19:21 (T35)	05:58		19:35 (T35)	06:09		19:35 (T35)	06:38		07:07 (T36)	07:09	07:40	07:16	07:48
	17:25	18:02	19:35	20:08		20:40	46	20:07 (T35)	21:05	26	20:01 (T35)	21:05	38	20:13 (T35)	20:36	66	20:09 (T35)	19:45	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55		06:15		19:21 (T35)	05:58		19:35 (T35)	06:10		19:35 (T35)	06:39		07:05 (T36)	07:10	07:41	07:18	07:49
	17:26	18:04	19:36	20:09		20:41	46	20:07 (T35)	21:05	26	20:01 (T35)	21:05	39	20:14 (T35)	20:34	64	20:06 (T35)	19:44	18:53	17:14	17:03
15	07:55	07:27	07:45	06:53	07:12 (T36)	06:14		19:21 (T35)	05:58		19:36 (T35)	06:11		19:34 (T35)	06:40		07:05 (T36)	07:11	07:42	07:19	07:50
	17:27	18:05	19:38	20:10	13 07:25 (T36)	20:42	46	20:07 (T35)	21:06	25	20:01 (T35)	21:04	39	20:13 (T35)	20:33	60	20:04 (T35)	19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52	07:11 (T36)	06:13		19:21 (T35)	05:58		19:36 (T35)	06:12		19:34 (T35)	06:41		07:05 (T36)	07:12	07:44	07:20	07:50
	17:28	18:06	19:39	20:11	17 07:28 (T36)	20:43	46	20:07 (T35)	21:06	25	20:01 (T35)	21:04	40	20:14 (T35)	20:31	56	20:02 (T35)	19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50	07:09 (T36)	06:12		19:22 (T35)	05:58		19:36 (T35)	06:13		19:34 (T35)	06:42		07:05 (T36)	07:13	07:45	07:21	07:51
	17:29	18:07	19:40	20:12	20 07:29 (T36)	20:44	46	20:08 (T35)	21:06	25	20:01 (T35)	21:03	41	20:15 (T35)	20:30	48	19:58 (T35)	19:39	18:49	17:11	17:04
18	07:54	07:23	07:40	06:49	07:08 (T36)	06:11		19:22 (T35)	05:58		19:37 (T35)	06:13		19:34 (T35)	06:43		07:05 (T36)	07:14	07:46	07:22	07:52
	17:30	18:09	19:41	20:13	23 07:31 (T36)	20:45	45	20:07 (T35)	21:07	24	20:01 (T35)	21:02	41	20:15 (T35)	20:29	36	07:41 (T36)	19:37	18:47	17:11	17:04
19	07:53	07:22	07:38	06:47	07:06 (T36)	06:10		19:22 (T35)	05:58		19:38 (T35)	06:14		19:34 (T35)	06:44		07:05 (T36)	07:15	07:47	07:24	07:52
	17:31	18:10	19:42	20:14	26 07:32 (T36)	20:45	45	20:07 (T35)	21:07	23	20:01 (T35)	21:02	42	20:16 (T35)	20:27	35	07:40 (T36)	19:35	18:46	17:10	17:04
20	07:53	07:20	07:36	06:46	07:05 (T36)	06:09		19:22 (T35)	05:58		19:38 (T35)	06:15		19:32 (T35)	06:45		07:06 (T36)	07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	28 07:33 (T36)	20:46	45	20:07 (T35)	21:07	23	20:01 (T35)	21:01	44	20:16 (T35)	20:26	33	07:39 (T36)	19:33	18:44	17:09	17:05
21	07:52	07:19	07:35	06:44	07:03 (T36)	06:08		19:22 (T35)	05:59		19:38 (T35)	06:16		19:32 (T35)	06:46		07:07 (T36)	07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16	30 07:33 (T36)	20:47	44	20:06 (T35)	21:08	23	20:01 (T35)	21:00	44	20:16 (T35)	20:24	32	07:39 (T36)	19:32	18:43	17:08	17:05
22	07:52	07:18	07:33	06:43	07:02 (T36)	06:08		19:23 (T35)	05:59		19:38 (T35)	06:17		19:32 (T35)	06:47		07:08 (T36)	07:18	07:50	07:27	07:54
	17:35	18:13	19:45	20:17	32 07:34 (T36)	20:48	44	20:07 (T35)	21:08	23	20:01 (T35)	20:59	45	20:17 (T35)	20:23	30	07:38 (T36)	19:30	18:41	17:08	17:06
23	07:51	07:16	07:31	06:41	07:01 (T36)	06:07		19:23 (T35)	05:59		19:38 (T35)	06:18		19:32 (T35)	06:48		07:09 (T36)	07:19	07:51	07:28	07:54
	17:36	18:15	19:46	20:18	34 07:35 (T36)	20:49	43	20:06 (T35)	21:08	23	20:01 (T35)	20:59	45	20:17 (T35)	20:21	28	07:37 (T36)	19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:40	06:59 (T36)	06:06		19:23 (T35)	05:59		19:39 (T35)	06:19		19:32 (T35)	06:49		07:10 (T36)	07:20	07:53	07:29	07:55
	17:37	18:16	19:47	20:20	35 07:34 (T36)	20:50	43	20:06 (T35)	21:08	23	20:02 (T35)	20:58	45	20:17 (T35)	20:20	25	07:35 (T36)	19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:38	06:59 (T36)	06:05		19:24 (T35)	06:00		19:38 (T35)	06:20		19:32 (T35)	06:50		07:11 (T36)	07:21	07:54	07:30	07:55
	17:39	18:17	19:48	20:21	36 07:35 (T36)	20:51	42	20:06 (T35)	21:08	25	20:03 (T35)	20:57	46	20:18 (T35)	20:18	23	07:34 (T36)	19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	06:58 (T36)	06:05		19:24 (T35)	06:00		19:38 (T35)	06:20		19:32 (T35)	06:51		07:12 (T36)	07:22	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	50 19:52 (T35)	20:52	42	20:06 (T35)	21:08	25	20:03 (T35)	20:56	46	20:18 (T35)	20:17	20	07:32 (T36)	19:23	18:36	17:06	17:08
27	07:48	07:10	07:24	06:36	06:58 (T36)	06:04		19:24 (T35)	06:00		19:39 (T35)	06:21		19:31 (T35)	06:52		07:13 (T36)	07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23	57 19:56 (T35)	20:53	41	20:05 (T35)	21:09	25	20:04 (T35)	20:55	46	20:17 (T35)	20:15	17	07:30 (T36)	19:21	18:34	17:05	17:09
28	07:47	07:09	07:23	06:34	06:58 (T36)	06:03		19:25 (T35)	06:01		19:38 (T35)	06:22		19:31 (T35)	06:53		07:15 (T36)	07:24	07:57	07:34	07:56
	17:42	18:20	19:52	20:24	62 19:58 (T35)	20:54	40	20:05 (T35)	21:09	26	20:04 (T35)	20:54	46	20:17 (T35)	20:14	11	07:26 (T36)	19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:58 (T36)	06:03		19:25 (T35)	06:01		19:39 (T35)	06:23		19:31 (T35)	06:54			07:25	07:58	07:35	07:57
	17:44		19:53	20:25	65 19:59 (T35)	20:55	40	20:05 (T35)	21:09	26	20:05 (T35)	20:53	46	20:17 (T35)	20:12			19:18	18:32	17:04	17:10
30	07:45		07:19	06:31	06:58 (T36)	06:02		19:26 (T35)	06:01		19:38 (T35)	06:24		19:31 (T35)	06:55			07:26	08:00	07:36	07:57
	17:45		19:54	20:26	68 20:01 (T35)	20:55	39	20:05 (T35)	21:09	27	20:05 (T35)	20:52	46	20:17 (T35)	20:10			19:16	18:30	17:04	17:11
31	07:44		07:18			06:02		19:26 (T35)				06:25		07:22 (T36)	06:56				08:01		07:57
	17:46		19:55			20:56	38	20:04 (T35)				20:51	51	20:17 (T35)	20:09				18:29		17:12
Potential sun hours	297	297	370	399		449		453		460		429		375	345	297	287	
Total, worst case					596		1639		821		1212		1408					
Sun reduction					0.52		0.57		0.64		0.66		0.61					
Oper. time red.					1.00		1.00		1.00		1.00		1.00					
Wind dir. red.					0.65		0.59		0.57		0.57		0.62					
Total reduction					0.34		0.33		0.36		0.37		0.38					
Total, real					201		548		298		454		537					

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 197 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6346)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58		15:49 (T11)	07:44		16:03 (T11)	07:07		07:48 (T10)	07:16			06:30		07:04 (T8)	06:01		07:38 (T9)
	17:13	47	16:36 (T11)	17:47	41	16:44 (T11)	18:22	43	08:31 (T10)	19:56			20:27	87	08:38 (T9)	20:57	41	08:19 (T9)
2	07:58		15:49 (T11)	07:43		16:05 (T11)	07:06		07:48 (T10)	07:14			06:29		07:07 (T8)	06:01		07:39 (T9)
	17:14	48	16:37 (T11)	17:49	38	16:43 (T11)	18:23	42	08:30 (T10)	19:57			20:28	80	08:38 (T9)	20:58	39	08:18 (T9)
3	07:58		15:49 (T11)	07:42		16:06 (T11)	07:04		07:49 (T10)	07:13		07:59 (T9)	06:27		07:22 (T9)	06:00		07:40 (T9)
	17:14	48	16:37 (T11)	17:50	36	16:42 (T11)	18:24	40	08:29 (T10)	19:58	18	08:17 (T9)	20:29	75	08:37 (T9)	20:59	38	08:18 (T9)
4	07:58		15:50 (T11)	07:41		16:08 (T11)	07:03		07:49 (T10)	07:11		07:54 (T9)	06:26		07:22 (T9)	06:00		06:26 (T7)
	17:15	48	16:38 (T11)	17:51	33	16:41 (T11)	18:25	39	08:28 (T10)	19:59	27	08:21 (T9)	20:30	74	08:36 (T9)	21:00	45	08:17 (T9)
5	07:58		15:50 (T11)	07:40		16:09 (T11)	07:01		07:50 (T10)	07:09		07:49 (T9)	06:25		07:22 (T9)	06:00		06:24 (T7)
	17:16	49	16:39 (T11)	17:52	31	16:40 (T11)	18:26	36	08:26 (T10)	20:00	35	08:24 (T9)	20:32	74	08:36 (T9)	21:00	46	08:16 (T9)
6	07:58		15:51 (T11)	07:39		16:12 (T11)	06:59		07:51 (T10)	07:08		07:47 (T9)	06:24		07:23 (T9)	05:59		06:23 (T7)
	17:17	48	16:39 (T11)	17:54	26	16:38 (T11)	18:27	34	08:25 (T10)	20:00	40	08:27 (T9)	20:33	73	08:36 (T9)	21:01	48	08:16 (T9)
7	07:58		15:51 (T11)	07:37		16:14 (T11)	06:58		07:52 (T10)	07:06		07:44 (T9)	06:23		07:23 (T9)	05:59		06:22 (T7)
	17:18	49	16:40 (T11)	17:55	22	16:36 (T11)	18:29	31	08:23 (T10)	20:02	45	08:29 (T9)	20:34	73	08:36 (T9)	21:02	48	08:15 (T9)
8	07:58		15:51 (T11)	07:36		08:07 (T10)	07:56		08:54 (T10)	07:05		07:42 (T9)	06:21		07:22 (T9)	05:59		06:22 (T7)
	17:19	50	16:41 (T11)	17:56	21	16:32 (T11)	19:30	27	09:21 (T10)	20:03	49	08:31 (T9)	20:35	72	08:34 (T9)	21:02	48	08:15 (T9)
9	07:57		15:51 (T11)	07:35		08:02 (T10)	07:55		08:56 (T10)	07:03		07:40 (T9)	06:20		07:23 (T9)	05:58		06:22 (T7)
	17:20	50	16:41 (T11)	17:57	17	08:19 (T10)	19:31	22	09:18 (T10)	20:04	52	08:32 (T9)	20:36	71	08:34 (T9)	21:03	47	08:14 (T9)
10	07:57		15:51 (T11)	07:34		08:00 (T10)	07:53		08:59 (T10)	07:01		07:38 (T9)	06:19		07:23 (T9)	05:58		06:20 (T7)
	17:21	50	16:41 (T11)	17:59	22	08:22 (T10)	19:32	15	09:14 (T10)	20:05	55	08:33 (T9)	20:37	70	08:33 (T9)	21:03	47	08:13 (T9)
11	07:57		15:52 (T11)	07:33		07:58 (T10)	07:51			07:00		07:37 (T9)	06:18		07:23 (T9)	05:58		06:20 (T7)
	17:22	50	16:42 (T11)	18:00	26	08:24 (T10)	19:33			20:06	58	08:35 (T9)	20:38	70	08:33 (T9)	21:04	46	08:12 (T9)
12	07:57		15:52 (T11)	07:31		07:56 (T10)	07:50			06:58		07:35 (T9)	06:17		07:24 (T9)	05:58		06:20 (T7)
	17:23	50	16:42 (T11)	18:01	29	08:25 (T10)	19:34			20:07	60	08:35 (T9)	20:39	68	08:32 (T9)	21:05	46	08:12 (T9)
13	07:56		15:52 (T11)	07:30		07:54 (T10)	07:48			06:57		07:34 (T9)	06:16		07:24 (T9)	05:58		06:20 (T7)
	17:24	51	16:43 (T11)	18:02	33	08:27 (T10)	19:35			20:08	63	08:37 (T9)	20:40	68	08:32 (T9)	21:05	44	08:11 (T9)
14	07:56		15:53 (T11)	07:29		07:53 (T10)	07:46			06:55		07:32 (T9)	06:15		07:25 (T9)	05:58		06:20 (T7)
	17:26	51	16:44 (T11)	18:04	36	08:29 (T10)	19:37			20:09	65	08:37 (T9)	20:41	66	08:31 (T9)	21:05	44	08:11 (T9)
15	07:56		15:53 (T11)	07:28		07:52 (T10)	07:45			06:53		07:12 (T8)	06:14		07:25 (T9)	05:58		06:20 (T7)
	17:27	51	16:44 (T11)	18:05	37	08:29 (T10)	19:38			20:10	71	08:37 (T9)	20:42	65	08:30 (T9)	21:06	43	08:10 (T9)
16	07:55		15:54 (T11)	07:26		07:51 (T10)	07:43			06:52		07:11 (T8)	06:13		07:26 (T9)	05:58		06:20 (T7)
	17:28	51	16:45 (T11)	18:06	39	08:30 (T10)	19:39			20:11	76	08:38 (T9)	20:43	64	08:30 (T9)	21:06	43	08:10 (T9)
17	07:55		15:54 (T11)	07:25		07:51 (T10)	07:41			06:50		07:09 (T8)	06:12		07:27 (T9)	05:58		06:20 (T7)
	17:29	51	16:45 (T11)	18:07	41	08:32 (T10)	19:40			20:12	81	08:38 (T9)	20:44	63	08:30 (T9)	21:07	41	08:09 (T9)
18	07:54		15:55 (T11)	07:24		07:49 (T10)	07:40			06:49		07:08 (T8)	06:11		07:27 (T9)	05:58		06:20 (T7)
	17:30	51	16:46 (T11)	18:09	43	08:32 (T10)	19:41			20:13	85	08:39 (T9)	20:45	62	08:29 (T9)	21:07	41	08:09 (T9)
19	07:54		15:55 (T11)	07:22		07:49 (T10)	07:38			06:47		07:06 (T8)	06:10		07:28 (T9)	05:58		06:21 (T7)
	17:31	50	16:45 (T11)	18:10	43	08:32 (T10)	19:42			20:14	87	08:38 (T9)	20:46	60	08:28 (T9)	21:07	40	08:10 (T9)
20	07:53		15:55 (T11)	07:21		07:48 (T10)	07:36			06:46		07:05 (T8)	06:09		07:28 (T9)	05:58		06:21 (T7)
	17:32	50	16:45 (T11)	18:11	44	08:32 (T10)	19:43			20:15	91	08:39 (T9)	20:47	59	08:27 (T9)	21:08	40	08:10 (T9)
21	07:53		15:56 (T11)	07:19		07:48 (T10)	07:35			06:44		07:03 (T8)	06:08		07:29 (T9)	05:58		06:21 (T7)
	17:34	50	16:46 (T11)	18:12	45	08:33 (T10)	19:44			20:17	93	08:39 (T9)	20:48	57	08:26 (T9)	21:08	40	08:09 (T9)
22	07:52		15:56 (T11)	07:18		07:48 (T10)	07:33			06:43		07:02 (T8)	06:08		07:30 (T9)	05:59		06:21 (T7)
	17:35	50	16:46 (T11)	18:13	46	08:34 (T10)	19:45			20:18	95	08:39 (T9)	20:49	57	08:27 (T9)	21:08	41	08:10 (T9)
23	07:51		15:56 (T11)	07:16		07:47 (T10)	07:31			06:41		07:01 (T8)	06:07		07:31 (T9)	05:59		06:21 (T7)
	17:36	50	16:46 (T11)	18:15	46	08:33 (T10)	19:46			20:19	97	08:40 (T9)	20:50	55	08:26 (T9)	21:08	40	08:10 (T9)
24	07:51		15:56 (T11)	07:15		07:48 (T10)	07:30			06:40		06:59 (T8)	06:06		07:31 (T9)	05:59		06:22 (T7)
	17:37	50	16:46 (T11)	18:16	45	08:33 (T10)	19:47			20:20	98	08:39 (T9)	20:51	54	08:25 (T9)	21:09	40	08:11 (T9)
25	07:50		15:58 (T11)	07:13		07:47 (T10)	07:28			06:38		06:59 (T8)	06:05		07:32 (T9)	05:59		06:22 (T7)
	17:39	48	16:46 (T11)	18:17	46	08:33 (T10)	19:49			20:21	98	08:39 (T9)	20:51	53	08:25 (T9)	21:09	41	08:11 (T9)
26	07:49		15:58 (T11)	07:12		07:47 (T10)	07:26			06:37		06:58 (T8)	06:05		07:33 (T9)	06:00		06:22 (T7)
	17:40	48	16:46 (T11)	18:18	45	08:32 (T10)	19:50			20:22	98	08:38 (T9)	20:52	50	08:23 (T9)	21:09	43	08:12 (T9)
27	07:48		15:59 (T11)	07:10		07:47 (T10)	07:25			06:36		06:59 (T8)	06:04		07:33 (T9)	06:00		06:23 (T7)
	17:41	47	16:46 (T11)	18:19	45	08:32 (T10)	19:51			20:23	98	08:39 (T9)	20:53	49	08:22 (T9)	21:09	42	08:13 (T9)
28	07:47		16:00 (T11)	07:09		07:47 (T10)	07:23			06:34		07:00 (T8)	06:03		07:35 (T9)	06:00		06:23 (T7)
	17:42	46	16:46 (T11)	18:21	44	08:31 (T10)	19:52			20:24	96	08:39 (T9)	20:54	47	08:22 (T9)	21:09	43	08:13 (T9)
29	07:47		16:00 (T11)				07:21			06:33		07:00 (T8)	06:03		07:35 (T9)	06:01		06:24 (T7)
	17:44	45	16:45 (T11)				19:53			20:25	94	08:38 (T9)	20:55	46	08:21 (T9)	21:09	45	08:15 (T9)
30	07:46		16:01 (T11)				07:19			06:31		07:02 (T8)	06:02		07:37 (T9)	06:01		06:24 (T7)
	17:45	44	16:45 (T11)				19:54			20:26	91	08:38 (T9)	20:56	44	08:21 (T9)	21:09	45	08:15 (T9)
31	07:45		16:02 (T11)				07:18						06:02		07:37 (T9)			
	17:46	42	16:44 (T11)				19:55						20:57	43	08:20 (T9)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		1513			1020			329			2016			1949			1295	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.74			0.60			0.56			0.65			0.65			0.68	
Total reduction		0.23			0.24			0.25			0.34			0.38			0.44	
Total, real		350			247			81			693			731			574	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 197 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6346)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December		
1	06:02		06:24 (T7)	06:26		07:34 (T9)	06:57		07:36 (T9)	07:28		07:02	
	21:09	46	08:16 (T9)	20:50	69	08:43 (T9)	20:07	58	08:34 (T9)	19:15		17:28	21
2	06:02		06:25 (T7)	06:27		07:34 (T9)	06:58		07:37 (T9)	07:29		07:03	
	21:09	47	08:17 (T9)	20:49	70	08:44 (T9)	20:06	55	08:32 (T9)	19:13		17:27	21
3	06:03		06:25 (T7)	06:28		07:34 (T9)	06:59		07:38 (T9)	07:30		08:40 (T10)	07:05
	21:09	48	08:18 (T9)	20:48	70	08:44 (T9)	20:04	52	08:30 (T9)	19:11	11	08:51 (T10)	17:25
4	06:03		06:27 (T7)	06:29		07:33 (T9)	07:00		07:39 (T9)	07:31		08:35 (T10)	07:06
	21:09	47	08:19 (T9)	20:47	72	08:45 (T9)	20:02	49	08:28 (T9)	19:10	20	08:55 (T10)	17:24
5	06:04		06:28 (T7)	06:30		07:33 (T9)	07:01		07:41 (T9)	07:32		08:32 (T10)	07:07
	21:08	48	08:21 (T9)	20:46	72	08:45 (T9)	20:01	45	08:26 (T9)	19:08	25	08:57 (T10)	17:23
6	06:05		06:29 (T7)	06:31		07:33 (T9)	07:02		07:43 (T9)	07:33		08:30 (T10)	07:08
	21:08	47	08:21 (T9)	20:45	72	08:45 (T9)	19:57	40	08:23 (T9)	19:06	29	08:59 (T10)	17:22
7	06:05		06:30 (T7)	06:32		07:32 (T9)	07:03		07:45 (T9)	07:34		08:28 (T10)	07:09
	21:08	48	08:23 (T9)	20:44	74	08:46 (T9)	19:56	35	08:20 (T9)	19:05	32	09:00 (T10)	17:21
8	06:06		06:31 (T7)	06:33		07:32 (T9)	07:04		07:48 (T9)	07:35		08:26 (T10)	07:11
	21:08	46	08:23 (T9)	20:42	74	08:46 (T9)	19:54	29	08:17 (T9)	19:03	35	09:01 (T10)	17:20
9	06:06		06:34 (T7)	06:34		07:32 (T9)	07:05		07:53 (T9)	07:36		08:25 (T10)	07:12
	21:07	43	08:25 (T9)	20:41	74	08:46 (T9)	19:52	19	08:12 (T9)	19:02	37	09:02 (T10)	17:19
10	06:07		07:47 (T9)	06:35		07:32 (T9)	07:06			07:37		08:23 (T10)	07:13
	21:07	39	08:26 (T9)	20:40	74	08:46 (T9)	19:51			19:00	39	09:02 (T10)	17:18
11	06:08		07:46 (T9)	06:36		07:14 (T8)	07:07			07:38		08:22 (T10)	07:14
	21:06	40	08:26 (T9)	20:39	83	08:46 (T9)	19:49			18:58	41	09:03 (T10)	17:17
12	06:09		07:46 (T9)	06:37		07:12 (T8)	07:08			07:39		08:21 (T10)	07:16
	21:06	41	08:27 (T9)	20:37	89	08:47 (T9)	19:47			18:57	42	09:03 (T10)	17:16
13	06:09		07:45 (T9)	06:38		07:10 (T8)	07:09			07:40		08:21 (T10)	07:17
	21:05	44	08:29 (T9)	20:36	92	08:47 (T9)	19:46			18:55	44	09:05 (T10)	17:15
14	06:10		07:45 (T9)	06:39		07:08 (T8)	07:10			07:42		08:20 (T10)	07:18
	21:05	45	08:30 (T9)	20:35	94	08:46 (T9)	19:44			18:54	45	09:05 (T10)	17:14
15	06:11		07:43 (T9)	06:40		07:07 (T8)	07:11			07:43		08:20 (T10)	07:19
	21:04	47	08:30 (T9)	20:33	96	08:46 (T9)	19:42			18:52	45	09:05 (T10)	17:13
16	06:12		07:43 (T9)	06:41		07:06 (T8)	07:12			07:44		08:19 (T10)	07:20
	21:04	48	08:31 (T9)	20:32	96	08:45 (T9)	19:40			18:50	46	09:05 (T10)	17:12
17	06:12		07:43 (T9)	06:42		07:05 (T8)	07:13			07:45		08:19 (T10)	07:21
	21:03	49	08:32 (T9)	20:30	98	08:45 (T9)	19:39			18:49	45	09:04 (T10)	17:11
18	06:13		07:42 (T9)	06:43		07:05 (T8)	07:14			07:46		08:18 (T10)	07:23
	21:03	52	08:34 (T9)	20:29	98	08:45 (T9)	19:37			18:47	46	09:04 (T10)	17:10
19	06:14		07:42 (T9)	06:44		07:05 (T8)	07:15			07:47		08:19 (T10)	07:24
	21:02	53	08:35 (T9)	20:27	98	08:45 (T9)	19:35			18:46	46	09:05 (T10)	17:10
20	06:15		07:40 (T9)	06:45		07:06 (T8)	07:16			07:48		08:19 (T10)	07:25
	21:01	55	08:35 (T9)	20:26	96	08:44 (T9)	19:34			18:44	45	09:04 (T10)	17:09
21	06:16		07:40 (T9)	06:46		07:07 (T8)	07:17			07:49		08:19 (T10)	07:26
	21:00	56	08:36 (T9)	20:25	95	08:44 (T9)	19:32			18:43	44	09:03 (T10)	17:08
22	06:17		07:39 (T9)	06:47		07:08 (T8)	07:18			07:51		08:19 (T10)	07:27
	21:00	58	08:37 (T9)	20:23	92	08:43 (T9)	19:30			18:41	44	09:03 (T10)	17:08
23	06:18		07:39 (T9)	06:48		07:09 (T8)	07:19			07:52		08:19 (T10)	07:29
	20:59	58	08:37 (T9)	20:22	90	08:43 (T9)	19:28			18:40	43	09:02 (T10)	17:07
24	06:19		07:39 (T9)	06:49		07:10 (T8)	07:20			07:53		08:20 (T10)	07:30
	20:58	59	08:38 (T9)	20:20	87	08:42 (T9)	19:27			18:39	42	09:02 (T10)	17:06
25	06:19		07:38 (T9)	06:50		07:11 (T8)	07:21			07:54		08:21 (T10)	07:31
	20:57	61	08:39 (T9)	20:18	83	08:41 (T9)	19:25			18:37	40	09:01 (T10)	17:06
26	06:20		07:38 (T9)	06:51		07:12 (T8)	07:22			07:55		08:21 (T10)	07:32
	20:56	62	08:40 (T9)	20:17	81	08:41 (T9)	19:23			18:36	39	09:00 (T10)	17:05
27	06:21		07:36 (T9)	06:52		07:13 (T8)	07:23			07:56		08:22 (T10)	07:33
	20:55	64	08:40 (T9)	20:15	76	08:40 (T9)	19:22			18:34	37	08:59 (T10)	17:05
28	06:22		07:36 (T9)	06:53		07:14 (T8)	07:25			07:58		08:23 (T10)	07:34
	20:54	64	08:40 (T9)	20:14	71	08:39 (T9)	19:20			18:33	35	08:58 (T10)	17:05
29	06:23		07:35 (T9)	06:54		07:33 (T9)	07:26			07:59		08:24 (T10)	07:35
	20:54	66	08:41 (T9)	20:12	65	08:38 (T9)	19:18			18:32	33	08:57 (T10)	17:04
30	06:24		07:35 (T9)	06:55		07:34 (T9)	07:27			08:00		08:26 (T10)	07:36
	20:53	67	08:42 (T9)	20:11	62	08:36 (T9)	19:16			18:30	29	08:55 (T10)	17:04
31	06:25		07:35 (T9)	06:56		07:35 (T9)				08:01		08:27 (T10)	
	20:51	67	08:42 (T9)	20:09	60	08:35 (T9)				18:29	26	08:53 (T10)	
Potential sun hours	460			429			375			345			297
Total, worst case		1615			2523			382			1085		
Sun reduction		0.66			0.61			0.59			0.48		
Oper. time red.		1.00			1.00			1.00			1.00		
Wind dir. red.		0.66			0.65			0.65			0.56		
Total reduction		0.44			0.40			0.39			0.27		
Total, real		709			1016			148			293		

	December		
1	07:30 (T10)	07:37	15:34 (T11)
	07:51 (T10)	17:03	16:24 (T11)
2	07:33 (T10)	07:38	15:35 (T11)
	15:58 (T11)	17:03	16:25 (T11)
3	15:46 (T11)	07:39	15:35 (T11)
	16:03 (T11)	17:03	16:25 (T11)
4	15:43 (T11)	07:40	15:35 (T11)
	16:05 (T11)	17:03	16:25 (T11)
5	15:41 (T11)	07:41	15:36 (T11)
	16:08 (T11)	17:03	16:25 (T11)
6	15:39 (T11)	07:42	15:37 (T11)
	16:10 (T11)	17:02	16:25 (T11)
7	15:37 (T11)	07:43	15:37 (T11)
	16:11 (T11)	17:02	16:26 (T11)
8	15:37 (T11)	07:44	15:38 (T11)
	16:13 (T11)	17:02	16:26 (T11)
9	15:35 (T11)	07:45	15:39 (T11)
	16:14 (T11)	17:02	16:26 (T11)
10	15:34 (T11)	07:46	15:39 (T11)
	16:14 (T11)	17:02	16:27 (T11)
11	15:33 (T11)	07:47	15:40 (T11)
	16:15 (T11)	17:02	16:27 (T11)
12	15:33 (T11)	07:48	15:40 (T11)
	16:17 (T11)	17:03	16:27 (T11)
13	15:32 (T11)	07:49	15:41 (T11)
	16:17 (T11)	17:03	16:27 (T11)
14	15:32 (T11)	07:49	15:41 (T11)
	16:18 (T11)	17:03	16:28 (T11)
15	15:32 (T11)	07:50	15:42 (T11)
	16:19 (T11)	17:03	16:28 (T11)
16	15:31 (T11)	07:51	15:42 (T11)
	16:19 (T11)	17:03	16:28 (T11)
17	15:31 (T11)	07:51	15:43 (T11)
	16:19 (T11)	17:04	16:29 (T11)
18	15:30 (T11)	07:52	15:44 (T11)
	16:20 (T11)	17:04	16:30 (T11)
19	15:31 (T11)	07:53	15:44 (T11)
	16:21 (T11)	17:04	16:29 (T11)
20	15:31 (T11)	07:53	15:45 (T11)
	16:21 (T11)	17:05	16:30 (T11)
21	15:31 (T11)	07:54	15:45 (T11)
	16:21 (T11)	17:05	16:30 (T11)
22	15:31 (T11)	07:54	15:46 (T11)
	16:21 (T11)	17:06	16:31 (T11)
23	15:32 (T11)	07:55	15:46 (T11)
	16:22 (T11)	17:06	16:31 (T11)
24	15:32 (T11)	07:55	15:46 (T11)
	16:23 (T11)	17:07	16:31 (T11)
25	15:32 (T11)	07:56	15:47 (T11)
	16:23 (T11)	17:07	16:32 (T11)
26	15:32 (T11)	07:56	15:47 (T11)
	16:23 (T11)	17:08	16:33 (T11)
27	15:32 (T11)	07:56	15:47 (T11)
	16:23 (T11)	17:09	16:33 (T11)
28	15:33 (T11)	07:57	15:48 (T11)
	16:24 (T11)	17:09	16:34 (T11)
29	15:33 (T11)	07:57	15:48 (T11)
	16:24 (T11)	17:10	16:35 (T11)
30	15:34 (T11)	07:57	15:48 (T11)
	16:24 (T11)	17:11	16:35 (T11)
31		07:57	15:49 (T11)
		17:12	16:35 (T11)
Potential sun hours	287		
Total, worst case		1453	
Sun reduction		0.22	
Oper. time red.		1.00	
Wind dir. red.		0.74	
Total reduction		0.16	
Total, real		239	

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

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

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EDR
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US-SYRACUSE, NY 13202
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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 228 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6374)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		08:04 (T44)		07:07		07:16		07:41 (T77)	
	17:13		17:48	25	08:29 (T44)		18:22		19:56	35	08:16 (T77)	
2	07:57		07:42		08:03 (T44)		07:06		07:15		07:41 (T77)	
	17:14		17:49	26	08:29 (T44)		18:23		19:57	35	08:16 (T77)	
3	07:57		07:41		08:02 (T44)		07:04		07:13		07:41 (T77)	
	17:15		17:50	28	08:30 (T44)		18:24		19:58	34	08:15 (T77)	
4	07:58		07:40		08:01 (T44)		07:03		07:11		07:41 (T77)	
	17:16		17:51	29	08:30 (T44)		18:25		19:59	33	08:14 (T77)	
5	07:57		07:39		08:01 (T44)		07:01		07:10		07:42 (T77)	
	17:17		17:53	29	08:30 (T44)		18:26		20:00	32	08:14 (T77)	
6	07:57		07:38		08:01 (T44)		06:59		07:08		07:42 (T77)	
	17:18		17:54	29	08:30 (T44)		18:28		20:00	30	08:12 (T77)	
7	07:57		07:37		08:01 (T44)		06:58		07:06		07:43 (T77)	
	17:19		17:55	29	08:30 (T44)		18:29		20:01	28	08:11 (T77)	
8	07:57		07:36		08:02 (T44)		07:56		07:05		07:44 (T77)	
	17:20		17:56	28	08:30 (T44)		19:30		20:02	26	08:10 (T77)	
9	07:57		07:35		08:02 (T44)		07:55		07:03		07:45 (T77)	
	17:21		17:58	27	08:29 (T44)		19:31		20:04	22	08:07 (T77)	
10	07:57		07:34		08:03 (T44)		07:53		07:01		07:47 (T77)	
	17:22		17:59	26	08:29 (T44)		19:32		20:05	17	08:04 (T77)	
11	07:57		07:32		08:03 (T44)		07:51		07:00		07:50 (T77)	
	17:23		18:00	25	08:28 (T44)		19:33		20:06	11	08:01 (T77)	
12	07:56		07:31		08:04 (T44)		07:50		06:58			
	17:24		18:01	23	08:27 (T44)		19:34		20:07			
13	07:56		07:30		08:06 (T44)		07:48		06:57			
	17:25		18:03	20	08:26 (T44)		19:35		20:08			
14	07:56		07:29		08:08 (T44)		07:46		06:55			
	17:26		18:04	17	08:25 (T44)		19:37		20:09			
15	07:55		07:27		08:10 (T44)		07:45		06:53			
	17:27		18:05	12	08:22 (T44)		19:38		20:10			
16	07:55		07:26				07:43		06:52			
	17:28		18:06				19:39		20:11			
17	07:54		07:25				07:41		06:50			
	17:29		18:07				19:40		20:12			
18	07:54		07:23				07:40		06:49			
	17:30		18:09				19:41		20:13			
19	07:53		07:22				07:38		06:47			
	17:32		18:10				19:42		20:14			
20	07:53		07:21				07:36		07:58 (T77)		06:46	
	17:33		18:11				19:43	9	08:07 (T77)		20:15	
21	07:52		07:19				07:35		07:55 (T77)		06:44	
	17:34		18:12				19:44	16	08:11 (T77)		20:16	
22	07:52		07:18				07:33		07:52 (T77)		06:43	
	17:35		18:14				19:45	21	08:13 (T77)		20:17	
23	07:51		07:16				07:31		07:50 (T77)		06:41	
	17:36		18:15				19:46	24	08:14 (T77)		20:18	
24	07:50	08:11 (T44)	07:15				07:30		07:49 (T77)		06:40	
	17:38	7 08:18 (T44)	18:16				19:47	27	08:16 (T77)		20:20	
25	07:50	08:10 (T44)	07:13				07:28		07:47 (T77)		06:39	
	17:39	10 08:20 (T44)	18:17				19:49	29	08:16 (T77)		20:21	
26	07:49	08:09 (T44)	07:12				07:26		07:45 (T77)		06:37	
	17:40	13 08:22 (T44)	18:18				19:50	32	08:17 (T77)		20:22	
27	07:48	08:09 (T44)	07:10				07:25		07:45 (T77)		06:36	
	17:41	15 08:24 (T44)	18:19				19:51	33	08:18 (T77)		20:23	
28	07:47	08:08 (T44)	07:09				07:23		07:43 (T77)		06:34	
	17:43	17 08:25 (T44)	18:21				19:52	35	08:18 (T77)		20:24	
29	07:46	08:07 (T44)					07:21		07:42 (T77)		06:33	
	17:44	19 08:26 (T44)					19:53	35	08:17 (T77)		20:25	
30	07:45	08:06 (T44)					07:20		07:42 (T77)		06:32	
	17:45	21 08:27 (T44)					19:54	35	08:17 (T77)		20:26	
31	07:44	08:05 (T44)					07:18		07:42 (T77)			
	17:46	23 08:28 (T44)					19:55	35	08:17 (T77)			
Potential sun hours	297		297		370		399		448		453	
Total, worst case		125		373		331		303		1039		716
Sun reduction		0.31		0.40		0.44		0.52		0.57		0.64
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.54		0.54		0.63		0.63		0.70		0.70
Total reduction		0.16		0.21		0.27		0.32		0.39		0.44
Total, real		20		79		90		97		407		315

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 228 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6374)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December	
1	06:02		06:52 (T42)	06:26		06:49 (T42)	06:57		07:49 (T77)	07:28			07:02		07:32 (T44)	07:37	
	21:09	25	07:17 (T42)	20:50	37	07:26 (T42)	20:07	11	08:00 (T77)	19:15			17:28	26	07:58 (T44)	17:04	
2	06:03		06:52 (T42)	06:27		06:49 (T42)	06:58		07:46 (T77)	07:29			07:03		07:32 (T44)	07:38	
	21:08	25	07:17 (T42)	20:49	36	07:25 (T42)	20:06	17	08:03 (T77)	19:13			17:27	27	07:59 (T44)	17:03	
3	06:03		06:52 (T42)	06:28		06:50 (T42)	06:59		07:43 (T77)	07:30			07:04		07:31 (T44)	07:39	
	21:08	26	07:18 (T42)	20:48	35	07:25 (T42)	20:04	22	08:05 (T77)	19:11			17:26	29	08:00 (T44)	17:03	
4	06:04		06:51 (T42)	06:29		06:51 (T42)	07:00		07:42 (T77)	07:31			07:06		07:31 (T44)	07:40	
	21:08	27	07:18 (T42)	20:47	33	07:24 (T42)	20:02	25	08:07 (T77)	19:10			17:24	29	08:00 (T44)	17:03	
5	06:04		06:52 (T42)	06:30		06:52 (T42)	07:01		07:40 (T77)	07:32			07:07		07:30 (T44)	07:41	
	21:08	27	07:19 (T42)	20:46	32	07:24 (T42)	20:01	28	08:08 (T77)	19:08			17:23	29	07:59 (T44)	17:03	
6	06:05		06:51 (T42)	06:31		06:53 (T42)	07:02		07:39 (T77)	07:33			07:08		07:31 (T44)	07:42	
	21:08	28	07:19 (T42)	20:44	30	07:23 (T42)	19:57	29	08:08 (T77)	19:06			17:22	29	08:00 (T44)	17:03	
7	06:06		06:51 (T42)	06:32		06:54 (T42)	07:03		07:37 (T77)	07:34			07:09		07:31 (T44)	07:43	
	21:07	29	07:20 (T42)	20:43	28	07:22 (T42)	19:56	32	08:09 (T77)	19:05			17:21	29	08:00 (T44)	17:03	
8	06:06		06:51 (T42)	06:33		06:55 (T42)	07:04		07:36 (T77)	07:35			07:10		07:32 (T44)	07:44	
	21:07	30	07:21 (T42)	20:42	25	07:20 (T42)	19:54	33	08:09 (T77)	19:03			17:20	28	08:00 (T44)	17:03	
9	06:07		06:50 (T42)	06:34		06:56 (T42)	07:05		07:36 (T77)	07:36			07:12		07:34 (T44)	07:45	
	21:07	31	07:21 (T42)	20:41	23	07:19 (T42)	19:52	34	08:10 (T77)	19:02			17:19	26	08:00 (T44)	17:03	
10	06:08		06:50 (T42)	06:35		06:57 (T42)	07:06		07:35 (T77)	07:37			07:13		07:35 (T44)	07:46	
	21:06	32	07:22 (T42)	20:40	20	07:17 (T42)	19:51	35	08:10 (T77)	19:00			17:18	25	08:00 (T44)	17:03	
11	06:08		06:50 (T42)	06:36		06:59 (T42)	07:07		07:34 (T77)	07:38			07:14		07:36 (T44)	07:47	
	21:06	32	07:22 (T42)	20:38	15	07:14 (T42)	19:49	36	08:10 (T77)	18:58			17:17	23	07:59 (T44)	17:03	
12	06:09		06:49 (T42)	06:37		07:03 (T42)	07:08		07:33 (T77)	07:39			07:15		07:37 (T44)	07:47	
	21:06	33	07:22 (T42)	20:37	7	07:10 (T42)	19:47	35	08:08 (T77)	18:57			17:16	21	07:58 (T44)	17:03	
13	06:10		06:49 (T42)	06:38			07:09		07:33 (T77)	07:40			07:16		07:39 (T44)	07:48	
	21:05	34	07:23 (T42)	20:36			19:46	35	08:08 (T77)	18:55			17:15	19	07:58 (T44)	17:03	
14	06:10		06:50 (T42)	06:39			07:10		07:33 (T77)	07:41			07:18		07:40 (T44)	07:49	
	21:05	34	07:24 (T42)	20:34			19:44	35	08:08 (T77)	18:54			17:14	17	07:57 (T44)	17:03	
15	06:11		06:50 (T42)	06:40			07:11		07:33 (T77)	07:43			07:19		07:41 (T44)	07:50	
	21:04	35	07:25 (T42)	20:33			19:42	34	08:07 (T77)	18:52			17:13	15	07:56 (T44)	17:03	
16	06:12		06:49 (T42)	06:41			07:12		07:33 (T77)	07:44			07:20		07:43 (T44)	07:50	
	21:03	35	07:24 (T42)	20:32			19:40	33	08:06 (T77)	18:50			17:12	13	07:56 (T44)	17:04	
17	06:13		06:49 (T42)	06:42			07:13		07:33 (T77)	07:45			07:21		07:44 (T44)	07:51	
	21:03	36	07:25 (T42)	20:30			19:39	32	08:05 (T77)	18:49			17:12	10	07:54 (T44)	17:04	
18	06:14		06:49 (T42)	06:43			07:14		07:34 (T77)	07:46			07:22		07:45 (T44)	07:52	
	21:02	36	07:25 (T42)	20:29			19:37	30	08:04 (T77)	18:47			17:11	7	07:52 (T44)	17:04	
19	06:14		06:49 (T42)	06:44			07:15		07:35 (T77)	07:47			07:24			07:52	
	21:02	37	07:26 (T42)	20:27			19:35	28	08:03 (T77)	18:46			17:10			17:05	
20	06:15		06:49 (T42)	06:45			07:16		07:36 (T77)	07:48			07:25			07:53	
	21:01	37	07:26 (T42)	20:26			19:34	25	08:01 (T77)	18:44			17:09			17:05	
21	06:16		06:48 (T42)	06:46			07:17		07:37 (T77)	07:49			07:26			07:53	
	21:00	38	07:26 (T42)	20:24			19:32	22	07:59 (T77)	18:43			17:09			17:06	
22	06:17		06:48 (T42)	06:47			07:18		07:38 (T77)	07:50			07:27			07:54	
	20:59	38	07:26 (T42)	20:23			19:30	18	07:56 (T77)	18:42			17:08			17:06	
23	06:18		06:48 (T42)	06:48			07:19		07:41 (T77)	07:52			07:28			07:54	
	20:59	39	07:27 (T42)	20:21			19:28	12	07:53 (T77)	18:40			17:07			17:07	
24	06:19		06:48 (T42)	06:49			07:20			07:53			07:29			07:55	
	20:58	39	07:27 (T42)	20:20			19:27			18:39			17:07			17:07	
25	06:20		06:48 (T42)	06:50			07:21			07:54			07:30			07:55	
	20:57	39	07:27 (T42)	20:18			19:25			18:37			17:06			17:08	
26	06:21		06:48 (T42)	06:51			07:22			07:55		08:43 (T44)	07:32			07:56	
	20:56	39	07:27 (T42)	20:17			19:23			18:36	5	08:48 (T44)	17:06			17:08	
27	06:22		06:49 (T42)	06:52			07:23			07:56		08:39 (T44)	07:33			07:56	
	20:55	38	07:27 (T42)	20:15			19:22			18:35	13	08:52 (T44)	17:05			17:09	
28	06:23		06:49 (T42)	06:53			07:24			07:57		08:36 (T44)	07:34			07:56	
	20:54	38	07:27 (T42)	20:14			19:20			18:33	18	08:54 (T44)	17:05			17:10	
29	06:23		06:48 (T42)	06:54			07:25			07:58		08:35 (T44)	07:35			07:57	
	20:53	38	07:26 (T42)	20:12			19:18			18:32	21	08:56 (T44)	17:04			17:10	
30	06:24		06:48 (T42)	06:55			07:27			08:00		08:34 (T44)	07:36			07:57	
	20:52	38	07:26 (T42)	20:10			19:16			18:31	23	08:57 (T44)	17:04			17:11	
31	06:25		06:49 (T42)	06:56						08:01		08:33 (T44)				07:57	
	20:51	37	07:26 (T42)	20:09						18:29	25	08:58 (T44)				17:12	
Potential sun hours	460			429			375			345			297			287	
Total, worst case		1050			321			641			105			402			
Sun reduction		0.66			0.61			0.59			0.48			0.30			
Oper. time red.		1.00			1.00			1.00			1.00			1.00			
Wind dir. red.		0.70			0.70			0.63			0.54			0.54			
Total reduction		0.45			0.42			0.36			0.25			0.16			
Total, real		476			135			233			27			64			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 232 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6378)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March			April			May			June		
1	07:57	07:43		07:07		07:37 (T58)	07:16			06:30		07:00 (T54)	06:02		18:55 (T56)
	17:13	17:48		18:22	17	07:54 (T58)	19:56			20:27	121	19:37 (T56)	20:57	22	19:17 (T56)
2	07:57	07:42		07:06		07:38 (T58)	07:15			06:29		07:01 (T54)	06:01		18:57 (T56)
	17:14	17:49		18:23	14	07:52 (T58)	19:57			20:28	120	19:37 (T56)	20:57	19	19:16 (T56)
3	07:57	07:41		07:04		07:41 (T58)	07:13			06:28		07:03 (T54)	06:01		18:59 (T56)
	17:15	17:50		18:24	7	07:48 (T58)	19:58			20:29	116	19:37 (T56)	20:58	16	19:15 (T56)
4	07:57	07:40		07:02			07:11			06:27		07:04 (T54)	06:00		19:01 (T56)
	17:16	17:51		18:25			19:59			20:30	114	19:36 (T56)	20:59	11	19:12 (T56)
5	07:57	07:39		07:01			07:10			06:25		07:06 (T54)	06:00		19:06 (T56)
	17:17	17:53		18:26			20:00			20:31	110	19:36 (T56)	21:00	1	19:07 (T56)
6	07:57	07:38		06:59			07:08		19:05 (T56)	06:24		07:15 (T55)	06:00		
	17:18	17:54		18:28			20:00	9	19:14 (T56)	20:32	100	19:36 (T56)	21:00		
7	07:57	07:37		06:58			07:06		18:58 (T56)	06:23		07:16 (T55)	05:59		
	17:19	17:55		18:29			20:01	22	19:20 (T56)	20:33	97	19:36 (T56)	21:01		
8	07:57	07:36		07:56			07:05		07:33 (T55)	06:22		07:18 (T55)	05:59		
	17:20	17:56		19:30			20:02	42	19:24 (T56)	20:34	93	19:35 (T56)	21:02		
9	07:57	07:35		07:55			07:03		07:29 (T55)	06:21		07:19 (T55)	05:59		
	17:21	17:58		19:31			20:03	55	19:26 (T56)	20:35	90	19:35 (T56)	21:02		
10	07:57	07:34		07:53			07:01		07:25 (T55)	06:19		07:20 (T55)	05:59		
	17:22	17:59		19:32			20:05	65	19:27 (T56)	20:36	87	19:35 (T56)	21:03		
11	07:56	07:32		07:51			07:00		07:24 (T55)	06:18		07:22 (T55)	05:59		
	17:23	18:00		19:33			20:06	73	19:29 (T56)	20:37	81	19:34 (T56)	21:03		
12	07:56	07:31		07:50			06:58		07:21 (T55)	06:17		07:24 (T55)	05:59		
	17:24	18:01		19:34			20:07	80	19:30 (T56)	20:38	77	19:34 (T56)	21:04		
13	07:56	07:30		07:48			06:57		07:20 (T55)	06:16		07:27 (T55)	05:58		
	17:25	18:03		19:35			20:08	85	19:32 (T56)	20:39	68	19:33 (T56)	21:04		
14	07:56	07:29		07:46			06:55		07:18 (T55)	06:15		18:36 (T56)	05:58		
	17:26	18:04		19:37			20:09	91	19:33 (T56)	20:40	56	19:32 (T56)	21:05		
15	07:55	07:27		07:45			06:54		07:13 (T54)	06:14		18:37 (T56)	05:58		
	17:27	18:05		19:38			20:10	99	19:34 (T56)	20:41	55	19:32 (T56)	21:05		
16	07:55	07:26	07:46 (T58)	07:43			06:52		07:11 (T54)	06:13		18:38 (T56)	05:58		
	17:28	18:06	6 07:52 (T58)	19:39			20:11	103	19:34 (T56)	20:42	53	19:31 (T56)	21:06		
17	07:54	07:25	07:44 (T58)	07:41			06:50		07:10 (T54)	06:12		18:38 (T56)	05:58		
	17:29	18:08	10 07:54 (T58)	19:40			20:12	107	19:36 (T56)	20:43	52	19:30 (T56)	21:06		
18	07:54	07:23	07:43 (T58)	07:40			06:49		07:08 (T54)	06:11		18:39 (T56)	05:59		
	17:31	18:09	13 07:56 (T58)	19:41			20:13	111	19:36 (T56)	20:44	51	19:30 (T56)	21:06		
19	07:53	07:22	07:42 (T58)	07:38			06:47		07:07 (T54)	06:10		18:39 (T56)	05:59		
	17:32	18:10	15 07:57 (T58)	19:42			20:14	114	19:37 (T56)	20:45	50	19:29 (T56)	21:07		
20	07:53	07:20	07:40 (T58)	07:36			06:46		07:05 (T54)	06:10		18:40 (T56)	05:59		
	17:33	18:11	17 07:57 (T58)	19:43			20:15	116	19:37 (T56)	20:46	48	19:28 (T56)	21:07		
21	07:52	07:19	07:39 (T58)	07:35			06:44		07:04 (T54)	06:09		18:42 (T56)	05:59		
	17:34	18:12	19 07:58 (T58)	19:44			20:16	119	19:37 (T56)	20:47	46	19:28 (T56)	21:07		
22	07:51	07:18	07:37 (T58)	07:33			06:43		07:02 (T54)	06:08		18:42 (T56)	05:59		
	17:35	18:14	21 07:58 (T58)	19:45			20:17	121	19:37 (T56)	20:48	45	19:27 (T56)	21:08		
23	07:51	07:16	07:36 (T58)	07:31			06:41		07:01 (T54)	06:07		18:43 (T56)	05:59		
	17:37	18:15	22 07:58 (T58)	19:46			20:18	123	19:38 (T56)	20:49	43	19:26 (T56)	21:08		
24	07:50	07:15	07:34 (T58)	07:30			06:40		06:59 (T54)	06:06		18:45 (T56)	06:00		
	17:38	18:16	24 07:58 (T58)	19:47			20:19	124	19:37 (T56)	20:50	41	19:26 (T56)	21:08		
25	07:49	07:13	07:34 (T58)	07:28			06:39		06:59 (T54)	06:06		18:46 (T56)	06:00		
	17:39	18:17	24 07:58 (T58)	19:48			20:21	126	19:38 (T56)	20:51	38	19:24 (T56)	21:08		
26	07:49	07:12	07:34 (T58)	07:26			06:37		06:59 (T54)	06:05		18:46 (T56)	06:00		
	17:40	18:18	23 07:57 (T58)	19:50			20:22	126	19:38 (T56)	20:52	37	19:23 (T56)	21:08		
27	07:48	07:10	07:35 (T58)	07:25			06:36		06:58 (T54)	06:04		18:48 (T56)	06:01		
	17:41	18:19	22 07:57 (T58)	19:51			20:23	125	19:37 (T56)	20:53	35	19:23 (T56)	21:08		
28	07:47	07:09	07:35 (T58)	07:23			06:34		06:59 (T54)	06:04		18:49 (T56)	06:01		
	17:43	18:21	20 07:55 (T58)	19:52			20:24	125	19:38 (T56)	20:53	32	19:21 (T56)	21:08		
29	07:46			07:21			06:33		07:00 (T54)	06:03		18:51 (T56)	06:01		
	17:44			19:53			20:25	123	19:38 (T56)	20:54	30	19:21 (T56)	21:08		
30	07:45			07:20			06:32		06:59 (T54)	06:03		18:52 (T56)	06:02		
	17:45			19:54			20:26	123	19:37 (T56)	20:55	27	19:19 (T56)	21:08		
31	07:44			07:18						06:02		18:54 (T56)			
	17:46			19:55						20:56	25	19:19 (T56)			
Potential sun hours	297	297		370			399			448			452		
Total, worst case			236		38			2407			2038			69	
Sun reduction			0.40		0.44			0.52			0.57			0.64	
Oper. time red.			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.			0.56		0.56			0.63			0.61			0.59	
Total reduction			0.23		0.25			0.33			0.35			0.38	
Total, real			53		9			784			707			26	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 232 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6378)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		06:27		07:33 (T55)	06:57		07:23 (T55)	07:28			07:02	07:37
	21:08		20:50	77	19:43 (T56)	20:07	73	19:28 (T56)	19:15			17:28	17:04
2	06:03		06:27		07:31 (T55)	06:58		07:24 (T55)	07:29			07:03	07:38
	21:08		20:49	83	19:44 (T56)	20:06	65	19:26 (T56)	19:13			17:27	17:04
3	06:03		06:28		07:29 (T55)	06:59		07:27 (T55)	07:30			07:04	07:39
	21:08		20:48	88	19:44 (T56)	20:04	55	19:24 (T56)	19:11			17:26	17:03
4	06:04		06:29		07:28 (T55)	07:00		07:30 (T55)	07:31			07:05	07:40
	21:08		20:47	91	19:45 (T56)	20:02	43	19:21 (T56)	19:10			17:25	17:03
5	06:05		06:30		07:27 (T55)	07:01		18:55 (T56)	07:32			07:07	07:41
	21:08		20:46	95	19:45 (T56)	20:01	22	19:17 (T56)	19:08			17:23	17:03
6	06:05		06:31		07:26 (T55)	07:02		19:01 (T56)	07:33			07:08	07:42
	21:07		20:44	97	19:45 (T56)	19:57	9	19:10 (T56)	19:07			17:22	17:03
7	06:06		06:32		07:19 (T54)	07:03			07:34			07:09	07:43
	21:07		20:43	102	19:45 (T56)	19:56			19:05			17:21	17:03
8	06:06		06:33		07:15 (T54)	07:04			07:35			07:10	07:44
	21:07	8	19:18 (T56)	20:42	112	19:46 (T56)	19:54			19:03			17:20	17:03
9	06:07		19:06 (T56)	06:34		07:13 (T54)	07:05			07:36			07:11	07:45
	21:07	14	19:20 (T56)	20:41	114	19:46 (T56)	19:52			19:02			17:19	17:03
10	06:08		19:05 (T56)	06:35		07:11 (T54)	07:06			07:37			07:13	07:45
	21:06	17	19:22 (T56)	20:39	118	19:46 (T56)	19:51			19:00			17:18	17:03
11	06:08		19:04 (T56)	06:36		07:10 (T54)	07:07			07:38		08:14 (T58)	07:14	07:46
	21:06	20	19:24 (T56)	20:38	120	19:46 (T56)	19:49			18:58	10	08:24 (T58)	17:17	17:03
12	06:09		19:02 (T56)	06:37		07:09 (T54)	07:08			07:39		08:11 (T58)	07:15	07:47
	21:05	24	19:26 (T56)	20:37	121	19:46 (T56)	19:47			18:57	15	08:26 (T58)	17:16	17:03
13	06:10		19:01 (T56)	06:38		07:08 (T54)	07:09			07:40		08:09 (T58)	07:16	07:48
	21:05	26	19:27 (T56)	20:36	123	19:46 (T56)	19:45			18:55	18	08:27 (T58)	17:15	17:03
14	06:11		19:00 (T56)	06:39		07:07 (T54)	07:10			07:41		08:07 (T58)	07:17	07:49
	21:04	29	19:29 (T56)	20:34	125	19:46 (T56)	19:44			18:54	21	08:28 (T58)	17:14	17:03
15	06:11		18:59 (T56)	06:40		07:07 (T54)	07:11			07:42		08:07 (T58)	07:19	07:49
	21:04	31	19:30 (T56)	20:33	124	19:45 (T56)	19:42			18:52	22	08:29 (T58)	17:13	17:04
16	06:12		18:58 (T56)	06:41		07:06 (T54)	07:12			07:44		08:06 (T58)	07:20	07:50
	21:03	34	19:32 (T56)	20:31	125	19:45 (T56)	19:40			18:51	24	08:30 (T58)	17:12	17:04
17	06:13		18:56 (T56)	06:42		07:06 (T54)	07:13			07:45		08:06 (T58)	07:21	07:51
	21:03	36	19:32 (T56)	20:30	125	19:45 (T56)	19:39			18:49	23	08:29 (T58)	17:12	17:04
18	06:14		18:55 (T56)	06:43		07:05 (T54)	07:14			07:46		08:06 (T58)	07:22	07:51
	21:02	38	19:33 (T56)	20:29	125	19:44 (T56)	19:37			18:48	23	08:29 (T58)	17:11	17:05
19	06:15		18:55 (T56)	06:44		07:06 (T54)	07:15			07:47		08:07 (T58)	07:23	07:52
	21:01	39	19:34 (T56)	20:27	124	19:44 (T56)	19:35			18:46	22	08:29 (T58)	17:10	17:05
20	06:15		18:54 (T56)	06:45		07:06 (T54)	07:16			07:48		08:08 (T58)	07:25	07:53
	21:01	42	19:36 (T56)	20:26	122	19:42 (T56)	19:34			18:45	20	08:28 (T58)	17:09	17:05
21	06:16		18:53 (T56)	06:46		07:07 (T54)	07:17			07:49		08:10 (T58)	07:26	07:53
	21:00	44	19:37 (T56)	20:24	121	19:42 (T56)	19:32			18:43	19	08:29 (T58)	17:09	17:06
22	06:17		18:52 (T56)	06:47		07:08 (T54)	07:18			07:50		08:11 (T58)	07:27	07:54
	20:59	45	19:37 (T56)	20:23	118	19:41 (T56)	19:30			18:42	17	08:28 (T58)	17:08	17:06
23	06:18		18:51 (T56)	06:48		07:09 (T54)	07:19			07:51		08:12 (T58)	07:28	07:54
	20:58	47	19:38 (T56)	20:21	115	19:40 (T56)	19:28			18:40	14	08:26 (T58)	17:07	17:07
24	06:19		18:50 (T56)	06:49		07:10 (T54)	07:20			07:53		08:13 (T58)	07:29	07:55
	20:58	49	19:39 (T56)	20:20	112	19:39 (T56)	19:27			18:39	12	08:25 (T58)	17:07	17:07
25	06:20		18:50 (T56)	06:50		07:11 (T54)	07:21			07:54		08:14 (T58)	07:30	07:55
	20:57	50	19:40 (T56)	20:18	110	19:38 (T56)	19:25			18:37	9	08:23 (T58)	17:06	17:08
26	06:21		18:49 (T56)	06:51		07:12 (T54)	07:22			07:55		08:16 (T58)	07:31	07:55
	20:56	51	19:40 (T56)	20:17	106	19:37 (T56)	19:23			18:36	5	08:21 (T58)	17:06	17:09
27	06:22		18:48 (T56)	06:52		07:13 (T54)	07:23			07:56			07:33	07:56
	20:55	53	19:41 (T56)	20:15	103	19:36 (T56)	19:22			18:35			17:05	17:09
28	06:23		18:48 (T56)	06:53		07:14 (T54)	07:24			07:57			07:34	07:56
	20:54	54	19:42 (T56)	20:14	99	19:35 (T56)	19:20			18:33			17:05	17:10
29	06:24		18:47 (T56)	06:54		07:19 (T55)	07:25			07:58			07:35	07:56
	20:53	56	19:43 (T56)	20:12	91	19:34 (T56)	19:18			18:32			17:05	17:11
30	06:25		07:42 (T55)	06:55		07:20 (T55)	07:27			08:00			07:36	07:57
	20:52	59	19:43 (T56)	20:10	85	19:32 (T56)	19:17			18:31			17:04	17:11
31	06:26		07:36 (T55)	06:56		07:21 (T55)				08:01				07:57
	20:51	71	19:43 (T56)	20:09	80	19:30 (T56)				18:29				17:12
Potential sun hours	459			428			375			345			297	287
Total, worst case		937			3351			267			274			
Sun reduction		0.66			0.61			0.59			0.48			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.59			0.62			0.61			0.56			
Total reduction		0.39			0.38			0.36			0.27			
Total, real		367			1276			97			74			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 255 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6398)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April			May			June			July			August			September	October	November	December
1	07:57	07:44	07:07	07:16			06:30			06:56 (T39)	06:02		06:57 (T39)	06:02		07:07 (T39)	06:26		07:01 (T39)	06:57	07:28	07:02	07:37
	17:13	17:48	18:22	19:56			20:27	46		07:42 (T39)	20:57	44	07:41 (T39)	21:09	36	07:43 (T39)	20:50	54	07:55 (T39)	20:07	19:15	17:28	17:04
2	07:58	07:43	07:06	07:15			06:29			06:56 (T39)	06:01		06:58 (T39)	06:03		07:07 (T39)	06:27		07:02 (T39)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57			20:28	47		07:43 (T39)	20:58	43	07:41 (T39)	21:09	36	07:43 (T39)	20:49	53	07:55 (T39)	20:06	19:13	17:27	17:04
3	07:58	07:42	07:04	07:13			06:28			06:55 (T39)	06:01		06:58 (T39)	06:03		07:07 (T39)	06:28		07:02 (T39)	06:59	07:30	07:05	07:39
	17:15	17:50	18:24	19:58			20:29	49		07:44 (T39)	20:59	42	07:40 (T39)	21:08	37	07:44 (T39)	20:48	53	07:55 (T39)	20:04	19:12	17:26	17:03
4	07:58	07:41	07:03	07:11			06:26			06:54 (T39)	06:00		06:59 (T39)	06:04		07:06 (T39)	06:29		07:02 (T39)	07:00	07:31	07:06	07:40
	17:16	17:51	18:25	19:59			20:30	49		07:43 (T39)	20:59	41	07:40 (T39)	21:08	38	07:44 (T39)	20:47	53	07:55 (T39)	20:02	19:10	17:24	17:03
5	07:58	07:40	07:01	07:10			06:25			06:53 (T39)	06:00		06:59 (T39)	06:04		07:06 (T39)	06:30		07:02 (T39)	07:01	07:32	07:07	07:41
	17:17	17:53	18:26	20:00			20:31	51		07:44 (T39)	21:00	41	07:40 (T39)	21:08	39	07:45 (T39)	20:46	53	07:55 (T39)	20:01	19:08	17:23	17:03
6	07:58	07:38	06:59	07:08			06:24			06:53 (T39)	06:00		06:59 (T39)	06:05		07:06 (T39)	06:31		07:02 (T39)	07:02	07:33	07:08	07:42
	17:18	17:54	18:28	20:00			20:32	51		07:44 (T39)	21:01	40	07:39 (T39)	21:08	39	07:45 (T39)	20:45	52	07:54 (T39)	19:57	19:07	17:22	17:03
7	07:58	07:37	06:58	07:06			06:23			06:53 (T39)	05:59		07:00 (T39)	06:06		07:06 (T39)	06:32		07:03 (T39)	07:03	07:34	07:09	07:43
	17:19	17:55	18:29	20:02			20:34	52		07:45 (T39)	21:01	39	07:39 (T39)	21:08	40	07:46 (T39)	20:43	51	07:54 (T39)	19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05			06:22			06:52 (T39)	05:59		07:01 (T39)	06:06		07:06 (T39)	06:33		07:03 (T39)	07:04	07:35	07:11	07:44
	17:20	17:56	19:30	20:03			20:35	53		07:45 (T39)	21:02	38	07:39 (T39)	21:07	41	07:47 (T39)	20:42	50	07:53 (T39)	19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03			06:20			06:52 (T39)	05:59		07:02 (T39)	06:07		07:05 (T39)	06:34		07:03 (T39)	07:05	07:36	07:12	07:45
	17:21	17:58	19:31	20:04			20:36	53		07:45 (T39)	21:03	37	07:39 (T39)	21:07	42	07:47 (T39)	20:41	50	07:53 (T39)	19:52	19:02	17:19	17:03
10	07:57	07:34	07:53	07:01			06:19			06:52 (T39)	05:59		07:02 (T39)	06:08		07:05 (T39)	06:35		07:04 (T39)	07:06	07:37	07:13	07:46
	17:22	17:59	19:32	20:05			20:37	53		07:45 (T39)	21:03	37	07:39 (T39)	21:07	43	07:48 (T39)	20:40	48	07:52 (T39)	19:51	19:00	17:18	17:03
11	07:57	07:33	07:51	07:00			06:18			06:52 (T39)	05:58		07:03 (T39)	06:08		07:05 (T39)	06:36		07:05 (T39)	07:07	07:38	07:14	07:47
	17:23	18:00	19:33	20:06			20:38	54		07:46 (T39)	21:04	36	07:39 (T39)	21:06	44	07:49 (T39)	20:38	47	07:52 (T39)	19:49	18:58	17:17	17:03
12	07:57	07:31	07:50	06:58			06:17			06:52 (T39)	05:58		07:03 (T39)	06:09		07:04 (T39)	06:37		07:05 (T39)	07:08	07:39	07:15	07:48
	17:24	18:01	19:34	20:07			20:39	54		07:46 (T39)	21:04	36	07:39 (T39)	21:06	45	07:49 (T39)	20:37	46	07:51 (T39)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57			06:16			06:52 (T39)	05:58		07:03 (T39)	06:10		07:04 (T39)	06:38		07:06 (T39)	07:09	07:40	07:17	07:48
	17:25	18:03	19:36	20:08			20:40	53		07:45 (T39)	21:05	35	07:38 (T39)	21:05	46	07:50 (T39)	20:36	44	07:50 (T39)	19:46	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55			06:15			06:52 (T39)	05:58		07:04 (T39)	06:10		07:04 (T39)	06:39		07:07 (T39)	07:10	07:42	07:18	07:49
	17:26	18:04	19:37	20:09			20:41	53		07:45 (T39)	21:05	34	07:38 (T39)	21:05	46	07:50 (T39)	20:34	42	07:49 (T39)	19:44	18:54	17:14	17:03
15	07:56	07:28	07:45	06:54			06:14			06:52 (T39)	05:58		07:04 (T39)	06:11		07:04 (T39)	06:40		07:08 (T39)	07:11	07:43	07:19	07:50
	17:27	18:05	19:38	20:10			20:42	53		07:45 (T39)	21:06	34	07:38 (T39)	21:04	47	07:51 (T39)	20:33	39	07:47 (T39)	19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52			06:13			06:52 (T39)	05:58		07:05 (T39)	06:12		07:03 (T39)	06:41		07:09 (T39)	07:12	07:44	07:20	07:51
	17:28	18:06	19:39	20:11			20:43	53		07:45 (T39)	21:06	34	07:39 (T39)	21:04	48	07:51 (T39)	20:32	37	07:46 (T39)	19:41	18:51	17:12	17:04
17	07:55	07:25	07:41	06:50			06:12			06:52 (T39)	05:58		07:06 (T39)	06:13		07:03 (T39)	06:42		07:10 (T39)	07:13	07:45	07:21	07:51
	17:29	18:08	19:40	20:12			20:44	53		07:45 (T39)	21:07	33	07:39 (T39)	21:03	49	07:52 (T39)	20:30	34	07:44 (T39)	19:39	18:49	17:12	17:04
18	07:54	07:23	07:40	06:49			06:11			06:52 (T39)	05:58		07:06 (T39)	06:14		07:03 (T39)	06:43		07:12 (T39)	07:14	07:46	07:23	07:52
	17:30	18:09	19:41	20:13			20:45	52		07:44 (T39)	21:07	33	07:39 (T39)	21:02	49	07:52 (T39)	20:29	30	07:42 (T39)	19:37	18:48	17:11	17:04
19	07:54	07:22	07:38	06:47			06:10			06:52 (T39)	05:58		07:06 (T39)	06:14		07:03 (T39)	06:44		07:14 (T39)	07:15	07:47	07:24	07:52
	17:32	18:10	19:42	20:14			20:46	52		07:44 (T39)	21:07	33	07:39 (T39)	21:02	50	07:53 (T39)	20:27	26	07:40 (T39)	19:35	18:46	17:10	17:05
20	07:53	07:21	07:36	06:46			06:09			06:52 (T39)	05:59		07:06 (T39)	06:15		07:03 (T39)	06:45		07:15 (T39)	07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15			20:47	52		07:44 (T39)	21:08	33	07:39 (T39)	21:01	50	07:53 (T39)	20:26	21	07:36 (T39)	19:34	18:45	17:09	17:05
21	07:52	07:19	07:35	06:44			06:09			06:53 (T39)	05:59		07:06 (T39)	06:16		07:02 (T39)	06:46		07:19 (T39)	07:17	07:49	07:26	07:54
	17:34	18:12	19:44	20:16			20:48	51		07:44 (T39)	21:08	33	07:39 (T39)	21:00	51	07:53 (T39)	20:24	13	07:32 (T39)	19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43		07:14 (T39)	06:08			06:53 (T39)	05:59		07:06 (T39)	06:17		07:02 (T39)	06:47			07:18	07:51	07:27	07:54
	17:35	18:14	19:45	20:18	14	07:28 (T39)	20:49	51		07:44 (T39)	21:08	33	07:39 (T39)	21:00	52	07:54 (T39)	20:23			19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:41		07:10 (T39)	06:07			06:53 (T39)	05:59		07:07 (T39)	06:18		07:02 (T39)	06:48			07:19	07:52	07:28	07:55
	17:36	18:15	19:46	20:19	22	07:32 (T39)	20:49	50		07:43 (T39)	21:08	33	07:40 (T39)	20:59	52	07:54 (T39)	20:21			19:29	18:40	17:07	17:07
24	07:50	07:15	07:30	06:40		07:07 (T39)	06:06			06:53 (T39)	05:59		07:07 (T39)	06:19		07:02 (T39)	06:49			07:20	07:53	07:30	07:55
	17:38	18:16	19:48	20:20	27	07:34 (T39)	20:50	50		07:43 (T39)	21:08	33	07:40 (T39)	20:58	52	07:54 (T39)	20:20			19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:39		07:05 (T39)	06:06			06:54 (T39)	06:00		07:07 (T39)	06:20		07:02 (T39)	06:50			07:21	07:54	07:31	07:55
	17:39	18:17	19:49	20:21	31	07:36 (T39)	20:51	49		07:43 (T39)	21:09	33	07:40 (T39)	20:57	53	07:55 (T39)	20:18			19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37		07:03 (T39)	06:05			06:54 (T39)	06:00		07:07 (T39)	06:21		07:02 (T39)	06:51			07:23	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	35	07:38 (T39)	20:52	48		07:42 (T39)	21:09	34	07:41 (T39)	20:56	53	07:55 (T39)	20:17			19:23	18:36	17:06	17:08
27	07:48	07:10	07:25	06:36		07:01 (T39)	06:04			06:55 (T39)	06:00		07:07 (T39)	06:22		07:02 (T39)	06:52			07:24	07:56	07:33	07:56
	17:41	18:20	19:51	20:23	38	07:39 (T39)	20:53	48		07:43 (T39)	21:09	34	07:41 (T39)	20:55	53	07:55 (T39)	20:15			19:22	18:35	17:05	17:09
28	07:47	07:09	07:23	06:34		07:00 (T39)	06:04			06:55 (T39)	06:01		07:07 (T39)	06:23		07:02 (T39)	06:53			07:25	07:57	07:34	07:57
	17:43	18:21	19:52	20:24	40	07:40 (T39)	20:54	47		07:42 (T39)	21:09	34	07:41 (T39)	20:54	54	07:56 (T39)	20:14			19:20	18:33	17:05	17:10
29	07:46		07:21	06:33		06:59 (T39)	06:03			06:56 (T39)	06:01		07:07 (T39)	06:24		07:02 (T39)	06:54			07:26	07:59	07:35	07:57
	17:44		19:53	20:25	42	07:41 (T39)	20:55	46		07:42 (T39)	21:09	35	07:42 (T39)	20:53	54	07:56 (T39)	20:12			19:18	18:32	17:04	17:10
30	07:46		07:20	06:32		06:57 (T39)	06:03			06:56 (T39)	06:02		07:07 (T39)	06:24		07:01 (T39)	06:55			07:27	08:00	07:36	07:57
	17:45		19:54	20:26	44	07:41 (T39)	20:56	45		07:41 (T39)	21:09	35	07:42 (T39)	20:52	54	07:55 (T39)	20:11			19:17	18:31	17:04	17:11
31	07:45		07:18				06:02			06:57 (T39)				06:25		07:01 (T39)	06:56				08:01		07:57
	17:46		19:55				20:56	45		07:42 (T39)				20:51	54	07:55 (T39)	20:09				18:29		17:12
Potential sun hours	297	297	370	399			449			453			460			429			375	345	297	287	
Total, worst case					293			1563			1080			1447			896						
Sun reduction					0.52			0.57			0.64			0.66			0.61						
Oper. time red.					1.00			1.00			1.00			1.00			1.00						
Wind dir. red.					0.68			0.68			0.68			0.68			0.68						
Total reduction					0.35			0.39			0.44			0.45			0.42						
Total, real					104			608			472			652			373						

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 275 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6413)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58		08:48 (T38)	07:44		09:00 (T38)	07:07		07:27 (T37)	07:16			06:30			06:02		06:23 (T87)
	17:13	68	09:56 (T38)	17:48	64	10:04 (T38)	18:22	26	07:53 (T37)	19:56			20:27			20:57	42	07:05 (T34)
2	07:58		08:49 (T38)	07:43		09:00 (T38)	07:06		07:25 (T37)	07:15			06:29			06:01		06:23 (T87)
	17:14	68	09:57 (T38)	17:49	63	10:03 (T38)	18:23	28	07:53 (T37)	19:57			20:28			20:58	44	07:07 (T34)
3	07:58		08:49 (T38)	07:42		09:01 (T38)	07:04		07:24 (T37)	07:13			06:28			06:01		06:22 (T87)
	17:15	68	09:57 (T38)	17:50	62	10:03 (T38)	18:24	30	07:54 (T37)	19:58			20:29			20:59	45	07:07 (T34)
4	07:58		08:49 (T38)	07:41		09:02 (T38)	07:03		07:23 (T37)	07:11			06:27			06:00		06:22 (T87)
	17:16	69	09:58 (T38)	17:51	60	10:02 (T38)	18:25	31	07:54 (T37)	19:59			20:30			20:59	47	07:09 (T34)
5	07:58		08:50 (T38)	07:40		09:03 (T38)	07:01		07:22 (T37)	07:10			06:25			06:00		06:22 (T87)
	17:17	69	09:59 (T38)	17:53	58	10:01 (T38)	18:27	33	07:55 (T37)	20:01			20:32			21:00	48	07:10 (T34)
6	07:58		08:50 (T38)	07:39		09:04 (T38)	07:00		07:22 (T37)	07:08			06:24			06:00		06:23 (T87)
	17:18	69	09:59 (T38)	17:54	57	10:01 (T38)	18:28	33	07:55 (T37)	20:01			20:33			21:01	48	07:11 (T34)
7	07:58		08:51 (T38)	07:37		09:05 (T38)	06:58		07:21 (T37)	07:06			06:23			05:59		06:22 (T87)
	17:19	69	10:00 (T38)	17:55	55	10:00 (T38)	18:29	33	07:54 (T37)	20:02			20:34			21:02	49	07:11 (T34)
8	07:58		08:51 (T38)	07:36		09:06 (T38)	07:56		08:21 (T37)	07:05			06:22			05:59		06:22 (T87)
	17:20	70	10:01 (T38)	17:56	52	09:58 (T38)	19:30	34	08:55 (T37)	20:03			20:35			21:02	50	07:12 (T34)
9	07:57		08:51 (T38)	07:35		09:07 (T38)	07:55		08:21 (T37)	07:03			06:21			05:59		06:23 (T87)
	17:21	69	10:00 (T38)	17:58	50	09:57 (T38)	19:31	33	08:54 (T37)	20:04			20:36			21:03	50	07:13 (T34)
10	07:57		08:51 (T38)	07:34		09:09 (T38)	07:53		08:20 (T37)	07:02			06:19			05:59		06:23 (T87)
	17:22	70	10:01 (T38)	17:59	46	09:55 (T38)	19:32	33	08:53 (T37)	20:05			20:37			21:03	51	07:14 (T34)
11	07:57		08:52 (T38)	07:33		09:10 (T38)	07:52		08:21 (T37)	07:00			06:18			05:59		06:23 (T87)
	17:23	70	10:02 (T38)	18:00	44	09:54 (T38)	19:33	32	08:53 (T37)	20:06			20:38			21:04	51	07:14 (T34)
12	07:57		08:51 (T38)	07:31		09:11 (T38)	07:50		08:21 (T37)	06:58			06:17			05:58		06:23 (T87)
	17:24	71	10:02 (T38)	18:01	40	09:51 (T38)	19:34	31	08:52 (T37)	20:07			20:39			21:04	52	07:15 (T34)
13	07:56		08:52 (T38)	07:30		09:14 (T38)	07:48		08:22 (T37)	06:57			06:16			05:58		06:24 (T87)
	17:25	71	10:03 (T38)	18:03	35	09:49 (T38)	19:36	28	08:50 (T37)	20:08			20:40			21:05	52	07:16 (T34)
14	07:56		08:53 (T38)	07:29		09:16 (T38)	07:47		08:23 (T37)	06:55			06:15			05:58		06:24 (T87)
	17:26	71	10:04 (T38)	18:04	31	09:47 (T38)	19:37	26	08:49 (T37)	20:09			20:41			21:05	52	07:16 (T34)
15	07:56		08:53 (T38)	07:28		09:19 (T38)	07:45		08:24 (T37)	06:54			06:14			05:58		06:24 (T87)
	17:27	70	10:03 (T38)	18:05	24	09:43 (T38)	19:38	23	08:47 (T37)	20:10			20:42			21:06	52	07:16 (T34)
16	07:55		08:53 (T38)	07:26		09:24 (T38)	07:43		08:25 (T37)	06:52			06:13			05:58		06:24 (T87)
	17:28	71	10:04 (T38)	18:06	14	09:38 (T38)	19:39	20	08:45 (T37)	20:11			20:43			21:06	53	07:17 (T34)
17	07:55		08:53 (T38)	07:25			07:42		08:28 (T37)	06:51			06:12			05:58		06:24 (T87)
	17:29	71	10:04 (T38)	18:08			19:40	15	08:43 (T37)	20:12			20:44			21:07	53	07:17 (T34)
18	07:54		08:54 (T38)	07:24			07:40		08:32 (T37)	06:49			06:11		06:33 (T87)	05:58		06:24 (T87)
	17:31	71	10:05 (T38)	18:09			19:41	6	08:38 (T37)	20:13			20:45	9	06:42 (T87)	21:07	53	07:17 (T34)
19	07:54		08:54 (T38)	07:22			07:38			06:47			06:10		06:31 (T87)	05:59		06:24 (T87)
	17:32	71	10:05 (T38)	18:10			19:42			20:14			20:46	14	06:45 (T87)	21:07	53	07:17 (T34)
20	07:53		08:54 (T38)	07:21			07:37			06:46			06:10		06:30 (T87)	05:59		06:24 (T87)
	17:33	71	10:05 (T38)	18:11			19:43			20:16			20:47	16	06:46 (T87)	21:08	54	07:18 (T34)
21	07:53		08:55 (T38)	07:19			07:35			06:44			06:09		06:30 (T87)	05:59		06:24 (T87)
	17:34	71	10:06 (T38)	18:12			19:44			20:17			20:48	19	06:49 (T87)	21:08	54	07:18 (T34)
22	07:52		08:55 (T38)	07:18			07:33			06:43			06:08		06:29 (T87)	05:59		06:25 (T87)
	17:35	70	10:05 (T38)	18:14			19:45			20:18			20:49	21	06:50 (T87)	21:08	54	07:19 (T34)
23	07:51		08:55 (T38)	07:16			07:31			06:42			06:07		06:28 (T87)	05:59		06:25 (T87)
	17:36	70	10:05 (T38)	18:15			19:47			20:19			20:50	22	06:50 (T87)	21:08	54	07:19 (T34)
24	07:51		08:55 (T38)	07:15			07:30			06:40			06:06		06:28 (T87)	06:00		06:25 (T87)
	17:38	70	10:05 (T38)	18:16			19:48			20:20			20:50	24	06:52 (T87)	21:09	53	07:18 (T34)
25	07:50		08:57 (T38)	07:14		07:35 (T37)	07:28			06:39			06:06		06:27 (T87)	06:00		06:25 (T87)
	17:39	69	10:06 (T38)	18:17	9	07:44 (T37)	19:49			20:21			20:51	25	06:52 (T87)	21:09	53	07:18 (T34)
26	07:49		08:57 (T38)	07:12		07:32 (T37)	07:26			06:37			06:05		06:26 (T87)	06:00		06:26 (T87)
	17:40	69	10:06 (T38)	18:18	16	07:48 (T37)	19:50			20:22			20:52	27	06:53 (T87)	21:09	53	07:19 (T34)
27	07:48		08:57 (T38)	07:11		07:30 (T37)	07:25			06:36			06:04		06:26 (T87)	06:01		06:26 (T87)
	17:41	68	10:05 (T38)	18:20	20	07:50 (T37)	19:51			20:23			20:53	28	06:54 (T87)	21:09	53	07:19 (T34)
28	07:47		08:58 (T38)	07:09		07:28 (T37)	07:23			06:34			06:04		06:25 (T87)	06:01		06:26 (T87)
	17:43	67	10:05 (T38)	18:21	23	07:51 (T37)	19:52			20:24			20:54	32	06:57 (T34)	21:09	52	07:18 (T34)
29	07:47		08:58 (T38)				07:21			06:33			06:03		06:25 (T87)	06:01		06:27 (T87)
	17:44	67	10:05 (T38)				19:53			20:25			20:55	36	07:01 (T34)	21:09	52	07:19 (T34)
30	07:46		08:58 (T38)				07:20			06:32			06:03		06:24 (T87)	06:02		06:26 (T87)
	17:45	67	10:05 (T38)				19:54			20:26			20:56	38	07:02 (T34)	21:09	52	07:18 (T34)
31	07:45		08:59 (T38)				07:18						06:02		06:24 (T87)			
	17:46	65	10:04 (T38)				19:55						20:56	40	07:04 (T34)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		2150			823			495						351			1529	
Sun reduction		0.31			0.40			0.44						0.57			0.64	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.53			0.53			0.57						0.72			0.72	
Total reduction		0.16			0.20			0.24						0.39			0.44	
Total, real		335			167			119						137			670	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 275 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6413)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August		September			October			November			December		
1	06:02		06:27 (T87)	06:26		06:58			07:28		08:01 (T37)	07:02		08:38 (T38)	07:37		08:34 (T38)
	21:09	52	07:19 (T34)	20:50		20:07			19:15	30	08:31 (T37)	17:28	47	09:25 (T38)	17:04	70	09:44 (T38)
2	06:03		06:27 (T87)	06:27		06:59			07:29		08:00 (T37)	07:04		08:37 (T38)	07:38		08:34 (T38)
	21:09	51	07:18 (T34)	20:49		20:06			19:13	31	08:31 (T37)	17:27	50	09:27 (T38)	17:04	70	09:44 (T38)
3	06:03		06:28 (T87)	06:28		07:00			07:30		07:59 (T37)	07:05		08:35 (T38)	07:39		08:35 (T38)
	21:09	50	07:18 (T34)	20:48		20:04			19:12	32	08:31 (T37)	17:26	53	09:28 (T38)	17:03	69	09:44 (T38)
4	06:04		06:27 (T87)	06:29		07:01			07:31		07:58 (T37)	07:06		08:34 (T38)	07:40		08:35 (T38)
	21:08	50	07:17 (T34)	20:47		20:03			19:10	33	08:31 (T37)	17:25	55	09:29 (T38)	17:03	70	09:45 (T38)
5	06:04		06:28 (T87)	06:30		07:02			07:32		07:58 (T37)	07:07		08:34 (T38)	07:41		08:36 (T38)
	21:08	50	07:18 (T34)	20:46		20:01			19:08	33	08:31 (T37)	17:23	57	09:31 (T38)	17:03	69	09:45 (T38)
6	06:05		06:29 (T87)	06:31		07:03			07:33		07:57 (T37)	07:08		08:33 (T38)	07:42		08:36 (T38)
	21:08	49	07:18 (T34)	20:45		19:58			19:07	34	08:31 (T37)	17:22	58	09:31 (T38)	17:03	69	09:45 (T38)
7	06:06		06:28 (T87)	06:32		07:04			07:34		07:57 (T37)	07:09		08:32 (T38)	07:43		08:37 (T38)
	21:08	49	07:17 (T34)	20:44		19:56			19:05	34	08:31 (T37)	17:21	60	09:32 (T38)	17:03	69	09:46 (T38)
8	06:06		06:29 (T87)	06:33		07:05			07:35		07:57 (T37)	07:11		08:32 (T38)	07:44		08:37 (T38)
	21:07	47	07:16 (T34)	20:42		19:54			19:03	33	08:30 (T37)	17:20	62	09:34 (T38)	17:03	69	09:46 (T38)
9	06:07		06:29 (T87)	06:34		07:06			07:36		07:57 (T37)	07:12		08:31 (T38)	07:45		08:38 (T38)
	21:07	46	07:15 (T34)	20:41		19:53			19:02	32	08:29 (T37)	17:19	63	09:34 (T38)	17:03	68	09:46 (T38)
10	06:08		06:30 (T87)	06:35		07:07			07:37		07:57 (T37)	07:13		08:31 (T38)	07:46		08:39 (T38)
	21:07	45	07:15 (T34)	20:40		19:51			19:00	31	08:28 (T37)	17:18	64	09:35 (T38)	17:03	68	09:47 (T38)
11	06:08		06:31 (T87)	06:36		07:08			07:38		07:58 (T37)	07:14		08:30 (T38)	07:47		08:38 (T38)
	21:06	43	07:14 (T34)	20:39		19:49			18:59	29	08:27 (T37)	17:17	65	09:35 (T38)	17:03	68	09:46 (T38)
12	06:09		06:31 (T87)	06:37		07:09			07:39		08:00 (T37)	07:16		08:30 (T38)	07:48		08:39 (T38)
	21:06	41	07:12 (T34)	20:37		19:47			18:57	27	08:27 (T37)	17:16	67	09:37 (T38)	17:03	68	09:47 (T38)
13	06:10		06:32 (T87)	06:38		07:10			07:41		08:01 (T37)	07:17		08:30 (T38)	07:48		08:40 (T38)
	21:05	39	07:11 (T34)	20:36		19:46			18:55	25	08:26 (T37)	17:15	67	09:37 (T38)	17:03	67	09:47 (T38)
14	06:11		06:33 (T87)	06:39		07:11			07:42		08:02 (T37)	07:18		08:29 (T38)	07:49		08:41 (T38)
	21:05	37	07:10 (T34)	20:35		19:44			18:54	22	08:24 (T37)	17:14	68	09:37 (T38)	17:03	67	09:48 (T38)
15	06:11		06:34 (T87)	06:40		07:12			07:43		08:03 (T37)	07:19		08:30 (T38)	07:50		08:41 (T38)
	21:04	34	07:08 (T34)	20:33		19:42			18:52	19	08:22 (T37)	17:13	68	09:38 (T38)	17:03	67	09:48 (T38)
16	06:12		06:34 (T87)	06:41		07:13			07:44		08:04 (T37)	07:20		08:30 (T38)	07:51		08:41 (T38)
	21:04	30	07:04 (T34)	20:32		19:41			18:51	15	08:19 (T37)	17:12	69	09:39 (T38)	17:04	67	09:48 (T38)
17	06:13		06:35 (T87)	06:42		07:14			07:45		08:10 (T37)	07:21		08:29 (T38)	07:51		08:42 (T38)
	21:03	27	07:02 (T87)	20:30		19:39			18:49	3	08:13 (T37)	17:12	70	09:39 (T38)	17:04	67	09:49 (T38)
18	06:14		06:36 (T87)	06:43		07:15			07:46			07:23		08:29 (T38)	07:52		08:42 (T38)
	21:03	26	07:02 (T87)	20:29		19:37			18:48			17:11	70	09:39 (T38)	17:04	67	09:49 (T38)
19	06:15		06:37 (T87)	06:44		07:16			07:47			07:24		08:30 (T38)	07:53		08:43 (T38)
	21:02	25	07:02 (T87)	20:28		19:35			18:46			17:10	70	09:40 (T38)	17:05	67	09:50 (T38)
20	06:15		06:38 (T87)	06:45		07:17			07:48			07:25		08:30 (T38)	07:53		08:44 (T38)
	21:01	23	07:01 (T87)	20:26		19:34			18:45			17:09	70	09:40 (T38)	17:05	67	09:51 (T38)
21	06:16		06:39 (T87)	06:46		07:18			07:49			07:26		08:30 (T38)	07:54		08:44 (T38)
	21:00	21	07:00 (T87)	20:25		19:32			18:43			17:09	71	09:41 (T38)	17:06	67	09:51 (T38)
22	06:17		06:39 (T87)	06:47		07:19			07:51			07:27		08:30 (T38)	07:54		08:45 (T38)
	21:00	20	06:59 (T87)	20:23		19:30			18:42			17:08	71	09:41 (T38)	17:06	67	09:52 (T38)
23	06:18		06:40 (T87)	06:48		07:20			07:52			07:29		08:31 (T38)	07:55		08:45 (T38)
	20:59	18	06:58 (T87)	20:22		19:29			18:40			17:07	71	09:42 (T38)	17:07	67	09:52 (T38)
24	06:19		06:41 (T87)	06:49		07:21			07:53			07:30		08:31 (T38)	07:55		08:45 (T38)
	20:58	15	06:56 (T87)	20:20		19:27			18:39			17:07	71	09:42 (T38)	17:07	67	09:52 (T38)
25	06:20		06:42 (T87)	06:50		07:22			07:54			07:31		08:31 (T38)	07:56		08:46 (T38)
	20:57	13	06:55 (T87)	20:19		19:25			18:37			17:06	71	09:42 (T38)	17:08	67	09:53 (T38)
26	06:21		06:45 (T87)	06:51		07:23		08:10 (T37)	07:55		09:52 (T38)	07:32		08:31 (T38)	07:56		08:46 (T38)
	20:56	6	06:51 (T87)	20:17		19:23	13	08:23 (T37)	18:36	17	10:09 (T38)	17:06	71	09:42 (T38)	17:08	67	09:53 (T38)
27	06:22			06:52		07:24		08:07 (T37)	07:56		09:48 (T38)	07:33		08:32 (T38)	07:56		08:46 (T38)
	20:55			20:15		19:22	19	08:26 (T37)	18:35	25	10:13 (T38)	17:05	70	09:42 (T38)	17:09	67	09:53 (T38)
28	06:23			06:53		07:25		08:06 (T37)	07:58		09:46 (T38)	07:34		08:32 (T38)	07:57		08:47 (T38)
	20:54			20:14		19:20	22	08:28 (T37)	18:33	31	10:17 (T38)	17:05	71	09:43 (T38)	17:10	68	09:55 (T38)
29	06:24			06:54		07:26		08:04 (T37)	07:59		09:43 (T38)	07:35		08:33 (T38)	07:57		08:48 (T38)
	20:53			20:12		19:18	25	08:29 (T37)	18:32	36	10:19 (T38)	17:05	71	09:44 (T38)	17:11	67	09:55 (T38)
30	06:25			06:56		07:27		08:02 (T37)	08:00		09:41 (T38)	07:36		08:33 (T38)	07:57		08:48 (T38)
	20:53			20:11		19:17	28	08:30 (T37)	18:31	40	10:21 (T38)	17:04	71	09:44 (T38)	17:11	67	09:55 (T38)
31	06:25			06:57					08:01		09:39 (T38)				07:57		08:48 (T38)
	20:51			20:09					18:29	44	10:23 (T38)				17:12	68	09:56 (T38)
Potential sun hours	460			429		375			345			297			287		
Total, worst case		907					107			656			1962			2102	
Sun reduction		0.66					0.59			0.48			0.30			0.22	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.72					0.57			0.56			0.53			0.53	
Total reduction		0.45					0.32			0.26			0.15			0.11	
Total, real		409					34			168			296			233	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 277 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6414)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April		May		June		July		August		September	October	November	December
1	07:57	07:43	07:07	07:16		06:30		07:16 (T49)	06:02	06:51 (T49)	06:02	06:56 (T49)	06:26	07:09 (T49)	06:57	07:28	07:02	07:37
	17:13	17:48	18:22	19:56		20:27	37	07:53 (T49)	20:57 87	08:18 (T49)	21:08 89	08:25 (T49)	20:50 70	08:19 (T49)	20:07	19:15	17:28	17:04
2	07:57	07:42	07:06	07:15		06:29		07:14 (T49)	06:01	06:51 (T49)	06:03	06:56 (T49)	06:27	07:10 (T49)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57		20:28	42	07:56 (T49)	20:58 87	08:18 (T49)	21:08 88	08:24 (T49)	20:49 68	08:18 (T49)	20:06	19:13	17:27	17:04
3	07:57	07:41	07:04	07:13		06:28		07:12 (T49)	06:01	06:50 (T49)	06:03	06:57 (T49)	06:28	07:11 (T49)	06:59	07:30	07:04	07:39
	17:15	17:50	18:24	19:58		20:29	46	07:58 (T49)	20:58 88	08:18 (T49)	21:08 88	08:25 (T49)	20:48 66	08:17 (T49)	20:04	19:11	17:26	17:03
4	07:57	07:40	07:03	07:11		06:27		07:09 (T49)	06:00	06:51 (T49)	06:04	06:56 (T49)	06:29	07:12 (T49)	07:00	07:31	07:06	07:40
	17:16	17:51	18:25	19:59		20:30	50	07:59 (T49)	20:59 87	08:18 (T49)	21:08 89	08:25 (T49)	20:47 64	08:16 (T49)	20:02	19:10	17:25	17:03
5	07:57	07:39	07:01	07:10		06:25		07:07 (T49)	06:00	06:51 (T49)	06:04	06:57 (T49)	06:30	07:13 (T49)	07:01	07:32	07:07	07:41
	17:17	17:53	18:26	20:00		20:31	54	08:01 (T49)	21:00 88	08:19 (T49)	21:08 88	08:25 (T49)	20:46 62	08:15 (T49)	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08		06:24		07:06 (T49)	06:00	06:52 (T49)	06:05	06:58 (T49)	06:31	07:15 (T49)	07:02	07:33	07:08	07:42
	17:18	17:54	18:28	20:00		20:32	57	08:03 (T49)	21:00 88	08:20 (T49)	21:08 88	08:26 (T49)	20:44 58	08:13 (T49)	19:57	19:06	17:22	17:03
7	07:57	07:37	06:58	07:06		06:23		07:04 (T49)	05:59	06:51 (T49)	06:06	06:57 (T49)	06:32	07:16 (T49)	07:03	07:34	07:09	07:43
	17:19	17:55	18:29	20:01		20:33	60	08:04 (T49)	21:01 88	08:19 (T49)	21:07 88	08:25 (T49)	20:43 56	08:12 (T49)	19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05		06:22		07:03 (T49)	05:59	06:51 (T49)	06:06	06:58 (T49)	06:33	07:17 (T49)	07:04	07:35	07:10	07:44
	17:20	17:56	19:30	20:02		20:34	63	08:06 (T49)	21:02 88	08:19 (T49)	21:07 88	08:26 (T49)	20:42 53	08:10 (T49)	19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03		06:21		07:02 (T49)	05:59	06:51 (T49)	06:07	06:58 (T49)	06:34	07:19 (T49)	07:05	07:36	07:12	07:45
	17:21	17:58	19:31	20:03		20:35	65	08:07 (T49)	21:02 89	08:20 (T49)	21:07 87	08:25 (T49)	20:41 49	08:08 (T49)	19:52	19:02	17:19	17:03
10	07:57	07:34	07:53	07:01		06:19		07:01 (T49)	05:59	06:52 (T49)	06:08	06:58 (T49)	06:35	07:21 (T49)	07:06	07:37	07:13	07:46
	17:22	17:59	19:32	20:05		20:36	67	08:08 (T49)	21:03 88	08:20 (T49)	21:06 88	08:26 (T49)	20:39 45	08:06 (T49)	19:51	19:00	17:18	17:03
11	07:57	07:32	07:51	07:00		06:18		07:00 (T49)	05:59	06:52 (T49)	06:08	06:59 (T49)	06:36	07:23 (T49)	07:07	07:38	07:14	07:46
	17:23	18:00	19:33	20:06		20:37	69	08:09 (T49)	21:03 89	08:21 (T49)	21:06 87	08:26 (T49)	20:38 41	08:04 (T49)	19:49	18:58	17:17	17:03
12	07:56	07:31	07:50	06:58		06:17		06:59 (T49)	05:59	06:52 (T49)	06:09	07:00 (T49)	06:37	07:26 (T49)	07:08	07:39	07:15	07:47
	17:24	18:01	19:34	20:07		20:38	71	08:10 (T49)	21:04 89	08:21 (T49)	21:05 86	08:26 (T49)	20:37 35	08:01 (T49)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57		06:16		06:58 (T49)	05:58	06:52 (T49)	06:10	06:59 (T49)	06:38	07:29 (T49)	07:09	07:40	07:16	07:48
	17:25	18:03	19:35	20:08		20:39	72	08:10 (T49)	21:04 89	08:21 (T49)	21:05 87	08:26 (T49)	20:36 29	07:58 (T49)	19:45	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55		06:15		06:57 (T49)	05:58	06:53 (T49)	06:11	07:00 (T49)	06:39	07:34 (T49)	07:10	07:41	07:18	07:49
	17:26	18:04	19:37	20:09		20:40	74	08:11 (T49)	21:05 88	08:21 (T49)	21:04 86	08:26 (T49)	20:34 19	07:53 (T49)	19:44	18:54	17:14	17:03
15	07:55	07:27	07:45	06:54		06:14		06:57 (T49)	05:58	06:53 (T49)	06:11	07:00 (T49)	06:40		07:11	07:42	07:19	07:49
	17:27	18:05	19:38	20:10		20:41	75	08:12 (T49)	21:05 89	08:22 (T49)	21:04 86	08:26 (T49)	20:33		19:42	18:52	17:13	17:04
16	07:55	07:26	07:43	06:52		06:13		06:56 (T49)	05:58	06:53 (T49)	06:12	07:01 (T49)	06:41		07:12	07:44	07:20	07:50
	17:28	18:06	19:39	20:11		20:42	76	08:12 (T49)	21:06 89	08:22 (T49)	21:03 85	08:26 (T49)	20:31		19:40	18:51	17:12	17:04
17	07:54	07:25	07:41	06:50		06:12		06:55 (T49)	05:58	06:53 (T49)	06:13	07:01 (T49)	06:42		07:13	07:45	07:21	07:51
	17:29	18:08	19:40	20:12		20:43	78	08:13 (T49)	21:06 89	08:22 (T49)	21:03 84	08:25 (T49)	20:30		19:39	18:49	17:12	17:04
18	07:54	07:23	07:40	06:49		06:11		06:54 (T49)	05:58	06:53 (T49)	06:14	07:01 (T49)	06:43		07:14	07:46	07:22	07:52
	17:31	18:09	19:41	20:13		20:44	79	08:13 (T49)	21:07 89	08:22 (T49)	21:02 84	08:25 (T49)	20:29		19:37	18:47	17:11	17:04
19	07:53	07:22	07:38	06:47		06:10		06:54 (T49)	05:59	06:53 (T49)	06:15	07:02 (T49)	06:44		07:15	07:47	07:23	07:52
	17:32	18:10	19:42	20:14		20:45	79	08:13 (T49)	21:07 89	08:22 (T49)	21:01 84	08:26 (T49)	20:27		19:35	18:46	17:10	17:05
20	07:53	07:20	07:36	06:46		06:10		06:53 (T49)	05:59	06:53 (T49)	06:15	07:02 (T49)	06:45		07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15		20:46	81	08:14 (T49)	21:07 89	08:22 (T49)	21:01 84	08:26 (T49)	20:26		19:34	18:45	17:09	17:05
21	07:52	07:19	07:35	06:44		06:09		06:53 (T49)	05:59	06:53 (T49)	06:16	07:03 (T49)	06:46		07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16		20:47	82	08:15 (T49)	21:07 89	08:22 (T49)	21:00 82	08:25 (T49)	20:24		19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43		06:08		06:53 (T49)	05:59	06:54 (T49)	06:17	07:03 (T49)	06:47		07:18	07:50	07:27	07:54
	17:35	18:14	19:45	20:17		20:48	82	08:15 (T49)	21:08 89	08:23 (T49)	20:59 81	08:24 (T49)	20:23		19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:41		06:07		06:52 (T49)	05:59	06:54 (T49)	06:18	07:03 (T49)	06:48		07:19	07:51	07:28	07:54
	17:36	18:15	19:46	20:18		20:49	83	08:15 (T49)	21:08 89	08:23 (T49)	20:58 81	08:24 (T49)	20:21		19:28	18:40	17:07	17:07
24	07:50	07:15	07:30	06:40		06:06		06:53 (T49)	06:00	06:54 (T49)	06:19	07:04 (T49)	06:49		07:20	07:53	07:29	07:55
	17:38	18:16	19:47	20:19		20:50	83	08:16 (T49)	21:08 89	08:23 (T49)	20:58 80	08:24 (T49)	20:20		19:27	18:39	17:07	17:07
25	07:49	07:13	07:28	06:39		06:06		06:52 (T49)	06:00	06:54 (T49)	06:20	07:05 (T49)	06:50		07:21	07:54	07:30	07:55
	17:39	18:17	19:48	20:21		20:51	84	08:16 (T49)	21:08 89	08:23 (T49)	20:57 79	08:24 (T49)	20:18		19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37		06:05		06:51 (T49)	06:00	06:55 (T49)	06:21	07:05 (T49)	06:51		07:22	07:55	07:31	07:56
	17:40	18:18	19:50	20:22		20:52	85	08:16 (T49)	21:08 89	08:24 (T49)	20:56 78	08:23 (T49)	20:17		19:23	18:36	17:06	17:09
27	07:48	07:10	07:25	06:36		06:04		06:52 (T49)	06:01	06:55 (T49)	06:22	07:06 (T49)	06:52		07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23		20:53	85	08:17 (T49)	21:08 89	08:24 (T49)	20:55 77	08:23 (T49)	20:15		19:22	18:35	17:05	17:09
28	07:47	07:09	07:23	06:34		06:04		06:51 (T49)	06:01	06:56 (T49)	06:23	07:07 (T49)	06:53		07:24	07:57	07:34	07:56
	17:43	18:21	19:52	20:24		20:54	86	08:17 (T49)	21:08 88	08:24 (T49)	20:54 75	08:22 (T49)	20:14		19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	07:25 (T49)	06:03		06:52 (T49)	06:01	06:55 (T49)	06:24	07:07 (T49)	06:54		07:25	07:58	07:35	07:56
	17:44		19:53	20:25 21	07:46 (T49)	20:54	85	08:17 (T49)	21:08 89	08:24 (T49)	20:53 75	08:22 (T49)	20:12		19:18	18:32	17:05	17:11
30	07:45		07:20	06:32	07:20 (T49)	06:03		06:51 (T49)	06:02	06:55 (T49)	06:25	07:08 (T49)	06:55		07:27	08:00	07:36	07:57
	17:45		19:54	20:26 30	07:50 (T49)	20:55	86	08:17 (T49)	21:08 89	08:24 (T49)	20:52 73	08:21 (T49)	20:10		19:17	18:31	17:04	17:11
31	07:44		07:18			06:02		06:51 (T49)			06:26	07:08 (T49)	06:56			08:01		07:57
	17:46		19:55			20:56	87	08:18 (T49)			20:51 72	08:20 (T49)	20:09			18:29		17:12
Potential sun hours	297	297	370	399		448		452		459		428		375	345	297	287	
Total, worst case				51		2223		2656		2587		715						
Sun reduction				0.52		0.57		0.64		0.66		0.61						
Oper. time red.				1.00		1.00		1.00		1.00		1.00						
Wind dir. red.				0.69		0.69		0.69		0.69		0.69						
Total reduction				0.36		0.40		0.44		0.46		0.42						
Total, real				18		879		1179		1184		302						

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 304 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March			April			May			June
1	07:58	07:44	07:07			07:16		07:49 (T38)	06:30		07:31 (T38)	06:02
	17:13	17:48	18:22			19:56	35	08:24 (T38)	20:27	54	08:25 (T38)	20:57
2	07:58	07:43	07:06			07:15		07:47 (T38)	06:29		07:32 (T38)	06:01
	17:14	17:49	18:23			19:57	39	08:26 (T38)	20:28	52	08:24 (T38)	20:58
3	07:58	07:42	07:04			07:13		07:45 (T38)	06:28		07:33 (T38)	06:01
	17:15	17:50	18:24			19:58	43	08:28 (T38)	20:29	50	08:23 (T38)	20:59
4	07:58	07:41	07:03			07:11		07:42 (T38)	06:27		07:33 (T38)	06:00
	17:16	17:51	18:25			19:59	47	08:29 (T38)	20:30	48	08:21 (T38)	20:59
5	07:58	07:40	07:01			07:10		07:29 (T37)	06:25		07:34 (T38)	06:00
	17:17	17:53	18:27			20:01	59	08:30 (T38)	20:32	46	08:20 (T38)	21:00
6	07:58	07:39	07:00			07:08		07:27 (T37)	06:24		07:35 (T38)	06:00
	17:18	17:54	18:28			20:01	64	08:31 (T38)	20:33	44	08:19 (T38)	21:01
7	07:58	07:37	06:58			07:06		07:25 (T37)	06:23		07:37 (T38)	05:59
	17:19	17:55	18:29			20:02	66	08:31 (T38)	20:34	41	08:18 (T38)	21:02
8	07:58	07:36	07:56			07:05		07:24 (T37)	06:22		07:38 (T38)	05:59
	17:20	17:56	19:30			20:03	68	08:32 (T38)	20:35	39	08:17 (T38)	21:02
9	07:57	07:35	07:55			07:03		07:22 (T37)	06:21		07:39 (T38)	05:59
	17:21	17:58	19:31			20:04	70	08:32 (T38)	20:36	36	08:15 (T38)	21:03
10	07:57	07:34	07:53			07:02		07:21 (T37)	06:19		07:41 (T38)	05:59
	17:22	17:59	19:32			20:05	72	08:33 (T38)	20:37	33	08:14 (T38)	21:03
11	07:57	07:33	07:52			07:00		07:19 (T37)	06:18		07:43 (T38)	05:59
	17:23	18:00	19:33			20:06	74	08:33 (T38)	20:38	29	08:12 (T38)	21:04
12	07:57	07:31	07:50			06:58		07:17 (T37)	06:17		07:45 (T38)	05:58
	17:24	18:01	19:35			20:07	76	08:33 (T38)	20:39	25	08:10 (T38)	21:04
13	07:56	07:30	07:48			06:57		07:16 (T37)	06:16		07:47 (T38)	05:58
	17:25	18:03	19:36			20:08	78	08:34 (T38)	20:40	20	08:07 (T38)	21:05
14	07:56	07:29	07:47			06:55		07:15 (T37)	06:15		07:51 (T38)	05:58
	17:26	18:04	19:37			20:09	78	08:33 (T38)	20:41	12	08:03 (T38)	21:05
15	07:56	07:28	07:45			06:54		07:16 (T37)	06:14			05:58
	17:27	18:05	19:38			20:10	78	08:34 (T38)	20:42			21:06
16	07:55	07:26	07:43			06:52		07:15 (T37)	06:13			05:58
	17:28	18:06	19:39			20:11	78	08:33 (T38)	20:43			21:06
17	07:55	07:25	07:42			06:51		07:16 (T37)	06:12			05:58
	17:29	18:08	19:40			20:12	77	08:33 (T38)	20:44			21:07
18	07:54	07:24	07:40			06:49		07:16 (T37)	06:11			05:58
	17:31	18:09	19:41			20:13	77	08:33 (T38)	20:45			21:07
19	07:54	07:22	07:38			06:47		07:17 (T37)	06:10			05:59
	17:32	18:10	19:42			20:14	76	08:33 (T38)	20:46			21:07
20	07:53	07:21	07:37			06:46		07:17 (T37)	06:10			05:59
	17:33	18:11	19:43			20:16	75	08:32 (T38)	20:47			21:08
21	07:53	07:19	07:35			06:44		07:18 (T37)	06:09			05:59
	17:34	18:12	19:44			20:17	74	08:32 (T38)	20:48			21:08
22	07:52	07:18	07:33			06:43		07:19 (T37)	06:08			05:59
	17:35	18:14	19:45			20:18	72	08:31 (T38)	20:49			21:08
23	07:51	07:16	07:31			06:42		07:21 (T37)	06:07			05:59
	17:36	18:15	19:47			20:19	70	08:31 (T38)	20:50			21:08
24	07:51	07:15	07:30			06:40		07:24 (T37)	06:06			06:00
	17:38	18:16	19:48			20:20	66	08:30 (T38)	20:50			21:09
25	07:50	07:14	07:28			06:39		07:29 (T38)	06:06			06:00
	17:39	18:17	19:49			20:21	60	08:29 (T38)	20:51			21:09
26	07:49	07:12	07:26			06:37		07:30 (T38)	06:05			06:00
	17:40	18:18	19:50			20:22	59	08:29 (T38)	20:52			21:09
27	07:48	07:11	07:25			06:36		07:30 (T38)	06:04			06:01
	17:41	18:20	19:51			20:23	58	08:28 (T38)	20:53			21:09
28	07:47	07:09	07:23			06:34		07:30 (T38)	06:04			06:01
	17:43	18:21	19:52			20:24	57	08:27 (T38)	20:54			21:09
29	07:47		07:21		08:01 (T38)	06:33		07:31 (T38)	06:03			06:01
	17:44		19:53	12	08:13 (T38)	20:25	56	08:27 (T38)	20:55			21:09
30	07:46		07:20		07:56 (T38)	06:32		07:31 (T38)	06:03			06:02
	17:45		19:54	23	08:19 (T38)	20:26	54	08:25 (T38)	20:56			21:09
31	07:45		07:18		07:52 (T38)				06:02			
	17:46		19:55	30	08:22 (T38)				20:56			
Potential sun hours	297	297	370			399			449			453
Total, worst case				65			1956			529		
Sun reduction				0.44			0.52			0.57		
Oper. time red.				1.00			1.00			1.00		
Wind dir. red.				0.64			0.64			0.64		
Total reduction				0.28			0.34			0.37		
Total, real				18			656			194		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 304 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December
1	06:02		06:26		06:58		07:18 (T37)	07:28	07:02	07:37
	21:09		20:50	26	08:20 (T38)	20:07	74	08:32 (T38)	19:15	17:28	17:04
2	06:03		06:27		07:52 (T38)	06:59		07:19 (T37)	07:29	07:04	07:38
	21:09		20:49	30	08:22 (T38)	20:06	72	08:31 (T38)	19:13	17:27	17:04
3	06:03		06:28		07:50 (T38)	07:00		07:20 (T37)	07:30	07:05	07:39
	21:09		20:48	34	08:24 (T38)	20:04	70	08:30 (T38)	19:12	17:26	17:03
4	06:04		06:29		07:49 (T38)	07:01		07:21 (T37)	07:31	07:06	07:40
	21:08		20:47	36	08:25 (T38)	20:03	68	08:29 (T38)	19:10	17:25	17:03
5	06:04		06:30		07:47 (T38)	07:02		07:22 (T37)	07:32	07:07	07:41
	21:08		20:46	40	08:27 (T38)	20:01	66	08:28 (T38)	19:08	17:23	17:03
6	06:05		06:31		07:46 (T38)	07:03		07:23 (T37)	07:33	07:08	07:42
	21:08		20:45	42	08:28 (T38)	19:58	64	08:27 (T38)	19:07	17:22	17:03
7	06:06		06:32		07:45 (T38)	07:04		07:24 (T37)	07:34	07:09	07:43
	21:08		20:44	44	08:29 (T38)	19:56	60	08:25 (T38)	19:05	17:21	17:03
8	06:06		06:33		07:44 (T38)	07:05		07:27 (T37)	07:35	07:11	07:44
	21:07		20:42	46	08:30 (T38)	19:54	49	08:24 (T38)	19:03	17:20	17:03
9	06:07		06:34		07:43 (T38)	07:06		07:39 (T38)	07:36	07:12	07:45
	21:07		20:41	48	08:31 (T38)	19:53	43	08:22 (T38)	19:02	17:19	17:03
10	06:08		06:35		07:42 (T38)	07:07		07:40 (T38)	07:37	07:13	07:46
	21:07		20:40	50	08:32 (T38)	19:51	40	08:20 (T38)	19:00	17:18	17:03
11	06:08		06:36		07:41 (T38)	07:08		07:42 (T38)	07:38	07:14	07:47
	21:06		20:39	52	08:33 (T38)	19:49	35	08:17 (T38)	18:59	17:17	17:03
12	06:09		06:37		07:40 (T38)	07:09		07:44 (T38)	07:39	07:16	07:48
	21:06		20:37	53	08:33 (T38)	19:47	31	08:15 (T38)	18:57	17:16	17:03
13	06:10		06:38		07:39 (T38)	07:10		07:47 (T38)	07:41	07:17	07:48
	21:05		20:36	55	08:34 (T38)	19:46	24	08:11 (T38)	18:55	17:15	17:03
14	06:11		06:39		07:38 (T38)	07:11		07:51 (T38)	07:42	07:18	07:49
	21:05		20:35	57	08:35 (T38)	19:44	15	08:06 (T38)	18:54	17:14	17:03
15	06:11		06:40		07:38 (T38)	07:12			07:43	07:19	07:50
	21:04		20:33	57	08:35 (T38)	19:42			18:52	17:13	17:04
16	06:12		06:41		07:37 (T38)	07:13			07:44	07:20	07:51
	21:04		20:32	59	08:36 (T38)	19:41			18:51	17:12	17:04
17	06:13		06:42		07:37 (T38)	07:14			07:45	07:21	07:51
	21:03		20:30	59	08:36 (T38)	19:39			18:49	17:12	17:04
18	06:14		06:43		07:36 (T38)	07:15			07:46	07:23	07:52
	21:03		20:29	60	08:36 (T38)	19:37			18:48	17:11	17:04
19	06:15		06:44		07:30 (T37)	07:16			07:47	07:24	07:53
	21:02		20:28	67	08:37 (T38)	19:35			18:46	17:10	17:05
20	06:15		06:45		07:27 (T37)	07:17			07:48	07:25	07:53
	21:01		20:26	70	08:37 (T38)	19:34			18:45	17:09	17:05
21	06:16		06:46		07:24 (T37)	07:18			07:49	07:26	07:54
	21:00		20:25	73	08:37 (T38)	19:32			18:43	17:09	17:06
22	06:17		06:47		07:23 (T37)	07:19			07:51	07:27	07:54
	21:00		20:23	74	08:37 (T38)	19:30			18:42	17:08	17:06
23	06:18		06:48		07:20 (T37)	07:20			07:52	07:29	07:55
	20:59		20:22	76	08:36 (T38)	19:29			18:40	17:07	17:07
24	06:19		06:49		07:19 (T37)	07:21			07:53	07:30	07:55
	20:58		20:20	77	08:36 (T38)	19:27			18:39	17:07	17:07
25	06:20		06:50		07:18 (T37)	07:22			07:54	07:31	07:56
	20:57		20:19	78	08:36 (T38)	19:25			18:37	17:06	17:08
26	06:21		06:51		07:18 (T37)	07:23			07:55	07:32	07:56
	20:56		20:17	77	08:35 (T38)	19:23			18:36	17:06	17:08
27	06:22		06:52		07:17 (T37)	07:24			07:56	07:33	07:56
	20:55		20:15	78	08:35 (T38)	19:22			18:35	17:05	17:09
28	06:23		06:54		07:17 (T37)	07:25			07:58	07:34	07:57
	20:54		20:14	78	08:35 (T38)	19:20			18:33	17:05	17:10
29	06:24	08:05 (T38)	06:55		07:16 (T37)	07:26			07:59	07:35	07:57
	20:53	5 08:10 (T38)	20:12	78	08:34 (T38)	19:18			18:32	17:05	17:11
30	06:25	08:00 (T38)	06:56		07:16 (T37)	07:27			08:00	07:36	07:57
	20:53	16 08:16 (T38)	20:11	78	08:34 (T38)	19:17			18:31	17:04	17:11
31	06:26	07:56 (T38)	06:57		07:17 (T37)				08:01		07:57
	20:51	22 08:18 (T38)	20:09	76	08:33 (T38)				18:29		17:12
Potential sun hours	460		429		375			345	297	287	
Total, worst case		43		1828		711					
Sun reduction		0.66		0.61		0.59					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.64		0.64		0.64					
Total reduction		0.42		0.39		0.38					
Total, real		18		718		270					

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 319 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6442)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March			April			May			June		
1	07:57		07:43		07:07			07:16		18:44 (T79)	06:30		18:20 (T79)	06:02		
	17:13		17:48		18:22			19:56	48	19:32 (T62)	20:27	68	19:28 (T79)	20:56		
2	07:57		07:42		07:05			07:14		18:41 (T79)	06:29		18:21 (T79)	06:01		
	17:14		17:49		18:23			19:57	52	19:33 (T62)	20:28	67	19:28 (T79)	20:57		
3	07:57		07:41		07:04			07:13		18:39 (T79)	06:28		18:20 (T79)	06:01		
	17:15		17:50		18:24			19:58	55	19:34 (T62)	20:29	66	19:26 (T79)	20:58		
4	07:57		07:40		07:02			07:11		18:36 (T79)	06:26		18:21 (T79)	06:00		
	17:16		17:51		18:25			19:59	58	19:34 (T62)	20:30	65	19:26 (T79)	20:59		
5	07:57		07:39		07:01			07:09		18:34 (T79)	06:25		18:22 (T79)	06:00		
	17:17		17:53		18:26			20:00	60	19:34 (T62)	20:31	64	19:26 (T79)	20:59		
6	07:57		07:38		06:59			07:08		18:32 (T79)	06:24		18:22 (T79)	06:00		
	17:18		17:54		18:27			20:00	63	19:35 (T62)	20:32	63	19:25 (T79)	21:00		
7	07:57		07:37		06:58			07:06		18:30 (T79)	06:23		18:23 (T79)	05:59		
	17:19		17:55		18:29			20:01	65	19:35 (T62)	20:33	62	19:25 (T79)	21:01		
8	07:57		07:36		07:56			07:05		18:29 (T79)	06:22		18:24 (T79)	05:59		
	17:20		17:56		19:30			20:02	65	19:34 (T62)	20:34	60	19:24 (T79)	21:01		
9	07:57		07:34		07:54			07:03		18:28 (T79)	06:20		18:25 (T79)	05:59		
	17:21		17:58		19:31			20:03	67	19:35 (T62)	20:35	58	19:23 (T79)	21:02		
10	07:56		07:33		07:53			07:01		18:26 (T79)	06:19		18:25 (T79)	05:59		
	17:22		17:59		19:32			20:04	68	19:34 (T62)	20:36	57	19:22 (T79)	21:03		
11	07:56		07:32		07:51			07:00		18:26 (T79)	06:18		18:25 (T79)	05:59		
	17:23		18:00		19:33			20:05	68	19:34 (T62)	20:37	56	19:21 (T79)	21:03		
12	07:56		07:31		07:49			06:58		18:24 (T79)	06:17		18:26 (T79)	05:58		
	17:24		18:01		19:34			20:06	70	19:34 (T62)	20:38	54	19:20 (T79)	21:04		
13	07:56		07:30		07:48			06:57		18:24 (T79)	06:16		18:27 (T79)	05:58		
	17:25		18:02		19:35			20:07	70	19:34 (T62)	20:39	52	19:19 (T79)	21:04		
14	07:55		07:28		07:46			06:55		18:23 (T79)	06:15		18:28 (T79)	05:58		
	17:26		18:04		19:36			20:09	70	19:33 (T62)	20:40	50	19:18 (T79)	21:05		
15	07:55		07:27		07:44			06:53		18:21 (T79)	06:14		18:30 (T79)	05:58		
	17:27		18:05		19:37			20:10	70	19:31 (T62)	20:41	48	19:18 (T79)	21:05		
16	07:54		07:26		07:43			06:52		18:21 (T79)	06:13		18:31 (T79)	05:58		
	17:28		18:06		19:39			20:11	70	19:31 (T79)	20:42	46	19:17 (T79)	21:05		
17	07:54		07:24		07:41			06:50		18:20 (T79)	06:12		18:32 (T79)	05:58		
	17:29		18:07		19:40			20:12	70	19:30 (T79)	20:43	44	19:16 (T79)	21:06		
18	07:54		07:23		07:39			06:49		18:20 (T79)	06:11		18:33 (T79)	05:58		
	17:30		18:09		19:41			20:13	71	19:31 (T79)	20:44	42	19:15 (T79)	21:06		
19	07:53		07:22		07:38			06:47		18:19 (T79)	06:10		18:34 (T79)	05:59		
	17:32		18:10		19:42			20:14	71	19:30 (T79)	20:45	40	19:14 (T79)	21:07		
20	07:52		07:20		07:36			06:46		18:20 (T79)	06:09		18:36 (T79)	05:59		
	17:33		18:11		19:43			20:15	71	19:31 (T79)	20:46	36	19:12 (T79)	21:07		
21	07:52		07:19		07:34			06:44		18:19 (T79)	06:09		18:38 (T79)	05:59		
	17:34		18:12		19:44			20:16	71	19:30 (T79)	20:47	34	19:12 (T79)	21:07		
22	07:51		07:17		07:33			06:43		18:19 (T79)	06:08		18:39 (T79)	05:59		
	17:35		18:13		19:45			20:17	72	19:31 (T79)	20:48	31	19:10 (T79)	21:07		
23	07:51		07:16		07:31			06:41		18:19 (T79)	06:07		18:41 (T79)	05:59		
	17:36		18:15		19:46			20:18	72	19:31 (T79)	20:49	27	19:08 (T79)	21:08		
24	07:50		07:14		07:29			06:40		18:19 (T79)	06:06		18:42 (T79)	06:00		
	17:38		18:16		19:47			20:19	71	19:30 (T79)	20:50	24	19:06 (T79)	21:08		
25	07:49		07:13		07:28			06:38		18:19 (T79)	06:06		18:45 (T79)	06:00		
	17:39		18:17		19:48			20:20	71	19:30 (T79)	20:51	20	19:05 (T79)	21:08		
26	07:48		07:11		07:26			06:37		18:18 (T79)	06:05		18:48 (T79)	06:00		
	17:40		18:18		19:49			20:21	71	19:29 (T79)	20:51	13	19:01 (T79)	21:08		
27	07:48		07:10		07:24			06:36		18:19 (T79)	06:04			06:01		
	17:41		18:19		19:50			20:22	70	19:29 (T79)	20:52			21:08		
28	07:47		07:08		07:23		19:10 (T62)	06:34		18:19 (T79)	06:04			06:01		
	17:43		18:20		19:51	16	19:26 (T62)	20:23	70	19:29 (T79)	20:53			21:08		
29	07:46				07:21		19:06 (T62)	06:33		18:19 (T79)	06:03			06:01		
	17:44				19:53	22	19:28 (T62)	20:25	69	19:28 (T79)	20:54			21:08		
30	07:45				07:19		18:55 (T79)	06:32		18:19 (T79)	06:03			06:02		
	17:45				19:54	35	19:30 (T62)	20:26	69	19:28 (T79)	20:55			21:08		
31	07:44				07:18		18:49 (T79)				06:02					
	17:46				19:55	43	19:32 (T62)				20:56					
Potential sun hours	297		297		370			399			448			452		
Total, worst case					116				2008			1247				
Sun reduction					0.44				0.52			0.57				
Oper. time red.					1.00				1.00			1.00				
Wind dir. red.					0.61				0.61			0.61				
Total reduction					0.27				0.32			0.35				
Total, real					31				639			434				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 319 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6442)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November	December
1	06:02			06:26		18:37 (T79)	06:57		18:25 (T79)	07:27	07:02	07:37
	21:08			20:50	54	19:31 (T79)	20:07	68	19:33 (T62)	19:15	17:28	17:04
2	06:03			06:27		18:36 (T79)	06:58		18:25 (T79)	07:28	07:03	07:38
	21:08			20:49	56	19:32 (T79)	20:05	68	19:33 (T62)	19:13	17:27	17:04
3	06:03			06:28		18:35 (T79)	06:59		18:26 (T79)	07:29	07:04	07:39
	21:08			20:48	58	19:33 (T79)	20:04	67	19:33 (T62)	19:11	17:26	17:03
4	06:04			06:29		18:34 (T79)	07:00		18:27 (T79)	07:30	07:05	07:40
	21:08			20:46	59	19:33 (T79)	20:02	65	19:32 (T62)	19:10	17:24	17:03
5	06:04			06:30		18:33 (T79)	07:01		18:27 (T79)	07:31	07:06	07:41
	21:07			20:45	61	19:34 (T79)	20:00	65	19:32 (T62)	19:08	17:23	17:03
6	06:05			06:31		18:33 (T79)	07:02		18:28 (T79)	07:33	07:08	07:42
	21:07			20:44	61	19:34 (T79)	19:57	63	19:31 (T62)	19:06	17:22	17:03
7	06:06			06:32		18:32 (T79)	07:03		18:30 (T79)	07:34	07:09	07:43
	21:07			20:43	63	19:35 (T79)	19:55	60	19:30 (T62)	19:05	17:21	17:03
8	06:06			06:33		18:31 (T79)	07:04		18:30 (T79)	07:35	07:10	07:43
	21:07			20:42	64	19:35 (T79)	19:54	59	19:29 (T62)	19:03	17:20	17:03
9	06:07			06:34		18:30 (T79)	07:05		18:32 (T79)	07:36	07:11	07:44
	21:06			20:40	66	19:36 (T79)	19:52	55	19:27 (T62)	19:01	17:19	17:03
10	06:08			06:35		18:30 (T79)	07:06		18:34 (T79)	07:37	07:12	07:45
	21:06			20:39	66	19:36 (T79)	19:50	52	19:26 (T62)	19:00	17:18	17:03
11	06:08			06:36		18:29 (T79)	07:07		18:36 (T79)	07:38	07:14	07:46
	21:06			20:38	67	19:36 (T79)	19:49	49	19:25 (T62)	18:58	17:17	17:03
12	06:09			06:37		18:29 (T79)	07:08		18:39 (T79)	07:39	07:15	07:47
	21:05			20:37	68	19:37 (T79)	19:47	44	19:23 (T62)	18:57	17:16	17:03
13	06:10			06:38		18:28 (T79)	07:09		18:45 (T79)	07:40	07:16	07:48
	21:05			20:35	69	19:37 (T79)	19:45	36	19:21 (T62)	18:55	17:15	17:03
14	06:11			06:39		18:28 (T79)	07:10		18:56 (T62)	07:41	07:17	07:48
	21:04			20:34	69	19:37 (T79)	19:44	23	19:19 (T62)	18:53	17:14	17:03
15	06:11			06:40		18:27 (T79)	07:11		18:58 (T62)	07:42	07:18	07:49
	21:04			20:33	70	19:37 (T79)	19:42	17	19:15 (T62)	18:52	17:13	17:03
16	06:12			06:41		18:26 (T79)	07:12		19:03 (T62)	07:43	07:20	07:50
	21:03			20:31	70	19:36 (T79)	19:40	7	19:10 (T62)	18:50	17:12	17:04
17	06:13		18:59 (T79)	06:42		18:25 (T79)	07:13			07:44	07:21	07:51
	21:02	10	19:09 (T79)	20:30	71	19:36 (T79)	19:38			18:49	17:12	17:04
18	06:14		18:56 (T79)	06:43		18:25 (T79)	07:14			07:46	07:22	07:51
	21:02	17	19:13 (T79)	20:28	71	19:36 (T79)	19:37			18:47	17:11	17:04
19	06:15		18:54 (T79)	06:44		18:24 (T79)	07:15			07:47	07:23	07:52
	21:01	21	19:15 (T79)	20:27	72	19:36 (T79)	19:35			18:46	17:10	17:05
20	06:15		18:52 (T79)	06:45		18:24 (T79)	07:16			07:48	07:24	07:52
	21:00	26	19:18 (T79)	20:25	72	19:36 (T79)	19:33			18:44	17:09	17:05
21	06:16		18:49 (T79)	06:46		18:24 (T79)	07:17			07:49	07:25	07:53
	21:00	29	19:18 (T79)	20:24	71	19:35 (T79)	19:32			18:43	17:09	17:06
22	06:17		18:48 (T79)	06:47		18:24 (T79)	07:18			07:50	07:27	07:53
	20:59	32	19:20 (T79)	20:22	71	19:35 (T79)	19:30			18:41	17:08	17:06
23	06:18		18:47 (T79)	06:48		18:23 (T79)	07:19			07:51	07:28	07:54
	20:58	35	19:22 (T79)	20:21	72	19:35 (T79)	19:28			18:40	17:07	17:07
24	06:19		18:46 (T79)	06:49		18:23 (T79)	07:20			07:52	07:29	07:54
	20:57	37	19:23 (T79)	20:19	71	19:34 (T79)	19:26			18:39	17:07	17:07
25	06:20		18:44 (T79)	06:50		18:23 (T79)	07:21			07:53	07:30	07:55
	20:56	41	19:25 (T79)	20:18	71	19:34 (T79)	19:25			18:37	17:06	17:08
26	06:21		18:43 (T79)	06:51		18:23 (T79)	07:22			07:55	07:31	07:55
	20:56	43	19:26 (T79)	20:16	70	19:33 (T79)	19:23			18:36	17:06	17:08
27	06:22		18:42 (T79)	06:52		18:23 (T79)	07:23			07:56	07:32	07:56
	20:55	45	19:27 (T79)	20:15	70	19:33 (T62)	19:21			18:34	17:05	17:09
28	06:23		18:41 (T79)	06:53		18:23 (T79)	07:24			07:57	07:33	07:56
	20:54	47	19:28 (T79)	20:13	70	19:33 (T62)	19:20			18:33	17:05	17:10
29	06:23		18:39 (T79)	06:54		18:24 (T79)	07:25			07:58	07:34	07:56
	20:53	49	19:28 (T79)	20:12	69	19:33 (T62)	19:18			18:32	17:04	17:11
30	06:24		18:38 (T79)	06:55		18:24 (T79)	07:26			07:59	07:36	07:56
	20:52	51	19:29 (T79)	20:10	70	19:34 (T62)	19:16			18:31	17:04	17:11
31	06:25		18:37 (T79)	06:56		18:24 (T79)				08:00		07:57
	20:51	53	19:30 (T79)	20:09	70	19:34 (T62)				18:29		17:12
Potential sun hours	459			428			375			345	298	288
Total, worst case		536			2082			798				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.61			0.61			0.61				
Total reduction		0.40			0.37			0.36				
Total, real		216			776			289				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 328 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6450)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May		June		July		August		September	October	November	December
1	07:57	07:44	07:07	07:16	06:30		06:02		06:36 (T43)	06:02	06:41 (T43)	06:27	06:58 (T43)	06:58	07:28	07:02	07:37
	17:13	17:48	18:22	19:56	20:27		20:57	56	07:32 (T43)	21:09 58	07:39 (T43)	20:50 30	07:28 (T43)	20:07	19:15	17:28	17:04
2	07:58	07:43	07:06	07:15	06:29		06:01		06:36 (T43)	06:03	06:41 (T43)	06:28	07:00 (T43)	06:59	07:29	07:03	07:38
	17:14	17:49	18:23	19:57	20:28		20:58	57	07:33 (T43)	21:09 58	07:39 (T43)	20:49 26	07:26 (T43)	20:06	19:13	17:27	17:04
3	07:58	07:42	07:04	07:13	06:28		06:01		06:36 (T43)	06:03	06:41 (T43)	06:29	07:03 (T43)	07:00	07:30	07:05	07:39
	17:15	17:50	18:24	19:58	20:29		20:59	57	07:33 (T43)	21:08 59	07:40 (T43)	20:48 20	07:23 (T43)	20:04	19:12	17:26	17:03
4	07:58	07:41	07:03	07:11	06:27		06:00		06:36 (T43)	06:04	06:42 (T43)	06:29	07:07 (T43)	07:01	07:31	07:06	07:40
	17:16	17:52	18:25	19:59	20:30		20:59	57	07:33 (T43)	21:08 58	07:40 (T43)	20:47 12	07:19 (T43)	20:03	19:10	17:25	17:03
5	07:58	07:40	07:01	07:10	06:25		06:00		06:36 (T43)	06:05	06:42 (T43)	06:30		07:02	07:32	07:07	07:41
	17:17	17:53	18:27	20:01	20:31		21:00	58	07:34 (T43)	21:08 58	07:40 (T43)	20:46		20:01	19:08	17:23	17:03
6	07:58	07:38	07:00	07:08	06:24		06:00		06:36 (T43)	06:05	06:42 (T43)	06:31		07:03	07:33	07:08	07:42
	17:18	17:54	18:28	20:01	20:33		21:01	58	07:34 (T43)	21:08 58	07:40 (T43)	20:45		19:58	19:07	17:22	17:03
7	07:58	07:37	06:58	07:06	06:23		05:59		06:36 (T43)	06:06	06:42 (T43)	06:32		07:04	07:34	07:09	07:43
	17:19	17:55	18:29	20:02	20:34		21:01	58	07:34 (T43)	21:08 58	07:40 (T43)	20:43		19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05	06:22		05:59		06:36 (T43)	06:06	06:43 (T43)	06:33		07:05	07:35	07:11	07:44
	17:20	17:57	19:30	20:03	20:35		21:02	58	07:34 (T43)	21:07 57	07:40 (T43)	20:42		19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03	06:21		05:59		06:36 (T43)	06:07	06:43 (T43)	06:34		07:06	07:36	07:12	07:45
	17:21	17:58	19:31	20:04	20:36	15	06:56 (T43) 07:11 (T43)	21:03 59	07:35 (T43)	21:07 58	07:41 (T43)	20:41		19:53	19:02	17:19	17:03
10	07:57	07:34	07:53	07:02	06:20		06:52 (T43)	05:59	06:37 (T43)	06:08	06:43 (T43)	06:35		07:07	07:37	07:13	07:46
	17:22	17:59	19:32	20:05	20:37	22	07:14 (T43)	21:03 58	07:35 (T43)	21:07 57	07:40 (T43)	20:40		19:51	19:00	17:18	17:03
11	07:57	07:33	07:51	07:00	06:18		06:50 (T43)	05:59	06:37 (T43)	06:08	06:44 (T43)	06:36		07:08	07:38	07:14	07:47
	17:23	18:00	19:33	20:06	20:38	27	07:17 (T43)	21:04 58	07:35 (T43)	21:06 56	07:40 (T43)	20:38		19:49	18:59	17:17	17:03
12	07:57	07:31	07:50	06:58	06:17		06:48 (T43)	05:59	06:37 (T43)	06:09	06:44 (T43)	06:37		07:09	07:39	07:15	07:48
	17:24	18:02	19:35	20:07	20:39	31	07:19 (T43)	21:04 59	07:36 (T43)	21:06 57	07:41 (T43)	20:37		19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57	06:16		06:46 (T43)	05:58	06:37 (T43)	06:10	06:44 (T43)	06:38		07:10	07:41	07:17	07:48
	17:25	18:03	19:36	20:08	20:40	34	07:20 (T43)	21:05 59	07:36 (T43)	21:05 56	07:40 (T43)	20:36		19:46	18:55	17:15	17:03
14	07:56	07:29	07:47	06:55	06:15		06:45 (T43)	05:58	06:37 (T43)	06:11	06:45 (T43)	06:39		07:11	07:42	07:18	07:49
	17:26	18:04	19:37	20:09	20:41	37	07:22 (T43)	21:05 59	07:36 (T43)	21:05 55	07:40 (T43)	20:34		19:44	18:54	17:14	17:03
15	07:56	07:28	07:45	06:54	06:14		06:44 (T43)	05:58	06:38 (T43)	06:11	06:45 (T43)	06:40		07:12	07:43	07:19	07:50
	17:27	18:05	19:38	20:10	20:42	39	07:23 (T43)	21:06 58	07:36 (T43)	21:04 55	07:40 (T43)	20:33		19:42	18:52	17:13	17:04
16	07:55	07:26	07:43	06:52	06:13		06:43 (T43)	05:58	06:38 (T43)	06:12	06:46 (T43)	06:41		07:13	07:44	07:20	07:51
	17:28	18:06	19:39	20:11	20:43	41	07:24 (T43)	21:06 58	07:36 (T43)	21:04 54	07:40 (T43)	20:32		19:41	18:51	17:13	17:04
17	07:55	07:25	07:42	06:51	06:12		06:41 (T43)	05:58	06:38 (T43)	06:13	06:45 (T43)	06:42		07:14	07:45	07:21	07:51
	17:29	18:08	19:40	20:12	20:44	44	07:25 (T43)	21:07 59	07:37 (T43)	21:03 54	07:39 (T43)	20:30		19:39	18:49	17:12	17:04
18	07:54	07:24	07:40	06:49	06:11		06:40 (T43)	05:59	06:38 (T43)	06:14	06:46 (T43)	06:43		07:15	07:46	07:23	07:52
	17:31	18:09	19:41	20:13	20:45	45	07:25 (T43)	21:07 59	07:37 (T43)	21:02 53	07:39 (T43)	20:29		19:37	18:48	17:11	17:05
19	07:54	07:22	07:38	06:48	06:11		06:40 (T43)	05:59	06:38 (T43)	06:15	06:47 (T43)	06:44		07:16	07:47	07:24	07:52
	17:32	18:10	19:42	20:14	20:46	46	07:26 (T43)	21:07 59	07:37 (T43)	21:02 52	07:39 (T43)	20:27		19:35	18:46	17:10	17:05
20	07:53	07:21	07:37	06:46	06:10		06:40 (T43)	05:59	06:38 (T43)	06:16	06:48 (T43)	06:45		07:17	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	20:47	47	07:27 (T43)	21:08 59	07:37 (T43)	21:01 51	07:39 (T43)	20:26		19:34	18:45	17:09	17:05
21	07:52	07:19	07:35	06:45	06:09		06:39 (T43)	05:59	06:38 (T43)	06:16	06:48 (T43)	06:47		07:18	07:49	07:26	07:54
	17:34	18:13	19:44	20:17	20:48	49	07:28 (T43)	21:08 59	07:37 (T43)	21:00 51	07:39 (T43)	20:25		19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43	06:08		06:38 (T43)	05:59	06:39 (T43)	06:17	06:48 (T43)	06:48		07:19	07:51	07:27	07:54
	17:35	18:14	19:45	20:18	20:49	50	07:28 (T43)	21:08 59	07:38 (T43)	21:00 50	07:38 (T43)	20:23		19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:42	06:07		06:37 (T43)	05:59	06:39 (T43)	06:18	06:49 (T43)	06:49		07:20	07:52	07:28	07:55
	17:37	18:15	19:47	20:19	20:49	52	07:29 (T43)	21:08 59	07:38 (T43)	20:59 48	07:37 (T43)	20:22		19:29	18:40	17:08	17:07
24	07:50	07:15	07:30	06:40	06:07		06:38 (T43)	06:00	06:39 (T43)	06:19	06:50 (T43)	06:50		07:21	07:53	07:30	07:55
	17:38	18:16	19:48	20:20	20:50	52	07:30 (T43)	21:08 59	07:38 (T43)	20:58 47	07:37 (T43)	20:20		19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:39	06:06		06:37 (T43)	06:00	06:40 (T43)	06:20	06:51 (T43)	06:51		07:22	07:54	07:31	07:55
	17:39	18:17	19:49	20:21	20:51	53	07:30 (T43)	21:09 59	07:39 (T43)	20:57 45	07:36 (T43)	20:18		19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	06:05		06:36 (T43)	06:00	06:40 (T43)	06:21	06:51 (T43)	06:52		07:23	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	20:52	54	07:30 (T43)	21:09 59	07:39 (T43)	20:56 45	07:36 (T43)	20:17		19:23	18:36	17:06	17:09
27	07:48	07:10	07:25	06:36	06:04		06:37 (T43)	06:01	06:40 (T43)	06:22	06:52 (T43)	06:53		07:24	07:56	07:33	07:56
	17:41	18:20	19:51	20:23	20:53	54	07:31 (T43)	21:09 58	07:38 (T43)	20:55 43	07:35 (T43)	20:15		19:22	18:35	17:05	17:09
28	07:47	07:09	07:23	06:35	06:04		06:36 (T43)	06:01	06:40 (T43)	06:23	06:54 (T43)	06:54		07:25	07:58	07:34	07:57
	17:43	18:21	19:52	20:24	20:54	55	07:31 (T43)	21:09 59	07:39 (T43)	20:54 40	07:34 (T43)	20:14		19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:03		06:36 (T43)	06:01	06:40 (T43)	06:24	06:55 (T43)	06:55		07:26	07:59	07:35	07:57
	17:44		19:53	20:25	20:55	56	07:32 (T43)	21:09 59	07:39 (T43)	20:53 38	07:33 (T43)	20:12		19:18	18:32	17:05	17:11
30	07:46		07:20	06:32	06:03		06:36 (T43)	06:02	06:40 (T43)	06:25	06:56 (T43)	06:56		07:27	08:00	07:36	07:57
	17:45		19:54	20:26	20:56	56	07:32 (T43)	21:09 59	07:39 (T43)	20:52 36	07:32 (T43)	20:11		19:17	18:31	17:04	17:11
31	07:45		07:18		06:02		06:36 (T43)			06:26	06:58 (T43)	06:57			08:01		07:57
	17:46		19:55		20:56	56	07:32 (T43)			20:51 32	07:30 (T43)	20:09			18:30		17:12
Potential sun hours	297	297	370	399	448		453			460	429		375	345	297	287
Total, worst case						1015		1752		1597		88				
Sun reduction						0.57		0.64		0.66		0.61				
Oper. time red.						1.00		1.00		1.00		1.00				
Wind dir. red.						0.71		0.71		0.71		0.71				
Total reduction						0.40		0.45		0.47		0.43				
Total, real						409		793		746		38				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 332 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6454)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May	June
1	07:57		16:03 (T5) | 07:43		16:02 (T5) | 07:07		17:08 (T4) | 07:16		19:19 (T3) | 06:30	| 06:01
	17:12	35	16:38 (T5) | 17:47	57	16:59 (T5) | 18:21	23	17:31 (T4) | 19:56	15	19:34 (T3) | 20:27	| 20:57
2	07:57		16:03 (T5) | 07:42		16:03 (T5) | 07:05		17:11 (T4) | 07:14		19:16 (T3) | 06:28	| 06:00
	17:13	35	16:38 (T5) | 17:48	56	16:59 (T5) | 18:22	18	17:29 (T4) | 19:57	19	19:35 (T3) | 20:28	| 20:58
3	07:57		16:03 (T5) | 07:41		16:03 (T5) | 07:04		17:14 (T4) | 07:12		19:14 (T3) | 06:27	| 06:00
	17:14	36	16:39 (T5) | 17:49	56	16:59 (T5) | 18:24	10	17:24 (T4) | 19:58	22	19:36 (T3) | 20:29	| 20:58
4	07:57		16:03 (T5) | 07:40		16:04 (T5) | 07:02			| 07:11		19:13 (T3) | 06:26	| 05:59
	17:15	37	16:40 (T5) | 17:51	55	16:59 (T5) | 18:25			| 19:59	24	19:37 (T3) | 20:30	| 20:59
5	07:57		16:03 (T5) | 07:39		16:03 (T5) | 07:01			| 07:09		19:12 (T3) | 06:24	| 05:59
	17:16	38	16:41 (T5) | 17:52	57	17:21 (T4) | 18:26			| 20:00	26	19:38 (T3) | 20:31	| 21:00
6	07:57		16:03 (T5) | 07:38		16:04 (T5) | 06:59			| 07:07		19:11 (T3) | 06:23	| 05:59
	17:17	40	16:43 (T5) | 17:53	68	17:27 (T4) | 18:27			| 20:00	28	19:39 (T3) | 20:32	| 21:01
7	07:57		16:02 (T5) | 07:37		16:05 (T5) | 06:57			| 07:06		19:10 (T3) | 06:22	| 05:58
	17:18	41	16:43 (T5) | 17:54	72	17:30 (T4) | 18:28			| 20:01	31	19:41 (T3) | 20:33	| 21:01
8	07:57		16:02 (T5) | 07:36		16:06 (T5) | 07:56			| 07:04		19:10 (T3) | 06:21	| 05:58
	17:19	42	16:44 (T5) | 17:56	75	17:32 (T4) | 19:29			| 20:02	31	19:41 (T3) | 20:34	| 21:02
9	07:57		16:02 (T5) | 07:35		16:07 (T5) | 07:54			| 07:02		19:09 (T3) | 06:20	| 05:58
	17:20	43	16:45 (T5) | 17:57	77	17:34 (T4) | 19:30			| 20:03	31	19:40 (T3) | 20:35	| 21:02
10	07:57		16:02 (T5) | 07:33		16:07 (T5) | 07:53			| 07:01		19:09 (T3) | 06:19	| 05:58
	17:21	44	16:46 (T5) | 17:58	77	17:34 (T4) | 19:32			| 20:04	31	19:40 (T3) | 20:36	| 21:03
11	07:57		16:01 (T5) | 07:32		16:08 (T5) | 07:51			| 06:59		19:09 (T3) | 06:17	| 05:58
	17:22	45	16:46 (T5) | 17:59	79	17:36 (T4) | 19:33			| 20:05	31	19:40 (T3) | 20:37	| 21:04
12	07:56		16:02 (T5) | 07:31		16:09 (T5) | 07:49			| 06:58		19:09 (T3) | 06:16	| 05:57
	17:23	46	16:48 (T5) | 18:01	78	17:37 (T4) | 19:34			| 20:06	31	19:40 (T3) | 20:38	| 21:04
13	07:56		16:02 (T5) | 07:30		16:11 (T5) | 07:48			| 06:56		19:09 (T3) | 06:15	| 05:57
	17:24	47	16:49 (T5) | 18:02	78	17:38 (T4) | 19:35			| 20:07	30	19:39 (T3) | 20:39	| 21:05
14	07:56		16:01 (T5) | 07:28		16:11 (T5) | 07:46			| 06:54		19:10 (T3) | 06:14	| 05:57
	17:25	48	16:49 (T5) | 18:03	77	17:38 (T4) | 19:36			| 20:09	28	19:38 (T3) | 20:40	| 21:05
15	07:55		16:02 (T5) | 07:27		16:13 (T5) | 07:44			| 06:53		19:10 (T3) | 06:13	| 05:57
	17:26	49	16:51 (T5) | 18:04	75	17:39 (T4) | 19:37			| 20:10	27	19:37 (T3) | 20:41	| 21:06
16	07:55		16:01 (T5) | 07:26		16:15 (T5) | 07:43			| 06:51		19:10 (T3) | 06:12	| 05:57
	17:27	50	16:51 (T5) | 18:06	73	17:40 (T4) | 19:38			| 20:11	25	19:35 (T3) | 20:42	| 21:06
17	07:54		16:01 (T5) | 07:24		16:17 (T5) | 07:41			| 06:50		19:12 (T3) | 06:11	| 05:57
	17:28	51	16:52 (T5) | 18:07	68	17:39 (T4) | 19:39			| 20:12	22	19:34 (T3) | 20:43	| 21:06
18	07:54		16:01 (T5) | 07:23		16:19 (T5) | 07:39			| 06:48		19:13 (T3) | 06:10	| 05:57
	17:30	52	16:53 (T5) | 18:08	65	17:40 (T4) | 19:40			| 20:13	19	19:32 (T3) | 20:44	| 21:07
19	07:53		16:01 (T5) | 07:22		16:22 (T5) | 07:38			| 06:47		19:15 (T3) | 06:10	| 05:58
	17:31	53	16:54 (T5) | 18:09	58	17:39 (T4) | 19:42			| 20:14	15	19:30 (T3) | 20:45	| 21:07
20	07:53		16:01 (T5) | 07:20		16:27 (T5) | 07:36			| 06:45		19:17 (T3) | 06:09	| 05:58
	17:32	53	16:54 (T5) | 18:10	49	17:40 (T4) | 19:43			| 20:15	9	19:26 (T3) | 20:46	| 21:07
21	07:52		16:01 (T5) | 07:19		17:03 (T4) | 07:34			| 06:44			| 06:08	| 05:58
	17:33	54	16:55 (T5) | 18:12	37	17:40 (T4) | 19:44			| 20:16			| 20:47	| 21:08
22	07:52		16:01 (T5) | 07:17		17:02 (T4) | 07:33			| 06:42			| 06:07	| 05:58
	17:34	55	16:56 (T5) | 18:13	37	17:39 (T4) | 19:45			| 20:17			| 20:48	| 21:08
23	07:51		16:01 (T5) | 07:16		17:03 (T4) | 07:31			| 06:41			| 06:06	| 05:58
	17:36	55	16:56 (T5) | 18:14	36	17:39 (T4) | 19:46			| 20:18			| 20:49	| 21:08
24	07:50		16:01 (T5) | 07:14		17:03 (T4) | 07:29			| 06:39			| 06:05	| 05:59
	17:37	56	16:57 (T5) | 18:15	35	17:38 (T4) | 19:47			| 20:19			| 20:50	| 21:08
25	07:49		16:01 (T5) | 07:13		17:04 (T4) | 07:27			| 06:38			| 06:05	| 05:59
	17:38	56	16:57 (T5) | 18:16	33	17:37 (T4) | 19:48			| 20:20			| 20:51	| 21:08
26	07:49		16:01 (T5) | 07:11		17:05 (T4) | 07:26			| 06:36			| 06:04	| 05:59
	17:39	56	16:57 (T5) | 18:18	31	17:36 (T4) | 19:49			| 20:21			| 20:52	| 21:08
27	07:48		16:02 (T5) | 07:10		17:05 (T4) | 07:24			| 06:35			| 06:03	| 06:00
	17:41	56	16:58 (T5) | 18:19	29	17:34 (T4) | 19:50			| 20:23			| 20:53	| 21:09
28	07:47		16:02 (T5) | 07:08		17:07 (T4) | 07:22			| 06:34			| 06:03	| 06:00
	17:42	57	16:59 (T5) | 18:20	26	17:33 (T4) | 19:51			| 20:24			| 20:54	| 21:09
29	07:46		16:02 (T5) |			| 07:21		| 06:32			| 06:02	| 06:00
	17:43	57	16:59 (T5) |			| 19:52		| 20:25			| 20:54	| 21:09
30	07:45		16:02 (T5) |			| 07:19		| 06:31			| 06:02	| 06:01
	17:44	57	16:59 (T5) |			| 19:53		| 20:26			| 20:55	| 21:09
31	07:44		16:02 (T5) |			| 07:17		19:21 (T3) |			| 06:01	|
	17:46	57	16:59 (T5) |			| 19:55	12	19:33 (T3) |			| 20:56	|
Potential sun hours	297		| 297			| 370		| 399			| 449	| 453
Total, worst case		1501	|	1614		|	63	|	495		|	|
Sun reduction		0.31	|	0.40		|	0.44	|	0.52		|	|
Oper. time red.		1.00	|	1.00		|	1.00	|	1.00		|	|
Wind dir. red.		0.73	|	0.72		|	0.69	|	0.61		|	|
Total reduction		0.23	|	0.29		|	0.31	|	0.32		|	|
Total, real		344	|	471		|	19	|	158		|	|

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 332 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6454)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August		September		October		November		December	
1	06:01	06:26		06:57		19:07 (T3)	07:27		07:02	15:36 (T5)	07:37	15:43 (T5)
	21:08	20:50		20:07	32	19:39 (T3)	19:14		17:27	78	17:04 (T4)	17:03	46	16:29 (T5)
2	06:02	06:27		06:58		19:07 (T3)	07:28		07:03		15:35 (T5)	07:38		15:45 (T5)
	21:08	20:49		20:05	31	19:38 (T3)	19:13		17:26	77	17:02 (T4)	17:03	44	16:29 (T5)
3	06:02	06:28		06:59		19:07 (T3)	07:29		07:04		15:35 (T5)	07:39		15:46 (T5)
	21:08	20:48		20:04	31	19:38 (T3)	19:11		17:25	76	17:02 (T4)	17:02	43	16:29 (T5)
4	06:03	06:29		07:00		19:07 (T3)	07:30		07:05		15:35 (T5)	07:40		15:47 (T5)
	21:08	20:47		20:02	31	19:38 (T3)	19:09		17:24	72	17:00 (T4)	17:02	42	16:29 (T5)
5	06:03	06:30		07:01		19:07 (T3)	07:31		07:07		15:34 (T5)	07:41		15:48 (T5)
	21:08	20:46		20:00	30	19:37 (T3)	19:08		17:23	66	16:56 (T4)	17:02	41	16:29 (T5)
6	06:04	06:31		07:02		19:07 (T3)	07:32		07:08		15:34 (T5)	07:42		15:49 (T5)
	21:08	20:44		19:57	28	19:35 (T3)	19:06		17:21	55	16:29 (T5)	17:02	40	16:29 (T5)
7	06:05	06:31		07:03		19:07 (T3)	07:33		07:09		15:34 (T5)	07:43		15:50 (T5)
	21:07	20:43		19:55	26	19:33 (T3)	19:04		17:20	55	16:29 (T5)	17:02	39	16:29 (T5)
8	06:05	06:32		07:04		19:07 (T3)	07:35		07:10		15:33 (T5)	07:44		15:50 (T5)
	21:07	20:42		19:54	25	19:32 (T3)	19:03		17:19	56	16:29 (T5)	17:02	37	16:27 (T5)
9	06:06	06:34		07:05		19:08 (T3)	07:36		07:11		15:33 (T5)	07:45		15:51 (T5)
	21:07	20:41		19:52	22	19:30 (T3)	19:01		17:18	56	16:29 (T5)	17:02	36	16:27 (T5)
10	06:07	06:35		07:06		19:09 (T3)	07:37		07:13		15:33 (T5)	07:46		15:52 (T5)
	21:06	20:39		19:50	19	19:28 (T3)	18:59		17:17	57	16:30 (T5)	17:02	36	16:28 (T5)
11	06:07	06:36		07:07		19:11 (T3)	07:38	17:47 (T4)	07:14		15:33 (T5)	07:46		15:53 (T5)
	21:06	20:38		19:49	16	19:27 (T3)	18:58	14 18:01 (T4)	17:16	57	16:30 (T5)	17:02	35	16:28 (T5)
12	06:08	06:37		07:08		19:13 (T3)	07:39	17:43 (T4)	07:15		15:33 (T5)	07:47		15:54 (T5)
	21:06	20:37		19:47	12	19:25 (T3)	18:56	20 18:03 (T4)	17:15	57	16:30 (T5)	17:02	34	16:28 (T5)
13	06:09	06:38		07:09			07:40	17:41 (T4)	07:16		15:34 (T5)	07:48		15:55 (T5)
	21:05	20:35		19:45			18:55	24 18:05 (T4)	17:14	57	16:31 (T5)	17:02	33	16:28 (T5)
14	06:10	06:39		07:10			07:41	17:39 (T4)	07:17		15:34 (T5)	07:49		15:55 (T5)
	21:05	20:34		19:43			18:53	27 18:06 (T4)	17:13	57	16:31 (T5)	17:02	32	16:27 (T5)
15	06:10	06:40		07:11			07:42	17:37 (T4)	07:19		15:34 (T5)	07:50		15:56 (T5)
	21:04	20:33		19:42			18:51	30 18:07 (T4)	17:12	56	16:30 (T5)	17:03	32	16:28 (T5)
16	06:11	06:41		07:12			07:43	17:37 (T4)	07:20		15:34 (T5)	07:50		15:57 (T5)
	21:03	20:31		19:40			18:50	32 18:09 (T4)	17:12	56	16:30 (T5)	17:03	31	16:28 (T5)
17	06:12	06:42		07:13			07:44	17:36 (T4)	07:21		15:35 (T5)	07:51		15:58 (T5)
	21:03	20:30		19:38			18:48	33 18:09 (T4)	17:11	56	16:31 (T5)	17:03	30	16:28 (T5)
18	06:13	06:43		07:14			07:46	17:34 (T4)	07:22		15:35 (T5)	07:52		15:59 (T5)
	21:02	20:28		19:37			18:47	35 18:09 (T4)	17:10	56	16:31 (T5)	17:03	29	16:28 (T5)
19	06:14	06:44		07:15			07:47	17:34 (T4)	07:23		15:35 (T5)	07:52		16:00 (T5)
	21:02	20:27		19:35			18:45	36 18:10 (T4)	17:09	55	16:30 (T5)	17:04	29	16:29 (T5)
20	06:14	06:45		07:16			07:48	17:33 (T4)	07:25		15:36 (T5)	07:53		16:00 (T5)
	21:01	20:26		19:33			18:44	37 18:10 (T4)	17:08	55	16:31 (T5)	17:04	29	16:29 (T5)
21	06:15	06:46		07:17			07:49	17:33 (T4)	07:26		15:37 (T5)	07:53		16:01 (T5)
	21:00	20:24		19:31			18:42	38 18:11 (T4)	17:08	54	16:31 (T5)	17:05	29	16:30 (T5)
22	06:16	06:47		07:18			07:50	16:56 (T5)	07:27		15:37 (T5)	07:54		16:01 (T5)
	20:59	20:23		19:30			18:41	52 18:10 (T4)	17:07	53	16:30 (T5)	17:05	29	16:30 (T5)
23	06:17	06:48	19:22 (T3)	07:19			07:51	16:52 (T5)	07:28		15:37 (T5)	07:54		16:02 (T5)
	20:59	20:21	9 19:31 (T3)	19:28			18:39	60 18:10 (T4)	17:07	53	16:30 (T5)	17:06	29	16:31 (T5)
24	06:18	06:49	19:18 (T3)	07:20			07:52	16:48 (T5)	07:29		15:38 (T5)	07:55		16:02 (T5)
	20:58	20:20	16 19:34 (T3)	19:26			18:38	67 18:10 (T4)	17:06	52	16:30 (T5)	17:06	29	16:31 (T5)
25	06:19	06:50	19:16 (T3)	07:21			07:54	16:46 (T5)	07:30		15:39 (T5)	07:55		16:02 (T5)
	20:57	20:18	20 19:36 (T3)	19:25			18:37	69 18:09 (T4)	17:05	51	16:30 (T5)	17:07	29	16:31 (T5)
26	06:20	06:51	19:14 (T3)	07:22			07:55	16:45 (T5)	07:32		15:40 (T5)	07:56		16:03 (T5)
	20:56	20:16	23 19:37 (T3)	19:23			18:35	72 18:09 (T4)	17:05	50	16:30 (T5)	17:07	29	16:32 (T5)
27	06:21	06:52	19:13 (T3)	07:23			07:56	16:43 (T5)	07:33		15:41 (T5)	07:56		16:02 (T5)
	20:55	20:15	25 19:38 (T3)	19:21			18:34	75 18:09 (T4)	17:04	49	16:30 (T5)	17:08	31	16:33 (T5)
28	06:22	06:53	19:12 (T3)	07:24			07:57	16:41 (T5)	07:34		15:41 (T5)	07:56		16:02 (T5)
	20:54	20:13	27 19:39 (T3)	19:19			18:33	77 18:08 (T4)	17:04	48	16:29 (T5)	17:09	31	16:33 (T5)
29	06:23	06:54	19:10 (T3)	07:25			07:58	16:39 (T5)	07:35		15:42 (T5)	07:57		16:02 (T5)
	20:53	20:12	28 19:38 (T3)	19:18			18:31	79 18:07 (T4)	17:04	47	16:29 (T5)	17:10	32	16:34 (T5)
30	06:24	06:55	19:09 (T3)	07:26			07:59	16:39 (T5)	07:36		15:43 (T5)	07:57		16:03 (T5)
	20:52	20:10	30 19:39 (T3)	19:16			18:30	78 18:07 (T4)	17:03	46	16:29 (T5)	17:10	33	16:36 (T5)
31	06:25	06:56	19:08 (T3)				08:01	16:38 (T5)				07:57		16:03 (T5)
	20:51	20:09	31 19:39 (T3)				18:29	78 18:05 (T4)				17:11	33	16:36 (T5)
Potential sun hours	460	429		375			345		297			287		
Total, worst case			209		303			1033		1713			1052	
Sun reduction			0.61		0.59			0.48		0.30			0.22	
Oper. time red.			1.00		1.00			1.00		1.00			1.00	
Wind dir. red.			0.61		0.61			0.72		0.73			0.73	
Total reduction			0.37		0.36			0.35		0.22			0.16	
Total, real			78		110			360		380			171	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 344 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6466)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:43	07:07	07:16	06:30	06:50 (T5)	06:01	06:31 (T4)	06:01	06:37 (T4)	06:26	06:51 (T4)	06:57	07:27	07:02	07:37
	17:12	17:47	18:21	19:56	20:27 31	07:21 (T5) 20:57 46	07:17 (T4) 21:09 47	07:24 (T4) 20:50 36	07:27 (T5) 20:07	19:14	17:27	17:03
2	07:57	07:42	07:05	07:14	06:28	06:50 (T5) 06:00	06:31 (T4) 06:02	06:37 (T4) 06:27	06:52 (T4) 06:58	07:28	07:03	07:38
	17:13	17:48	18:22	19:57	20:28 32	07:22 (T5) 20:58 47	07:18 (T4) 21:08 46	07:23 (T4) 20:49 36	07:28 (T5) 20:05	19:13	17:26	17:03
3	07:57	07:41	07:04	07:12	06:27	06:50 (T5) 06:00	06:32 (T4) 06:02	06:38 (T4) 06:28	06:54 (T4) 06:59	07:29	07:04	07:39
	17:14	17:49	18:24	19:58	20:29 32	07:22 (T5) 20:58 46	07:18 (T4) 21:08 46	07:24 (T4) 20:48 35	07:29 (T5) 20:04	19:11	17:25	17:02
4	07:58	07:40	07:02	07:11	06:26	06:50 (T5) 05:59	06:31 (T4) 06:03	06:38 (T4) 06:29	06:56 (T4) 07:00	07:30	07:05	07:40
	17:15	17:51	18:25	19:59	20:30 32	07:22 (T5) 20:59 47	07:18 (T4) 21:08 47	07:25 (T4) 20:47 32	07:28 (T5) 20:02	19:09	17:24	17:02
5	07:58	07:39	07:01	07:09	06:25	06:49 (T5) 05:59	06:32 (T4) 06:04	06:38 (T4) 06:30	07:00 (T5) 07:01	07:31	07:07	07:41
	17:16	17:52	18:26	20:00	20:31 31	07:20 (T5) 21:00 46	07:18 (T4) 21:08 46	07:24 (T4) 20:46 29	07:29 (T5) 20:00	19:08	17:23	17:02
6	07:57	07:38	06:59	07:07	06:23	06:50 (T5) 05:59	06:32 (T4) 06:04	06:39 (T4) 06:31	07:00 (T5) 07:02	07:32	07:08	07:42
	17:17	17:53	18:27	20:00	20:32 30	07:20 (T5) 21:01 47	07:19 (T4) 21:08 46	07:25 (T4) 20:44 29	07:29 (T5) 19:57	19:06	17:21	17:02
7	07:57	07:37	06:57	07:06	06:22	06:50 (T5) 05:58	06:32 (T4) 06:05	06:38 (T4) 06:32	06:59 (T5) 07:03	07:34	07:09	07:43
	17:18	17:54	18:28	20:01	20:33 30	07:20 (T5) 21:01 46	07:18 (T4) 21:07 47	07:25 (T4) 20:43 31	07:30 (T5) 19:55	19:04	17:20	17:02
8	07:57	07:36	07:56	07:04	06:21	06:50 (T4) 05:58	06:32 (T4) 06:05	06:39 (T4) 06:33	06:59 (T5) 07:04	07:35	07:10	07:44
	17:19	17:56	19:29	20:02	20:34 29	07:19 (T5) 21:02 47	07:19 (T4) 21:07 46	07:25 (T4) 20:42 31	07:30 (T5) 19:54	19:03	17:19	17:02
9	07:57	07:35	07:54	07:03	06:20	06:46 (T4) 05:58	06:33 (T4) 06:06	06:39 (T4) 06:34	06:59 (T5) 07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03	20:35 33	07:19 (T5) 21:02 46	07:19 (T4) 21:07 47	07:26 (T4) 20:41 31	07:30 (T5) 19:52	19:01	17:18	17:02
10	07:57	07:34	07:53	07:01	06:19	06:43 (T4) 05:58	06:33 (T4) 06:07	06:39 (T4) 06:35	06:59 (T5) 07:06	07:37	07:13	07:46
	17:21	17:58	19:32	20:04	20:36 35	07:18 (T5) 21:03 46	07:19 (T4) 21:06 46	07:25 (T4) 20:39 31	07:30 (T5) 19:50	18:59	17:17	17:02
11	07:57	07:32	07:51	06:59	06:18	06:41 (T4) 05:58	06:33 (T4) 06:07	06:39 (T4) 06:36	06:58 (T5) 07:07	07:38	07:14	07:47
	17:22	17:59	19:33	20:05	20:37 36	07:17 (T5) 21:04 46	07:19 (T4) 21:06 47	07:26 (T4) 20:38 32	07:30 (T5) 19:49	18:58	17:16	17:02
12	07:56	07:31	07:49	06:58	06:16	06:40 (T4) 05:58	06:34 (T4) 06:08	06:40 (T4) 06:37	06:58 (T5) 07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:06	20:38 36	07:16 (T5) 21:04 46	07:20 (T4) 21:06 46	07:26 (T4) 20:37 32	07:30 (T5) 19:47	18:56	17:15	17:02
13	07:56	07:30	07:48	06:56	06:15	06:38 (T4) 05:57	06:34 (T4) 06:09	06:39 (T4) 06:38	06:59 (T5) 07:09	07:40	07:16	07:48
	17:24	18:02	19:35	20:08	20:39 37	07:15 (T5) 21:05 46	07:20 (T4) 21:05 46	07:25 (T4) 20:36 31	07:30 (T5) 19:45	18:55	17:14	17:02
14	07:56	07:28	07:46	06:55	06:14	06:37 (T4) 05:57	06:34 (T4) 06:10	06:40 (T4) 06:39	07:00 (T5) 07:10	07:41	07:18	07:49
	17:25	18:03	19:36	20:09	20:41 36	07:13 (T5) 21:05 46	07:20 (T4) 21:05 46	07:26 (T4) 20:34 29	07:29 (T5) 19:44	18:53	17:13	17:02
15	07:55	07:27	07:44	06:53	06:13	06:36 (T4) 05:57	06:34 (T4) 06:10	06:40 (T4) 06:40	07:01 (T5) 07:11	07:42	07:19	07:50
	17:26	18:04	19:37	20:10	20:42 35	07:11 (T4) 21:06 46	07:20 (T4) 21:04 46	07:26 (T4) 20:33 28	07:29 (T5) 19:42	18:52	17:12	17:03
16	07:55	07:26	07:43	06:51	06:12	06:35 (T4) 05:57	06:35 (T4) 06:11	06:41 (T4) 06:41	07:02 (T5) 07:12	07:43	07:20	07:50
	17:27	18:06	19:38	20:11	20:43 37	07:12 (T4) 21:06 45	07:20 (T4) 21:03 45	07:26 (T4) 20:31 26	07:28 (T5) 19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50	06:11	06:34 (T4) 05:57	06:35 (T4) 06:12	06:40 (T4) 06:42	07:03 (T5) 07:13	07:44	07:21	07:51
	17:29	18:07	19:39	20:12	20:44 38	07:12 (T4) 21:06 45	07:20 (T4) 21:03 45	07:25 (T4) 20:30 24	07:27 (T5) 19:38	18:48	17:11	17:03
18	07:54	07:23	07:39	06:48	06:10	06:34 (T4) 05:58	06:35 (T4) 06:13	06:41 (T4) 06:43	07:04 (T5) 07:14	07:46	07:22	07:52
	17:30	18:08	19:41	20:13	20:44 39	07:13 (T4) 21:07 46	07:21 (T4) 21:02 44	07:25 (T4) 20:29 22	07:26 (T5) 19:37	18:47	17:10	17:04
19	07:53	07:22	07:38	06:47	06:10	06:33 (T4) 05:58	06:35 (T4) 06:14	06:41 (T4) 06:44	07:05 (T5) 07:15	07:47	07:23	07:52
	17:31	18:09	19:42	20:14	20:45 40	07:13 (T4) 21:07 46	07:21 (T4) 21:02 45	07:26 (T4) 20:27 20	07:25 (T5) 19:35	18:45	17:09	17:04
20	07:53	07:20	07:36	06:45 07:06 (T5)	06:09	06:33 (T4) 05:58	06:35 (T4) 06:15	06:42 (T4) 06:45	07:06 (T5) 07:16	07:48	07:25	07:53
	17:32	18:11	19:43	20:15 4 07:10 (T5)	20:46 41	07:14 (T4) 21:07 46	07:21 (T4) 21:01 44	07:26 (T4) 20:26 17	07:23 (T5) 19:33	18:44	17:09	17:04
21	07:52	07:19	07:34	06:44 07:03 (T5)	06:08	06:33 (T4) 05:58	06:35 (T4) 06:15	06:42 (T4) 06:46	07:07 (T5) 07:17	07:49	07:26	07:53
	17:33	18:12	19:44	20:16 11 07:14 (T5)	20:47 42	07:15 (T4) 21:08 46	07:21 (T4) 21:00 43	07:25 (T4) 20:24 15	07:22 (T5) 19:31	18:42	17:08	17:05
22	07:52	07:17	07:33	06:42 07:02 (T5)	06:07	06:32 (T4) 05:58	06:36 (T4) 06:16	06:43 (T4) 06:47	07:08 (T5) 07:18	07:50	07:27	07:54
	17:34	18:13	19:45	20:17 15 07:17 (T5)	20:48 43	07:15 (T4) 21:08 46	07:22 (T4) 20:59 42	07:25 (T4) 20:23 11	07:19 (T5) 19:30	18:41	17:07	17:05
23	07:51	07:16	07:31	06:41 07:00 (T5)	06:06	06:31 (T4) 05:58	06:36 (T4) 06:17	06:42 (T4) 06:48	07:19	07:51	07:28	07:54
	17:36	18:14	19:46	20:18 18 07:18 (T5)	20:49 44	07:15 (T4) 21:08 46	07:22 (T4) 20:59 42	07:24 (T4) 20:21	19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:39 06:59 (T5)	06:06	06:32 (T4) 05:59	06:36 (T4) 06:18	06:43 (T4) 06:49	07:20	07:52	07:29	07:55
	17:37	18:15	19:47	20:19 20 07:19 (T5)	20:50 44	07:16 (T4) 21:08 46	07:22 (T4) 20:58 41	07:24 (T4) 20:20	19:26	18:38	17:06	17:06
25	07:49	07:13	07:28	06:38 06:57 (T5)	06:05	06:31 (T4) 05:59	06:37 (T4) 06:19	06:44 (T4) 06:50	07:21	07:54	07:30	07:55
	17:38	18:17	19:48	20:20 23 07:20 (T5)	20:51 45	07:16 (T4) 21:08 46	07:23 (T4) 20:57 39	07:23 (T4) 20:18	19:25	18:37	17:05	17:07
26	07:49	07:12	07:26	06:36 06:56 (T5)	06:04	06:31 (T4) 05:59	06:37 (T4) 06:20	06:44 (T4) 06:51	07:22	07:55	07:32	07:56
	17:39	18:18	19:49	20:22 25 07:21 (T5)	20:52 45	07:16 (T4) 21:09 45	07:22 (T4) 20:56 39	07:23 (T4) 20:17	19:23	18:35	17:05	17:08
27	07:48	07:10	07:24	06:35 06:55 (T5)	06:04	06:31 (T4) 06:00	06:36 (T4) 06:21	06:45 (T4) 06:52	07:23	07:56	07:33	07:56
	17:41	18:19	19:50	20:23 27 07:22 (T5)	20:53 46	07:17 (T4) 21:09 46	07:22 (T4) 20:55 37	07:22 (T4) 20:15	19:21	18:34	17:05	17:08
28	07:47	07:08	07:22	06:34 06:53 (T5)	06:03	06:31 (T4) 06:00	06:37 (T4) 06:22	06:46 (T4) 06:53	07:24	07:57	07:34	07:56
	17:42	18:20	19:51	20:24 28 07:21 (T5)	20:54 46	07:17 (T4) 21:09 46	07:23 (T4) 20:54 36	07:22 (T4) 20:13	19:19	18:33	17:04	17:09
29	07:46		07:21	06:32 06:52 (T5)	06:02	06:31 (T4) 06:00	06:37 (T4) 06:23	06:47 (T4) 06:54	07:25	07:58	07:35	07:57
	17:43		19:52	20:25 30 07:22 (T5)	20:55 46	07:17 (T4) 21:09 46	07:23 (T4) 20:53 36	07:23 (T5) 20:12	19:18	18:31	17:04	17:10
30	07:45		07:19	06:31 06:51 (T5)	06:02	06:31 (T4) 06:01	06:38 (T4) 06:24	06:48 (T4) 06:55	07:26	08:00	07:36	07:57
	17:44		19:54	20:26 31 07:22 (T5)	20:55 46	07:17 (T4) 21:09 46	07:24 (T4) 20:52 36	07:24 (T5) 20:10	19:16	18:30	17:03	17:10
31	07:44		07:17		06:01	06:31 (T4)		06:49 (T4) 06:56		08:01		07:57
	17:46		19:55		20:56 47	07:18 (T4)		07:26 (T5) 20:09		18:29		17:11
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				232	1184	1381	1346	608				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.68	0.70	0.71	0.71	0.68				
Total reduction				0.35	0.40	0.45	0.47	0.42				
Total, real				82	472	626	628	254				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 360 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6479)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:58	07:44		07:07		07:27 (T86)	07:16		07:50 (T84)	06:30		07:31 (T84)	06:01
	17:12	17:47		18:21	19	07:46 (T86)	19:56	113	19:15 (T85)	20:27	70	08:41 (T84)	20:57
2	07:58	07:43		07:06		07:25 (T86)	07:14		07:48 (T84)	06:29		07:31 (T84)	06:00
	17:13	17:48		18:23	23	07:48 (T86)	19:57	117	19:15 (T85)	20:28	68	08:39 (T84)	20:58
3	07:58	07:42		07:04		07:23 (T86)	07:13		07:47 (T84)	06:27		07:31 (T84)	06:00
	17:14	17:50		18:24	26	07:49 (T86)	19:58	119	19:15 (T85)	20:29	68	08:39 (T84)	20:59
4	07:58	07:41		07:02		07:22 (T86)	07:11		07:45 (T84)	06:26		07:32 (T84)	06:00
	17:15	17:51		18:25	29	07:51 (T86)	19:59	123	19:15 (T85)	20:30	66	08:38 (T84)	20:59
5	07:58	07:39		07:01		07:20 (T86)	07:09		07:43 (T84)	06:25		07:33 (T84)	05:59
	17:16	17:52		18:26	31	07:51 (T86)	20:00	125	19:14 (T85)	20:31	65	08:38 (T84)	21:00
6	07:58	07:38		06:59		07:19 (T86)	07:08		07:42 (T84)	06:24		07:33 (T84)	05:59
	17:17	17:53		18:27	33	07:52 (T86)	20:00	127	19:14 (T85)	20:32	64	08:37 (T84)	21:01
7	07:58	07:37		06:58		07:18 (T86)	07:06		07:40 (T84)	06:22		07:33 (T84)	05:59
	17:18	17:55		18:28	35	07:53 (T86)	20:01	129	19:14 (T85)	20:33	62	08:35 (T84)	21:01
8	07:57	07:36		07:56		08:16 (T86)	07:04		07:39 (T84)	06:21		07:34 (T84)	05:58
	17:19	17:56		19:30	37	08:53 (T86)	20:02	130	19:13 (T85)	20:35	60	08:34 (T84)	21:02
9	07:57	07:35		07:54		08:16 (T86)	07:03		07:38 (T84)	06:20		07:35 (T84)	05:58
	17:20	17:57		19:31	37	08:53 (T86)	20:03	131	19:13 (T85)	20:36	59	08:34 (T84)	21:03
10	07:57	07:34		07:53		08:15 (T86)	07:01		07:37 (T84)	06:19		07:35 (T84)	05:58
	17:21	17:58		19:32	38	08:53 (T86)	20:05	131	19:12 (T85)	20:37	58	08:33 (T84)	21:03
11	07:57	07:33		07:51		08:15 (T86)	07:00		07:36 (T84)	06:18		07:36 (T84)	05:58
	17:22	18:00		19:33	38	08:53 (T86)	20:06	132	19:12 (T85)	20:38	56	08:32 (T84)	21:04
12	07:57	07:31		07:50		08:15 (T86)	06:58		07:35 (T84)	06:17		07:37 (T84)	05:58
	17:23	18:01		19:34	38	08:53 (T86)	20:07	131	19:10 (T85)	20:39	54	08:31 (T84)	21:04
13	07:56	07:30		07:48		08:15 (T86)	06:56		07:34 (T84)	06:16		07:38 (T84)	05:58
	17:24	18:02		19:35	37	08:52 (T86)	20:08	131	19:09 (T85)	20:40	52	08:30 (T84)	21:05
14	07:56	07:29		07:46		08:14 (T86)	06:55		07:34 (T84)	06:15		07:39 (T84)	05:58
	17:25	18:03		19:36	37	08:51 (T86)	20:09	130	19:09 (T85)	20:41	49	08:28 (T84)	21:05
15	07:56	07:27		07:45		08:15 (T86)	06:53		07:33 (T84)	06:14		07:40 (T84)	05:58
	17:26	18:05		19:37	52	18:56 (T85)	20:10	129	19:07 (T85)	20:42	47	08:27 (T84)	21:06
16	07:55	07:26		07:43		08:15 (T86)	06:52		07:33 (T84)	06:13		07:41 (T84)	05:58
	17:28	18:06		19:39	60	19:00 (T85)	20:11	128	19:07 (T85)	20:43	45	08:26 (T84)	21:06
17	07:55	07:25		07:41		08:15 (T86)	06:50		07:32 (T84)	06:12		07:42 (T84)	05:58
	17:29	18:07		19:40	66	19:03 (T85)	20:12	127	19:05 (T85)	20:44	43	08:25 (T84)	21:07
18	07:54	07:23		07:40		08:16 (T86)	06:49		07:32 (T84)	06:11		07:43 (T84)	05:58
	17:30	18:08		19:41	69	19:06 (T85)	20:13	124	19:04 (T85)	20:45	40	08:23 (T84)	21:07
19	07:54	07:22		07:38		08:17 (T86)	06:47		07:31 (T84)	06:10		07:46 (T84)	05:58
	17:31	18:10		19:42	71	19:08 (T85)	20:14	123	19:03 (T85)	20:46	36	08:22 (T84)	21:07
20	07:53	07:21		07:36		08:18 (T86)	06:45		07:31 (T84)	06:09		07:47 (T84)	05:58
	17:32	18:11		19:43	71	19:09 (T85)	20:15	119	19:01 (T85)	20:47	34	08:21 (T84)	21:08
21	07:52	07:19		07:34		08:20 (T86)	06:44		07:30 (T84)	06:08		07:48 (T84)	05:58
	17:33	18:12		19:44	71	19:11 (T85)	20:16	117	18:59 (T85)	20:48	31	08:19 (T84)	21:08
22	07:52	07:18		07:33		08:21 (T86)	06:42		07:30 (T84)	06:07		07:50 (T84)	05:58
	17:35	18:13		19:45	69	19:11 (T85)	20:17	114	18:58 (T85)	20:49	27	08:17 (T84)	21:08
23	07:51	07:16		07:31		08:24 (T86)	06:41		07:30 (T84)	06:07		07:53 (T84)	05:59
	17:36	18:14		19:46	65	19:12 (T85)	20:19	109	18:55 (T85)	20:49	22	08:15 (T84)	21:08
24	07:50	07:15		07:29		18:17 (T85)	06:40		07:30 (T84)	06:06		07:55 (T84)	05:59
	17:37	18:16		19:47	56	19:13 (T85)	20:20	105	18:53 (T85)	20:50	18	08:13 (T84)	21:09
25	07:50	07:13		07:28		18:17 (T85)	06:38		07:30 (T84)	06:05		07:58 (T84)	05:59
	17:38	18:17		19:48	57	19:14 (T85)	20:21	100	18:51 (T85)	20:51	11	08:09 (T84)	21:09
26	07:49	07:12		07:26		18:15 (T85)	06:37		07:30 (T84)	06:04			06:00
	17:40	18:18		19:49	59	19:14 (T85)	20:22	91	18:47 (T85)	20:52			21:09
27	07:48	07:10		07:24		08:08 (T84)	06:35		07:30 (T84)	06:04			06:00
	17:41	18:19		19:51	76	19:14 (T85)	20:23	77	18:40 (T85)	20:53			21:09
28	07:47	07:09	07:31 (T86)	07:23		08:03 (T84)	06:34		07:30 (T84)	06:03			06:00
	17:42	18:20	11 07:42 (T86)	19:52	88	19:15 (T85)	20:24	72	08:42 (T84)	20:54			21:09
29	07:46			07:21		07:59 (T84)	06:33		07:30 (T84)	06:02			06:01
	17:43			19:53	96	19:15 (T85)	20:25	72	08:42 (T84)	20:55			21:09
30	07:45			07:19		07:55 (T84)	06:31		07:31 (T84)	06:02			06:01
	17:45			19:54	103	19:15 (T85)	20:26	70	08:41 (T84)	20:56			21:09
31	07:45			07:18		07:53 (T84)				06:01			
	17:46			19:55	109	19:16 (T85)				20:56			
Potential sun hours	297	297		370			399			449			453
Total, worst case			11		1696			3446			1205		
Sun reduction			0.40		0.44			0.52			0.57		
Oper. time red.			1.00		1.00			1.00			1.00		
Wind dir. red.			0.57		0.62			0.64			0.64		
Total reduction			0.23		0.27			0.33			0.36		
Total, real			3		459			1149			439		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 360 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6479)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November	December
1	06:02			06:26		07:47 (T84)	06:57		07:35 (T84)	07:27		07:54 (T86)	07:02	07:37
	21:09			20:50	55	08:42 (T84)	20:07	132	19:11 (T85)	19:15	37	08:31 (T86)	17:28	17:03
2	06:02			06:27		07:47 (T84)	06:58		07:36 (T84)	07:28		07:53 (T86)	07:03	07:38
	21:09			20:49	56	08:43 (T84)	20:06	131	19:11 (T85)	19:13	38	08:31 (T86)	17:26	17:03
3	06:03			06:28		07:46 (T84)	06:59		07:36 (T84)	07:30		07:53 (T86)	07:05	07:39
	21:09			20:48	58	08:44 (T84)	20:04	131	19:11 (T85)	19:11	38	08:31 (T86)	17:25	17:03
4	06:03			06:29		07:45 (T84)	07:00		07:37 (T84)	07:31		07:53 (T86)	07:06	07:40
	21:08			20:47	59	08:44 (T84)	20:02	130	19:11 (T85)	19:10	37	08:30 (T86)	17:24	17:02
5	06:04			06:30		07:44 (T84)	07:01		07:37 (T84)	07:32		07:54 (T86)	07:07	07:41
	21:08			20:46	61	08:45 (T84)	20:01	129	19:11 (T85)	19:08	36	08:30 (T86)	17:23	17:02
6	06:04			06:31		07:43 (T84)	07:02		07:37 (T84)	07:33		07:54 (T86)	07:08	07:42
	21:08			20:45	63	08:46 (T84)	19:57	127	19:09 (T85)	19:06	36	08:30 (T86)	17:22	17:02
7	06:05			06:32		07:43 (T84)	07:03		07:38 (T84)	07:34		07:54 (T86)	07:09	07:43
	21:08			20:43	64	08:47 (T84)	19:56	125	19:09 (T85)	19:05	35	08:29 (T86)	17:21	17:02
8	06:06			06:33		07:41 (T84)	07:04		07:39 (T84)	07:35		07:55 (T86)	07:11	07:44
	21:07			20:42	65	08:46 (T84)	19:54	123	19:09 (T85)	19:03	32	08:27 (T86)	17:19	17:02
9	06:06			06:34		07:40 (T84)	07:05		07:40 (T84)	07:36		07:56 (T86)	07:12	07:45
	21:07			20:41	67	08:47 (T84)	19:52	120	19:09 (T85)	19:01	30	08:26 (T86)	17:18	17:02
10	06:07			06:35		07:40 (T84)	07:06		07:41 (T84)	07:37		07:57 (T86)	07:13	07:46
	21:07			20:40	68	08:48 (T84)	19:51	117	19:08 (T85)	19:00	27	08:24 (T86)	17:17	17:02
11	06:08			06:36		07:39 (T84)	07:07		07:42 (T84)	07:38		07:58 (T86)	07:14	07:47
	21:06			20:38	69	08:48 (T84)	19:49	114	19:08 (T85)	18:58	24	08:22 (T86)	17:16	17:02
12	06:08			06:37		07:39 (T84)	07:08		07:44 (T84)	07:39		07:59 (T86)	07:15	07:48
	21:06			20:37	70	08:49 (T84)	19:47	109	19:07 (T85)	18:56	21	08:20 (T86)	17:15	17:02
13	06:09			06:38		07:38 (T84)	07:09		07:46 (T84)	07:40		08:01 (T86)	07:17	07:48
	21:05			20:36	71	08:49 (T84)	19:45	103	19:06 (T85)	18:55	16	08:17 (T86)	17:14	17:02
14	06:10			06:39		07:38 (T84)	07:10		07:48 (T84)	07:41		08:07 (T86)	07:18	07:49
	21:05			20:34	71	08:49 (T84)	19:44	97	19:05 (T85)	18:53	6	08:13 (T86)	17:14	17:03
15	06:11			06:40		07:37 (T84)	07:11		07:51 (T84)	07:42			07:19	07:50
	21:04			20:33	73	08:50 (T84)	19:42	91	19:05 (T85)	18:52			17:13	17:03
16	06:11			06:41		07:37 (T84)	07:12		07:56 (T84)	07:44			07:20	07:51
	21:04			20:32	82	18:49 (T85)	19:40	79	19:04 (T85)	18:50			17:12	17:03
17	06:12			06:42		07:36 (T84)	07:13		18:03 (T85)	07:45			07:21	07:51
	21:03			20:30	93	18:54 (T85)	19:39	60	19:03 (T85)	18:49			17:11	17:03
18	06:13		08:12 (T84)	06:43		07:36 (T84)	07:14		18:04 (T85)	07:46			07:23	07:52
	21:02	2	08:14 (T84)	20:29	99	18:57 (T85)	19:37	57	19:01 (T85)	18:47			17:10	17:04
19	06:14		08:06 (T84)	06:44		07:36 (T84)	07:15		18:04 (T85)	07:47			07:24	07:53
	21:02	14	08:20 (T84)	20:27	105	19:00 (T85)	19:35	56	19:00 (T85)	18:46			17:09	17:04
20	06:15		08:03 (T84)	06:45		07:35 (T84)	07:16		08:12 (T86)	07:48			07:25	07:53
	21:01	21	08:24 (T84)	20:26	111	19:01 (T85)	19:33	63	18:59 (T85)	18:44			17:09	17:05
21	06:16		08:01 (T84)	06:46		07:35 (T84)	07:17		08:07 (T86)	07:49			07:26	07:54
	21:00	25	08:26 (T84)	20:24	114	19:03 (T85)	19:32	69	18:57 (T85)	18:43			17:08	17:05
22	06:17		08:00 (T84)	06:47		07:35 (T84)	07:18		08:05 (T86)	07:50			07:27	07:54
	21:00	28	08:28 (T84)	20:23	117	19:04 (T85)	19:30	70	18:55 (T85)	18:41			17:07	17:05
23	06:17		07:58 (T84)	06:48		07:35 (T84)	07:19		08:02 (T86)	07:52			07:28	07:55
	20:59	32	08:30 (T84)	20:21	119	19:05 (T85)	19:28	72	18:54 (T85)	18:40			17:07	17:06
24	06:18		07:57 (T84)	06:49		07:35 (T84)	07:20		08:01 (T86)	07:53			07:30	07:55
	20:58	35	08:32 (T84)	20:20	122	19:06 (T85)	19:27	71	18:52 (T85)	18:38			17:06	17:07
25	06:19		07:55 (T84)	06:50		07:35 (T84)	07:21		07:59 (T86)	07:54			07:31	07:56
	20:57	38	08:33 (T84)	20:18	124	19:07 (T85)	19:25	69	18:49 (T85)	18:37			17:06	17:07
26	06:20		07:53 (T84)	06:51		07:35 (T84)	07:22		07:58 (T86)	07:55			07:32	07:56
	20:56	41	08:34 (T84)	20:17	127	19:08 (T85)	19:23	66	18:46 (T85)	18:36			17:05	17:08
27	06:21		07:52 (T84)	06:52		07:35 (T84)	07:23		07:57 (T86)	07:56			07:33	07:56
	20:55	44	08:36 (T84)	20:15	128	19:09 (T85)	19:21	62	18:43 (T85)	18:34			17:05	17:08
28	06:22		07:51 (T84)	06:53		07:35 (T84)	07:24		07:56 (T86)	07:57			07:34	07:57
	20:54	46	08:37 (T84)	20:14	129	19:09 (T85)	19:20	56	18:39 (T85)	18:33			17:04	17:09
29	06:23		07:50 (T84)	06:54		07:35 (T84)	07:25		07:55 (T86)	07:59			07:35	07:57
	20:53	48	08:38 (T84)	20:12	130	19:10 (T85)	19:18	40	18:30 (T85)	18:31			17:04	17:10
30	06:24		07:49 (T84)	06:55		07:35 (T84)	07:26		07:54 (T86)	08:00			07:36	07:57
	20:52	50	08:39 (T84)	20:10	131	19:10 (T85)	19:16	38	08:32 (T86)	18:30			17:04	17:11
31	06:25		07:48 (T84)	06:56		07:35 (T84)				08:01				07:57
	20:51	53	08:41 (T84)	20:09	131	19:10 (T85)				18:29				17:11
Potential sun hours	460			429			375			345			297	287
Total, worst case		477			2832			2707			413			
Sun reduction		0.66			0.61			0.59			0.48			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.64			0.64			0.64			0.57			
Total reduction		0.42			0.39			0.37			0.28			
Total, real		201			1106			1014			114			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 382 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6496)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February		March			April			May			June		
1	07:57		15:13 (T44)	07:43		07:07			07:16		07:35 (T76)	06:30		18:37 (T77)	06:01		19:57 (T42)
	17:13	42	15:55 (T44)	17:47		18:22			19:56	72	19:23 (T77)	20:27	34	19:11 (T77)	20:57	31	20:28 (T42)
2	07:57		15:14 (T44)	07:42		07:06			07:14		07:33 (T76)	06:29		18:39 (T77)	06:01		19:57 (T42)
	17:14	41	15:55 (T44)	17:49		18:23			19:57	77	19:24 (T77)	20:28	31	19:10 (T77)	20:58	32	20:29 (T42)
3	07:57		15:14 (T44)	07:41		07:04			07:13		07:32 (T76)	06:28		18:40 (T77)	06:01		19:55 (T42)
	17:15	41	15:55 (T44)	17:50		18:24			19:58	80	19:25 (T77)	20:29	27	19:07 (T77)	20:58	34	20:29 (T42)
4	07:57		15:15 (T44)	07:40		07:02			07:11		07:31 (T76)	06:26		18:43 (T77)	06:00		19:55 (T42)
	17:16	41	15:56 (T44)	17:51		18:25			19:59	83	19:26 (T77)	20:30	22	19:05 (T77)	20:59	35	20:30 (T42)
5	07:57		15:16 (T44)	07:39		07:01			07:09		07:30 (T76)	06:25		18:46 (T77)	06:00		19:55 (T42)
	17:17	40	15:56 (T44)	17:52		18:26			20:00	85	19:26 (T77)	20:31	15	19:01 (T77)	21:00	36	20:31 (T42)
6	07:57		15:17 (T44)	07:38		06:59			07:08		07:30 (T76)	06:24			06:00		19:54 (T42)
	17:17	39	15:56 (T44)	17:54		18:27			20:00	86	19:27 (T77)	20:32			21:00	37	20:31 (T42)
7	07:57		15:18 (T44)	07:37		06:58			07:06		07:30 (T76)	06:23			05:59		19:54 (T42)
	17:18	37	15:55 (T44)	17:55		18:29			20:01	86	19:27 (T77)	20:33			21:01	38	20:32 (T42)
8	07:57		15:19 (T44)	07:36		07:56			07:05		07:30 (T76)	06:22			05:59		19:54 (T42)
	17:19	36	15:55 (T44)	17:56		19:30			20:02	87	19:27 (T77)	20:34			21:02	39	20:33 (T42)
9	07:57		15:20 (T44)	07:35		07:54			07:03		07:30 (T76)	06:20			05:59		19:54 (T42)
	17:20	35	15:55 (T44)	17:58		19:31			20:03	87	19:27 (T77)	20:35			21:02	39	20:33 (T42)
10	07:57		15:22 (T44)	07:34		07:53			07:01		07:30 (T76)	06:19			05:59		19:54 (T42)
	17:21	33	15:55 (T44)	17:59		19:32			20:05	85	19:27 (T77)	20:36			21:03	40	20:34 (T42)
11	07:57		15:23 (T44)	07:32		07:51			07:00		07:31 (T76)	06:18			05:58		19:54 (T42)
	17:23	30	15:53 (T44)	18:00		19:33			20:06	84	19:27 (T77)	20:37			21:03	41	20:35 (T42)
12	07:56		15:24 (T44)	07:31		07:50			06:58		07:32 (T76)	06:17			05:58		19:54 (T42)
	17:24	29	15:53 (T44)	18:01		19:34			20:07	82	19:27 (T77)	20:38			21:04	40	20:34 (T42)
13	07:56		15:26 (T44)	07:30		07:48			06:57		07:34 (T76)	06:16			05:58		19:54 (T42)
	17:25	27	15:53 (T44)	18:02		19:35			20:08	79	19:27 (T77)	20:39			21:05	41	20:35 (T42)
14	07:56		15:28 (T44)	07:29		07:46			06:55		07:35 (T76)	06:15			05:58		19:54 (T42)
	17:26	23	15:51 (T44)	18:04		19:36			20:09	74	19:26 (T77)	20:40			21:05	41	20:35 (T42)
15	07:55		15:30 (T44)	07:27		07:45			06:53		07:38 (T76)	06:14			05:58		19:54 (T42)
	17:27	20	15:50 (T44)	18:05		19:38			20:10	67	19:26 (T77)	20:41			21:05	41	20:35 (T42)
16	07:55		15:33 (T44)	07:26		07:43			06:52		18:27 (T77)	06:13			05:58		19:54 (T42)
	17:28	15	15:48 (T44)	18:06		19:39			20:11	59	19:26 (T77)	20:42			21:06	42	20:36 (T42)
17	07:54		15:37 (T44)	07:25		07:41			06:50		18:26 (T77)	06:12			05:58		19:55 (T42)
	17:29	8	15:45 (T44)	18:07		19:40			20:12	59	19:25 (T77)	20:43			21:06	42	20:37 (T42)
18	07:54			07:23		07:40			06:49		18:27 (T77)	06:11			05:58		19:55 (T42)
	17:30			18:09		19:41			20:13	58	19:25 (T77)	20:44			21:07	42	20:37 (T42)
19	07:53			07:22		07:38			06:47		18:27 (T77)	06:10			05:58		19:55 (T42)
	17:32			18:10		19:42			20:14	57	19:24 (T77)	20:45			21:07	42	20:37 (T42)
20	07:53			07:20		07:36			06:46		18:27 (T77)	06:09			05:59		19:55 (T42)
	17:33			18:11		19:43			20:15	56	19:23 (T77)	20:46			21:07	42	20:37 (T42)
21	07:52			07:19		07:35			06:44		18:28 (T77)	06:09			05:59		19:55 (T42)
	17:34			18:12		19:44			20:16	55	19:23 (T77)	20:47			21:08	42	20:37 (T42)
22	07:52			07:18		07:33			06:43		18:28 (T77)	06:08			05:59		19:55 (T42)
	17:35			18:13		19:45			20:17	54	19:22 (T77)	20:48			21:08	42	20:37 (T42)
23	07:51			07:16		07:31			06:41		18:29 (T77)	06:07			05:59		19:56 (T42)
	17:36			18:15		19:46			20:18	52	19:21 (T77)	20:49			21:08	42	20:38 (T42)
24	07:50			07:15		07:30			06:40		18:29 (T77)	06:06			05:59		19:56 (T42)
	17:38			18:16		19:47			20:19	51	19:20 (T77)	20:50			21:08	42	20:38 (T42)
25	07:49			07:13		07:28		18:57 (T77)	06:38		18:30 (T77)	06:06		20:07 (T42)	06:00		19:56 (T42)
	17:39			18:17		19:48	11	19:08 (T77)	20:21	49	19:19 (T77)	20:51	10	20:17 (T42)	21:08	42	20:38 (T42)
26	07:49			07:12		07:26		18:51 (T77)	06:37		18:30 (T77)	06:05		20:04 (T42)	06:00		19:57 (T42)
	17:40			18:18		19:50	22	19:13 (T77)	20:22	48	19:18 (T77)	20:52	15	20:19 (T42)	21:08	42	20:39 (T42)
27	07:48			07:10		07:24		07:43 (T76)	06:36		18:32 (T77)	06:04		20:02 (T42)	06:00		19:57 (T42)
	17:41			18:19		19:51	37	19:15 (T77)	20:23	45	19:17 (T77)	20:53	20	20:22 (T42)	21:08	42	20:39 (T42)
28	07:47			07:09		07:23		07:42 (T76)	06:34		18:33 (T77)	06:04		20:00 (T42)	06:01		19:57 (T42)
	17:42			18:21		19:52	47	19:18 (T77)	20:24	43	19:16 (T77)	20:54	23	20:23 (T42)	21:09	41	20:38 (T42)
29	07:46					07:21		07:40 (T76)	06:33		18:33 (T77)	06:03		19:59 (T42)	06:01		19:58 (T42)
	17:44					19:53	55	19:20 (T77)	20:25	41	19:14 (T77)	20:54	25	20:24 (T42)	21:09	41	20:39 (T42)
30	07:45					07:19		07:38 (T76)	06:32		18:35 (T77)	06:02		19:58 (T42)	06:02		19:58 (T42)
	17:45					19:54	62	19:21 (T77)	20:26	38	19:13 (T77)	20:55	28	20:26 (T42)	21:08	40	20:38 (T42)
31	07:44					07:18		07:37 (T76)				06:02		19:57 (T42)			
	17:46					19:55	68	19:23 (T77)				20:56	29	20:26 (T42)			
Potential sun hours	297			297		370			399			448			453		
Total, worst case		537					302			1979			279			1191	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.74					0.63			0.63			0.58			0.54	
Total reduction		0.24					0.28			0.34			0.34			0.35	
Total, real		128					86			665			95			422	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 382 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6496)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		19:58 (T42)	06:26			06:57			07:30 (T76)	07:27		07:02			07:37		15:05 (T44)
	21:08	41	20:39 (T42)	20:50			20:07	84		19:26 (T77)	19:15		17:28			17:04	30	15:35 (T44)
2	06:03		19:58 (T42)	06:27			06:58			07:29 (T76)	07:29		07:03			07:38		15:04 (T44)
	21:08	40	20:38 (T42)	20:49			20:06	85		19:26 (T77)	19:13		17:27			17:03	33	15:37 (T44)
3	06:03		19:59 (T42)	06:28			06:59			07:28 (T76)	07:30		07:04			07:39		15:03 (T44)
	21:08	40	20:39 (T42)	20:48			20:04	86		19:25 (T77)	19:11		17:26			17:03	35	15:38 (T44)
4	06:04		19:59 (T42)	06:29			07:00			07:27 (T76)	07:31		07:06			07:40		15:04 (T44)
	21:08	39	20:38 (T42)	20:47			20:02	86		19:24 (T77)	19:10		17:24			17:03	36	15:40 (T44)
5	06:04		20:00 (T42)	06:30			07:01			07:27 (T76)	07:32		07:07			07:41		15:04 (T44)
	21:08	38	20:38 (T42)	20:46			20:01	86		19:24 (T77)	19:08		17:23			17:03	37	15:41 (T44)
6	06:05		20:00 (T42)	06:31			07:02			07:26 (T76)	07:33		07:08			07:42		15:03 (T44)
	21:08	38	20:38 (T42)	20:44			19:57	86		19:23 (T77)	19:06		17:22			17:03	38	15:41 (T44)
7	06:05		20:01 (T42)	06:32		18:59 (T77)	07:03			07:26 (T76)	07:34		07:09			07:43		15:02 (T44)
	21:07	37	20:38 (T42)	20:43	9	19:08 (T77)	19:56	85		19:22 (T77)	19:05		17:21			17:03	40	15:42 (T44)
8	06:06		20:02 (T42)	06:33		18:54 (T77)	07:04			07:26 (T76)	07:35		07:10			07:44		15:02 (T44)
	21:07	36	20:38 (T42)	20:42	18	19:12 (T77)	19:54	83		19:21 (T77)	19:03		17:20			17:03	41	15:43 (T44)
9	06:07		20:02 (T42)	06:34		18:51 (T77)	07:05			07:26 (T76)	07:36		07:12			07:45		15:03 (T44)
	21:07	35	20:37 (T42)	20:41	24	19:15 (T77)	19:52	81		19:20 (T77)	19:02		17:19			17:03	40	15:43 (T44)
10	06:07		20:04 (T42)	06:35		18:49 (T77)	07:06			07:26 (T76)	07:37		07:13			07:46		15:03 (T44)
	21:06	33	20:37 (T42)	20:39	28	19:17 (T77)	19:51	76		19:17 (T77)	19:00		17:18			17:03	41	15:44 (T44)
11	06:08		20:05 (T42)	06:36		18:47 (T77)	07:07			07:27 (T76)	07:38		07:14			07:46		15:03 (T44)
	21:06	31	20:36 (T42)	20:38	32	19:19 (T77)	19:49	73		19:16 (T77)	18:58		17:17			17:03	42	15:45 (T44)
12	06:09		20:05 (T42)	06:37		18:45 (T77)	07:08			07:28 (T76)	07:39		07:15			07:47		15:03 (T44)
	21:06	30	20:35 (T42)	20:37	35	19:20 (T77)	19:47	68		19:14 (T77)	18:57		17:16			17:03	43	15:46 (T44)
13	06:10		20:06 (T42)	06:38		18:43 (T77)	07:09			07:29 (T76)	07:40		07:16			07:48		15:04 (T44)
	21:05	29	20:35 (T42)	20:36	39	19:22 (T77)	19:45	63		19:12 (T77)	18:55		17:15			17:03	43	15:47 (T44)
14	06:10		20:08 (T42)	06:39		18:42 (T77)	07:10			07:30 (T76)	07:41		07:18			07:49		15:03 (T44)
	21:05	26	20:34 (T42)	20:34	41	19:23 (T77)	19:44	56		19:10 (T77)	18:54		17:14			17:03	44	15:47 (T44)
15	06:11		20:09 (T42)	06:40		18:40 (T77)	07:11			07:31 (T76)	07:42		07:19			07:50		15:04 (T44)
	21:04	24	20:33 (T42)	20:33	44	19:24 (T77)	19:42	50		19:08 (T77)	18:52		17:13			17:03	44	15:48 (T44)
16	06:12		20:10 (T42)	06:41		18:38 (T77)	07:12			07:32 (T76)	07:44		07:20			07:50		15:04 (T44)
	21:03	21	20:31 (T42)	20:31	46	19:24 (T77)	19:40	40		19:05 (T77)	18:50		17:12			17:04	45	15:49 (T44)
17	06:13		20:12 (T42)	06:42		18:37 (T77)	07:13			18:38 (T77)	07:45		07:21			07:51		15:04 (T44)
	21:03	18	20:30 (T42)	20:30	48	19:25 (T77)	19:39	24		19:02 (T77)	18:49		17:11			17:04	45	15:49 (T44)
18	06:14		20:15 (T42)	06:43		18:36 (T77)	07:14			18:43 (T77)	07:46		07:22			07:52		15:05 (T44)
	21:02	13	20:28 (T42)	20:29	49	19:25 (T77)	19:37	14		18:57 (T77)	18:47		17:11			17:04	45	15:50 (T44)
19	06:14		20:20 (T42)	06:44		18:35 (T77)	07:15				07:47		07:23			07:52		15:05 (T44)
	21:01	3	20:23 (T42)	20:27	51	19:26 (T77)	19:35				18:46		17:10			17:05	46	15:51 (T44)
20	06:15			06:45		18:34 (T77)	07:16				07:48		07:25			07:53		15:05 (T44)
	21:01			20:26	52	19:26 (T77)	19:33				18:44		17:09			17:05	45	15:50 (T44)
21	06:16			06:46		18:33 (T77)	07:17				07:49		07:26			07:53		15:06 (T44)
	21:00			20:24	54	19:27 (T77)	19:32				18:43		17:09			17:06	45	15:51 (T44)
22	06:17			06:47		18:32 (T77)	07:18				07:50		07:27			07:54		15:06 (T44)
	20:59			20:23	55	19:27 (T77)	19:30				18:41		17:08			17:06	45	15:51 (T44)
23	06:18			06:48		18:31 (T77)	07:19				07:51		07:28			07:54		15:07 (T44)
	20:59			20:21	56	19:27 (T77)	19:28				18:40		17:07			17:07	45	15:52 (T44)
24	06:19			06:49		18:30 (T77)	07:20				07:53		07:29			07:55		15:07 (T44)
	20:58			20:20	58	19:28 (T77)	19:27				18:39		17:07			17:07	45	15:52 (T44)
25	06:20			06:50		18:30 (T77)	07:21				07:54		07:30		15:16 (T44)	07:55		15:08 (T44)
	20:57			20:18	58	19:28 (T77)	19:25				18:37		17:06	7	15:23 (T44)	17:08	45	15:53 (T44)
26	06:21			06:51		18:29 (T77)	07:22				07:55		07:32		15:12 (T44)	07:56		15:09 (T44)
	20:56			20:17	59	19:28 (T77)	19:23				18:36		17:06	15	15:27 (T44)	17:08	45	15:54 (T44)
27	06:22			06:52		18:29 (T77)	07:23				07:56		07:33		15:10 (T44)	07:56		15:09 (T44)
	20:55			20:15	59	19:28 (T77)	19:22				18:34		17:05	19	15:29 (T44)	17:09	45	15:54 (T44)
28	06:22			06:53		07:40 (T76)	07:24				07:57		07:34		15:08 (T44)	07:56		15:10 (T44)
	20:54			20:14	67	19:27 (T77)	19:20				18:33		17:05	23	15:31 (T44)	17:10	44	15:54 (T44)
29	06:23			06:54		07:36 (T76)	07:25				07:58		07:35		15:07 (T44)	07:57		15:10 (T44)
	20:53			20:12	74	19:27 (T77)	19:18				18:32		17:04	26	15:33 (T44)	17:10	44	15:54 (T44)
30	06:24			06:55		07:34 (T76)	07:26				08:00		07:36		15:06 (T44)	07:57		15:11 (T44)
	20:52			20:10	79	19:27 (T77)	19:16				18:31		17:04	28	15:34 (T44)	17:11	44	15:55 (T44)
31	06:25			06:56		07:32 (T76)					08:01					07:57		15:12 (T44)
	20:51			20:09	82	19:27 (T77)					18:29					17:12	43	15:55 (T44)
Potential sun hours	460			429			375				345		297			287		
Total, worst case		572			1217			1226						118			1303	
Sun reduction		0.66			0.61			0.59						0.30			0.22	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.54			0.62			0.63						0.74			0.74	
Total reduction		0.37			0.39			0.38						0.23			0.17	
Total, real		209			478			469						27			220	

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 385 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6499)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		16:54 (T5)	07:07		16:31 (T5)	07:16		06:30	
	17:12	17:47	10	17:04 (T5)	18:21	86	17:57 (T4)	19:56		20:27	21
2	07:57	07:42		16:50 (T5)	07:05		16:32 (T5)	07:14		06:28	
	17:13	17:48	19	17:09 (T5)	18:22	86	17:58 (T4)	19:57		20:28	19
3	07:57	07:41		16:47 (T5)	07:04		16:32 (T5)	07:12		06:27	
	17:14	17:49	26	17:13 (T5)	18:24	86	17:58 (T4)	19:58		20:29	15
4	07:57	07:40		16:45 (T5)	07:02		16:33 (T5)	07:11		06:26	
	17:15	17:51	30	17:15 (T5)	18:25	85	17:58 (T4)	19:59		20:30	10
5	07:57	07:39		16:42 (T5)	07:01		16:34 (T5)	07:09		06:24	
	17:16	17:52	34	17:16 (T5)	18:26	84	17:58 (T4)	20:00		20:31	
6	07:57	07:38		16:41 (T5)	06:59		16:34 (T5)	07:07		06:23	
	17:17	17:53	37	17:18 (T5)	18:27	83	17:57 (T4)	20:00		20:32	
7	07:57	07:37		16:39 (T5)	06:57		16:36 (T5)	07:06		06:22	
	17:18	17:54	41	17:20 (T5)	18:28	82	17:58 (T4)	20:01		20:33	
8	07:57	07:36		16:38 (T5)	07:56		17:37 (T5)	07:04		06:21	
	17:19	17:56	44	17:22 (T5)	19:29	80	18:57 (T4)	20:02		20:34	
9	07:57	07:35		16:37 (T5)	07:54		17:38 (T5)	07:02		06:20	
	17:20	17:57	46	17:23 (T5)	19:30	77	18:56 (T4)	20:03		20:35	
10	07:57	07:33		16:36 (T5)	07:53		17:40 (T5)	07:01		06:19	
	17:21	17:58	48	17:24 (T5)	19:32	73	18:56 (T4)	20:04		20:36	
11	07:57	07:32		16:35 (T5)	07:51		17:42 (T5)	06:59		06:17	
	17:22	17:59	50	17:25 (T5)	19:33	67	18:55 (T4)	20:05		20:37	
12	07:56	07:31		16:34 (T5)	07:49		17:44 (T5)	06:58	19:36 (T3)	06:16	
	17:23	18:01	52	17:26 (T5)	19:34	60	18:53 (T4)	20:06	19:46 (T3)	20:38	10
13	07:56	07:30		16:34 (T5)	07:48		17:47 (T5)	06:56	19:32 (T3)	06:15	
	17:24	18:02	53	17:27 (T5)	19:35	53	18:53 (T4)	20:07	19:46 (T3)	20:39	14
14	07:56	07:28		16:33 (T5)	07:46		17:52 (T5)	06:54	19:31 (T3)	06:14	
	17:25	18:03	54	17:27 (T5)	19:36	39	18:51 (T4)	20:09	19:48 (T3)	20:40	17
15	07:55	07:27		16:32 (T5)	07:44		18:24 (T4)	06:53	19:28 (T3)	06:13	
	17:26	18:04	56	17:28 (T5)	19:37	25	18:49 (T4)	20:10	19:48 (T3)	20:41	20
16	07:55	07:26		16:32 (T5)	07:43		18:26 (T4)	06:51	19:26 (T3)	06:12	
	17:27	18:06	57	17:29 (T5)	19:38	21	18:47 (T4)	20:11	19:49 (T3)	20:42	23
17	07:54	07:24		16:31 (T5)	07:41		18:28 (T4)	06:50	19:26 (T3)	06:11	
	17:28	18:07	58	17:29 (T5)	19:39	16	18:44 (T4)	20:12	19:51 (T3)	20:43	25
18	07:54	07:23		16:31 (T5)	07:39		18:35 (T4)	06:48	19:24 (T3)	06:10	
	17:30	18:08	59	17:30 (T5)	19:40	1	18:36 (T4)	20:13	19:51 (T3)	20:44	27
19	07:53	07:22		16:30 (T5)	07:38			06:47	19:24 (T3)	06:10	
	17:31	18:09	59	17:29 (T5)	19:42			20:14	19:53 (T3)	20:45	29
20	07:53	07:20		16:30 (T5)	07:36			06:45	19:23 (T3)	06:09	
	17:32	18:10	60	17:30 (T5)	19:43			20:15	19:53 (T3)	20:46	30
21	07:52	07:19		16:31 (T5)	07:34			06:44	19:23 (T3)	06:08	
	17:33	18:12	60	17:31 (T5)	19:44			20:16	19:54 (T3)	20:47	31
22	07:52	07:17		16:30 (T5)	07:33			06:42	19:23 (T3)	06:07	
	17:34	18:13	75	17:48 (T4)	19:45			20:17	19:54 (T3)	20:48	31
23	07:51	07:16		16:30 (T5)	07:31			06:41	19:22 (T3)	06:06	
	17:36	18:14	81	17:51 (T4)	19:46			20:18	19:53 (T3)	20:49	31
24	07:50	07:14		16:30 (T5)	07:29			06:39	19:23 (T3)	06:05	
	17:37	18:15	82	17:52 (T4)	19:47			20:19	19:54 (T3)	20:50	31
25	07:49	07:13		16:30 (T5)	07:27			06:38	19:22 (T3)	06:05	
	17:38	18:16	84	17:54 (T4)	19:48			20:20	19:53 (T3)	20:51	31
26	07:49	07:11		16:30 (T5)	07:26			06:36	19:23 (T3)	06:04	
	17:39	18:18	85	17:55 (T4)	19:49			20:21	19:52 (T3)	20:52	29
27	07:48	07:10		16:30 (T5)	07:24			06:35	19:23 (T3)	06:03	
	17:41	18:19	86	17:56 (T4)	19:50			20:23	19:52 (T3)	20:53	29
28	07:47	07:08		16:31 (T5)	07:22			06:34	19:23 (T3)	06:03	
	17:42	18:20	86	17:57 (T4)	19:51			20:24	19:51 (T3)	20:54	28
29	07:46				07:21			06:32	19:24 (T3)	06:02	
	17:43				19:52			20:25	19:50 (T3)	20:54	26
30	07:45				07:19			06:31	19:25 (T3)	06:02	
	17:44				19:53			20:26	19:49 (T3)	20:55	24
31	07:44				07:17					06:01	
	17:46				19:55					20:56	
Potential sun hours	297	297			370			399		449	
Total, worst case			1532			1104			486		65
Sun reduction			0.40			0.44			0.52		0.57
Oper. time red.			1.00			1.00			1.00		1.00
Wind dir. red.			0.71			0.70			0.57		0.57
Total reduction			0.29			0.31			0.30		0.33
Total, real			440			342			146		21

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 385 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6499)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August		September		October		November		December
1	06:01	06:26		06:57		07:27		17:24 (T5)	07:02	16:06 (T5)	07:37
	21:08	20:50		20:07		19:14	58	18:32 (T4)	17:27	47 16:53 (T5)	17:03
2	06:02	06:27		06:58		07:28		17:21 (T5)	07:03	16:06 (T5)	07:38
	21:08	20:49		20:05		19:13	65	18:33 (T4)	17:26	46 16:52 (T5)	17:03
3	06:02	06:28		06:59		07:29		17:19 (T5)	07:04	16:08 (T5)	07:39
	21:08	20:48		20:04		19:11	70	18:33 (T4)	17:25	43 16:51 (T5)	17:02
4	06:03	06:29		07:00		07:30		17:16 (T5)	07:05	16:09 (T5)	07:40
	21:08	20:47		20:02		19:09	75	18:33 (T4)	17:24	41 16:50 (T5)	17:02
5	06:03	06:30		07:01		07:31		17:14 (T5)	07:07	16:11 (T5)	07:41
	21:08	20:46		20:00		19:08	80	18:34 (T4)	17:23	37 16:48 (T5)	17:02
6	06:04	06:31		07:02		07:32		17:12 (T5)	07:08	16:13 (T5)	07:42
	21:08	20:44		19:57		19:06	81	18:33 (T4)	17:21	34 16:47 (T5)	17:02
7	06:05	06:32		07:03		07:33		17:10 (T5)	07:09	16:15 (T5)	07:43
	21:07	20:43		19:55		19:04	83	18:33 (T4)	17:20	30 16:45 (T5)	17:02
8	06:05	06:33		07:04		07:35		17:10 (T5)	07:10	16:17 (T5)	07:44
	21:07	20:42		19:54		19:03	84	18:34 (T4)	17:19	25 16:42 (T5)	17:02
9	06:06	06:34		19:40 (T3)	07:05	07:36		17:08 (T5)	07:11	16:20 (T5)	07:45
	21:07	20:41	11	19:51 (T3)	19:52	19:01	85	18:33 (T4)	17:18	19 16:39 (T5)	17:02
10	06:07	06:35		19:37 (T3)	07:06	07:37		17:07 (T5)	07:13	16:26 (T5)	07:46
	21:06	20:39	16	19:53 (T3)	19:50	18:59	86	18:33 (T4)	17:17	9 16:35 (T5)	17:02
11	06:07	06:36		19:35 (T3)	07:07	07:38		17:06 (T5)	07:14		07:46
	21:06	20:38	20	19:55 (T3)	19:49	18:58	86	18:32 (T4)	17:16		17:02
12	06:08	06:37		19:34 (T3)	07:08	07:39		17:05 (T5)	07:15		07:47
	21:06	20:37	22	19:56 (T3)	19:47	18:56	86	18:31 (T4)	17:15		17:02
13	06:09	06:38		19:33 (T3)	07:09	07:40		17:04 (T5)	07:16		07:48
	21:05	20:35	24	19:57 (T3)	19:45	18:55	86	18:30 (T4)	17:14		17:02
14	06:10	06:39		19:32 (T3)	07:10	07:41		17:03 (T5)	07:17		07:49
	21:05	20:34	26	19:58 (T3)	19:43	18:53	86	18:29 (T4)	17:13		17:02
15	06:10	06:40		19:31 (T3)	07:11	07:42		17:02 (T5)	07:19		07:50
	21:04	20:33	27	19:58 (T3)	19:42	18:51	86	18:28 (T4)	17:12		17:03
16	06:11	06:41		19:30 (T3)	07:12	07:43		17:03 (T5)	07:20		07:50
	21:03	20:31	29	19:59 (T3)	19:40	18:50	84	18:27 (T4)	17:12		17:03
17	06:12	06:42		19:29 (T3)	07:13	07:44		17:02 (T5)	07:21		07:51
	21:03	20:30	30	19:59 (T3)	19:38	18:48	83	18:25 (T4)	17:11		17:03
18	06:13	06:43		19:29 (T3)	07:14	07:46		17:01 (T5)	07:22		07:52
	21:02	20:28	30	19:59 (T3)	19:37	18:47	82	18:23 (T4)	17:10		17:03
19	06:14	06:44		19:28 (T3)	07:15	07:47		17:01 (T5)	07:23		07:52
	21:02	20:27	31	19:59 (T3)	19:35	18:45	79	18:21 (T4)	17:09		17:04
20	06:14	06:45		19:28 (T3)	07:16	07:48		17:01 (T5)	07:25		07:53
	21:01	20:26	31	19:59 (T3)	19:33	18:44	72	18:17 (T4)	17:08		17:04
21	06:15	06:46		19:28 (T3)	07:17	07:49		17:00 (T5)	07:26		07:53
	21:00	20:24	31	19:59 (T3)	19:31	18:42	60	18:00 (T5)	17:08		17:05
22	06:16	06:47		19:28 (T3)	07:18	07:50		17:01 (T5)	07:27		07:54
	20:59	20:23	31	19:59 (T3)	19:30	18:41	60	18:01 (T5)	17:07		17:05
23	06:17	06:48		19:28 (T3)	07:19	07:51		17:01 (T5)	07:28		07:54
	20:58	20:21	30	19:58 (T3)	19:28	18:39	59	18:00 (T5)	17:07		17:06
24	06:18	06:49		19:28 (T3)	07:20	07:52		17:01 (T5)	07:29		07:55
	20:58	20:20	28	19:56 (T3)	19:26	18:38	58	17:59 (T5)	17:06		17:06
25	06:19	06:50		19:28 (T3)	07:21	07:54		17:01 (T5)	07:30		07:55
	20:57	20:18	27	19:55 (T3)	19:25	18:37	58	17:59 (T5)	17:05		17:07
26	06:20	06:51		19:29 (T3)	07:22	18:12 (T4)	07:55		17:02 (T5)	07:32		07:56
	20:56	20:16	24	19:53 (T3)	19:23	13 18:25 (T4)	18:35	57	17:59 (T5)	17:05		17:07
27	06:21	06:52		19:29 (T3)	07:23	18:09 (T4)	07:56		17:02 (T5)	07:33		07:56
	20:55	20:15	23	19:52 (T3)	19:21	19 18:28 (T4)	18:34	56	17:58 (T5)	17:04		17:08
28	06:22	06:53		19:30 (T3)	07:24	18:06 (T4)	07:57		17:02 (T5)	07:34		07:56
	20:54	20:13	20	19:50 (T3)	19:19	23 18:29 (T4)	18:33	55	17:57 (T5)	17:04		17:09
29	06:23	06:54		19:31 (T3)	07:25	18:04 (T4)	07:58		17:03 (T5)	07:35		07:57
	20:53	20:12	17	19:48 (T3)	19:18	27 18:31 (T4)	18:31	53	17:56 (T5)	17:04		17:10
30	06:24	06:55		19:32 (T3)	07:26	17:29 (T5)	07:59		17:04 (T5)	07:36		07:57
	20:52	20:10	14	19:46 (T3)	19:16	48 18:32 (T4)	18:30	52	17:56 (T5)	17:03		17:10
31	06:25	06:56		19:35 (T3)			08:01		17:05 (T5)			07:57
	20:51	20:09	9	19:44 (T3)			18:29	49	17:54 (T5)			17:11
Potential sun hours	460	429		375			345		297		287	
Total, worst case			551		130			2214		331		
Sun reduction			0.61		0.59			0.48		0.30		
Oper. time red.			1.00		1.00			1.00		1.00		
Wind dir. red.			0.57		0.69			0.71		0.72		
Total reduction			0.35		0.41			0.34		0.22		
Total, real			195		53			756		72		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 390 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6504)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57			07:43		08:09 (T4)	07:07		07:49 (T5)	07:16			06:30		07:14 (T3)	06:01		07:20 (T3)
	17:12			17:47	43	08:52 (T4)	18:21	16	08:05 (T5)	19:56			20:27	77	08:31 (T3)	20:57	63	08:23 (T3)
2	07:57			07:42		08:09 (T4)	07:05		07:54 (T5)	07:14			06:28		07:14 (T3)	06:00		07:20 (T3)
	17:13			17:48	44	08:53 (T4)	18:22	8	08:02 (T5)	19:57			20:28	78	08:32 (T3)	20:58	63	08:23 (T3)
3	07:57			07:41		08:09 (T4)	07:04			07:12			06:27		07:14 (T3)	06:00		07:21 (T3)
	17:14			17:49	44	08:53 (T4)	18:24			19:58			20:29	78	08:32 (T3)	20:58	62	08:23 (T3)
4	07:58			07:40		08:09 (T4)	07:02			07:11			06:26		07:14 (T3)	05:59		07:21 (T3)
	17:15			17:51	45	08:54 (T4)	18:25			19:59			20:30	78	08:32 (T3)	20:59	61	08:22 (T3)
5	07:58			07:39		08:09 (T4)	07:01			07:09			06:25		07:13 (T3)	05:59		07:22 (T3)
	17:16			17:52	45	08:54 (T4)	18:26			20:00			20:31	78	08:31 (T3)	21:00	60	08:22 (T3)
6	07:57			07:38		08:08 (T4)	06:59			07:07			06:23		07:13 (T3)	05:59		07:23 (T3)
	17:17			17:53	46	08:54 (T4)	18:27			20:00			20:32	78	08:31 (T3)	21:01	59	08:22 (T3)
7	07:57			07:37		08:08 (T4)	06:57			07:06			06:22		07:13 (T3)	05:58		07:23 (T3)
	17:18			17:54	46	08:54 (T4)	18:28			20:01			20:33	78	08:31 (T3)	21:01	58	08:21 (T3)
8	07:57			07:36		08:08 (T4)	07:56			07:04		07:54 (T3)	06:21		07:13 (T3)	05:58		07:23 (T3)
	17:19			17:56	46	08:54 (T4)	19:29			20:02	9	08:03 (T3)	20:34	78	08:31 (T3)	21:02	58	08:21 (T3)
9	07:57			07:35		07:55 (T5)	07:54			07:03		07:47 (T3)	06:20		07:13 (T3)	05:58		07:24 (T3)
	17:20			17:57	55	08:54 (T4)	19:30			20:03	24	08:11 (T3)	20:35	78	08:31 (T3)	21:02	57	08:21 (T3)
10	07:57			07:34		07:54 (T5)	07:53			07:01		07:42 (T3)	06:19		07:13 (T3)	05:58		07:25 (T3)
	17:21			17:58	59	08:54 (T4)	19:32			20:04	32	08:14 (T3)	20:36	78	08:31 (T3)	21:03	56	08:21 (T3)
11	07:57			07:32		07:52 (T5)	07:51			06:59		07:39 (T3)	06:18		07:13 (T3)	05:58		07:25 (T3)
	17:22			17:59	61	08:53 (T4)	19:33			20:05	38	08:17 (T3)	20:37	77	08:30 (T3)	21:04	56	08:21 (T3)
12	07:56			07:31		07:51 (T5)	07:49			06:58		07:36 (T3)	06:16		07:13 (T3)	05:58		07:26 (T3)
	17:23			18:01	62	08:53 (T4)	19:34			20:06	43	08:19 (T3)	20:38	77	08:30 (T3)	21:04	55	08:21 (T3)
13	07:56			07:30		07:50 (T5)	07:48			06:56		07:34 (T3)	06:15		07:13 (T3)	05:57		07:26 (T3)
	17:24			18:02	63	08:53 (T4)	19:35			20:08	47	08:21 (T3)	20:40	77	08:30 (T3)	21:05	55	08:21 (T3)
14	07:56			07:29		07:48 (T5)	07:46			06:55		07:32 (T3)	06:14		07:13 (T3)	05:57		07:27 (T3)
	17:25			18:03	64	08:52 (T4)	19:36			20:09	51	08:23 (T3)	20:41	76	08:29 (T3)	21:05	54	08:21 (T3)
15	07:55			07:27		07:47 (T5)	07:44			06:53		07:30 (T3)	06:13		07:13 (T3)	05:57		07:27 (T3)
	17:26			18:04	65	08:52 (T4)	19:37			20:10	54	08:24 (T3)	20:42	76	08:29 (T3)	21:06	54	08:21 (T3)
16	07:55			07:26		07:46 (T5)	07:43			06:51		07:28 (T3)	06:12		07:13 (T3)	05:57		07:27 (T3)
	17:27			18:06	65	08:51 (T4)	19:38			20:11	58	08:26 (T3)	20:43	76	08:29 (T3)	21:06	54	08:21 (T3)
17	07:54			07:25		07:44 (T5)	07:41			06:50		07:26 (T3)	06:11		07:14 (T3)	05:57		07:28 (T3)
	17:29			18:07	66	08:50 (T4)	19:39			20:12	60	08:26 (T3)	20:44	74	08:28 (T3)	21:06	53	08:21 (T3)
18	07:54			07:23		07:43 (T5)	07:39			06:48		07:24 (T3)	06:10		07:14 (T3)	05:58		07:28 (T3)
	17:30			18:08	66	08:49 (T4)	19:41			20:13	63	08:27 (T3)	20:45	74	08:28 (T3)	21:07	53	08:21 (T3)
19	07:53		08:22 (T4)	07:22		07:43 (T5)	07:38			06:47		07:24 (T3)	06:10		07:14 (T3)	05:58		07:28 (T3)
	17:31	11	08:33 (T4)	18:09	64	08:47 (T4)	19:42			20:14	64	08:28 (T3)	20:45	73	08:27 (T3)	21:07	53	08:21 (T3)
20	07:53		08:19 (T4)	07:20		07:43 (T5)	07:36			06:45		07:23 (T3)	06:09		07:15 (T3)	05:58		07:28 (T3)
	17:32	17	08:36 (T4)	18:11	62	08:46 (T4)	19:43			20:15	66	08:29 (T3)	20:46	73	08:28 (T3)	21:07	53	08:21 (T3)
21	07:52		08:17 (T4)	07:19		07:43 (T5)	07:34			06:44		07:21 (T3)	06:08		07:15 (T3)	05:58		07:28 (T3)
	17:33	21	08:38 (T4)	18:12	58	08:44 (T4)	19:44			20:16	68	08:29 (T3)	20:47	72	08:27 (T3)	21:08	53	08:21 (T3)
22	07:52		08:16 (T4)	07:17		07:43 (T5)	07:33			06:42		07:21 (T3)	06:07		07:15 (T3)	05:58		07:29 (T3)
	17:34	25	08:41 (T4)	18:13	53	08:41 (T4)	19:45			20:17	69	08:30 (T3)	20:48	71	08:26 (T3)	21:08	53	08:22 (T3)
23	07:51		08:15 (T4)	07:16		07:44 (T5)	07:31			06:41		07:19 (T3)	06:06		07:15 (T3)	05:58		07:29 (T3)
	17:36	27	08:42 (T4)	18:14	46	08:39 (T4)	19:46			20:18	71	08:30 (T3)	20:49	71	08:26 (T3)	21:08	53	08:22 (T3)
24	07:50		08:14 (T4)	07:15		07:44 (T5)	07:29			06:39		07:19 (T3)	06:06		07:16 (T3)	05:59		07:29 (T3)
	17:37	30	08:44 (T4)	18:15	29	08:13 (T5)	19:47			20:19	72	08:31 (T3)	20:50	70	08:26 (T3)	21:08	53	08:22 (T3)
25	07:49		08:13 (T4)	07:13		07:45 (T5)	07:28			06:38		07:17 (T3)	06:05		07:17 (T3)	05:59		07:30 (T3)
	17:38	32	08:45 (T4)	18:17	28	08:13 (T5)	19:48			20:20	74	08:31 (T3)	20:51	68	08:25 (T3)	21:08	53	08:23 (T3)
26	07:49		08:12 (T4)	07:12		07:45 (T5)	07:26			06:36		07:17 (T3)	06:04		07:17 (T3)	05:59		07:29 (T3)
	17:39	34	08:46 (T4)	18:18	26	08:11 (T5)	19:49			20:22	74	08:31 (T3)	20:52	68	08:25 (T3)	21:09	54	08:23 (T3)
27	07:48		08:12 (T4)	07:10		07:47 (T5)	07:24			06:35		07:17 (T3)	06:03		07:18 (T3)	06:00		07:29 (T3)
	17:41	36	08:48 (T4)	18:19	23	08:10 (T5)	19:50			20:23	75	08:32 (T3)	20:53	67	08:25 (T3)	21:09	54	08:23 (T3)
28	07:47		08:11 (T4)	07:09		07:48 (T5)	07:22			06:34		07:15 (T3)	06:03		07:18 (T3)	06:00		07:30 (T3)
	17:42	38	08:49 (T4)	18:20	20	08:08 (T5)	19:51			20:24	76	08:31 (T3)	20:54	66	08:24 (T3)	21:09	54	08:24 (T3)
29	07:46		08:11 (T4)				07:21			06:32		07:15 (T3)	06:02		07:19 (T3)	06:00		07:29 (T3)
	17:43	39	08:50 (T4)				19:52			20:25	77	08:32 (T3)	20:55	65	08:24 (T3)	21:09	55	08:24 (T3)
30	07:45		08:10 (T4)				07:19			06:31		07:15 (T3)	06:02		07:19 (T3)	06:01		07:30 (T3)
	17:44	40	08:50 (T4)				19:54			20:26	77	08:32 (T3)	20:55	65	08:24 (T3)	21:09	55	08:25 (T3)
31	07:44		08:10 (T4)				07:17						06:01		07:20 (T3)			
	17:46	41	08:51 (T4)				19:55						20:56	64	08:24 (T3)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		391			1394			24			1342			2279			1674	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.53			0.54			0.56			0.66			0.66			0.66	
Total reduction		0.16			0.21			0.24			0.34			0.37			0.42	
Total, real		63			296			6			453			844			696	

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

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

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 390 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6504)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:01		07:29 (T3)	06:26		07:24 (T3)	06:57		07:38 (T3)	07:27		07:02		07:23 (T5)	07:37
	21:09	56	08:25 (T3)	20:50	77	08:41 (T3)	20:07	37	08:15 (T3)	19:14		17:27	58	08:23 (T4)	17:03
2	06:02		07:29 (T3)	06:27		07:23 (T3)	06:58		07:41 (T3)	07:28		07:03		07:25 (T5)	07:38
	21:08	56	08:25 (T3)	20:49	78	08:41 (T3)	20:05	31	08:12 (T3)	19:13		17:26	55	08:24 (T4)	17:03
3	06:02		07:29 (T3)	06:28		07:22 (T3)	06:59		07:44 (T3)	07:29		07:04		07:38 (T4)	07:39
	21:08	57	08:26 (T3)	20:48	78	08:40 (T3)	20:04	24	08:08 (T3)	19:11		17:25	46	08:24 (T4)	17:02
4	06:03		07:30 (T3)	06:29		07:22 (T3)	07:00		07:51 (T3)	07:30		07:05		07:38 (T4)	07:40
	21:08	57	08:27 (T3)	20:47	78	08:40 (T3)	20:02	9	08:00 (T3)	19:09		17:24	46	08:24 (T4)	17:02
5	06:04		07:29 (T3)	06:30		07:22 (T3)	07:01			07:31		07:07		07:38 (T4)	07:41
	21:08	58	08:27 (T3)	20:46	78	08:40 (T3)	20:00			19:08		17:23	45	08:23 (T4)	17:02
6	06:04		07:29 (T3)	06:31		07:22 (T3)	07:02			07:32		07:08		07:39 (T4)	07:42
	21:08	59	08:28 (T3)	20:44	79	08:41 (T3)	19:57			19:06		17:21	45	08:24 (T4)	17:02
7	06:05		07:28 (T3)	06:32		07:22 (T3)	07:03			07:34		07:09		07:39 (T4)	07:43
	21:07	60	08:28 (T3)	20:43	79	08:41 (T3)	19:55			19:04		17:20	44	08:23 (T4)	17:02
8	06:05		07:29 (T3)	06:33		07:22 (T3)	07:04			07:35		07:10		07:39 (T4)	07:44
	21:07	60	08:29 (T3)	20:42	79	08:41 (T3)	19:54			19:03		17:19	44	08:23 (T4)	17:02
9	06:06		07:29 (T3)	06:34		07:22 (T3)	07:05			07:36		07:12		07:40 (T4)	07:45
	21:07	61	08:30 (T3)	20:41	78	08:40 (T3)	19:52			19:01		17:18	43	08:23 (T4)	17:02
10	06:07		07:28 (T3)	06:35		07:22 (T3)	07:06			07:37		07:13		07:40 (T4)	07:46
	21:06	62	08:30 (T3)	20:39	78	08:40 (T3)	19:50			18:59		17:17	43	08:23 (T4)	17:02
11	06:07		07:28 (T3)	06:36		07:22 (T3)	07:07			07:38		07:14		07:41 (T4)	07:47
	21:06	63	08:31 (T3)	20:38	78	08:40 (T3)	19:49			18:58		17:16	41	08:22 (T4)	17:02
12	06:08		07:28 (T3)	06:37		07:23 (T3)	07:08			07:39	08:25 (T5)	07:15		07:41 (T4)	07:47
	21:06	64	08:32 (T3)	20:37	77	08:40 (T3)	19:47			18:56	12 08:37 (T5)	17:15	40	08:21 (T4)	17:02
13	06:09		07:27 (T3)	06:38		07:23 (T3)	07:09			07:40	08:22 (T5)	07:16		07:43 (T4)	07:48
	21:05	65	08:32 (T3)	20:36	77	08:40 (T3)	19:45			18:55	17 08:39 (T5)	17:14	39	08:22 (T4)	17:02
14	06:10		07:27 (T3)	06:39		07:23 (T3)	07:10			07:41	08:20 (T5)	07:18		07:43 (T4)	07:49
	21:05	65	08:32 (T3)	20:34	76	08:39 (T3)	19:44			18:53	21 08:41 (T5)	17:13	38	08:21 (T4)	17:02
15	06:10		07:27 (T3)	06:40		07:23 (T3)	07:11			07:42	08:18 (T5)	07:19		07:44 (T4)	07:50
	21:04	66	08:33 (T3)	20:33	76	08:39 (T3)	19:42			18:52	24 08:42 (T5)	17:12	36	08:20 (T4)	17:03
16	06:11		07:27 (T3)	06:41		07:23 (T3)	07:12			07:43	08:17 (T5)	07:20		07:46 (T4)	07:50
	21:04	67	08:34 (T3)	20:31	75	08:38 (T3)	19:40			18:50	27 08:44 (T5)	17:12	34	08:20 (T4)	17:03
17	06:12		07:26 (T3)	06:42		07:24 (T3)	07:13			07:44	08:16 (T5)	07:21		07:47 (T4)	07:51
	21:03	68	08:34 (T3)	20:30	74	08:38 (T3)	19:38			18:48	28 08:44 (T5)	17:11	32	08:19 (T4)	17:03
18	06:13		07:26 (T3)	06:43		07:24 (T3)	07:14			07:46	08:15 (T5)	07:22		07:48 (T4)	07:52
	21:02	69	08:35 (T3)	20:29	73	08:37 (T3)	19:37			18:47	39 09:06 (T4)	17:10	30	08:18 (T4)	17:04
19	06:14		07:26 (T3)	06:44		07:25 (T3)	07:15			07:47	08:14 (T5)	07:24		07:49 (T4)	07:52
	21:02	69	08:35 (T3)	20:27	72	08:37 (T3)	19:35			18:45	49 09:10 (T4)	17:09	27	08:16 (T4)	17:04
20	06:15		07:26 (T3)	06:45		07:25 (T3)	07:16			07:48	08:13 (T5)	07:25		07:51 (T4)	07:53
	21:01	70	08:36 (T3)	20:26	71	08:36 (T3)	19:33			18:44	56 09:13 (T4)	17:09	25	08:16 (T4)	17:04
21	06:15		07:26 (T3)	06:46		07:26 (T3)	07:17			07:49	08:14 (T5)	07:26		07:53 (T4)	07:53
	21:00	71	08:37 (T3)	20:24	69	08:35 (T3)	19:31			18:42	60 09:16 (T4)	17:08	21	08:14 (T4)	17:05
22	06:16		07:26 (T3)	06:47		07:26 (T3)	07:18			07:50	08:13 (T5)	07:27		07:55 (T4)	07:54
	20:59	71	08:37 (T3)	20:23	68	08:34 (T3)	19:30			18:41	64 09:17 (T4)	17:07	17	08:12 (T4)	17:05
23	06:17		07:25 (T3)	06:48		07:27 (T3)	07:19			07:51	08:13 (T5)	07:28		07:58 (T4)	07:54
	20:59	72	08:37 (T3)	20:21	66	08:33 (T3)	19:28			18:40	65 09:18 (T4)	17:07	11	08:09 (T4)	17:06
24	06:18		07:24 (T3)	06:49		07:28 (T3)	07:20			07:52	08:13 (T5)	07:29			07:55
	20:58	73	08:37 (T3)	20:20	64	08:32 (T3)	19:26			18:38	66 09:19 (T4)	17:06			17:06
25	06:19		07:24 (T3)	06:50		07:28 (T3)	07:21			07:54	08:14 (T5)	07:30			07:55
	20:57	74	08:38 (T3)	20:18	62	08:30 (T3)	19:25			18:37	66 09:20 (T4)	17:05			17:07
26	06:20		07:24 (T3)	06:51		07:29 (T3)	07:22			07:55	08:16 (T5)	07:32			07:56
	20:56	74	08:38 (T3)	20:17	60	08:29 (T3)	19:23			18:35	65 09:21 (T4)	17:05			17:08
27	06:21		07:24 (T3)	06:52		07:30 (T3)	07:23			07:56	08:17 (T5)	07:33			07:56
	20:55	75	08:39 (T3)	20:15	57	08:27 (T3)	19:21			18:34	65 09:22 (T4)	17:04			17:08
28	06:22		07:24 (T3)	06:53		07:32 (T3)	07:24			07:57	08:18 (T5)	07:34			07:56
	20:54	75	08:39 (T3)	20:13	54	08:26 (T3)	19:19			18:33	64 09:22 (T4)	17:04			17:09
29	06:23		07:24 (T3)	06:54		07:33 (T3)	07:25			07:58	08:19 (T5)	07:35			07:57
	20:53	76	08:40 (T3)	20:12	51	08:24 (T3)	19:18			18:31	63 09:22 (T4)	17:04			17:10
30	06:24		07:24 (T3)	06:55		07:35 (T3)	07:26			08:00	08:21 (T5)	07:36			07:57
	20:52	76	08:40 (T3)	20:10	47	08:22 (T3)	19:16			18:30	62 09:23 (T4)	17:03			17:10
31	06:25		07:24 (T3)	06:56		07:36 (T3)				08:01	08:22 (T5)				07:57
	20:51	76	08:40 (T3)	20:09	42	08:18 (T3)				18:29	61 09:23 (T4)				17:11
Potential sun hours	460			429			375			345		297			287
Total, worst case		2065			2171			101			974		860		
Sun reduction		0.66			0.61			0.59			0.48		0.30		
Oper. time red.		1.00			1.00			1.00			1.00		1.00		
Wind dir. red.		0.66			0.66			0.66			0.54		0.53		
Total reduction		0.43			0.40			0.38			0.26		0.16		
Total, real		885			860			39			251		135		

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

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

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 399 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6513)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April	May		June	
1	07:57	07:43		07:07		16:58 (T44)	07:16	06:30		06:01		06:34 (T76)
	17:13	17:47		18:22	51	17:49 (T44)	19:56	20:27		20:57	67	20:29 (T77)
2	07:57	07:42		07:06		16:57 (T44)	07:14	06:29		06:01		06:34 (T76)
	17:14	17:49		18:23	52	17:49 (T44)	19:57	20:28		20:58	68	20:30 (T77)
3	07:57	07:41		07:04		16:56 (T44)	07:13	06:28		06:01		06:34 (T76)
	17:15	17:50		18:24	53	17:49 (T44)	19:58	20:29		20:58	68	20:30 (T77)
4	07:57	07:40		07:02		16:56 (T44)	07:11	06:26		06:00		06:35 (T76)
	17:16	17:51		18:25	53	17:49 (T44)	19:59	20:30		20:59	69	20:31 (T77)
5	07:57	07:39		07:01		16:55 (T44)	07:09	06:25		06:00		06:36 (T76)
	17:17	17:52		18:26	54	17:49 (T44)	20:00	20:31		21:00	69	20:32 (T77)
6	07:57	07:38		06:59		16:55 (T44)	07:08	06:24		06:00		06:35 (T76)
	17:17	17:54		18:27	54	17:49 (T44)	20:00	20:32		21:00	69	20:32 (T77)
7	07:57	07:37		06:58		16:55 (T44)	07:06	06:23	06:45 (T76)	05:59		06:36 (T76)
	17:18	17:55		18:29	54	17:49 (T44)	20:01	20:33	9 06:54 (T76)	21:01	68	20:32 (T77)
8	07:57	07:36		07:56		17:54 (T44)	07:05	06:22	06:42 (T76)	05:59		06:37 (T76)
	17:19	17:56		19:30	54	18:48 (T44)	20:02	20:34	15 06:57 (T76)	21:02	68	20:33 (T77)
9	07:57	07:35		07:54		17:55 (T44)	07:03	06:20	06:41 (T76)	05:59		06:37 (T76)
	17:20	17:57		19:31	54	18:49 (T44)	20:03	20:35	18 06:59 (T76)	21:02	69	20:34 (T77)
10	07:57	07:34		07:53		17:55 (T44)	07:01	06:19	06:39 (T76)	05:59		06:38 (T76)
	17:21	17:59		19:32	53	18:48 (T44)	20:05	20:36	20 06:59 (T76)	21:03	68	20:34 (T77)
11	07:57	07:32		07:51		17:54 (T44)	07:00	06:18	06:38 (T76)	05:58		06:38 (T76)
	17:23	18:00		19:33	53	18:47 (T44)	20:06	20:37	22 07:00 (T76)	21:03	69	20:35 (T77)
12	07:56	07:31		07:50		17:55 (T44)	06:58	06:17	06:37 (T76)	05:58		06:38 (T76)
	17:24	18:01		19:34	52	18:47 (T44)	20:07	20:38	24 07:01 (T76)	21:04	69	20:34 (T77)
13	07:56	07:30		07:48		17:55 (T44)	06:57	06:16	06:36 (T76)	05:58		06:38 (T76)
	17:25	18:02		19:35	51	18:46 (T44)	20:08	20:39	26 07:02 (T76)	21:05	69	20:34 (T77)
14	07:56	07:29		07:46		17:56 (T44)	06:55	06:15	06:35 (T76)	05:58		06:39 (T76)
	17:26	18:04		19:36	49	18:45 (T44)	20:09	20:40	28 07:03 (T76)	21:05	68	20:35 (T77)
15	07:55	07:27		07:45		17:57 (T44)	06:53	06:14	06:35 (T76)	05:58		06:39 (T76)
	17:27	18:05		19:38	47	18:44 (T44)	20:10	20:41	29 07:04 (T76)	21:05	68	20:35 (T77)
16	07:55	07:26		07:43		17:57 (T44)	06:52	06:13	06:34 (T76)	05:58		06:39 (T76)
	17:28	18:06		19:39	46	18:43 (T44)	20:11	20:42	31 07:05 (T76)	21:06	68	20:35 (T77)
17	07:54	07:25	17:21 (T44)	07:41		17:58 (T44)	06:50	06:12	06:33 (T76)	05:58		06:41 (T76)
	17:29	18:07	6 17:27 (T44)	19:40	43	18:41 (T44)	20:12	20:43	32 07:05 (T76)	21:06	68	20:37 (T77)
18	07:54	07:23	17:15 (T44)	07:40		17:59 (T44)	06:49	06:11	06:32 (T76)	05:58		06:41 (T76)
	17:30	18:09	18 17:33 (T44)	19:41	41	18:40 (T44)	20:13	20:44	33 07:05 (T76)	21:07	68	20:37 (T77)
19	07:53	07:22	17:12 (T44)	07:38		18:00 (T44)	06:47	06:10	06:32 (T76)	05:58		06:41 (T76)
	17:32	18:10	25 17:37 (T44)	19:42	38	18:38 (T44)	20:14	20:45	33 07:05 (T76)	21:07	68	20:37 (T77)
20	07:53	07:20	17:09 (T44)	07:36		18:01 (T44)	06:46	06:09	06:32 (T76)	05:59		06:41 (T76)
	17:33	18:11	30 17:39 (T44)	19:43	35	18:36 (T44)	20:15	20:46	33 07:05 (T76)	21:07	68	20:37 (T77)
21	07:52	07:19	17:07 (T44)	07:35		18:04 (T44)	06:44	06:09	06:31 (T76)	05:59		06:41 (T76)
	17:34	18:12	34 17:41 (T44)	19:44	31	18:35 (T44)	20:16	20:47	34 07:05 (T76)	21:08	68	20:37 (T77)
22	07:52	07:18	17:05 (T44)	07:33		18:06 (T44)	06:43	06:08	06:32 (T76)	05:59		06:41 (T76)
	17:35	18:13	37 17:42 (T44)	19:45	26	18:32 (T44)	20:17	20:48	44 20:16 (T77)	21:08	68	20:37 (T77)
23	07:51	07:16	17:04 (T44)	07:31		18:09 (T44)	06:41	06:07	06:32 (T76)	05:59		06:42 (T76)
	17:36	18:15	40 17:44 (T44)	19:46	19	18:28 (T44)	20:18	20:49	50 20:19 (T77)	21:08	68	20:38 (T77)
24	07:50	07:15	17:02 (T44)	07:30		18:15 (T44)	06:40	06:06	06:31 (T76)	05:59		06:42 (T76)
	17:38	18:16	43 17:45 (T44)	19:47	8	18:23 (T44)	20:19	20:50	55 20:20 (T77)	21:08	68	20:38 (T77)
25	07:49	07:13	17:01 (T44)	07:28			06:38	06:06	06:32 (T76)	06:00		06:42 (T76)
	17:39	18:17	45 17:46 (T44)	19:48			20:21	20:51	57 20:23 (T77)	21:08	68	20:38 (T77)
26	07:49	07:12	17:00 (T44)	07:26			06:37	06:05	06:32 (T76)	06:00		06:42 (T76)
	17:40	18:18	47 17:47 (T44)	19:50			20:22	20:52	60 20:24 (T77)	21:08	68	20:38 (T77)
27	07:48	07:10	16:59 (T44)	07:24			06:36	06:04	06:33 (T76)	06:00		06:42 (T76)
	17:41	18:19	49 17:48 (T44)	19:51			20:23	20:53	60 20:25 (T77)	21:08	68	20:38 (T77)
28	07:47	07:09	16:58 (T44)	07:23			06:34	06:04	06:32 (T76)	06:01		06:42 (T76)
	17:42	18:21	50 17:48 (T44)	19:52			20:24	20:54	64 20:26 (T77)	21:08	68	20:38 (T77)
29	07:46			07:21			06:33	06:03	06:32 (T76)	06:01		06:42 (T76)
	17:44			19:53			20:25	20:54	64 20:26 (T77)	21:08	69	20:39 (T77)
30	07:45			07:19			06:32	06:02	06:33 (T76)	06:02		06:42 (T76)
	17:45			19:54			20:26	20:55	66 20:28 (T77)	21:08	69	20:38 (T77)
31	07:44			07:18				06:02	06:33 (T76)			
	17:46			19:55				20:56	66 20:28 (T77)			
Potential sun hours	297	297		370			399	448		453		
Total, worst case			424		1071				973		2048	
Sun reduction			0.40		0.44				0.57		0.64	
Oper. time red.			1.00		1.00				1.00		1.00	
Wind dir. red.			0.69		0.69				0.66		0.61	
Total reduction			0.28		0.31				0.38		0.39	
Total, real			118		328				371		800	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 399 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6513)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November	December
1	06:02		06:43 (T76)	06:26		06:48 (T76)	06:57			07:27		17:34 (T44)	07:02	07:37
	21:08	68	20:39 (T77)	20:50	23	07:11 (T76)	20:07			19:15	51	18:25 (T44)	17:28	17:04
2	06:03		06:42 (T76)	06:27		06:49 (T76)	06:58			07:29		17:33 (T44)	07:03	07:38
	21:08	68	20:38 (T77)	20:49	21	07:10 (T76)	20:06			19:13	52	18:25 (T44)	17:27	17:03
3	06:03		06:42 (T76)	06:28		06:50 (T76)	06:59			07:30		17:32 (T44)	07:04	07:39
	21:08	69	20:39 (T77)	20:48	19	07:09 (T76)	20:04			19:11	53	18:25 (T44)	17:26	17:03
4	06:04		06:42 (T76)	06:29		06:51 (T76)	07:00			07:31		17:32 (T44)	07:06	07:40
	21:08	68	20:38 (T77)	20:47	17	07:08 (T76)	20:02			19:10	53	18:25 (T44)	17:24	17:03
5	06:04		06:42 (T76)	06:30		06:52 (T76)	07:01			07:32		17:32 (T44)	07:07	07:41
	21:08	69	20:39 (T77)	20:46	13	07:05 (T76)	20:01			19:08	54	18:26 (T44)	17:23	17:03
6	06:05		06:42 (T76)	06:31		06:56 (T76)	07:02			07:33		17:31 (T44)	07:08	07:42
	21:08	68	20:38 (T77)	20:44	5	07:01 (T76)	19:57			19:06	55	18:26 (T44)	17:22	17:03
7	06:05		06:42 (T76)	06:32			07:03			07:34		17:31 (T44)	07:09	07:43
	21:07	68	20:38 (T77)	20:43			19:56			19:05	54	18:25 (T44)	17:21	17:03
8	06:06		06:42 (T76)	06:33			07:04			07:35		17:31 (T44)	07:10	07:44
	21:07	69	20:38 (T77)	20:42			19:54			19:03	54	18:25 (T44)	17:20	17:03
9	06:07		06:41 (T76)	06:34			07:05			07:36		17:30 (T44)	07:12	07:45
	21:07	69	20:38 (T77)	20:41			19:52			19:01	54	18:24 (T44)	17:19	17:03
10	06:07		06:42 (T76)	06:35			07:06			07:37		17:30 (T44)	07:13	07:46
	21:06	68	20:38 (T77)	20:39			19:51			19:00	54	18:24 (T44)	17:18	17:03
11	06:08		06:42 (T76)	06:36			07:07			07:38		17:30 (T44)	07:14	07:46
	21:06	68	20:38 (T77)	20:38			19:49			18:58	53	18:23 (T44)	17:17	17:03
12	06:09		06:41 (T76)	06:37			07:08			07:39		17:30 (T44)	07:15	07:47
	21:05	66	20:36 (T77)	20:37			19:47			18:57	52	18:22 (T44)	17:16	17:03
13	06:10		06:41 (T76)	06:38			07:09			07:40		17:30 (T44)	07:16	07:48
	21:05	66	20:36 (T77)	20:36			19:45			18:55	51	18:21 (T44)	17:15	17:03
14	06:10		06:42 (T76)	06:39			07:10			07:41		17:31 (T44)	07:18	07:49
	21:05	65	20:36 (T77)	20:34			19:44			18:54	49	18:20 (T44)	17:14	17:03
15	06:11		06:42 (T76)	06:40			07:11			07:42		17:32 (T44)	07:19	07:50
	21:04	64	20:36 (T77)	20:33			19:42			18:52	48	18:20 (T44)	17:13	17:03
16	06:12		06:41 (T76)	06:41			07:12			07:44		17:32 (T44)	07:20	07:50
	21:03	62	20:34 (T77)	20:31			19:40			18:50	47	18:19 (T44)	17:12	17:04
17	06:13		06:41 (T76)	06:42			07:13			07:45		17:33 (T44)	07:21	07:51
	21:03	60	20:33 (T77)	20:30			19:39			18:49	44	18:17 (T44)	17:11	17:04
18	06:14		06:42 (T76)	06:43			07:14			07:46		17:34 (T44)	07:22	07:52
	21:02	59	20:33 (T77)	20:29			19:37			18:47	42	18:16 (T44)	17:11	17:04
19	06:14		06:42 (T76)	06:44			07:15			07:47		17:35 (T44)	07:23	07:52
	21:01	56	20:32 (T77)	20:27			19:35			18:46	39	18:14 (T44)	17:10	17:05
20	06:15		06:42 (T76)	06:45			07:16		17:56 (T44)	07:48		17:36 (T44)	07:25	07:53
	21:01	52	20:30 (T77)	20:26			19:33	17	18:13 (T44)	18:44	36	18:12 (T44)	17:09	17:05
21	06:16		06:41 (T76)	06:46			07:17		17:52 (T44)	07:49		17:38 (T44)	07:26	07:53
	21:00	48	20:27 (T77)	20:24			19:32	24	18:16 (T44)	18:43	33	18:11 (T44)	17:09	17:06
22	06:17		06:42 (T76)	06:47			07:18		17:49 (T44)	07:50		17:40 (T44)	07:27	07:54
	20:59	39	20:23 (T77)	20:23			19:30	29	18:18 (T44)	18:41	29	18:09 (T44)	17:08	17:06
23	06:18		06:42 (T76)	06:48			07:19		17:46 (T44)	07:51		17:42 (T44)	07:28	07:54
	20:58	34	07:16 (T76)	20:21			19:28	34	18:20 (T44)	18:40	24	18:06 (T44)	17:07	17:07
24	06:19		06:42 (T76)	06:49			07:20		17:44 (T44)	07:53		17:46 (T44)	07:29	07:55
	20:58	34	07:16 (T76)	20:20			19:27	37	18:21 (T44)	18:39	16	18:02 (T44)	17:07	17:07
25	06:20		06:43 (T76)	06:50			07:21		17:42 (T44)	07:54			07:30	07:55
	20:57	33	07:16 (T76)	20:18			19:25	40	18:22 (T44)	18:37			17:06	17:08
26	06:21		06:43 (T76)	06:51			07:22		17:41 (T44)	07:55			07:32	07:56
	20:56	32	07:15 (T76)	20:17			19:23	42	18:23 (T44)	18:36			17:06	17:08
27	06:22		06:44 (T76)	06:52			07:23		17:39 (T44)	07:56			07:33	07:56
	20:55	31	07:15 (T76)	20:15			19:21	45	18:24 (T44)	18:34			17:05	17:09
28	06:22		06:45 (T76)	06:53			07:24		17:38 (T44)	07:57			07:34	07:56
	20:54	30	07:15 (T76)	20:14			19:20	46	18:24 (T44)	18:33			17:05	17:10
29	06:23		06:45 (T76)	06:54			07:25		17:36 (T44)	07:58			07:35	07:57
	20:53	29	07:14 (T76)	20:12			19:18	49	18:25 (T44)	18:32			17:04	17:10
30	06:24		06:46 (T76)	06:55			07:26		17:35 (T44)	08:00			07:36	07:57
	20:52	27	07:13 (T76)	20:10			19:16	50	18:25 (T44)	18:31			17:04	17:11
31	06:25		06:47 (T76)	06:56						08:01				07:57
	20:51	25	07:12 (T76)	20:09						18:29				17:12
Potential sun hours	460			429			375			345			297	287
Total, worst case		1664			98			413			1097			
Sun reduction		0.66			0.61			0.59			0.48			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.64			0.71			0.69			0.69			
Total reduction		0.42			0.43			0.41			0.33			
Total, real		704			43			170			367			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 404 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6518)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:39 (T71)	07:43		07:07		07:16		17:43 (T69)	06:30	07:03 (T67)	06:02
	17:13	43	09:22 (T71)	17:48		18:22		19:56	82	19:05 (T69)	20:27	108	18:39 (T69)	20:57
2	07:57		08:39 (T71)	07:42		07:06		07:15		17:43 (T69)	06:29	07:06 (T67)	06:01
	17:14	43	09:22 (T71)	17:49		18:23		19:57	83	19:06 (T69)	20:28	98	18:37 (T69)	20:57
3	07:57		08:40 (T71)	07:41		07:04		07:13		07:51 (T68)	06:28	07:20 (T68)	06:01
	17:15	43	09:23 (T71)	17:50		18:24		19:58	88	19:05 (T69)	20:29	81	18:35 (T69)	20:58
4	07:57		08:40 (T71)	07:40		07:02		07:11		07:44 (T68)	06:27	07:20 (T68)	06:01
	17:16	43	09:23 (T71)	17:51		18:25		19:59	102	19:05 (T69)	20:30	74	18:31 (T69)	20:59
5	07:57		08:41 (T71)	07:39		07:01		07:10		07:40 (T68)	06:25	07:21 (T68)	06:00
	17:17	42	09:23 (T71)	17:53		18:26		20:00	109	19:05 (T69)	20:31	64	18:27 (T69)	20:59
6	07:57		08:42 (T71)	07:38		06:59		07:08		07:37 (T68)	06:24	07:22 (T68)	06:00
	17:18	42	09:24 (T71)	17:54		18:28		20:00	114	19:04 (T69)	20:32	47	08:09 (T68)	21:00
7	07:57		08:42 (T71)	07:37		06:58		07:06		07:34 (T68)	06:23	07:23 (T68)	06:00
	17:19	42	09:24 (T71)	17:55		18:29		20:01	119	19:04 (T69)	20:33	45	08:08 (T68)	21:01
8	07:57		08:43 (T71)	07:36		07:56		07:05		07:33 (T68)	06:22	07:24 (T68)	05:59
	17:20	41	09:24 (T71)	17:57		19:30		20:02	122	19:04 (T69)	20:34	44	08:08 (T68)	21:01
9	07:57		08:44 (T71)	07:35		07:54		07:03		07:31 (T68)	06:21	07:24 (T68)	05:59
	17:21	41	09:25 (T71)	17:58		19:31		20:03	124	19:03 (T69)	20:35	43	08:07 (T68)	21:02
10	07:57		08:44 (T71)	07:33		07:53	18:22 (T69)	07:02		07:29 (T68)	06:20	07:26 (T68)	05:59
	17:22	40	09:24 (T71)	17:59		19:32	17 18:39 (T69)	20:04	125	19:02 (T69)	20:36	39	08:05 (T68)	21:03
11	07:56		08:45 (T71)	07:32		07:51	18:15 (T69)	07:00		07:28 (T68)	06:18	07:27 (T68)	05:59
	17:23	39	09:24 (T71)	18:00		19:33	29 18:44 (T69)	20:06	127	19:02 (T69)	20:37	37	08:04 (T68)	21:03
12	07:56		08:46 (T71)	07:31		07:50	18:12 (T69)	06:58		07:17 (T67)	06:17	07:28 (T68)	05:59
	17:24	39	09:25 (T71)	18:01		19:34	36 18:48 (T69)	20:07	134	19:01 (T69)	20:38	35	08:03 (T68)	21:04
13	07:56		08:47 (T71)	07:30		07:48	18:08 (T69)	06:57		07:16 (T67)	06:16	07:29 (T68)	05:59
	17:25	37	09:24 (T71)	18:03		19:35	42 18:50 (T69)	20:08	139	19:01 (T69)	20:39	32	08:01 (T68)	21:04
14	07:55		08:48 (T71)	07:28		07:46	18:05 (T69)	06:55		07:14 (T67)	06:15	07:31 (T68)	05:59
	17:26	36	09:24 (T71)	18:04		19:37	47 18:52 (T69)	20:09	140	19:00 (T69)	20:40	29	08:00 (T68)	21:05
15	07:55		08:48 (T71)	07:27		07:45	18:03 (T69)	06:54		07:13 (T67)	06:14	07:32 (T68)	05:59
	17:27	36	09:24 (T71)	18:05		19:38	52 18:55 (T69)	20:10	141	19:00 (T69)	20:41	26	07:58 (T68)	21:05
16	07:55		08:50 (T71)	07:26		07:43	18:01 (T69)	06:52		07:11 (T67)	06:13	07:34 (T68)	05:59
	17:28	34	09:24 (T71)	18:06		19:39	55 18:56 (T69)	20:11	142	18:59 (T69)	20:42	22	07:56 (T68)	21:06
17	07:54		08:50 (T71)	07:25		07:41	17:58 (T69)	06:51		07:10 (T67)	06:12	07:37 (T68)	05:59
	17:30	33	09:23 (T71)	18:08		19:40	59 18:57 (T69)	20:12	141	18:58 (T69)	20:43	16	07:53 (T68)	21:06
18	07:54		08:52 (T71)	07:23		07:40	17:57 (T69)	06:49		07:08 (T67)	06:11	07:41 (T68)	05:59
	17:31	31	09:23 (T71)	18:09		19:41	62 18:59 (T69)	20:13	142	18:57 (T69)	20:44	8	07:49 (T68)	21:06
19	07:53		08:53 (T71)	07:22		07:38	17:55 (T69)	06:47		07:07 (T67)	06:11			05:59
	17:32	29	09:22 (T71)	18:10		19:42	65 19:00 (T69)	20:14	142	18:57 (T69)	20:45			21:07
20	07:53		08:55 (T71)	07:20		07:36	17:53 (T69)	06:46		07:05 (T67)	06:10			05:59
	17:33	27	09:22 (T71)	18:11		19:43	68 19:01 (T69)	20:15	141	18:55 (T69)	20:46			21:07
21	07:52		08:56 (T71)	07:19		07:35	17:53 (T69)	06:44		07:04 (T67)	06:09			05:59
	17:34	24	09:20 (T71)	18:12		19:44	69 19:02 (T69)	20:16	140	18:54 (T69)	20:47			21:07
22	07:51		08:58 (T71)	07:18		07:33	17:51 (T69)	06:43		07:02 (T67)	06:08			05:59
	17:35	20	09:18 (T71)	18:14		19:45	72 19:03 (T69)	20:17	140	18:53 (T69)	20:48			21:07
23	07:51		09:01 (T71)	07:16		07:31	17:50 (T69)	06:42		07:01 (T67)	06:07			06:00
	17:37	16	09:17 (T71)	18:15		19:46	73 19:03 (T69)	20:18	139	18:52 (T69)	20:49			21:08
24	07:50		09:04 (T71)	07:15		07:30	17:49 (T69)	06:40		06:59 (T67)	06:07			06:00
	17:38	10	09:14 (T71)	18:16		19:47	75 19:04 (T69)	20:19	138	18:50 (T69)	20:50			21:08
25	07:49			07:13		07:28	17:48 (T69)	06:39		06:58 (T67)	06:06			06:00
	17:39			18:17		19:48	76 19:04 (T69)	20:20	136	18:49 (T69)	20:51			21:08
26	07:48			07:12		07:26	17:47 (T69)	06:37		06:59 (T67)	06:05			06:00
	17:40			18:18		19:50	77 19:04 (T69)	20:21	133	18:48 (T69)	20:52			21:08
27	07:48			07:10		07:25	17:47 (T69)	06:36		06:59 (T67)	06:05			06:01
	17:42			18:20		19:51	78 19:05 (T69)	20:23	129	18:46 (T69)	20:52			21:08
28	07:47			07:09		07:23	17:46 (T69)	06:35		07:00 (T67)	06:04			06:01
	17:43			18:21		19:52	79 19:05 (T69)	20:24	124	18:45 (T69)	20:53			21:08
29	07:46					07:21	17:45 (T69)	06:33		07:01 (T67)	06:03			06:02
	17:44					19:53	80 19:05 (T69)	20:25	121	18:44 (T69)	20:54			21:08
30	07:45					07:20	17:45 (T69)	06:32		07:02 (T67)	06:03			06:02
	17:45					19:54	81 19:06 (T69)	20:26	115	18:41 (T69)	20:55			21:08
31	07:44					07:18	17:44 (T69)				06:02			
	17:46					19:55	82 19:06 (T69)				20:56			
Potential sun hours	297			297		370		399			448			452
Total, worst case		831					1374		3772			848		
Sun reduction		0.31					0.44		0.52			0.57		
Oper. time red.		1.00					1.00		1.00			1.00		
Wind dir. red.		0.53					0.66		0.66			0.65		
Total reduction		0.16					0.28		0.34			0.37		
Total, real		134					390		1265			311		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 404 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6518)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:03			06:27		07:37 (T68)	06:57		07:27 (T68)	07:28		17:49 (T69)	07:02			07:37		08:27 (T71)
	21:08			20:50	36	08:13 (T68)	20:07	128	19:01 (T69)	19:15	39	18:28 (T69)	17:28			17:04	40	09:07 (T71)
2	06:03			06:28		07:36 (T68)	06:58		07:28 (T68)	07:29		17:52 (T69)	07:03			07:38		08:27 (T71)
	21:08			20:49	38	08:14 (T68)	20:05	125	19:01 (T69)	19:13	32	18:24 (T69)	17:27			17:04	40	09:07 (T71)
3	06:04			06:29		07:35 (T68)	06:59		07:29 (T68)	07:30		17:56 (T69)	07:04			07:39		08:27 (T71)
	21:08			20:48	41	08:16 (T68)	20:04	124	19:01 (T69)	19:11	23	18:19 (T69)	17:26			17:04	41	09:08 (T71)
4	06:04			06:30		07:34 (T68)	07:00		07:30 (T68)	07:31			07:05			07:40		08:27 (T71)
	21:08			20:47	43	08:17 (T68)	20:02	122	19:01 (T69)	19:10			17:25			17:03	41	09:08 (T71)
5	06:05			06:31		07:33 (T68)	07:01		07:31 (T68)	07:32			07:07			07:41		08:28 (T71)
	21:08			20:45	45	08:18 (T68)	20:01	119	19:01 (T69)	19:08			17:23			17:03	41	09:09 (T71)
6	06:05			06:31		07:32 (T68)	07:02		07:33 (T68)	07:33			07:08			07:42		08:28 (T71)
	21:07			20:44	46	08:18 (T68)	19:57	115	19:01 (T69)	19:07			17:22			17:03	42	09:10 (T71)
7	06:06			06:32		07:31 (T68)	07:03		07:35 (T68)	07:34			07:09			07:43		08:28 (T71)
	21:07			20:43	48	08:19 (T68)	19:56	110	19:00 (T69)	19:05			17:21			17:03	42	09:10 (T71)
8	06:07			06:33		07:30 (T68)	07:04		07:38 (T68)	07:35			07:10			07:44		08:28 (T71)
	21:07			20:42	68	18:38 (T69)	19:54	104	19:00 (T69)	19:03			17:20			17:03	43	09:11 (T71)
9	06:07			06:34		07:30 (T68)	07:05		07:44 (T68)	07:36			07:11			07:44		08:29 (T71)
	21:06			20:41	76	18:42 (T69)	19:52	91	18:59 (T69)	19:02			17:19			17:03	43	09:12 (T71)
10	06:08			06:35		07:18 (T67)	07:06		17:36 (T69)	07:37			07:13			07:45		08:29 (T71)
	21:06			20:39	89	18:45 (T69)	19:51	83	18:59 (T69)	19:00			17:18			17:03	43	09:12 (T71)
11	06:09			06:36		07:14 (T67)	07:07		17:36 (T69)	07:38			07:14			07:46		08:30 (T71)
	21:06			20:38	102	18:47 (T69)	19:49	82	18:58 (T69)	18:58			17:17			17:03	43	09:13 (T71)
12	06:09			06:37		07:12 (T67)	07:08		17:35 (T69)	07:39			07:15			07:47		08:29 (T71)
	21:05			20:37	110	18:49 (T69)	19:47	82	18:57 (T69)	18:57			17:16			17:03	44	09:13 (T71)
13	06:10			06:38		07:10 (T67)	07:09		17:35 (T69)	07:40			07:16			07:48		08:30 (T71)
	21:05			20:35	116	18:50 (T69)	19:45	81	18:56 (T69)	18:55			17:15			17:03	44	09:14 (T71)
14	06:11			06:39		07:09 (T67)	07:10		17:35 (T69)	07:41			07:17			07:49		08:31 (T71)
	21:04			20:34	121	18:52 (T69)	19:44	80	18:55 (T69)	18:54			17:14			17:04	43	09:14 (T71)
15	06:12			06:40		07:07 (T67)	07:11		17:35 (T69)	07:42			07:19			07:49		08:31 (T71)
	21:04			20:33	126	18:53 (T69)	19:42	80	18:55 (T69)	18:52			17:13			17:04	44	09:15 (T71)
16	06:12			06:41		07:06 (T67)	07:12		17:35 (T69)	07:44			07:20			07:50		08:31 (T71)
	21:03			20:31	130	18:54 (T69)	19:40	79	18:54 (T69)	18:51			17:13			17:04	44	09:15 (T71)
17	06:13			06:42		07:06 (T67)	07:13		17:35 (T69)	07:45			07:21			07:51		08:32 (T71)
	21:03			20:30	132	18:55 (T69)	19:39	78	18:53 (T69)	18:49			17:12			17:04	44	09:16 (T71)
18	06:14			06:43		07:05 (T67)	07:14		17:35 (T69)	07:46			07:22		08:38 (T71)	07:51		08:33 (T71)
	21:02			20:28	136	18:56 (T69)	19:37	77	18:52 (T69)	18:48			17:11	10	08:48 (T71)	17:05	44	09:17 (T71)
19	06:15			06:44		07:06 (T67)	07:15		17:35 (T69)	07:47			07:23		08:35 (T71)	07:52		08:32 (T71)
	21:01			20:27	137	18:57 (T69)	19:35	76	18:51 (T69)	18:46			17:10	16	08:51 (T71)	17:05	45	09:17 (T71)
20	06:16			06:45		07:07 (T67)	07:16		17:36 (T69)	07:48			07:24		08:33 (T71)	07:53		08:33 (T71)
	21:01			20:26	139	18:58 (T69)	19:34	73	18:49 (T69)	18:45			17:10	20	08:53 (T71)	17:05	44	09:17 (T71)
21	06:16			06:46		07:08 (T67)	07:17		17:36 (T69)	07:49			07:26		08:31 (T71)	07:53		08:33 (T71)
	21:00			20:24	140	18:59 (T69)	19:32	72	18:48 (T69)	18:43			17:09	24	08:55 (T71)	17:06	44	09:17 (T71)
22	06:17			06:47		07:08 (T67)	07:18		17:37 (T69)	07:50			07:27		08:31 (T71)	07:54		08:34 (T71)
	20:59			20:23	140	18:58 (T69)	19:30	70	18:47 (T69)	18:42			17:08	27	08:58 (T71)	17:06	44	09:18 (T71)
23	06:18			06:48		07:09 (T67)	07:19		17:37 (T69)	07:51			07:28		08:30 (T71)	07:54		08:34 (T71)
	20:58			20:21	142	18:59 (T69)	19:28	68	18:45 (T69)	18:40			17:08	29	08:59 (T71)	17:07	44	09:18 (T71)
24	06:19			06:49		07:10 (T67)	07:20		17:38 (T69)	07:53			07:29		08:29 (T71)	07:55		08:35 (T71)
	20:57			20:20	141	18:59 (T69)	19:27	66	18:44 (T69)	18:39			17:07	31	09:00 (T71)	17:07	45	09:20 (T71)
25	06:20			06:50		07:11 (T67)	07:21		17:39 (T69)	07:54			07:30		08:28 (T71)	07:55		08:35 (T71)
	20:57			20:18	142	19:00 (T69)	19:25	63	18:42 (T69)	18:37			17:06	33	09:01 (T71)	17:08	45	09:20 (T71)
26	06:21		07:49 (T68)	06:51		07:12 (T67)	07:22		17:40 (T69)	07:55			07:31		08:28 (T71)	07:55		08:36 (T71)
	20:56	12	08:01 (T68)	20:17	141	19:00 (T69)	19:23	60	18:40 (T69)	18:36			17:06	34	09:02 (T71)	17:09	44	09:20 (T71)
27	06:22		07:46 (T68)	06:52		07:13 (T67)	07:23		17:42 (T69)	07:56			07:32		08:28 (T71)	07:56		08:37 (T71)
	20:55	19	08:05 (T68)	20:15	142	19:01 (T69)	19:22	56	18:38 (T69)	18:35			17:06	36	09:04 (T71)	17:09	44	09:21 (T71)
28	06:23		07:44 (T68)	06:53		07:14 (T67)	07:24		17:43 (T69)	07:57			07:34		08:28 (T71)	07:56		08:37 (T71)
	20:54	23	08:07 (T68)	20:13	141	19:01 (T69)	19:20	53	18:36 (T69)	18:33			17:05	36	09:04 (T71)	17:10	44	09:21 (T71)
29	06:24		07:42 (T68)	06:54		07:15 (T67)	07:25		17:45 (T69)	07:58			07:35		08:28 (T71)	07:56		08:37 (T71)
	20:53	27	08:09 (T68)	20:12	140	19:01 (T69)	19:18	49	18:34 (T69)	18:32			17:05	37	09:05 (T71)	17:11	44	09:21 (T71)
30	06:25		07:41 (T68)	06:55		07:16 (T67)	07:26		17:47 (T69)	07:59			07:36		08:27 (T71)	07:56		08:38 (T71)
	20:52	30	08:11 (T68)	20:10	139	19:01 (T69)	19:17	44	18:31 (T69)	18:31			17:04	39	09:06 (T71)	17:12	43	09:21 (T71)
31	06:26		07:39 (T68)	06:56		07:17 (T67)				08:01						07:57		08:38 (T71)
	20:51	34	08:13 (T68)	20:09	134	19:01 (T69)				18:29						17:12	44	09:22 (T71)
Potential sun hours	459			428			375			345			298			288		
Total, worst case		145			3321			2510			94			372			1340	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.65			0.66			0.66			0.66			0.53			0.53	
Total reduction		0.42			0.39			0.38			0.31			0.16			0.11	
Total, real		61			1306			954			29			58			153	

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 422 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6530)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:21 (T77)	07:44		08:04 (T42)	07:07			07:16		08:06 (T41)	06:30			06:01		06:28 (T40)
	17:13	28	08:49 (T77)	17:48	24	08:28 (T42)	18:22			19:56	45	08:51 (T41)	20:27			20:57	34	07:02 (T40)
2	07:57		08:21 (T77)	07:43		08:03 (T42)	07:06			07:15		08:07 (T41)	06:29			06:01		06:28 (T40)
	17:14	28	08:49 (T77)	17:49	26	08:29 (T42)	18:23			19:57	42	08:49 (T41)	20:28			20:58	35	07:03 (T40)
3	07:57		08:22 (T77)	07:42		08:02 (T42)	07:04			07:13		08:08 (T41)	06:28			06:01		06:27 (T40)
	17:15	28	08:50 (T77)	17:50	28	08:30 (T42)	18:24			19:58	40	08:48 (T41)	20:29			20:58	36	07:03 (T40)
4	07:58		08:22 (T77)	07:40		08:01 (T42)	07:03			07:11		08:09 (T41)	06:26			06:00		06:27 (T40)
	17:16	28	08:50 (T77)	17:51	30	08:31 (T42)	18:25			19:59	37	08:46 (T41)	20:30			20:59	37	07:04 (T40)
5	07:58		08:23 (T77)	07:39		08:00 (T42)	07:01			07:10		08:11 (T41)	06:25			06:00		06:27 (T40)
	17:17	27	08:50 (T77)	17:53	31	08:31 (T42)	18:26			20:00	34	08:45 (T41)	20:31			21:00	38	07:05 (T40)
6	07:57		08:23 (T77)	07:38		07:59 (T42)	06:59		07:33 (T41)	07:08		08:12 (T41)	06:24			06:00		06:26 (T40)
	17:18	28	08:51 (T77)	17:54	32	08:31 (T42)	18:28	8	07:41 (T41)	20:00	30	08:42 (T41)	20:32			21:01	39	07:05 (T40)
7	07:57		08:23 (T77)	07:37		07:59 (T42)	06:58		07:27 (T41)	07:06		08:13 (T41)	06:23			05:59		06:26 (T40)
	17:18	27	08:50 (T77)	17:55	32	08:31 (T42)	18:29	20	07:47 (T41)	20:01	26	08:39 (T41)	20:33			21:01	40	07:06 (T40)
8	07:57		08:24 (T77)	07:36		07:59 (T42)	07:56		08:23 (T41)	07:05		08:17 (T41)	06:22			05:59		06:26 (T40)
	17:19	27	08:51 (T77)	17:56	33	08:32 (T42)	19:30	26	08:49 (T41)	20:02	20	08:37 (T41)	20:34			21:02	41	07:07 (T40)
9	07:57		08:25 (T77)	07:35		07:59 (T42)	07:55		08:21 (T41)	07:03		08:21 (T41)	06:20			05:59		06:26 (T40)
	17:20	26	08:51 (T77)	17:58	33	08:32 (T42)	19:31	31	08:52 (T41)	20:04	10	08:31 (T41)	20:35			21:02	41	07:07 (T40)
10	07:57		08:26 (T77)	07:34		08:00 (T42)	07:53		08:18 (T41)	07:01			06:19			05:59		06:26 (T40)
	17:22	26	08:52 (T77)	17:59	32	08:32 (T42)	19:32	36	08:54 (T41)	20:05			20:37			21:03	42	07:08 (T40)
11	07:57		08:26 (T77)	07:32		07:59 (T42)	07:51		08:17 (T41)	07:00			06:18			05:58		06:26 (T40)
	17:23	25	08:51 (T77)	18:00	32	08:31 (T42)	19:33	39	08:56 (T41)	20:06			20:38			21:04	43	07:09 (T40)
12	07:56		08:27 (T77)	07:31		08:00 (T42)	07:50		08:15 (T41)	06:58			06:17			05:58		06:26 (T40)
	17:24	24	08:51 (T77)	18:01	31	08:31 (T42)	19:34	42	08:57 (T41)	20:07			20:39			21:04	43	07:09 (T40)
13	07:56		08:28 (T77)	07:30		08:01 (T42)	07:48		08:13 (T41)	06:57			06:16			05:58		06:25 (T40)
	17:25	24	08:52 (T77)	18:03	29	08:30 (T42)	19:35	44	08:57 (T41)	20:08			20:40			21:05	44	07:09 (T40)
14	07:56		08:28 (T77)	07:29		08:02 (T42)	07:46		08:13 (T41)	06:55			06:15			05:58		06:25 (T40)
	17:26	23	08:51 (T77)	18:04	28	08:30 (T42)	19:37	46	08:59 (T41)	20:09			20:41			21:05	44	07:09 (T40)
15	07:55		08:29 (T77)	07:27		08:02 (T42)	07:45		08:11 (T41)	06:53			06:14			05:58		06:25 (T40)
	17:27	22	08:51 (T77)	18:05	26	08:28 (T42)	19:38	48	08:59 (T41)	20:10			20:42			21:06	44	07:09 (T40)
16	07:55		08:30 (T77)	07:26		08:04 (T42)	07:43		08:10 (T41)	06:52			06:13			05:58		06:26 (T40)
	17:28	21	08:51 (T77)	18:06	23	08:27 (T42)	19:39	49	08:59 (T41)	20:11			20:43			21:06	45	07:11 (T40)
17	07:55		08:32 (T77)	07:25		08:05 (T42)	07:41		08:08 (T41)	06:50			06:12			05:58		06:26 (T40)
	17:29	19	08:51 (T77)	18:07	20	08:25 (T42)	19:40	51	08:59 (T41)	20:12			20:44			21:06	45	07:11 (T40)
18	07:54		08:33 (T77)	07:23		08:07 (T42)	07:40		08:08 (T41)	06:49			06:11			05:58		06:26 (T40)
	17:30	16	08:49 (T77)	18:09	16	08:23 (T42)	19:41	52	09:00 (T41)	20:13			20:45			21:07	45	07:11 (T40)
19	07:53		08:35 (T77)	07:22		08:10 (T42)	07:38		08:07 (T41)	06:47			06:10			05:58		06:26 (T40)
	17:32	14	08:49 (T77)	18:10	11	08:21 (T42)	19:42	53	09:00 (T41)	20:14			20:46			21:07	45	07:11 (T40)
20	07:53		08:36 (T77)	07:21			07:36		08:06 (T41)	06:46			06:09			05:59		06:26 (T40)
	17:33	11	08:47 (T77)	18:11			19:43	53	08:59 (T41)	20:15			20:46			21:07	45	07:11 (T40)
21	07:52		08:40 (T77)	07:19			07:35		08:06 (T41)	06:44			06:09			05:59		06:26 (T40)
	17:34	4	08:44 (T77)	18:12			19:44	54	09:00 (T41)	20:16			20:47			21:08	45	07:11 (T40)
22	07:52			07:18			07:33		08:06 (T41)	06:43			06:08			05:59		06:26 (T40)
	17:35			18:14			19:45	53	08:59 (T41)	20:17			20:48			21:08	45	07:11 (T40)
23	07:51			07:16			07:31		08:05 (T41)	06:41			06:07			05:59		06:27 (T40)
	17:36			18:15			19:46	54	08:59 (T41)	20:18			20:49			21:08	45	07:12 (T40)
24	07:50			07:15			07:30		08:05 (T41)	06:40			06:06		06:41 (T40)	05:59		06:27 (T40)
	17:38			18:16			19:47	54	08:59 (T41)	20:20			20:50	5	06:46 (T40)	21:08	45	07:12 (T40)
25	07:50			07:13			07:28		08:05 (T41)	06:39			06:06		06:37 (T40)	06:00		06:27 (T40)
	17:39			18:17			19:49	53	08:58 (T41)	20:21			20:51	15	06:52 (T40)	21:08	45	07:12 (T40)
26	07:49		08:09 (T42)	07:12			07:26		08:05 (T41)	06:37			06:05		06:35 (T40)	06:00		06:28 (T40)
	17:40	9	08:18 (T42)	18:18			19:50	52	08:57 (T41)	20:22			20:52	19	06:54 (T40)	21:08	45	07:13 (T40)
27	07:48		08:09 (T42)	07:10			07:25		08:05 (T41)	06:36			06:04		06:34 (T40)	06:00		06:28 (T40)
	17:41	13	08:22 (T42)	18:19			19:51	52	08:57 (T41)	20:23			20:53	22	06:56 (T40)	21:09	45	07:13 (T40)
28	07:47		08:08 (T42)	07:09			07:23		08:05 (T41)	06:34			06:04		06:32 (T40)	06:01		06:28 (T40)
	17:43	16	08:24 (T42)	18:21			19:52	51	08:56 (T41)	20:24			20:54	25	06:57 (T40)	21:09	44	07:12 (T40)
29	07:46		08:07 (T42)				07:21		08:05 (T41)	06:33			06:03		06:31 (T40)	06:01		06:29 (T40)
	17:44	18	08:25 (T42)				19:53	50	08:55 (T41)	20:25			20:55	28	06:59 (T40)	21:09	44	07:13 (T40)
30	07:45		08:06 (T42)				07:20		08:06 (T41)	06:32			06:02		06:30 (T40)	06:02		06:29 (T40)
	17:45	20	08:26 (T42)				19:54	48	08:54 (T41)	20:26			20:55	30	07:00 (T40)	21:09	43	07:12 (T40)
31	07:44		08:05 (T42)				07:18		08:06 (T41)				06:02		06:29 (T40)			
	17:46	22	08:27 (T42)				19:55	47	08:53 (T41)				20:56	32	07:01 (T40)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		574			517			1166			284			176			1272	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.53			0.54			0.59			0.59			0.72			0.72	
Total reduction		0.16			0.21			0.25			0.30			0.40			0.45	
Total, real		91			108			291			84			70			568	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 422 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6530)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		06:30 (T40)	06:26			06:57			07:28		07:53 (T41)	07:02		07:28 (T42)	07:37		08:08 (T77)
	21:09	43	07:13 (T40)	20:50			20:07			19:15	43	08:36 (T41)	17:28	33	08:01 (T42)	17:04	25	08:33 (T77)
2	06:03		06:30 (T40)	06:27			06:58			07:29		07:54 (T41)	07:03		07:29 (T42)	07:38		08:09 (T77)
	21:08	42	07:12 (T40)	20:49			20:06			19:13	40	08:34 (T41)	17:27	33	08:02 (T42)	17:03	26	08:35 (T77)
3	06:03		06:31 (T40)	06:28			06:59		08:19 (T41)	07:30		07:55 (T41)	07:04		07:29 (T42)	07:39		08:09 (T77)
	21:08	42	07:13 (T40)	20:48			20:04	10	08:29 (T41)	19:11	37	08:32 (T41)	17:26	32	08:01 (T42)	17:03	26	08:35 (T77)
4	06:04		06:31 (T40)	06:29			07:00		08:14 (T41)	07:31		07:58 (T41)	07:06		07:28 (T42)	07:40		08:09 (T77)
	21:08	41	07:12 (T40)	20:47			20:02	20	08:34 (T41)	19:10	33	08:31 (T41)	17:24	33	08:01 (T42)	17:03	27	08:36 (T77)
5	06:04		06:32 (T40)	06:30			07:01		08:11 (T41)	07:32		07:59 (T41)	07:07		07:28 (T42)	07:41		08:09 (T77)
	21:08	40	07:12 (T40)	20:46			20:01	25	08:36 (T41)	19:08	29	08:28 (T41)	17:23	33	08:01 (T42)	17:03	27	08:36 (T77)
6	06:05		06:32 (T40)	06:31			07:02		08:08 (T41)	07:33		08:02 (T41)	07:08		07:30 (T42)	07:42		08:10 (T77)
	21:08	40	07:12 (T40)	20:45			19:57	30	08:38 (T41)	19:06	23	08:25 (T41)	17:22	31	08:01 (T42)	17:03	27	08:37 (T77)
7	06:06		06:33 (T40)	06:32			07:03		08:06 (T41)	07:34		08:06 (T41)	07:09		07:31 (T42)	07:43		08:10 (T77)
	21:07	39	07:12 (T40)	20:43			19:56	34	08:40 (T41)	19:05	15	08:21 (T41)	17:21	30	08:01 (T42)	17:03	27	08:37 (T77)
8	06:06		06:34 (T40)	06:33			07:04		08:04 (T41)	07:35			07:10		07:32 (T42)	07:44		08:09 (T77)
	21:07	38	07:12 (T40)	20:42			19:54	37	08:41 (T41)	19:03			17:20	28	08:00 (T42)	17:03	28	08:37 (T77)
9	06:07		06:34 (T40)	06:34			07:05		08:02 (T41)	07:36			07:12		07:34 (T42)	07:45		08:10 (T77)
	21:07	37	07:11 (T40)	20:41			19:52	40	08:42 (T41)	19:02			17:19	26	08:00 (T42)	17:03	28	08:38 (T77)
10	06:08		06:35 (T40)	06:35			07:06		08:01 (T41)	07:37			07:13		07:35 (T42)	07:46		08:10 (T77)
	21:06	36	07:11 (T40)	20:40			19:51	42	08:43 (T41)	19:00			17:18	24	07:59 (T42)	17:03	28	08:38 (T77)
11	06:08		06:36 (T40)	06:36			07:07		07:59 (T41)	07:38			07:14		07:36 (T42)	07:47		08:11 (T77)
	21:06	34	07:10 (T40)	20:38			19:49	45	08:44 (T41)	18:58			17:17	22	07:58 (T42)	17:03	28	08:39 (T77)
12	06:09		06:36 (T40)	06:37			07:08		07:57 (T41)	07:39			07:15		07:37 (T42)	07:47		08:11 (T77)
	21:06	33	07:09 (T40)	20:37			19:47	47	08:44 (T41)	18:57			17:16	20	07:57 (T42)	17:03	28	08:39 (T77)
13	06:10		06:38 (T40)	06:38			07:09		07:56 (T41)	07:40			07:16		07:39 (T42)	07:48		08:12 (T77)
	21:05	31	07:09 (T40)	20:36			19:46	48	08:44 (T41)	18:55			17:15	18	07:57 (T42)	17:03	28	08:40 (T77)
14	06:10		06:39 (T40)	06:39			07:10		07:55 (T41)	07:41			07:18		07:40 (T42)	07:49		08:12 (T77)
	21:05	29	07:08 (T40)	20:34			19:44	50	08:45 (T41)	18:54			17:14	15	07:55 (T42)	17:03	28	08:40 (T77)
15	06:11		06:41 (T40)	06:40			07:11		07:54 (T41)	07:43			07:19		07:41 (T42)	07:50		08:13 (T77)
	21:04	26	07:07 (T40)	20:33			19:42	51	08:45 (T41)	18:52			17:13	13	07:54 (T42)	17:03	27	08:40 (T77)
16	06:12		06:41 (T40)	06:41			07:12		07:54 (T41)	07:44			07:20		07:43 (T42)	07:50		08:14 (T77)
	21:04	24	07:05 (T40)	20:32			19:40	51	08:45 (T41)	18:50			17:12	9	07:52 (T42)	17:04	27	08:41 (T77)
17	06:13		06:43 (T40)	06:42			07:13		07:53 (T41)	07:45			07:21			07:51		08:14 (T77)
	21:03	21	07:04 (T40)	20:30			19:39	52	08:45 (T41)	18:49			17:11			17:04	27	08:41 (T77)
18	06:14		06:45 (T40)	06:43			07:14		07:52 (T41)	07:46			07:22			07:52		08:15 (T77)
	21:02	17	07:02 (T40)	20:29			19:37	53	08:45 (T41)	18:47			17:11			17:04	27	08:42 (T77)
19	06:14		06:49 (T40)	06:44			07:15		07:52 (T41)	07:47			07:24			07:52		08:16 (T77)
	21:02	10	06:59 (T40)	20:27			19:35	53	08:45 (T41)	18:46			17:10			17:05	27	08:43 (T77)
20	06:15			06:45			07:16		07:51 (T41)	07:48			07:25			07:53		08:16 (T77)
	21:01			20:26			19:34	54	08:45 (T41)	18:44			17:09			17:05	27	08:43 (T77)
21	06:16			06:46			07:17		07:51 (T41)	07:49			07:26		08:16 (T77)	07:53		08:17 (T77)
	21:00			20:24			19:32	54	08:45 (T41)	18:43			17:09	4	08:20 (T77)	17:06	27	08:44 (T77)
22	06:17			06:47			07:18		07:51 (T41)	07:50			07:27		08:13 (T77)	07:54		08:17 (T77)
	20:59			20:23			19:30	53	08:44 (T41)	18:42			17:08	10	08:23 (T77)	17:06	27	08:44 (T77)
23	06:18			06:48			07:19		07:51 (T41)	07:52		08:39 (T42)	07:28		08:11 (T77)	07:54		08:18 (T77)
	20:59			20:21			19:28	53	08:44 (T41)	18:40	12	08:51 (T42)	17:07	14	08:25 (T77)	17:07	27	08:45 (T77)
24	06:19			06:49			07:20		07:51 (T41)	07:53		08:36 (T42)	07:29		08:10 (T77)	07:55		08:18 (T77)
	20:58			20:20			19:27	52	08:43 (T41)	18:39	18	08:54 (T42)	17:07	16	08:26 (T77)	17:07	27	08:45 (T77)
25	06:20			06:50			07:21		07:51 (T41)	07:54		08:35 (T42)	07:31		08:10 (T77)	07:55		08:18 (T77)
	20:57			20:18			19:25	51	08:42 (T41)	18:37	21	08:56 (T42)	17:06	19	08:29 (T77)	17:08	27	08:45 (T77)
26	06:21			06:51			07:22		07:51 (T41)	07:55		08:33 (T42)	07:32		08:09 (T77)	07:56		08:19 (T77)
	20:56			20:17			19:23	51	08:42 (T41)	18:36	24	08:57 (T42)	17:06	21	08:30 (T77)	17:08	27	08:46 (T77)
27	06:22			06:52			07:23		07:51 (T41)	07:56		08:32 (T42)	07:33		08:09 (T77)	07:56		08:19 (T77)
	20:55			20:15			19:22	50	08:41 (T41)	18:35	26	08:58 (T42)	17:05	21	08:30 (T77)	17:09	27	08:46 (T77)
28	06:23			06:53			07:24		07:51 (T41)	07:57		08:30 (T42)	07:34		08:08 (T77)	07:56		08:19 (T77)
	20:54			20:14			19:20	49	08:40 (T41)	18:33	29	08:59 (T42)	17:05	23	08:31 (T77)	17:10	27	08:46 (T77)
29	06:23			06:54			07:26		07:52 (T41)	07:59		08:30 (T42)	07:35		08:08 (T77)	07:57		08:19 (T77)
	20:53			20:12			19:18	46	08:38 (T41)	18:32	30	09:00 (T42)	17:04	24	08:32 (T77)	17:10	28	08:47 (T77)
30	06:24			06:55			07:27		07:52 (T41)	08:00		08:30 (T42)	07:36		08:08 (T77)	07:57		08:20 (T77)
	20:52			20:10			19:16	45	08:37 (T41)	18:31	30	09:00 (T42)	17:04	25	08:33 (T77)	17:11	28	08:48 (T77)
31	06:25			06:56						08:01		08:29 (T42)				07:57		08:20 (T77)
	20:51			20:09						18:29	32	09:01 (T42)				17:12	28	08:48 (T77)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		623						1246			442			577			843	
Sun reduction		0.66						0.59			0.48			0.30			0.22	
Oper. time red.		1.00						1.00			1.00			1.00			1.00	
Wind dir. red.		0.72						0.59			0.56			0.53			0.52	
Total reduction		0.46						0.33			0.26			0.16			0.11	
Total, real		287						417			116			90			94	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 423 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6531)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		15:54 (T77)	07:43		16:08 (T77)	07:07		17:34 (T42)	07:16		06:30		19:27 (T41)	06:01
	17:13	45	16:39 (T77)	17:47	38	16:46 (T77)	18:22	18	17:52 (T42)	19:56		20:27	33	20:00 (T41)	20:57
2	07:57		15:54 (T77)	07:42		16:10 (T77)	07:06		17:30 (T42)	07:14		06:29		19:28 (T41)	06:01
	17:14	45	16:39 (T77)	17:49	35	16:45 (T77)	18:23	24	17:54 (T42)	19:57		20:28	32	20:00 (T41)	20:58
3	07:57		15:55 (T77)	07:41		16:11 (T77)	07:04		17:27 (T42)	07:13		06:28		19:27 (T41)	06:01
	17:15	45	16:40 (T77)	17:50	33	16:44 (T77)	18:24	29	17:56 (T42)	19:58		20:29	32	19:59 (T41)	20:58
4	07:57		15:55 (T77)	07:40		16:13 (T77)	07:02		17:26 (T42)	07:11		06:26		19:27 (T41)	06:00
	17:16	45	16:40 (T77)	17:51	30	16:43 (T77)	18:25	32	17:58 (T42)	19:59		20:30	32	19:59 (T41)	20:59
5	07:57		15:55 (T77)	07:39		16:15 (T77)	07:01		17:24 (T42)	07:09		06:25		19:28 (T41)	06:00
	17:17	46	16:41 (T77)	17:52	27	16:42 (T77)	18:26	35	17:59 (T42)	20:00		20:31	31	19:59 (T41)	21:00
6	07:57		15:56 (T77)	07:38		16:16 (T77)	06:59		17:23 (T42)	07:08		06:24		19:29 (T41)	05:59
	17:17	46	16:42 (T77)	17:54	23	16:39 (T77)	18:27	38	18:01 (T42)	20:00		20:32	29	19:58 (T41)	21:00
7	07:57		15:55 (T77)	07:37		16:19 (T77)	06:58		17:21 (T42)	07:06		06:23		19:29 (T41)	05:59
	17:18	47	16:42 (T77)	17:55	17	16:36 (T77)	18:29	41	18:02 (T42)	20:01		20:33	29	19:58 (T41)	21:01
8	07:57		15:56 (T77)	07:36		16:24 (T77)	07:56		18:19 (T42)	07:05		06:22		19:30 (T41)	05:59
	17:19	46	16:42 (T77)	17:56	8	16:32 (T77)	19:30	43	19:02 (T42)	20:02		20:34	27	19:57 (T41)	21:02
9	07:57		15:56 (T77)	07:35		07:55 (T76)	07:54		18:19 (T42)	07:03		06:20		19:31 (T41)	05:59
	17:20	47	16:43 (T77)	17:57	6	08:01 (T76)	19:31	44	19:03 (T42)	20:03		20:35	25	19:56 (T41)	21:02
10	07:57		15:57 (T77)	07:34		07:54 (T76)	07:53		18:18 (T42)	07:01		06:19		19:31 (T41)	05:59
	17:21	47	16:44 (T77)	17:59	11	08:05 (T76)	19:32	45	19:03 (T42)	20:05		20:36	23	19:54 (T41)	21:03
11	07:57		15:56 (T77)	07:32		07:52 (T76)	07:51		18:17 (T42)	07:00		06:18		19:32 (T41)	05:58
	17:23	48	16:44 (T77)	18:00	14	08:06 (T76)	19:33	46	19:03 (T42)	20:06		20:37	21	19:53 (T41)	21:04
12	07:56		15:57 (T77)	07:31		07:51 (T76)	07:50		18:17 (T42)	06:58		06:17		19:34 (T41)	05:58
	17:24	48	16:45 (T77)	18:01	17	08:08 (T76)	19:34	47	19:04 (T42)	20:07		20:38	18	19:52 (T41)	21:04
13	07:56		15:57 (T77)	07:30		07:50 (T76)	07:48		18:16 (T42)	06:57		06:16		19:36 (T41)	05:58
	17:25	49	16:46 (T77)	18:02	20	08:10 (T76)	19:35	48	19:04 (T42)	20:08		20:39	14	19:50 (T41)	21:05
14	07:56		15:57 (T77)	07:29		07:48 (T76)	07:46		18:15 (T42)	06:55		06:15		19:38 (T41)	05:58
	17:26	48	16:45 (T77)	18:04	22	08:10 (T76)	19:36	49	19:04 (T42)	20:09		20:41	9	19:47 (T41)	21:05
15	07:55		15:58 (T77)	07:27		07:47 (T76)	07:45		18:15 (T42)	06:53		06:14			05:58
	17:27	48	16:46 (T77)	18:05	24	08:11 (T76)	19:38	49	19:04 (T42)	20:10		20:42			21:05
16	07:55		15:58 (T77)	07:26		07:46 (T76)	07:43		18:15 (T42)	06:52		06:13			05:58
	17:28	48	16:46 (T77)	18:06	26	08:12 (T76)	19:39	49	19:04 (T42)	20:11		20:42			21:06
17	07:54		15:59 (T77)	07:25		07:44 (T76)	07:41		18:14 (T42)	06:50		06:12			05:58
	17:29	48	16:47 (T77)	18:07	28	08:12 (T76)	19:40	49	19:03 (T42)	20:12		20:43			21:06
18	07:54		15:59 (T77)	07:23		07:43 (T76)	07:40		18:15 (T42)	06:49		19:42 (T41)	06:11		05:58
	17:30	48	16:47 (T77)	18:09	29	08:12 (T76)	19:41	48	19:03 (T42)	20:13	8	19:50 (T41)	20:44		21:07
19	07:53		15:59 (T77)	07:22		07:43 (T76)	07:38		18:15 (T42)	06:47		19:38 (T41)	06:10		05:58
	17:32	49	16:48 (T77)	18:10	30	08:13 (T76)	19:42	47	19:02 (T42)	20:14	14	19:52 (T41)	20:45		21:07
20	07:53		16:00 (T77)	07:20		07:43 (T76)	07:36		18:15 (T42)	06:46		19:36 (T41)	06:09		05:59
	17:33	48	16:48 (T77)	18:11	29	08:12 (T76)	19:43	46	19:01 (T42)	20:15	18	19:54 (T41)	20:46		21:07
21	07:52		16:00 (T77)	07:19		07:43 (T76)	07:35		18:15 (T42)	06:44		19:34 (T41)	06:09		05:59
	17:34	48	16:48 (T77)	18:12	29	08:12 (T76)	19:44	46	19:01 (T42)	20:16	21	19:55 (T41)	20:47		21:08
22	07:52		16:01 (T77)	07:18		07:43 (T76)	07:33		18:16 (T42)	06:43		19:32 (T41)	06:08		05:59
	17:35	48	16:49 (T77)	18:13	28	08:11 (T76)	19:45	44	19:00 (T42)	20:17	24	19:56 (T41)	20:48		21:08
23	07:51		16:01 (T77)	07:16		07:44 (T76)	07:31		18:16 (T42)	06:41		19:32 (T41)	06:07		05:59
	17:36	47	16:48 (T77)	18:15	27	08:11 (T76)	19:46	43	18:59 (T42)	20:18	25	19:57 (T41)	20:49		21:08
24	07:50		16:01 (T77)	07:15		07:44 (T76)	07:30		18:17 (T42)	06:40		19:30 (T41)	06:06		05:59
	17:38	47	16:48 (T77)	18:16	26	08:10 (T76)	19:47	41	18:58 (T42)	20:19	28	19:58 (T41)	20:50		21:08
25	07:49		16:02 (T77)	07:13		07:45 (T76)	07:28		18:18 (T42)	06:38		19:30 (T41)	06:06		06:00
	17:39	46	16:48 (T77)	18:17	24	08:09 (T76)	19:48	38	18:56 (T42)	20:21	29	19:59 (T41)	20:51		21:08
26	07:49		16:02 (T77)	07:12		07:46 (T76)	07:26		18:18 (T42)	06:37		19:28 (T41)	06:05		06:00
	17:40	46	16:48 (T77)	18:18	21	08:07 (T76)	19:50	36	18:54 (T42)	20:22	31	19:59 (T41)	20:52		21:08
27	07:48		16:04 (T77)	07:10		07:48 (T76)	07:24		18:19 (T42)	06:36		19:28 (T41)	06:04		06:00
	17:41	44	16:48 (T77)	18:19	18	08:06 (T76)	19:51	33	18:52 (T42)	20:23	32	20:00 (T41)	20:53		21:08
28	07:47		16:05 (T77)	07:09		07:50 (T76)	07:23		18:22 (T42)	06:34		19:28 (T41)	06:04		06:01
	17:42	43	16:48 (T77)	18:21	16	17:44 (T42)	19:52	29	18:51 (T42)	20:24	33	20:01 (T41)	20:54		21:09
29	07:46		16:05 (T77)				07:21		18:23 (T42)	06:33		19:27 (T41)	06:03		06:01
	17:44	43	16:48 (T77)				19:53	25	18:48 (T42)	20:25	33	20:00 (T41)	20:54		21:09
30	07:45		16:06 (T77)				07:19		18:26 (T42)	06:32		19:27 (T41)	06:02		06:02
	17:45	41	16:47 (T77)				19:54	19	18:45 (T42)	20:26	33	20:00 (T41)	20:55		21:09
31	07:44		16:07 (T77)				07:18		18:31 (T42)				06:02		
	17:46	40	16:47 (T77)				19:55	9	18:40 (T42)				20:56		
Potential sun hours	297			297			370			399			448		453
Total, worst case		1434			656			1190			329			355	
Sun reduction		0.31			0.40			0.44			0.52			0.57	
Oper. time red.		1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.74			0.62			0.67			0.57			0.57	
Total reduction		0.23			0.25			0.30			0.30			0.33	
Total, real		336			166			358			100			119	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 423 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6531)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		19:44 (T41)	06:57			07:27		17:55 (T42)	07:02		07:23 (T76)	07:37		15:38 (T77)
	21:08			20:50	19	20:03 (T41)	20:07			19:15	48	18:43 (T42)	17:28	10	07:33 (T76)	17:04	48	16:26 (T77)
2	06:03			06:27		19:42 (T41)	06:58			07:29		17:55 (T42)	07:03		07:26 (T76)	07:38		15:39 (T77)
	21:08			20:49	22	20:04 (T41)	20:06			19:13	47	18:42 (T42)	17:27	3	07:29 (T76)	17:03	47	16:26 (T77)
3	06:03			06:28		19:41 (T41)	06:59			07:30		17:55 (T42)	07:04		15:53 (T77)	07:39		15:40 (T77)
	21:08			20:48	24	20:05 (T41)	20:04			19:11	46	18:41 (T42)	17:26	10	16:03 (T77)	17:03	47	16:27 (T77)
4	06:04			06:29		19:40 (T41)	07:00			07:31		17:55 (T42)	07:06		15:49 (T77)	07:40		15:41 (T77)
	21:08			20:47	26	20:06 (T41)	20:02			19:10	45	18:40 (T42)	17:24	18	16:07 (T77)	17:03	46	16:27 (T77)
5	06:04			06:30		19:39 (T41)	07:01			07:32		17:57 (T42)	07:07		15:46 (T77)	07:41		15:41 (T77)
	21:08			20:46	28	20:07 (T41)	20:01			19:08	43	18:40 (T42)	17:23	23	16:09 (T77)	17:03	47	16:28 (T77)
6	06:05			06:31		19:39 (T41)	07:02			07:33		17:57 (T42)	07:08		15:44 (T77)	07:42		15:42 (T77)
	21:08			20:44	29	20:08 (T41)	19:57			19:06	42	18:39 (T42)	17:22	28	16:12 (T77)	17:03	46	16:28 (T77)
7	06:05			06:32		19:38 (T41)	07:03			07:34		17:58 (T42)	07:09		15:42 (T77)	07:43		15:41 (T77)
	21:07			20:43	30	20:08 (T41)	19:56			19:05	39	18:37 (T42)	17:21	31	16:13 (T77)	17:03	46	16:27 (T77)
8	06:06			06:33		19:37 (T41)	07:04			07:35		17:59 (T42)	07:10		15:41 (T77)	07:44		15:42 (T77)
	21:07			20:42	32	20:09 (T41)	19:54			19:03	37	18:36 (T42)	17:20	33	16:14 (T77)	17:03	45	16:27 (T77)
9	06:07			06:34		19:37 (T41)	07:05			07:36		18:00 (T42)	07:12		15:40 (T77)	07:45		15:43 (T77)
	21:07			20:41	32	20:09 (T41)	19:52			19:01	34	18:34 (T42)	17:19	36	16:16 (T77)	17:03	45	16:28 (T77)
10	06:07			06:35		19:37 (T41)	07:06			07:37		18:01 (T42)	07:13		15:39 (T77)	07:46		15:43 (T77)
	21:06			20:39	32	20:09 (T41)	19:51			19:00	31	18:32 (T42)	17:18	38	16:17 (T77)	17:03	45	16:28 (T77)
11	06:08			06:36		19:36 (T41)	07:07			07:38		18:03 (T42)	07:14		15:38 (T77)	07:46		15:44 (T77)
	21:06			20:38	33	20:09 (T41)	19:49			18:58	26	18:29 (T42)	17:17	39	16:17 (T77)	17:03	45	16:29 (T77)
12	06:09			06:37		19:36 (T41)	07:08		18:23 (T42)	07:39		18:05 (T42)	07:15		15:37 (T77)	07:47		15:45 (T77)
	21:06			20:37	33	20:09 (T41)	19:47	7	18:30 (T42)	18:57	21	18:26 (T42)	17:16	41	16:18 (T77)	17:03	44	16:29 (T77)
13	06:10			06:38		19:36 (T41)	07:09		18:17 (T42)	07:40		08:25 (T76)	07:16		15:37 (T77)	07:48		15:46 (T77)
	21:05			20:36	33	20:09 (T41)	19:45	18	18:35 (T42)	18:55	21	18:22 (T42)	17:15	43	16:20 (T77)	17:03	44	16:30 (T77)
14	06:10			06:39		19:36 (T41)	07:10		18:14 (T42)	07:41		08:21 (T76)	07:18		15:36 (T77)	07:49		15:46 (T77)
	21:05			20:34	33	20:09 (T41)	19:44	24	18:38 (T42)	18:54	15	08:36 (T76)	17:14	44	16:20 (T77)	17:03	43	16:29 (T77)
15	06:11			06:40		19:36 (T41)	07:11		18:11 (T42)	07:42		08:20 (T76)	07:19		15:36 (T77)	07:50		15:46 (T77)
	21:04			20:33	33	20:09 (T41)	19:42	29	18:40 (T42)	18:52	19	08:39 (T76)	17:13	44	16:20 (T77)	17:03	44	16:30 (T77)
16	06:12			06:41		19:35 (T41)	07:12		18:09 (T42)	07:44		08:18 (T76)	07:20		15:35 (T77)	07:50		15:47 (T77)
	21:03			20:31	32	20:07 (T41)	19:40	32	18:41 (T42)	18:50	22	08:40 (T76)	17:12	46	16:21 (T77)	17:04	43	16:30 (T77)
17	06:13			06:42		19:35 (T41)	07:13		18:07 (T42)	07:45		08:17 (T76)	07:21		15:36 (T77)	07:51		15:47 (T77)
	21:03			20:30	31	20:06 (T41)	19:39	35	18:42 (T42)	18:49	24	08:41 (T76)	17:11	46	16:22 (T77)	17:04	43	16:30 (T77)
18	06:14			06:43		19:35 (T41)	07:14		18:05 (T42)	07:46		08:15 (T76)	07:22		15:35 (T77)	07:52		15:48 (T77)
	21:02			20:29	29	20:04 (T41)	19:37	38	18:43 (T42)	18:47	26	08:41 (T76)	17:11	47	16:22 (T77)	17:04	43	16:31 (T77)
19	06:14			06:44		19:36 (T41)	07:15		18:04 (T42)	07:47		08:14 (T76)	07:23		15:35 (T77)	07:52		15:49 (T77)
	21:02			20:27	27	20:03 (T41)	19:35	40	18:44 (T42)	18:46	28	08:42 (T76)	17:10	47	16:22 (T77)	17:05	43	16:32 (T77)
20	06:15			06:45		19:37 (T41)	07:16		18:02 (T42)	07:48		08:14 (T76)	07:25		15:36 (T77)	07:53		15:49 (T77)
	21:01			20:26	25	20:02 (T41)	19:33	43	18:45 (T42)	18:44	28	08:42 (T76)	17:09	48	16:24 (T77)	17:05	43	16:32 (T77)
21	06:16			06:46		19:37 (T41)	07:17		18:01 (T42)	07:49		08:14 (T76)	07:26		15:36 (T77)	07:53		15:50 (T77)
	21:00			20:24	23	20:00 (T41)	19:32	44	18:45 (T42)	18:43	29	08:43 (T76)	17:08	48	16:24 (T77)	17:05	42	16:32 (T77)
22	06:17			06:47		19:38 (T41)	07:18		18:00 (T42)	07:50		08:13 (T76)	07:27		15:36 (T77)	07:54		15:50 (T77)
	20:59			20:23	21	19:59 (T41)	19:30	45	18:45 (T42)	18:41	30	08:43 (T76)	17:08	48	16:24 (T77)	17:06	42	16:32 (T77)
23	06:18			06:48		19:40 (T41)	07:19		17:59 (T42)	07:51		08:13 (T76)	07:28		15:36 (T77)	07:54		15:51 (T77)
	20:59			20:21	17	19:57 (T41)	19:28	46	18:45 (T42)	18:40	29	08:42 (T76)	17:07	48	16:24 (T77)	17:07	42	16:33 (T77)
24	06:19			06:49		19:42 (T41)	07:20		17:58 (T42)	07:53		08:13 (T76)	07:29		15:36 (T77)	07:55		15:51 (T77)
	20:58			20:20	14	19:56 (T41)	19:27	48	18:46 (T42)	18:39	29	08:42 (T76)	17:07	48	16:24 (T77)	17:07	43	16:34 (T77)
25	06:20			06:50		19:46 (T41)	07:21		17:57 (T42)	07:54		08:15 (T76)	07:30		15:37 (T77)	07:55		15:51 (T77)
	20:57			20:18	6	19:52 (T41)	19:25	48	18:45 (T42)	18:37	27	08:42 (T76)	17:06	48	16:25 (T77)	17:08	43	16:34 (T77)
26	06:21			06:51			07:22		17:57 (T42)	07:55		08:16 (T76)	07:32		15:37 (T77)	07:56		15:52 (T77)
	20:56			20:17			19:23	48	18:45 (T42)	18:36	25	08:41 (T76)	17:06	48	16:25 (T77)	17:08	43	16:35 (T77)
27	06:22			06:52			07:23		17:56 (T42)	07:56		08:17 (T76)	07:33		15:37 (T77)	07:56		15:52 (T77)
	20:55			20:15			19:22	49	18:45 (T42)	18:34	23	08:40 (T76)	17:05	48	16:25 (T77)	17:09	43	16:35 (T77)
28	06:22			06:53			07:24		17:56 (T42)	07:57		08:18 (T76)	07:34		15:37 (T77)	07:56		15:52 (T77)
	20:54			20:14			19:20	49	18:45 (T42)	18:33	21	08:39 (T76)	17:05	49	16:26 (T77)	17:10	44	16:36 (T77)
29	06:23			06:54			07:25		17:55 (T42)	07:58		08:19 (T76)	07:35		15:37 (T77)	07:57		15:53 (T77)
	20:53			20:12			19:18	49	18:44 (T42)	18:32	19	08:38 (T76)	17:04	49	16:26 (T77)	17:10	43	16:36 (T77)
30	06:24		19:48 (T41)	06:55			07:26		17:55 (T42)	08:00		08:21 (T76)	07:36		15:38 (T77)	07:57		15:54 (T77)
	20:52	11	19:59 (T41)	20:10			19:16	49	18:44 (T42)	18:30	16	08:37 (T76)	17:04	48	16:26 (T77)	17:11	43	16:37 (T77)
31	06:25		19:45 (T41)	06:56						08:01		08:22 (T76)				07:57		15:54 (T77)
	20:51	16	20:01 (T41)	20:09						18:29	14	08:36 (T76)				17:12	44	16:38 (T77)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		27			664			741			904			1157			1369	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.57			0.57			0.67			0.61			0.74			0.74	
Total reduction		0.39			0.36			0.40			0.30			0.23			0.17	
Total, real		10			238			299			274			262			228	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 427 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6534)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58	09:13 (T12)	07:44	08:12 (T13)	07:07		07:16	18:33 (T11)	06:30	06:59 (T10)	06:01	07:01 (T10)
	17:13 53	10:06 (T12)	17:47 34	08:46 (T13)	18:22		19:56 51	19:24 (T11)	20:27 49	07:48 (T10)	20:57 44	07:45 (T10)
2	07:58	09:14 (T12)	07:43	08:12 (T13)	07:06		07:14	18:32 (T11)	06:29	06:58 (T10)	06:01	07:01 (T10)
	17:14 53	10:07 (T12)	17:49 34	08:46 (T13)	18:23		19:57 52	19:24 (T11)	20:28 51	07:49 (T10)	20:58 43	07:44 (T10)
3	07:58	09:14 (T12)	07:42	08:13 (T13)	07:04		07:13	18:32 (T11)	06:27	06:57 (T10)	06:00	07:02 (T10)
	17:14 53	10:07 (T12)	17:50 33	08:46 (T13)	18:24		19:58 53	19:25 (T11)	20:29 52	07:49 (T10)	20:59 42	07:44 (T10)
4	07:58	09:15 (T12)	07:41	08:13 (T13)	07:03		07:11	18:31 (T11)	06:26	06:57 (T10)	06:00	07:03 (T10)
	17:15 52	10:07 (T12)	17:51 33	08:46 (T13)	18:25		19:59 53	19:24 (T11)	20:30 52	07:49 (T10)	21:00 41	07:44 (T10)
5	07:58	09:16 (T12)	07:40	08:14 (T13)	07:01		07:09	18:30 (T11)	06:25	06:56 (T10)	06:00	07:03 (T10)
	17:16 51	10:07 (T12)	17:52 32	08:46 (T13)	18:26		20:00 54	19:24 (T11)	20:32 54	07:50 (T10)	21:00 40	07:43 (T10)
6	07:58	09:17 (T12)	07:39	08:15 (T13)	06:59		07:08	18:31 (T11)	06:24	06:56 (T10)	05:59	07:04 (T10)
	17:17 50	10:07 (T12)	17:54 30	08:45 (T13)	18:27		20:00 53	19:24 (T11)	20:33 54	07:50 (T10)	21:01 39	07:43 (T10)
7	07:58	09:18 (T12)	07:37	08:16 (T13)	06:58		07:06	18:30 (T11)	06:23	06:56 (T10)	05:59	07:05 (T10)
	17:18 49	10:07 (T12)	17:55 29	08:45 (T13)	18:29		20:01 53	19:23 (T11)	20:34 54	07:50 (T10)	21:02 38	07:43 (T10)
8	07:58	09:19 (T12)	07:36	08:16 (T13)	07:56		07:05	18:31 (T11)	06:21	06:55 (T10)	05:59	07:05 (T10)
	17:19 49	10:08 (T12)	17:56 27	08:43 (T13)	19:30		20:03 52	19:23 (T11)	20:35 54	07:49 (T10)	21:02 38	07:43 (T10)
9	07:57	09:19 (T12)	07:35	08:18 (T13)	07:55		07:03	18:30 (T11)	06:20	06:54 (T10)	05:58	07:06 (T10)
	17:20 48	10:07 (T12)	17:57 24	08:42 (T13)	19:31		20:04 53	19:23 (T11)	20:36 56	07:50 (T10)	21:03 37	07:43 (T10)
10	07:57	09:20 (T12)	07:34	08:19 (T13)	07:53		07:01	18:30 (T11)	06:19	06:54 (T10)	05:58	07:06 (T10)
	17:21 47	10:07 (T12)	17:59 22	08:41 (T13)	19:32		20:05 52	19:22 (T11)	20:37 56	07:50 (T10)	21:03 36	07:42 (T10)
11	07:57	09:21 (T12)	07:33	08:22 (T13)	07:51		07:00	18:31 (T11)	06:18	06:54 (T10)	05:58	07:07 (T10)
	17:22 46	10:07 (T12)	18:00 17	08:39 (T13)	19:33		20:06 51	19:22 (T11)	20:38 56	07:50 (T10)	21:04 35	07:42 (T10)
12	07:57	08:22 (T13)	07:31	08:24 (T13)	07:50		06:58	18:31 (T11)	06:17	06:54 (T10)	05:58	07:07 (T10)
	17:23 48	10:06 (T12)	18:01 12	08:36 (T13)	19:34		20:07 49	19:20 (T11)	20:39 56	07:50 (T10)	21:04 35	07:42 (T10)
13	07:56	08:19 (T13)	07:30		07:48		06:57	18:32 (T11)	06:16	06:54 (T10)	05:58	07:08 (T10)
	17:24 53	10:06 (T12)	18:02		19:35		20:08 48	19:20 (T11)	20:40 56	07:50 (T10)	21:05 34	07:42 (T10)
14	07:56	08:18 (T13)	07:29		07:46		06:55	18:32 (T11)	06:15	06:54 (T10)	05:58	07:08 (T10)
	17:26 56	10:06 (T12)	18:04		19:37		20:09 47	19:19 (T11)	20:41 55	07:49 (T10)	21:05 34	07:42 (T10)
15	07:56	08:17 (T13)	07:28		07:45		06:53	18:32 (T11)	06:14	06:54 (T10)	05:58	07:09 (T10)
	17:27 56	10:05 (T12)	18:05		19:38		20:10 45	19:17 (T11)	20:42 55	07:49 (T10)	21:06 33	07:42 (T10)
16	07:55	08:17 (T13)	07:26		07:43		06:52	18:33 (T11)	06:13	06:54 (T10)	05:58	07:09 (T10)
	17:28 56	10:05 (T12)	18:06		19:39		20:11 44	19:17 (T11)	20:43 55	07:49 (T10)	21:06 33	07:42 (T10)
17	07:55	08:16 (T13)	07:25		07:41		06:50	18:34 (T11)	06:12	06:55 (T10)	05:58	07:09 (T10)
	17:29 55	10:03 (T12)	18:07		19:40		20:12 41	19:15 (T11)	20:44 55	07:50 (T10)	21:07 33	07:42 (T10)
18	07:54	08:16 (T13)	07:24		07:40		06:49	18:35 (T11)	06:11	06:55 (T10)	05:58	07:10 (T10)
	17:30 55	10:03 (T12)	18:09		19:41		20:13 39	19:14 (T11)	20:45 54	07:49 (T10)	21:07 32	07:42 (T10)
19	07:54	08:15 (T13)	07:22		07:38		06:47	18:36 (T11)	06:10	06:55 (T10)	05:58	07:11 (T10)
	17:31 54	10:01 (T12)	18:10		19:42		20:14 36	19:12 (T11)	20:46 54	07:49 (T10)	21:07 32	07:43 (T10)
20	07:53	08:14 (T13)	07:21		07:36	18:57 (T11)	06:46	07:21 (T10)	06:09	06:56 (T10)	05:58	07:11 (T10)
	17:32 52	09:59 (T12)	18:11		19:43 10	19:07 (T11)	20:15 42	19:11 (T11)	20:47 52	07:48 (T10)	21:08 32	07:43 (T10)
21	07:53	08:14 (T13)	07:19		07:35	18:52 (T11)	06:44	07:15 (T10)	06:08	06:56 (T10)	05:58	07:11 (T10)
	17:34 49	09:58 (T12)	18:12		19:44 20	19:12 (T11)	20:17 49	19:08 (T11)	20:48 52	07:48 (T10)	21:08 32	07:43 (T10)
22	07:52	08:13 (T13)	07:18		07:33	18:48 (T11)	06:43	07:12 (T10)	06:08	06:57 (T10)	05:59	07:11 (T10)
	17:35 46	09:55 (T12)	18:13		19:45 27	19:15 (T11)	20:18 51	19:06 (T11)	20:49 51	07:48 (T10)	21:08 32	07:43 (T10)
23	07:51	08:12 (T13)	07:16		07:31	18:45 (T11)	06:41	07:10 (T10)	06:07	06:57 (T10)	05:59	07:11 (T10)
	17:36 39	09:51 (T12)	18:15		19:46 32	19:17 (T11)	20:19 50	19:04 (T11)	20:50 51	07:48 (T10)	21:08 32	07:43 (T10)
24	07:51	08:11 (T13)	07:15		07:30	18:44 (T11)	06:40	07:07 (T10)	06:06	06:57 (T10)	05:59	07:12 (T10)
	17:37 32	08:43 (T13)	18:16		19:47 35	19:19 (T11)	20:20 46	18:59 (T11)	20:51 50	07:47 (T10)	21:09 32	07:44 (T10)
25	07:50	08:12 (T13)	07:13		07:28	18:41 (T11)	06:38	07:06 (T10)	06:05	06:58 (T10)	05:59	07:11 (T10)
	17:39 32	08:44 (T13)	18:17		19:49 39	19:20 (T11)	20:21 37	07:43 (T10)	20:51 50	07:48 (T10)	21:09 33	07:44 (T10)
26	07:49	08:12 (T13)	07:12		07:26	18:39 (T11)	06:37	07:04 (T10)	06:05	06:58 (T10)	06:00	07:11 (T10)
	17:40 33	08:45 (T13)	18:18		19:50 42	19:21 (T11)	20:22 40	07:44 (T10)	20:52 49	07:47 (T10)	21:09 33	07:44 (T10)
27	07:48	08:11 (T13)	07:10		07:25	18:38 (T11)	06:36	07:03 (T10)	06:04	06:58 (T10)	06:00	07:12 (T10)
	17:41 34	08:45 (T13)	18:19		19:51 44	19:22 (T11)	20:23 42	07:45 (T10)	20:53 48	07:46 (T10)	21:09 33	07:45 (T10)
28	07:47	08:11 (T13)	07:09		07:23	18:37 (T11)	06:34	07:02 (T10)	06:03	06:59 (T10)	06:00	07:11 (T10)
	17:42 35	08:46 (T13)	18:21		19:52 46	19:23 (T11)	20:24 44	07:46 (T10)	20:54 47	07:46 (T10)	21:09 34	07:45 (T10)
29	07:47	08:11 (T13)			07:21	18:35 (T11)	06:33	07:00 (T10)	06:03	06:59 (T10)	06:01	07:12 (T10)
	17:44 35	08:46 (T13)			19:53 48	19:23 (T11)	20:25 47	07:47 (T10)	20:55 47	07:46 (T10)	21:09 34	07:46 (T10)
30	07:46	08:11 (T13)			07:19	18:34 (T11)	06:31	06:59 (T10)	06:02	07:00 (T10)	06:01	07:11 (T10)
	17:45 35	08:46 (T13)			19:54 49	19:23 (T11)	20:26 48	07:47 (T10)	20:56 46	07:46 (T10)	21:09 35	07:46 (T10)
31	07:45	08:12 (T13)			07:18	18:34 (T11)			06:02	07:00 (T10)		
	17:46 34	08:46 (T13)			19:55 50	19:24 (T11)			20:56 45	07:45 (T10)		
Potential sun hours	297		297		370		399		449		453	
Total, worst case	1440		327		442		1422		1616		1061	
Sun reduction	0.31		0.40		0.44		0.52		0.57		0.64	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.53		0.52		0.63		0.65		0.68		0.68	
Total reduction	0.16		0.20		0.27		0.32		0.37		0.42	
Total, real	227		66		119		462		604		445	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 427 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6534)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		07:11 (T10)	06:26		07:05 (T10)	06:57		18:30 (T11)	07:28			07:02		07:49 (T13)	07:37		09:03 (T12)
	21:09	35	07:46 (T10)	20:50	55	08:00 (T10)	20:07	51	19:21 (T11)	19:15			17:28	22	08:11 (T13)	17:03	46	09:49 (T12)
2	06:02		07:11 (T10)	06:27		07:05 (T10)	06:58		18:29 (T11)	07:29			07:03		07:47 (T13)	07:38		09:03 (T12)
	21:09	36	07:47 (T10)	20:49	55	08:00 (T10)	20:06	52	19:21 (T11)	19:13			17:27	25	08:12 (T13)	17:03	47	09:50 (T12)
3	06:03		07:10 (T10)	06:28		07:05 (T10)	06:59		18:28 (T11)	07:30			07:05		07:46 (T13)	07:39		09:03 (T12)
	21:09	37	07:47 (T10)	20:48	55	08:00 (T10)	20:04	53	19:21 (T11)	19:11			17:25	27	08:13 (T13)	17:03	48	09:51 (T12)
4	06:03		07:11 (T10)	06:29		07:05 (T10)	07:00		18:28 (T11)	07:31			07:06		07:45 (T13)	07:40		09:03 (T12)
	21:09	37	07:48 (T10)	20:47	55	08:00 (T10)	20:02	52	19:20 (T11)	19:10			17:24	29	08:14 (T13)	17:03	49	09:52 (T12)
5	06:04		07:11 (T10)	06:30		07:05 (T10)	07:01		18:27 (T11)	07:32			07:07		07:45 (T13)	07:41		09:03 (T12)
	21:08	38	07:49 (T10)	20:46	55	08:00 (T10)	20:01	53	19:20 (T11)	19:08			17:23	30	08:15 (T13)	17:03	49	09:52 (T12)
6	06:05		07:10 (T10)	06:31		07:05 (T10)	07:02		18:27 (T11)	07:33			07:08		07:44 (T13)	07:42		09:03 (T12)
	21:08	39	07:49 (T10)	20:45	55	08:00 (T10)	19:57	53	19:20 (T11)	19:06			17:22	32	08:16 (T13)	17:02	50	09:53 (T12)
7	06:05		07:10 (T10)	06:32		07:06 (T10)	07:03		18:26 (T11)	07:34			07:09		07:43 (T13)	07:43		09:03 (T12)
	21:08	40	07:50 (T10)	20:44	53	07:59 (T10)	19:56	54	19:20 (T11)	19:05			17:21	33	08:16 (T13)	17:02	51	09:54 (T12)
8	06:06		07:09 (T10)	06:33		07:06 (T10)	07:04		18:26 (T11)	07:35			07:11		07:44 (T13)	07:44		09:03 (T12)
	21:08	41	07:50 (T10)	20:42	53	07:59 (T10)	19:54	53	19:19 (T11)	19:03			17:20	33	08:17 (T13)	17:02	52	09:55 (T12)
9	06:07		07:10 (T10)	06:34		07:06 (T10)	07:05		18:26 (T11)	07:36			07:12		07:43 (T13)	07:45		09:03 (T12)
	21:07	41	07:51 (T10)	20:41	53	07:59 (T10)	19:52	53	19:19 (T11)	19:02			17:19	34	08:17 (T13)	17:02	53	09:56 (T12)
10	06:07		07:10 (T10)	06:35		07:07 (T10)	07:06		18:26 (T11)	07:37			07:13		07:43 (T13)	07:46		09:04 (T12)
	21:07	42	07:52 (T10)	20:40	51	07:58 (T10)	19:51	52	19:18 (T11)	19:00			17:18	34	08:17 (T13)	17:02	53	09:57 (T12)
11	06:08		07:09 (T10)	06:36		07:07 (T10)	07:07		18:25 (T11)	07:38			07:14		07:43 (T13)	07:47		09:03 (T12)
	21:06	43	07:52 (T10)	20:39	51	07:58 (T10)	19:49	51	19:16 (T11)	18:58			17:17	34	08:17 (T13)	17:02	53	09:56 (T12)
12	06:09		07:09 (T10)	06:37		07:08 (T10)	07:08		18:25 (T11)	07:39			07:15		07:43 (T13)	07:48		09:03 (T12)
	21:06	44	07:53 (T10)	20:37	49	07:57 (T10)	19:47	51	19:16 (T11)	18:57			17:16	35	08:18 (T13)	17:03	54	09:57 (T12)
13	06:09		07:09 (T10)	06:38		07:08 (T10)	07:09		18:25 (T11)	07:40			07:17		07:43 (T13)	07:48		09:04 (T12)
	21:05	45	07:54 (T10)	20:36	48	07:56 (T10)	19:46	50	19:15 (T11)	18:55			17:15	35	08:18 (T13)	17:03	54	09:58 (T12)
14	06:10		07:09 (T10)	06:39		07:08 (T10)	07:10		18:25 (T11)	07:42			07:18		07:43 (T13)	07:49		09:04 (T12)
	21:05	46	07:55 (T10)	20:35	46	07:54 (T10)	19:44	49	19:14 (T11)	18:54			17:14	35	08:18 (T13)	17:03	55	09:59 (T12)
15	06:11		07:08 (T10)	06:40		07:09 (T10)	07:11		18:26 (T11)	07:43			07:19		07:44 (T13)	07:50		09:05 (T12)
	21:04	46	07:54 (T10)	20:33	44	07:53 (T10)	19:42	46	19:12 (T11)	18:52			17:13	34	08:18 (T13)	17:03	55	10:00 (T12)
16	06:12		07:08 (T10)	06:41		07:10 (T10)	07:12		18:27 (T11)	07:44			07:20		07:45 (T13)	07:51		09:05 (T12)
	21:04	47	07:55 (T10)	20:32	42	07:52 (T10)	19:40	44	19:11 (T11)	18:50			17:12	33	08:18 (T13)	17:03	55	10:00 (T12)
17	06:12		07:08 (T10)	06:42		07:11 (T10)	07:13		18:27 (T11)	07:45			07:21		07:45 (T13)	07:51		09:05 (T12)
	21:03	48	07:56 (T10)	20:30	39	07:50 (T10)	19:39	42	19:09 (T11)	18:49			17:11	32	08:17 (T13)	17:04	56	10:01 (T12)
18	06:13		07:07 (T10)	06:43		07:12 (T10)	07:14		18:28 (T11)	07:46			07:23		07:45 (T13)	07:52		09:06 (T12)
	21:03	50	07:57 (T10)	20:29	37	07:49 (T10)	19:37	40	19:08 (T11)	18:47			17:10	32	08:17 (T13)	17:04	56	10:02 (T12)
19	06:14		07:07 (T10)	06:44		07:13 (T10)	07:15		18:29 (T11)	07:47			07:24		07:47 (T13)	07:53		09:06 (T12)
	21:02	50	07:57 (T10)	20:27	47	19:05 (T11)	19:35	37	19:06 (T11)	18:46			17:10	39	09:26 (T12)	17:04	55	10:01 (T12)
20	06:15		07:06 (T10)	06:45		07:15 (T10)	07:16		18:31 (T11)	07:48			07:25		07:48 (T13)	07:53		09:07 (T12)
	21:01	51	07:57 (T10)	20:26	51	19:09 (T11)	19:34	33	19:04 (T11)	18:44			17:09	46	09:30 (T12)	17:05	55	10:02 (T12)
21	06:16		07:06 (T10)	06:46		07:17 (T10)	07:17		18:33 (T11)	07:49			07:26		07:49 (T13)	07:54		09:07 (T12)
	21:00	52	07:58 (T10)	20:25	50	19:11 (T11)	19:32	28	19:01 (T11)	18:43			17:08	49	09:33 (T12)	17:05	55	10:02 (T12)
22	06:17		07:06 (T10)	06:47		07:20 (T10)	07:18		18:35 (T11)	07:51			07:27		07:50 (T13)	07:54		09:08 (T12)
	21:00	52	07:58 (T10)	20:23	49	19:13 (T11)	19:30	23	18:58 (T11)	18:41			17:08	52	09:35 (T12)	17:06	55	10:03 (T12)
23	06:18		07:06 (T10)	06:48		07:26 (T10)	07:19		18:39 (T11)	07:52			07:29		07:52 (T13)	07:55		09:08 (T12)
	20:59	53	07:59 (T10)	20:22	41	19:15 (T11)	19:28	14	18:53 (T11)	18:40			17:07	54	09:38 (T12)	17:06	55	10:03 (T12)
24	06:19		07:06 (T10)	06:49		18:39 (T11)	07:20			07:53			07:30		07:53 (T13)	07:55		09:08 (T12)
	20:58	53	07:59 (T10)	20:20	37	19:16 (T11)	19:27			18:39			17:06	55	09:40 (T12)	17:07	55	10:03 (T12)
25	06:19		07:06 (T10)	06:50		18:38 (T11)	07:21			07:54			07:31		07:54 (T13)	07:56		09:09 (T12)
	20:57	54	08:00 (T10)	20:18	39	19:17 (T11)	19:25			18:37			17:06	55	09:41 (T12)	17:07	56	10:05 (T12)
26	06:20		07:06 (T10)	06:51		18:36 (T11)	07:22			07:55			07:32		07:55 (T13)	07:56		09:09 (T12)
	20:56	54	08:00 (T10)	20:17	42	19:18 (T11)	19:23			18:36			17:05	56	09:43 (T12)	17:08	56	10:05 (T12)
27	06:21		07:05 (T10)	06:52		18:35 (T11)	07:23			07:56			07:33		07:56 (T13)	07:56		09:10 (T12)
	20:55	54	07:59 (T10)	20:15	44	19:19 (T11)	19:22			18:34			17:05	56	09:44 (T12)	17:09	55	10:05 (T12)
28	06:22		07:05 (T10)	06:53		18:34 (T11)	07:24			07:58			07:34		07:58 (T13)	07:57		09:11 (T12)
	20:54	55	08:00 (T10)	20:14	45	19:19 (T11)	19:20			18:33			17:05	56	09:46 (T12)	17:09	55	10:06 (T12)
29	06:23		07:05 (T10)	06:54		18:33 (T11)	07:26			07:59		08:59 (T13)	07:35		08:00 (T13)	07:57		09:11 (T12)
	20:54	55	08:00 (T10)	20:12	47	19:20 (T11)	19:18			18:32	2	09:01 (T13)	17:04	53	09:47 (T12)	17:10	55	10:06 (T12)
30	06:24		07:05 (T10)	06:55		18:32 (T11)	07:27			08:00		08:53 (T13)	07:36		08:03 (T13)	07:57		09:12 (T12)
	20:53	55	08:00 (T10)	20:11	48	19:20 (T11)	19:16			18:30	13	09:06 (T13)	17:04	49	09:48 (T12)	17:11	54	10:06 (T12)
31	06:25		07:05 (T10)	06:56		18:31 (T11)				08:01		08:50 (T13)				07:57		09:12 (T12)
	20:51	55	08:00 (T10)	20:09	49	19:20 (T11)				18:29	18	09:08 (T13)				17:12	54	10:06 (T12)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		1448			1485			1034			33			1189			1651	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.68			0.66			0.63			0.52			0.52			0.53	
Total reduction		0.43			0.39			0.36			0.24			0.15			0.11	
Total, real		627			582			374			8			181			185	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 477 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6572)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	15:49 (T77)	07:43	08:15 (T76)	07:07	17:04 (T42)	07:16	19:11 (T41)	06:30		06:01	19:57 (T40)
	17:13 34	16:23 (T77)	17:47 27	08:42 (T76)	18:22 28	17:32 (T42)	19:56 23	19:34 (T41)	20:27		20:57 25	20:22 (T40)
2	07:57	15:49 (T77)	07:42	08:16 (T76)	07:06	17:06 (T42)	07:14	19:09 (T41)	06:29		06:01	19:58 (T40)
	17:14 34	16:23 (T77)	17:49 26	08:42 (T76)	18:23 23	17:29 (T42)	19:57 26	19:35 (T41)	20:28		20:58 24	20:22 (T40)
3	07:57	15:50 (T77)	07:41	08:17 (T76)	07:04	17:08 (T42)	07:13	19:09 (T41)	06:28		06:01	19:58 (T40)
	17:15 33	16:23 (T77)	17:50 24	08:41 (T76)	18:24 18	17:26 (T42)	19:58 28	19:37 (T41)	20:29		20:58 23	20:21 (T40)
4	07:57	15:51 (T77)	07:40	08:18 (T76)	07:02	17:12 (T42)	07:11	19:08 (T41)	06:26		06:00	19:59 (T40)
	17:16 32	16:23 (T77)	17:51 23	08:41 (T76)	18:25 11	17:23 (T42)	19:59 29	19:37 (T41)	20:30		20:59 22	20:21 (T40)
5	07:57	15:52 (T77)	07:39	08:19 (T76)	07:01		07:09	19:07 (T41)	06:25		06:00	20:00 (T40)
	17:16 31	16:23 (T77)	17:52 34	17:25 (T42)	18:26		20:00 30	19:37 (T41)	20:31		21:00 22	20:22 (T40)
6	07:57	15:53 (T77)	07:38	08:20 (T76)	06:59		07:08	19:08 (T41)	06:24		05:59	20:00 (T40)
	17:17 30	16:23 (T77)	17:54 36	17:27 (T42)	18:27		20:00 30	19:38 (T41)	20:32		21:00 21	20:21 (T40)
7	07:57	15:53 (T77)	07:37	08:23 (T76)	06:58		07:06	19:07 (T41)	06:23	20:06 (T40)	05:59	20:01 (T40)
	17:18 30	16:23 (T77)	17:55 35	17:30 (T42)	18:29		20:01 30	19:37 (T41)	20:33 5	20:11 (T40)	21:01 19	20:20 (T40)
8	07:57	15:54 (T77)	07:36	08:28 (T76)	07:56		07:05	19:08 (T41)	06:22	20:03 (T40)	05:59	20:02 (T40)
	17:19 29	16:23 (T77)	17:56 30	17:32 (T42)	19:30		20:02 29	19:37 (T41)	20:34 9	20:12 (T40)	21:02 18	20:20 (T40)
9	07:57	08:19 (T76)	07:35	17:04 (T42)	07:54		07:03	19:08 (T41)	06:20	20:00 (T40)	05:59	20:02 (T40)
	17:20 35	16:23 (T77)	17:57 29	17:33 (T42)	19:31		20:03 28	19:36 (T41)	20:35 12	20:12 (T40)	21:02 18	20:20 (T40)
10	07:57	08:19 (T76)	07:34	17:03 (T42)	07:53		07:01	19:08 (T41)	06:19	19:58 (T40)	05:59	20:03 (T40)
	17:21 36	16:23 (T77)	17:59 32	17:35 (T42)	19:32		20:05 27	19:35 (T41)	20:36 15	20:13 (T40)	21:03 17	20:20 (T40)
11	07:57	08:18 (T76)	07:32	17:01 (T42)	07:51		07:00	19:09 (T41)	06:18	19:57 (T40)	05:58	20:04 (T40)
	17:23 36	16:22 (T77)	18:00 34	17:35 (T42)	19:33		20:06 25	19:34 (T41)	20:37 17	20:14 (T40)	21:04 16	20:20 (T40)
12	07:56	08:18 (T76)	07:31	17:01 (T42)	07:50		06:58	19:09 (T41)	06:17	19:56 (T40)	05:58	20:04 (T40)
	17:24 36	16:22 (T77)	18:01 35	17:36 (T42)	19:34		20:07 23	19:32 (T41)	20:38 19	20:15 (T40)	21:04 15	20:19 (T40)
13	07:56	08:18 (T76)	07:30	17:01 (T42)	07:48		06:57	19:11 (T41)	06:16	19:55 (T40)	05:58	20:04 (T40)
	17:25 36	16:21 (T77)	18:02 36	17:37 (T42)	19:35		20:08 20	19:31 (T41)	20:39 21	20:16 (T40)	21:05 15	20:19 (T40)
14	07:56	08:17 (T76)	07:29	16:59 (T42)	07:46		06:55	19:12 (T41)	06:15	19:55 (T40)	05:58	20:05 (T40)
	17:26 36	16:20 (T77)	18:04 38	17:37 (T42)	19:36		20:09 17	19:29 (T41)	20:41 22	20:17 (T40)	21:05 14	20:19 (T40)
15	07:55	08:17 (T76)	07:27	16:59 (T42)	07:45		06:53	19:14 (T41)	06:14	19:54 (T40)	05:58	20:06 (T40)
	17:27 33	16:19 (T77)	18:05 39	17:38 (T42)	19:38		20:10 11	19:25 (T41)	20:42 24	20:18 (T40)	21:05 12	20:18 (T40)
16	07:55	08:16 (T76)	07:26	16:59 (T42)	07:43		06:52		06:13	19:55 (T40)	05:58	20:06 (T40)
	17:28 31	16:17 (T77)	18:06 40	17:39 (T42)	19:39		20:11		20:42 25	20:20 (T40)	21:06 12	20:18 (T40)
17	07:54	08:16 (T76)	07:25	16:58 (T42)	07:41		06:50		06:12	19:54 (T40)	05:58	20:08 (T40)
	17:29 21	08:37 (T76)	18:07 40	17:38 (T42)	19:40		20:12		20:43 26	20:20 (T40)	21:06 11	20:19 (T40)
18	07:54	08:15 (T76)	07:23	16:58 (T42)	07:40		06:49		06:11	19:54 (T40)	05:58	20:08 (T40)
	17:30 23	08:38 (T76)	18:09 41	17:39 (T42)	19:41		20:13		20:44 27	20:21 (T40)	21:07 11	20:19 (T40)
19	07:53	08:15 (T76)	07:22	16:59 (T42)	07:38		06:47		06:10	19:54 (T40)	05:58	20:08 (T40)
	17:31 24	08:39 (T76)	18:10 40	17:39 (T42)	19:42		20:14		20:45 28	20:22 (T40)	21:07 11	20:19 (T40)
20	07:53	08:14 (T76)	07:20	16:58 (T42)	07:36		06:46		06:09	19:54 (T40)	05:58	20:08 (T40)
	17:33 26	08:40 (T76)	18:11 41	17:39 (T42)	19:43		20:15		20:46 29	20:23 (T40)	21:07 11	20:19 (T40)
21	07:52	08:13 (T76)	07:19	16:59 (T42)	07:35		06:44		06:09	19:53 (T40)	05:59	20:08 (T40)
	17:34 27	08:40 (T76)	18:12 40	17:39 (T42)	19:44		20:16		20:47 30	20:23 (T40)	21:08 11	20:19 (T40)
22	07:52	08:13 (T76)	07:18	16:58 (T42)	07:33		06:43		06:08	19:54 (T40)	05:59	20:08 (T40)
	17:35 28	08:41 (T76)	18:13 40	17:38 (T42)	19:45		20:17		20:48 30	20:24 (T40)	21:08 11	20:19 (T40)
23	07:51	08:12 (T76)	07:16	16:59 (T42)	07:31		06:41		06:07	19:54 (T40)	05:59	20:09 (T40)
	17:36 30	08:42 (T76)	18:15 39	17:38 (T42)	19:46		20:18		20:49 29	20:23 (T40)	21:08 11	20:20 (T40)
24	07:50	08:12 (T76)	07:15	16:59 (T42)	07:30		06:40		06:06	19:54 (T40)	05:59	20:09 (T40)
	17:37 30	08:42 (T76)	18:16 38	17:37 (T42)	19:47		20:19		20:50 29	20:23 (T40)	21:08 11	20:20 (T40)
25	07:49	08:12 (T76)	07:13	17:00 (T42)	07:28		06:38		06:06	19:55 (T40)	06:00	20:09 (T40)
	17:39 30	08:42 (T76)	18:17 37	17:37 (T42)	19:48		20:21		20:51 28	20:23 (T40)	21:08 11	20:20 (T40)
26	07:49	08:12 (T76)	07:12	17:00 (T42)	07:26		06:37		06:05	19:55 (T40)	06:00	20:09 (T40)
	17:40 30	08:42 (T76)	18:18 35	17:35 (T42)	19:50		20:22		20:52 28	20:23 (T40)	21:08 12	20:21 (T40)
27	07:48	08:13 (T76)	07:10	17:02 (T42)	07:24	19:23 (T41)	06:36		06:04	19:55 (T40)	06:00	20:09 (T40)
	17:41 30	08:43 (T76)	18:19 33	17:35 (T42)	19:51 4	19:27 (T41)	20:23		20:53 27	20:22 (T40)	21:08 12	20:21 (T40)
28	07:47	08:13 (T76)	07:09	17:03 (T42)	07:23	19:19 (T41)	06:34		06:04	19:55 (T40)	06:01	20:08 (T40)
	17:42 30	08:43 (T76)	18:21 30	17:33 (T42)	19:52 11	19:30 (T41)	20:24		20:54 28	20:23 (T40)	21:09 13	20:21 (T40)
29	07:46	08:13 (T76)			07:21	19:16 (T41)	06:33		06:03	19:55 (T40)	06:01	20:09 (T40)
	17:44 30	08:43 (T76)			19:53 15	19:31 (T41)	20:25		20:54 27	20:22 (T40)	21:09 14	20:23 (T40)
30	07:45	08:14 (T76)			07:19	19:13 (T41)	06:32		06:02	19:56 (T40)	06:02	20:08 (T40)
	17:45 29	08:43 (T76)			19:54 19	19:32 (T41)	20:26		20:55 27	20:23 (T40)	21:09 15	20:23 (T40)
31	07:44	08:14 (T76)			07:18	19:12 (T41)			06:02	19:56 (T40)		
	17:46 29	08:43 (T76)			19:55 22	19:34 (T41)			20:56 26	20:22 (T40)		
Potential sun hours	297		297		370		399		449		453	
Total, worst case	949		972		151		376		588		458	
Sun reduction	0.31		0.40		0.44		0.52		0.57		0.64	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.62		0.68		0.67		0.62		0.55		0.55	
Total reduction	0.20		0.28		0.30		0.33		0.32		0.36	
Total, real	186		270		45		123		190		166	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 477 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6572)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		20:08 (T40)	06:26		20:07 (T40)	06:57		19:08 (T41)	07:27			07:02		16:32 (T42)	07:37		08:00 (T76)
	21:08	16	20:24 (T40)	20:50	18	20:25 (T40)	20:07	25	19:33 (T41)	19:15			17:28	31	17:03 (T42)	17:04	36	16:04 (T77)
2	06:03		20:07 (T40)	06:27		20:08 (T40)	06:58		19:07 (T41)	07:29			07:03		16:34 (T42)	07:38		08:01 (T76)
	21:08	17	20:24 (T40)	20:49	16	20:24 (T40)	20:06	27	19:34 (T41)	19:13			17:27	29	17:03 (T42)	17:03	35	16:05 (T77)
3	06:03		20:08 (T40)	06:28		20:09 (T40)	06:59		19:06 (T41)	07:30			07:04		07:56 (T76)	07:39		08:03 (T76)
	21:08	17	20:25 (T40)	20:48	14	20:23 (T40)	20:04	28	19:34 (T41)	19:11			17:26	32	17:01 (T42)	17:03	35	16:07 (T77)
4	06:04		20:07 (T40)	06:29		20:11 (T40)	07:00		19:05 (T41)	07:31			07:06		07:52 (T76)	07:40		15:39 (T77)
	21:08	18	20:25 (T40)	20:47	11	20:22 (T40)	20:02	29	19:34 (T41)	19:10			17:24	35	16:59 (T42)	17:03	29	16:08 (T77)
5	06:04		20:07 (T40)	06:30		20:13 (T40)	07:01		19:04 (T41)	07:32			07:07		07:50 (T76)	07:41		15:39 (T77)
	21:08	19	20:26 (T40)	20:46	8	20:21 (T40)	20:01	30	19:34 (T41)	19:08			17:23	35	16:57 (T42)	17:03	30	16:09 (T77)
6	06:05		20:06 (T40)	06:31			07:02		19:04 (T41)	07:33			07:08		07:49 (T76)	07:42		15:39 (T77)
	21:08	21	20:27 (T40)	20:44			19:57	30	19:34 (T41)	19:06			17:22	33	16:54 (T42)	17:03	30	16:09 (T77)
7	06:05		20:06 (T40)	06:32			07:03		19:03 (T41)	07:34			07:09		07:48 (T76)	07:43		15:38 (T77)
	21:07	22	20:28 (T40)	20:43			19:56	30	19:33 (T41)	19:05			17:21	23	08:11 (T76)	17:03	31	16:09 (T77)
8	06:06		20:06 (T40)	06:33			07:04		19:03 (T41)	07:35			07:10		07:46 (T76)	07:44		15:38 (T77)
	21:07	23	20:29 (T40)	20:42			19:54	30	19:33 (T41)	19:03			17:20	25	08:11 (T76)	17:03	32	16:10 (T77)
9	06:07		20:06 (T40)	06:34			07:05		19:03 (T41)	07:36		17:52 (T42)	07:12		07:46 (T76)	07:45		15:38 (T77)
	21:07	22	20:28 (T40)	20:41			19:52	28	19:31 (T41)	19:01	1	17:53 (T42)	17:19	27	08:13 (T76)	17:03	33	16:11 (T77)
10	06:07		20:06 (T40)	06:35			07:06		19:02 (T41)	07:37		17:44 (T42)	07:13		07:46 (T76)	07:46		15:38 (T77)
	21:06	23	20:29 (T40)	20:39			19:51	26	19:28 (T41)	19:00	15	17:59 (T42)	17:18	27	08:13 (T76)	17:03	34	16:12 (T77)
11	06:08		20:06 (T40)	06:36			07:07		19:03 (T41)	07:38		17:41 (T42)	07:14		07:45 (T76)	07:46		15:39 (T77)
	21:06	24	20:30 (T40)	20:38			19:49	24	19:27 (T41)	18:58	21	18:02 (T42)	17:17	29	08:14 (T76)	17:03	34	16:13 (T77)
12	06:09		20:05 (T40)	06:37			07:08		19:03 (T41)	07:39		17:38 (T42)	07:15		07:45 (T76)	07:47		15:39 (T77)
	21:06	25	20:30 (T40)	20:37			19:47	22	19:25 (T41)	18:57	26	18:04 (T42)	17:16	29	08:14 (T76)	17:03	34	16:13 (T77)
13	06:10		20:05 (T40)	06:38			07:09		19:04 (T41)	07:40		17:36 (T42)	07:16		07:45 (T76)	07:48		15:40 (T77)
	21:05	26	20:31 (T40)	20:36			19:45	19	19:23 (T41)	18:55	29	18:05 (T42)	17:15	30	08:15 (T76)	17:03	34	16:14 (T77)
14	06:10		20:05 (T40)	06:39			07:10		19:06 (T41)	07:41		17:34 (T42)	07:18		07:45 (T76)	07:49		15:39 (T77)
	21:05	26	20:31 (T40)	20:34			19:44	16	19:22 (T41)	18:54	32	18:06 (T42)	17:14	30	08:15 (T76)	17:03	35	16:14 (T77)
15	06:11		20:05 (T40)	06:40			07:11		19:07 (T41)	07:42		17:34 (T42)	07:19		07:45 (T76)	07:50		15:40 (T77)
	21:04	27	20:32 (T40)	20:33			19:42	13	19:20 (T41)	18:52	33	18:07 (T42)	17:13	30	08:15 (T76)	17:03	35	16:15 (T77)
16	06:12		20:04 (T40)	06:41			07:12		19:11 (T41)	07:44		17:33 (T42)	07:20		07:45 (T76)	07:50		15:40 (T77)
	21:03	28	20:32 (T40)	20:31			19:40	7	19:18 (T41)	18:50	35	18:08 (T42)	17:12	30	08:15 (T76)	17:04	36	16:16 (T77)
17	06:13		20:04 (T40)	06:42			07:13			07:45		17:31 (T42)	07:21		07:46 (T76)	07:51		15:40 (T77)
	21:03	28	20:32 (T40)	20:30			19:39			18:49	37	18:08 (T42)	17:11	30	08:16 (T76)	17:04	36	16:16 (T77)
18	06:14		20:04 (T40)	06:43			07:14			07:46		17:30 (T42)	07:22		07:46 (T76)	07:52		15:41 (T77)
	21:02	29	20:33 (T40)	20:29			19:37			18:47	39	18:09 (T42)	17:11	30	08:16 (T76)	17:04	36	16:17 (T77)
19	06:14		20:04 (T40)	06:44			07:15			07:47		17:30 (T42)	07:23		07:46 (T76)	07:52		15:42 (T77)
	21:02	29	20:33 (T40)	20:27			19:35			18:46	39	18:09 (T42)	17:10	30	08:16 (T76)	17:05	35	16:17 (T77)
20	06:15		20:04 (T40)	06:45			07:16			07:48		17:29 (T42)	07:25		07:48 (T76)	07:53		15:42 (T77)
	21:01	30	20:34 (T40)	20:26			19:33			18:44	40	18:09 (T42)	17:09	28	08:16 (T76)	17:05	35	16:17 (T77)
21	06:16		20:04 (T40)	06:46			07:17			07:49		17:29 (T42)	07:26		07:49 (T76)	07:53		15:43 (T77)
	21:00	29	20:33 (T40)	20:24			19:32			18:43	40	18:09 (T42)	17:08	27	08:16 (T76)	17:05	35	16:18 (T77)
22	06:17		20:04 (T40)	06:47			07:18			07:50		17:29 (T42)	07:27		07:50 (T76)	07:54		15:43 (T77)
	20:59	29	20:33 (T40)	20:23			19:30			18:41	40	18:09 (T42)	17:08	26	08:16 (T76)	17:06	35	16:18 (T77)
23	06:18		20:04 (T40)	06:48			07:19			07:51		17:28 (T42)	07:28		07:51 (T76)	07:54		15:44 (T77)
	20:59	29	20:33 (T40)	20:21			19:28			18:40	41	18:09 (T42)	17:07	24	08:15 (T76)	17:07	35	16:19 (T77)
24	06:19		20:04 (T40)	06:49			07:20			07:53		17:28 (T42)	07:29		07:52 (T76)	07:55		15:44 (T77)
	20:58	29	20:33 (T40)	20:20			19:27			18:39	40	18:08 (T42)	17:07	23	08:15 (T76)	17:07	35	16:19 (T77)
25	06:20		20:04 (T40)	06:50			07:21			07:54		17:29 (T42)	07:30		07:54 (T76)	07:55		15:44 (T77)
	20:57	28	20:32 (T40)	20:18			19:25			18:37	40	18:09 (T42)	17:06	21	08:15 (T76)	17:08	36	16:20 (T77)
26	06:21		20:05 (T40)	06:51			07:22			07:55		17:29 (T42)	07:32		07:55 (T76)	07:56		15:45 (T77)
	20:56	26	20:31 (T40)	20:17			19:23			18:36	39	18:08 (T42)	17:06	31	15:56 (T77)	17:08	36	16:21 (T77)
27	06:22		20:05 (T40)	06:52			07:23			07:56		17:29 (T42)	07:33		07:56 (T76)	07:56		15:45 (T77)
	20:55	26	20:31 (T40)	20:15			19:21			18:34	39	18:08 (T42)	17:05	33	15:58 (T77)	17:09	36	16:21 (T77)
28	06:22		20:05 (T40)	06:53		19:16 (T41)	07:24			07:57		17:29 (T42)	07:34		07:57 (T76)	07:56		15:46 (T77)
	20:54	24	20:29 (T40)	20:14	11	19:27 (T41)	19:20			18:33	38	18:07 (T42)	17:05	35	16:00 (T77)	17:10	35	16:21 (T77)
29	06:23		20:05 (T40)	06:54		19:13 (T41)	07:25			07:58		17:29 (T42)	07:35		07:58 (T76)	07:57		15:46 (T77)
	20:53	23	20:28 (T40)	20:12	17	19:30 (T41)	19:18			18:32	37	18:06 (T42)	17:04	36	16:01 (T77)	17:10	35	16:21 (T77)
30	06:24		20:06 (T40)	06:55		19:11 (T41)	07:26			08:00		17:31 (T42)	07:36		07:59 (T76)	07:57		15:47 (T77)
	20:52	21	20:27 (T40)	20:10	20	19:31 (T41)	19:16			18:30	35	18:06 (T42)	17:04	36	16:03 (T77)	17:11	35	16:22 (T77)
31	06:25		20:06 (T40)	06:56		19:09 (T41)				08:01		17:31 (T42)				07:57		15:48 (T77)
	20:51	20	20:26 (T40)	20:09	23	19:32 (T41)				18:29	34	18:05 (T42)				17:12	34	16:22 (T77)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		754			138			384			770			885			1062	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.55			0.59			0.62			0.71			0.57			0.74	
Total reduction		0.37			0.37			0.37			0.35			0.18			0.17	
Total, real		282			50			142			268			155			176	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 500 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6592)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June		
1	07:57	15:39 (T35)	07:43		08:07 (T36)	07:07	07:16		07:35 (T31)	06:30	18:53 (T30)	06:01	20:03 (T27)
	17:13	38 16:17 (T35)	17:47	28	08:35 (T36)	18:22	19:56	15	07:50 (T31)	20:27	56 19:49 (T30)	20:57	30 20:33 (T27)
2	07:57	15:40 (T35)	07:43		08:07 (T36)	07:06	07:14		07:33 (T31)	06:29	18:53 (T30)	06:01	20:03 (T27)
	17:14	38 16:18 (T35)	17:49	28	08:35 (T36)	18:23	19:57	19	07:52 (T31)	20:28	56 19:49 (T30)	20:58	31 20:34 (T27)
3	07:58	15:40 (T35)	07:41		08:08 (T36)	07:04	07:13		07:32 (T31)	06:28	18:53 (T30)	06:00	20:02 (T27)
	17:15	38 16:18 (T35)	17:50	26	08:34 (T36)	18:24	19:58	22	07:54 (T31)	20:29	55 19:48 (T30)	20:58	32 20:34 (T27)
4	07:58	15:41 (T35)	07:40		08:09 (T36)	07:02	07:11		07:30 (T31)	06:26	18:53 (T30)	06:00	20:03 (T27)
	17:15	37 16:18 (T35)	17:51	25	08:34 (T36)	18:25	19:59	24	07:54 (T31)	20:30	55 19:48 (T30)	20:59	32 20:35 (T27)
5	07:58	15:42 (T35)	07:39		08:09 (T36)	07:01	07:09		07:28 (T31)	06:25	18:53 (T30)	06:00	20:03 (T27)
	17:16	36 16:18 (T35)	17:52	25	08:34 (T36)	18:26	20:00	27	07:55 (T31)	20:31	55 19:48 (T30)	21:00	33 20:36 (T27)
6	07:58	15:43 (T35)	07:38		08:10 (T36)	06:59	07:08		07:27 (T31)	06:24	18:54 (T30)	05:59	20:02 (T27)
	17:17	35 16:18 (T35)	17:54	22	08:32 (T36)	18:27	20:00	29	07:56 (T31)	20:32	54 19:48 (T30)	21:01	34 20:36 (T27)
7	07:57	15:44 (T35)	07:37		08:11 (T36)	06:58	07:06		07:25 (T31)	06:23	18:54 (T30)	05:59	20:03 (T27)
	17:18	34 16:18 (T35)	17:55	20	08:31 (T36)	18:29	20:01	31	07:56 (T31)	20:33	53 19:47 (T30)	21:01	33 20:36 (T27)
8	07:57	15:44 (T35)	07:36		08:13 (T36)	07:56	07:05		07:24 (T31)	06:21	18:54 (T30)	05:59	20:03 (T27)
	17:19	34 16:18 (T35)	17:56	17	08:30 (T36)	19:30	20:02	33	07:57 (T31)	20:34	52 19:46 (T30)	21:02	34 20:37 (T27)
9	07:57	15:45 (T35)	07:35		08:15 (T36)	07:54	07:03		07:22 (T31)	06:20	18:54 (T30)	05:59	20:03 (T27)
	17:20	33 16:18 (T35)	17:57	13	08:28 (T36)	19:31	20:03	34	07:56 (T31)	20:35	52 19:46 (T30)	21:02	34 20:37 (T27)
10	07:57	15:47 (T35)	07:34		08:20 (T36)	07:53	07:01		07:21 (T31)	06:19	18:55 (T30)	05:58	20:03 (T27)
	17:21	31 16:18 (T35)	17:59	3	08:23 (T36)	19:32	20:05	35	07:56 (T31)	20:36	50 19:45 (T30)	21:03	34 20:37 (T27)
11	07:57	15:47 (T35)	07:32			07:51	07:00		07:21 (T31)	06:18	18:55 (T30)	05:58	20:03 (T27)
	17:22	30 16:17 (T35)	18:00			19:33	20:06	49	19:32 (T30)	20:38	50 19:45 (T30)	21:04	34 20:37 (T27)
12	07:56	15:49 (T35)	07:31			07:50	06:58		07:21 (T31)	06:17	18:56 (T30)	05:58	20:03 (T27)
	17:23	28 16:17 (T35)	18:01			19:34	20:07	57	19:36 (T30)	20:39	48 19:44 (T30)	21:04	34 20:37 (T27)
13	07:56	15:50 (T35)	07:30			07:48	06:56		07:21 (T31)	06:16	18:56 (T30)	05:58	20:03 (T27)
	17:25	27 16:17 (T35)	18:02			19:35	20:08	62	19:39 (T30)	20:40	48 19:44 (T30)	21:05	35 20:38 (T27)
14	07:56	15:51 (T35)	07:29			07:46	06:55		07:21 (T31)	06:15	18:57 (T30)	05:58	20:04 (T27)
	17:26	24 16:15 (T35)	18:04			19:36	20:09	65	19:40 (T30)	20:41	46 19:43 (T30)	21:05	34 20:38 (T27)
15	07:55	08:17 (T36)	07:27			07:45	06:53		07:20 (T31)	06:14	18:58 (T30)	05:58	20:04 (T27)
	17:27	25 16:15 (T35)	18:05			19:38	20:10	69	19:41 (T30)	20:42	44 19:42 (T30)	21:06	34 20:38 (T27)
16	07:55	08:16 (T36)	07:26			07:43	06:52		07:21 (T31)	06:13	18:58 (T30)	05:58	06:28 (T28)
	17:28	24 16:13 (T35)	18:06			19:39	20:11	71	19:43 (T30)	20:43	44 19:42 (T30)	21:06	35 20:38 (T27)
17	07:55	08:16 (T36)	07:25			07:41	06:50		07:21 (T31)	06:12	19:00 (T30)	05:58	06:26 (T28)
	17:29	22 16:12 (T35)	18:07			19:40	20:12	72	19:44 (T30)	20:44	42 19:42 (T30)	21:06	40 20:39 (T27)
18	07:54	08:15 (T36)	07:23			07:40	06:49		07:22 (T31)	06:11	19:01 (T30)	05:58	06:25 (T28)
	17:30	18 16:09 (T35)	18:09			19:41	20:13	72	19:45 (T30)	20:45	43 20:19 (T27)	21:07	42 20:39 (T27)
19	07:53	08:15 (T36)	07:22			07:38	06:47		07:23 (T31)	06:10	19:02 (T30)	05:58	06:26 (T28)
	17:31	12 08:27 (T36)	18:10			19:42	20:14	73	19:46 (T30)	20:46	48 20:22 (T27)	21:07	43 20:40 (T27)
20	07:53	08:14 (T36)	07:21			07:36	06:46		07:24 (T31)	06:09	19:02 (T30)	05:58	06:26 (T28)
	17:33	14 08:28 (T36)	18:11			19:43	20:15	72	19:47 (T30)	20:46	50 20:23 (T27)	21:07	43 20:40 (T27)
21	07:52	08:13 (T36)	07:19			07:35	06:44		07:25 (T31)	06:08	19:03 (T30)	05:59	06:26 (T28)
	17:34	16 08:29 (T36)	18:12			19:44	20:16	70	19:47 (T30)	20:47	50 20:23 (T27)	21:08	43 20:40 (T27)
22	07:52	08:13 (T36)	07:18			07:33	06:43		07:28 (T31)	06:08	19:05 (T30)	05:59	06:26 (T28)
	17:35	18 08:31 (T36)	18:13			19:45	20:17	66	19:48 (T30)	20:48	50 20:25 (T27)	21:08	43 20:40 (T27)
23	07:51	08:12 (T36)	07:16			07:31	06:41		07:32 (T31)	06:07	19:06 (T30)	05:59	06:26 (T28)
	17:36	19 08:31 (T36)	18:15			19:46	20:18	60	19:49 (T30)	20:49	50 20:26 (T27)	21:08	43 20:40 (T27)
24	07:50	08:11 (T36)	07:15			07:30	06:40		18:55 (T30)	06:06	19:07 (T30)	05:59	06:27 (T28)
	17:37	21 08:32 (T36)	18:16			19:47	20:20	53	19:48 (T30)	20:50	48 20:26 (T27)	21:08	42 20:41 (T27)
25	07:50	08:10 (T36)	07:13			07:28	06:38		18:55 (T30)	06:05	19:09 (T30)	06:00	06:28 (T28)
	17:39	22 08:32 (T36)	18:17			19:48	20:21	54	19:49 (T30)	20:51	48 20:28 (T27)	21:08	41 20:41 (T27)
26	07:49	08:10 (T36)	07:12			07:26	06:37		18:54 (T30)	06:05	19:11 (T30)	06:00	06:29 (T28)
	17:40	24 08:34 (T36)	18:18			19:50	20:22	54	19:48 (T30)	20:52	45 20:28 (T27)	21:09	37 20:40 (T27)
27	07:48	08:09 (T36)	07:10			07:24	06:36		18:54 (T30)	06:04	19:12 (T30)	06:00	20:07 (T27)
	17:41	25 08:34 (T36)	18:19			19:51	20:23	55	19:49 (T30)	20:53	43 20:28 (T27)	21:09	34 20:41 (T27)
28	07:47	08:08 (T36)	07:09			07:23	06:34		18:54 (T30)	06:03	19:15 (T30)	06:01	20:07 (T27)
	17:42	26 08:34 (T36)	18:20			19:52	20:24	55	19:49 (T30)	20:54	39 20:30 (T27)	21:09	34 20:41 (T27)
29	07:46	08:07 (T36)				07:21	06:33		18:53 (T30)	06:03	19:19 (T30)	06:01	20:08 (T27)
	17:44	28 08:35 (T36)				19:53	20:25	55	19:48 (T30)	20:55	32 20:30 (T27)	21:09	34 20:42 (T27)
30	07:45	08:06 (T36)				07:19	06:31		18:53 (T30)	06:02	20:03 (T27)	06:01	20:07 (T27)
	17:45	29 08:35 (T36)				19:54	20:26	56	19:49 (T30)	20:55	28 20:31 (T27)	21:09	35 20:42 (T27)
31	07:44	08:06 (T36)				07:18	07:37 (T31)			06:02	20:02 (T27)		
	17:46	29 08:35 (T36)				19:55	10 07:47 (T31)			20:56	29 20:31 (T27)		
Potential sun hours	297		297			370		399		449		453	
Total, worst case		835		207		10			1509		1463		1087
Sun reduction		0.31		0.40		0.44			0.52		0.57		0.64
Oper. time red.		1.00		1.00		1.00			1.00		1.00		1.00
Wind dir. red.		0.66		0.53		0.65			0.61		0.57		0.55
Total reduction		0.21		0.22		0.29			0.32		0.33		0.36
Total, real		176		45		3			486		486		394

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 500 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6592)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December	
1	06:02		20:08 (T27)	06:26		19:06 (T30)	06:57		07:20 (T31)	07:27	07:02		07:48 (T36)	07:37		15:30 (T35)
	21:09	34	20:42 (T27)	20:50	49	19:55 (T30)	20:07	48	19:31 (T30)	19:15	17:28	6	07:54 (T36)	17:04	30	16:00 (T35)
2	06:02		20:08 (T27)	06:27		19:06 (T30)	06:58		07:20 (T31)	07:29	07:03		07:45 (T36)	07:38		15:30 (T35)
	21:08	34	20:42 (T27)	20:49	50	19:56 (T30)	20:06	35	07:55 (T31)	19:13	17:27	13	07:58 (T36)	17:03	31	16:01 (T35)
3	06:03		20:09 (T27)	06:28		19:05 (T30)	06:59		07:20 (T31)	07:30	07:04		07:42 (T36)	07:39		15:29 (T35)
	21:08	34	20:43 (T27)	20:48	51	19:56 (T30)	20:04	34	07:54 (T31)	19:11	17:25	18	08:00 (T36)	17:03	33	16:02 (T35)
4	06:04		20:08 (T27)	06:29		19:05 (T30)	07:00		07:21 (T31)	07:31	07:06		07:41 (T36)	07:40		15:29 (T35)
	21:08	34	20:42 (T27)	20:47	52	19:57 (T30)	20:02	33	07:54 (T31)	19:10	17:24	20	08:01 (T36)	17:03	34	16:03 (T35)
5	06:04		20:09 (T27)	06:30		19:04 (T30)	07:01		07:22 (T31)	07:32	07:07		07:39 (T36)	07:41		15:29 (T35)
	21:08	34	20:43 (T27)	20:46	53	19:57 (T30)	20:01	31	07:53 (T31)	19:08	17:23	23	08:02 (T36)	17:03	34	16:03 (T35)
6	06:05		20:09 (T27)	06:31		19:04 (T30)	07:02		07:23 (T31)	07:33	07:08		07:39 (T36)	07:42		15:29 (T35)
	21:08	33	20:42 (T27)	20:45	53	19:57 (T30)	19:57	29	07:52 (T31)	19:06	17:22	25	08:04 (T36)	17:03	35	16:04 (T35)
7	06:05		20:09 (T27)	06:32		19:03 (T30)	07:03		07:24 (T31)	07:34	07:09		07:38 (T36)	07:43		15:29 (T35)
	21:07	33	20:42 (T27)	20:43	54	19:57 (T30)	19:56	27	07:51 (T31)	19:05	17:21	26	08:04 (T36)	17:02	36	16:05 (T35)
8	06:06		20:09 (T27)	06:33		19:03 (T30)	07:04		07:25 (T31)	07:35	07:10		07:38 (T36)	07:44		15:29 (T35)
	21:07	32	20:41 (T27)	20:42	55	19:58 (T30)	19:54	24	07:49 (T31)	19:03	17:20	26	08:04 (T36)	17:02	37	16:06 (T35)
9	06:07		20:10 (T27)	06:34		19:03 (T30)	07:05		07:25 (T31)	07:36	07:12		07:38 (T36)	07:45		15:28 (T35)
	21:07	31	20:41 (T27)	20:41	55	19:58 (T30)	19:52	22	07:47 (T31)	19:01	17:19	28	08:06 (T36)	17:02	38	16:06 (T35)
10	06:07		20:10 (T27)	06:35		19:02 (T30)	07:06		07:26 (T31)	07:37	07:13		07:37 (T36)	07:46		15:29 (T35)
	21:06	31	20:41 (T27)	20:40	56	19:58 (T30)	19:51	19	07:45 (T31)	19:00	17:18	29	08:06 (T36)	17:02	38	16:07 (T35)
11	06:08		20:10 (T27)	06:36		19:02 (T30)	07:07		07:27 (T31)	07:38	07:14		07:37 (T36)	07:47		15:29 (T35)
	21:06	30	20:40 (T27)	20:38	56	19:58 (T30)	19:49	15	07:42 (T31)	18:58	17:17	29	08:06 (T36)	17:03	38	16:07 (T35)
12	06:09		20:11 (T27)	06:37		19:02 (T30)	07:08		07:28 (T31)	07:39	07:15		07:37 (T36)	07:47		15:29 (T35)
	21:06	29	20:40 (T27)	20:37	56	19:58 (T30)	19:47	11	07:39 (T31)	18:57	17:16	29	08:06 (T36)	17:03	39	16:08 (T35)
13	06:09		20:11 (T27)	06:38		19:02 (T30)	07:09			07:40	07:16		07:39 (T36)	07:48		15:30 (T35)
	21:05	29	20:40 (T27)	20:36	55	19:57 (T30)	19:45			18:55	17:15	28	08:07 (T36)	17:03	39	16:09 (T35)
14	06:10		20:12 (T27)	06:39		19:01 (T30)	07:10			07:41	07:18		07:40 (T36)	07:49		15:29 (T35)
	21:05	28	20:40 (T27)	20:34	55	19:56 (T30)	19:44			18:53	17:14	26	08:06 (T36)	17:03	40	16:09 (T35)
15	06:11		19:25 (T30)	06:40		19:00 (T30)	07:11			07:42	07:19		07:41 (T36)	07:50		15:30 (T35)
	21:04	36	20:38 (T27)	20:33	56	19:56 (T30)	19:42			18:52	17:13	25	08:06 (T36)	17:03	40	16:10 (T35)
16	06:12		19:23 (T30)	06:41		19:00 (T30)	07:12			07:44	07:20		07:43 (T36)	07:50		15:31 (T35)
	21:04	41	20:38 (T27)	20:32	55	19:55 (T30)	19:40			18:50	17:12	24	08:07 (T36)	17:03	40	16:11 (T35)
17	06:13		19:21 (T30)	06:42		19:01 (T30)	07:13			07:45	07:21		07:44 (T36)	07:51		15:31 (T35)
	21:03	44	20:38 (T27)	20:30	54	19:55 (T30)	19:39			18:49	17:11	22	08:06 (T36)	17:04	40	16:11 (T35)
18	06:13		19:19 (T30)	06:43		19:01 (T30)	07:14			07:46	07:22		07:45 (T36)	07:52		15:31 (T35)
	21:02	46	20:37 (T27)	20:29	54	19:55 (T30)	19:37			18:47	17:11	21	08:06 (T36)	17:04	40	16:11 (T35)
19	06:14		19:18 (T30)	06:44		19:01 (T30)	07:15			07:47	07:24		07:46 (T36)	07:52		15:32 (T35)
	21:02	48	20:37 (T27)	20:27	53	19:54 (T30)	19:35			18:46	17:10	19	08:05 (T36)	17:04	40	16:12 (T35)
20	06:15		19:16 (T30)	06:45		07:36 (T31)	07:16			07:48	07:25		07:48 (T36)	07:53		15:32 (T35)
	21:01	49	20:35 (T27)	20:26	61	19:53 (T30)	19:33			18:44	17:09	18	08:06 (T36)	17:05	40	16:12 (T35)
21	06:16		19:15 (T30)	06:46		07:32 (T31)	07:17			07:49	07:26		07:49 (T36)	07:53		15:33 (T35)
	21:00	50	20:35 (T27)	20:24	67	19:52 (T30)	19:32			18:43	17:08	16	08:05 (T36)	17:05	40	16:13 (T35)
22	06:17		19:14 (T30)	06:47		07:30 (T31)	07:18			07:50	07:27		07:50 (T36)	07:54		15:33 (T35)
	20:59	49	20:34 (T27)	20:23	70	19:52 (T30)	19:30			18:41	17:08	14	08:04 (T36)	17:06	40	16:13 (T35)
23	06:18		19:13 (T30)	06:48		07:28 (T31)	07:19			07:51	07:28		07:51 (T36)	07:54		15:34 (T35)
	20:59	51	20:34 (T27)	20:21	71	19:50 (T30)	19:28			18:40	17:07	13	08:04 (T36)	17:06	40	16:14 (T35)
24	06:19		19:13 (T30)	06:49		07:26 (T31)	07:20			07:53	07:29		07:53 (T36)	07:55		15:34 (T35)
	20:58	49	20:33 (T27)	20:20	73	19:49 (T30)	19:27			18:39	17:07	19	15:47 (T35)	17:07	40	16:14 (T35)
25	06:20		19:12 (T30)	06:50		07:25 (T31)	07:21			07:54	07:31		07:54 (T36)	07:55		15:34 (T35)
	20:57	47	20:32 (T27)	20:18	72	19:48 (T30)	19:25			18:37	17:06	22	15:50 (T35)	17:08	40	16:14 (T35)
26	06:20		19:11 (T30)	06:51		07:24 (T31)	07:22			07:55	07:32		07:55 (T36)	07:56		15:35 (T35)
	20:56	41	19:52 (T30)	20:17	72	19:47 (T30)	19:23			18:36	17:05	24	15:52 (T35)	17:08	40	16:15 (T35)
27	06:21		19:09 (T30)	06:52		07:23 (T31)	07:23			07:56	07:33		07:56 (T36)	07:56		15:35 (T35)
	20:55	43	19:52 (T30)	20:15	71	19:45 (T30)	19:21			18:34	17:05	25	15:54 (T35)	17:09	41	16:16 (T35)
28	06:22		19:09 (T30)	06:53		07:22 (T31)	07:24			07:57	07:34		15:31 (T35)	07:56		15:36 (T35)
	20:54	44	19:53 (T30)	20:14	69	19:43 (T30)	19:20			18:33	17:05	24	15:55 (T35)	17:09	40	16:16 (T35)
29	06:23		19:08 (T30)	06:54		07:21 (T31)	07:25			07:58	07:35		15:30 (T35)	07:57		15:37 (T35)
	20:53	45	19:53 (T30)	20:12	66	19:41 (T30)	19:18			18:32	17:04	27	15:57 (T35)	17:10	40	16:17 (T35)
30	06:24		19:07 (T30)	06:55		07:21 (T31)	07:26			08:00	07:36		15:30 (T35)	07:57		15:38 (T35)
	20:52	47	19:54 (T30)	20:10	62	19:39 (T30)	19:16			18:30	17:04	28	15:58 (T35)	17:11	39	16:17 (T35)
31	06:25		19:07 (T30)	06:56		07:20 (T31)				08:01				07:57		15:38 (T35)
	20:51	48	19:55 (T30)	20:09	57	19:35 (T30)				18:29				17:12	39	16:17 (T35)
Potential sun hours	460			429			375			345	297			287		
Total, worst case		1224			1833			328				667			1181	
Sun reduction		0.66			0.61			0.59				0.30			0.22	
Oper. time red.		1.00			1.00			1.00				1.00			1.00	
Wind dir. red.		0.56			0.59			0.65				0.57			0.75	
Total reduction		0.38			0.37			0.39				0.18			0.17	
Total, real		461			673			128				118			198	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 501 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6593)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February			March			April			May			June
1	07:57	07:43			07:07		07:27 (T31)	07:16			06:30		07:10 (T28)	06:01
	17:13	17:47			18:22	82	17:50 (T30)	19:56			20:27	47	07:57 (T28)	20:57
2	07:57	07:43			07:06		07:25 (T31)	07:14			06:29		07:10 (T28)	06:01
	17:14	17:49			18:23	84	17:49 (T30)	19:57			20:28	47	07:57 (T28)	20:58
3	07:58	07:41			07:04		07:24 (T31)	07:13			06:28		07:10 (T28)	06:00
	17:15	17:50			18:24	84	17:48 (T30)	19:58			20:29	45	07:55 (T28)	20:58
4	07:58	07:40			07:02		07:24 (T31)	07:11			06:26		07:11 (T28)	06:00
	17:15	17:51			18:25	84	17:49 (T30)	19:59			20:30	44	07:55 (T28)	20:59
5	07:58	07:39			07:01		07:24 (T31)	07:09		19:29 (T27)	06:25		07:11 (T28)	06:00
	17:16	17:52			18:26	83	17:48 (T30)	20:00	9	19:38 (T27)	20:31	43	07:54 (T28)	21:00
6	07:58	07:38			06:59		07:24 (T31)	07:08		19:26 (T27)	06:24		07:12 (T28)	05:59
	17:17	17:54			18:27	82	17:48 (T30)	20:00	14	19:40 (T27)	20:32	41	07:53 (T28)	21:01
7	07:57	07:37			06:58		07:24 (T31)	07:06		07:33 (T28)	06:23		07:13 (T28)	05:59
	17:18	17:55			18:29	80	17:47 (T30)	20:01	29	19:40 (T27)	20:33	39	07:52 (T28)	21:01
8	07:57	07:36			07:56		08:24 (T31)	07:05		07:29 (T28)	06:21		07:13 (T28)	05:59
	17:19	17:56			19:30	77	18:45 (T30)	20:02	42	19:42 (T27)	20:34	37	07:50 (T28)	21:02
9	07:57	07:35			07:54		08:25 (T31)	07:03		07:25 (T28)	06:20		07:14 (T28)	05:59
	17:20	17:57			19:31	74	18:45 (T30)	20:03	51	19:43 (T27)	20:35	35	07:49 (T28)	21:02
10	07:57	07:34			07:53		08:25 (T31)	07:01		07:23 (T28)	06:19		07:15 (T28)	05:58
	17:21	17:59			19:32	72	18:44 (T30)	20:05	55	19:43 (T27)	20:37	33	07:48 (T28)	21:03
11	07:57	07:32			07:51		08:26 (T31)	07:00		07:21 (T28)	06:18		07:17 (T28)	05:58
	17:22	18:00			19:33	67	18:42 (T30)	20:06	62	19:45 (T27)	20:38	30	07:47 (T28)	21:04
12	07:56	07:31			07:50		08:28 (T31)	06:58		07:19 (T28)	06:17		07:18 (T28)	05:58
	17:23	18:01			19:34	61	18:41 (T30)	20:07	67	19:46 (T27)	20:39	27	07:45 (T28)	21:04
13	07:56	07:30			07:48		08:29 (T31)	06:56		07:18 (T28)	06:16		07:20 (T28)	05:58
	17:25	18:02			19:35	54	18:39 (T30)	20:08	71	19:47 (T27)	20:40	23	07:43 (T28)	21:05
14	07:56	07:29		17:20 (T30)	07:46		08:31 (T31)	06:55		07:16 (T28)	06:15		07:22 (T28)	05:58
	17:26	18:04	14	17:34 (T30)	19:36	46	18:37 (T30)	20:09	75	19:48 (T27)	20:41	19	07:41 (T28)	21:05
15	07:55	07:27		17:15 (T30)	07:45		08:35 (T31)	06:53		07:14 (T28)	06:14		07:24 (T28)	05:58
	17:27	18:05	22	17:37 (T30)	19:38	34	18:35 (T30)	20:10	77	19:47 (T27)	20:42	15	07:39 (T28)	21:06
16	07:55	07:26		17:13 (T30)	07:43		18:12 (T30)	06:52		07:14 (T28)	06:13		07:29 (T28)	05:58
	17:28	18:06	26	17:39 (T30)	19:39	20	18:32 (T30)	20:11	79	19:48 (T27)	20:43	4	07:33 (T28)	21:06
17	07:55	07:25		17:11 (T30)	07:41		18:17 (T30)	06:50		07:12 (T28)	06:12			05:58
	17:29	18:07	30	17:41 (T30)	19:40	9	18:26 (T30)	20:12	80	19:47 (T27)	20:44			21:06
18	07:54	07:23		17:09 (T30)	07:40			06:49		07:12 (T28)	06:11			05:58
	17:30	18:09	34	17:43 (T30)	19:41			20:13	81	19:47 (T27)	20:45			21:07
19	07:53	07:22		17:08 (T30)	07:38			06:47		07:11 (T28)	06:10			05:58
	17:31	18:10	37	17:45 (T30)	19:42			20:14	81	19:46 (T27)	20:46			21:07
20	07:53	07:21		17:06 (T30)	07:36			06:46		07:11 (T28)	06:09			05:58
	17:33	18:11	39	17:45 (T30)	19:43			20:15	80	19:45 (T27)	20:46			21:07
21	07:52	07:19		07:39 (T31)	07:35			06:44		07:10 (T28)	06:08			05:59
	17:34	18:12	52	17:47 (T30)	19:44			20:16	80	19:44 (T27)	20:47			21:08
22	07:52	07:18		07:37 (T31)	07:33			06:43		07:10 (T28)	06:08			05:59
	17:35	18:13	59	17:47 (T30)	19:45			20:17	79	19:44 (T27)	20:48			21:08
23	07:51	07:16		07:36 (T31)	07:31			06:41		07:10 (T28)	06:07			05:59
	17:36	18:15	63	17:48 (T30)	19:46			20:18	78	19:43 (T27)	20:49			21:08
24	07:50	07:15		07:34 (T31)	07:30			06:40		07:09 (T28)	06:06			05:59
	17:37	18:16	67	17:48 (T30)	19:47			20:20	75	19:41 (T27)	20:50			21:08
25	07:50	07:13		07:33 (T31)	07:28			06:38		07:09 (T28)	06:05			06:00
	17:39	18:17	72	17:49 (T30)	19:48			20:21	73	19:40 (T27)	20:51			21:08
26	07:49	07:12		07:31 (T31)	07:26			06:37		07:08 (T28)	06:05			06:00
	17:40	18:18	75	17:49 (T30)	19:50			20:22	69	19:37 (T27)	20:52			21:09
27	07:48	07:10		07:30 (T31)	07:24			06:36		07:09 (T28)	06:04			06:00
	17:41	18:19	76	17:49 (T30)	19:51			20:23	63	19:35 (T27)	20:53			21:09
28	07:47	07:09		07:28 (T31)	07:23			06:34		07:09 (T28)	06:03			06:01
	17:42	18:20	79	17:49 (T30)	19:52			20:24	50	07:59 (T28)	20:54			21:09
29	07:46				07:21			06:33		07:09 (T28)	06:03			06:01
	17:44				19:53			20:25	49	07:58 (T28)	20:55			21:09
30	07:45				07:19			06:31		07:09 (T28)	06:02			06:01
	17:45				19:54			20:26	48	07:57 (T28)	20:55			21:09
31	07:44				07:18						06:02			
	17:46				19:55						20:56			
Potential sun hours	297	297			370			399			449			453
Total, worst case			745			1093			1617			529		
Sun reduction			0.40			0.44			0.52			0.57		
Oper. time red.			1.00			1.00			1.00			1.00		
Wind dir. red.			0.67			0.65			0.63			0.66		
Total reduction			0.27			0.28			0.33			0.38		
Total, real			198			311			534			199		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 501 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6593)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		06:26		07:28 (T28)	06:57		07:20 (T28)	07:27		08:07 (T31)	07:02	07:37
	21:09		20:50	28	07:56 (T28)	20:07	62	19:44 (T27)	19:15	59	18:19 (T30)	17:28	17:04
2	06:02		06:27		07:27 (T28)	06:58		07:22 (T28)	07:29		08:05 (T31)	07:03	07:38
	21:08		20:49	31	07:58 (T28)	20:06	55	19:42 (T27)	19:13	64	18:20 (T30)	17:27	17:03
3	06:03		06:28		07:25 (T28)	06:59		07:23 (T28)	07:30		08:03 (T31)	07:04	07:39
	21:08		20:48	34	07:59 (T28)	20:04	51	19:41 (T27)	19:11	70	18:21 (T30)	17:25	17:03
4	06:03		06:29		07:24 (T28)	07:00		07:26 (T28)	07:31		08:02 (T31)	07:06	07:40
	21:08		20:47	36	08:00 (T28)	20:02	42	19:39 (T27)	19:10	72	18:21 (T30)	17:24	17:03
5	06:04		06:30		07:23 (T28)	07:01		07:30 (T28)	07:32		08:02 (T31)	07:07	07:41
	21:08		20:46	38	08:01 (T28)	20:01	30	19:38 (T27)	19:08	77	18:23 (T30)	17:23	17:03
6	06:05		06:31		07:22 (T28)	07:02		19:21 (T27)	07:33		08:01 (T31)	07:08	07:42
	21:08		20:45	40	08:02 (T28)	19:57	15	19:36 (T27)	19:06	79	18:23 (T30)	17:22	17:03
7	06:05		06:32		07:22 (T28)	07:03		19:25 (T27)	07:34		08:00 (T31)	07:09	07:43
	21:07		20:43	41	08:03 (T28)	19:56	9	19:34 (T27)	19:05	81	18:23 (T30)	17:21	17:02
8	06:06		06:33		07:21 (T28)	07:04			07:35		08:00 (T31)	07:10	07:44
	21:07		20:42	43	08:04 (T28)	19:54			19:03	82	18:23 (T30)	17:20	17:02
9	06:07		06:34		07:20 (T28)	07:05			07:36		07:59 (T31)	07:12	07:45
	21:07		20:41	45	08:05 (T28)	19:52			19:01	83	18:23 (T30)	17:19	17:02
10	06:07		06:35		07:19 (T28)	07:06			07:37		07:59 (T31)	07:13	07:46
	21:06		20:40	46	08:05 (T28)	19:51			19:00	83	18:23 (T30)	17:18	17:02
11	06:08		06:36		07:19 (T28)	07:07			07:38		07:58 (T31)	07:14	07:47
	21:06		20:38	47	08:06 (T28)	19:49			18:58	85	18:23 (T30)	17:17	17:02
12	06:09		06:37		07:18 (T28)	07:08			07:39		07:59 (T31)	07:15	07:47
	21:06		20:37	48	08:06 (T28)	19:47			18:57	82	18:22 (T30)	17:16	17:03
13	06:09		06:38		07:18 (T28)	07:09			07:40		08:00 (T31)	07:16	07:48
	21:05		20:36	48	08:06 (T28)	19:45			18:55	81	18:22 (T30)	17:15	17:03
14	06:10		06:39		07:16 (T28)	07:10			07:41		08:02 (T31)	07:18	07:49
	21:05		20:34	50	08:06 (T28)	19:44			18:53	79	18:22 (T30)	17:14	17:03
15	06:11		06:40		07:16 (T28)	07:11			07:42		08:03 (T31)	07:19	07:50
	21:04		20:33	56	19:38 (T27)	19:42			18:52	77	18:22 (T30)	17:13	17:03
16	06:12		06:41		07:15 (T28)	07:12			07:44		08:04 (T31)	07:20	07:50
	21:04		20:32	65	19:42 (T27)	19:40			18:50	73	18:21 (T30)	17:12	17:03
17	06:13		06:42		07:15 (T28)	07:13			07:45		08:05 (T31)	07:21	07:51
	21:03		20:30	69	19:44 (T27)	19:39			18:49	70	18:20 (T30)	17:11	17:04
18	06:13		06:43		07:15 (T28)	07:14			07:46		08:06 (T31)	07:22	07:52
	21:02		20:29	73	19:46 (T27)	19:37			18:47	66	18:19 (T30)	17:11	17:04
19	06:14		06:44		07:15 (T28)	07:15			07:47		08:07 (T31)	07:24	07:52
	21:02		20:27	76	19:47 (T27)	19:35			18:46	61	18:18 (T30)	17:10	17:04
20	06:15		06:45		07:15 (T28)	07:16			07:48		08:09 (T31)	07:25	07:53
	21:01		20:26	77	19:48 (T27)	19:33			18:44	57	18:18 (T30)	17:09	17:05
21	06:16		06:46		07:15 (T28)	07:17			07:49		08:10 (T31)	07:26	07:53
	21:00		20:24	79	19:49 (T27)	19:32			18:43	50	18:17 (T30)	17:08	17:05
22	06:17		06:47		07:15 (T28)	07:18			07:50		17:37 (T30)	07:27	07:54
	20:59		20:23	80	19:49 (T27)	19:30			18:41	38	18:15 (T30)	17:08	17:06
23	06:18		06:48		07:15 (T28)	07:19			07:51		17:38 (T30)	07:28	07:54
	20:59		20:21	80	19:49 (T27)	19:28			18:40	36	18:14 (T30)	17:07	17:06
24	06:19		06:49		07:15 (T28)	07:20			07:53		17:39 (T30)	07:29	07:55
	20:58		20:20	82	19:50 (T27)	19:27			18:39	33	18:12 (T30)	17:07	17:07
25	06:20		06:50		07:15 (T28)	07:21			07:54		17:42 (T30)	07:31	07:55
	20:57		20:18	81	19:50 (T27)	19:25			18:37	29	18:11 (T30)	17:06	17:07
26	06:20		06:51		07:15 (T28)	07:22			07:55		17:43 (T30)	07:32	07:56
	20:56		20:17	81	19:50 (T27)	19:23			18:36	26	18:09 (T30)	17:05	17:08
27	06:21		06:52		07:16 (T28)	07:23		17:55 (T30)	07:56		17:46 (T30)	07:33	07:56
	20:55		20:15	78	19:49 (T27)	19:21	17	18:12 (T30)	18:34	20	18:06 (T30)	17:05	17:09
28	06:22	07:37 (T28)	06:53		07:16 (T28)	07:24		17:52 (T30)	07:57		17:49 (T30)	07:34	07:56
	20:54	10 07:47 (T28)	20:14	77	19:49 (T27)	19:20	23	18:15 (T30)	18:33	12	18:01 (T30)	17:05	17:09
29	06:23	07:34 (T28)	06:54		07:17 (T28)	07:25		08:12 (T31)	07:58			07:35	07:57
	20:53	16 07:50 (T28)	20:12	75	19:49 (T27)	19:18	43	18:17 (T30)	18:32			17:04	17:10
30	06:24	07:31 (T28)	06:55		07:18 (T28)	07:26		08:09 (T31)	08:00			07:36	07:57
	20:52	22 07:53 (T28)	20:10	71	19:47 (T27)	19:16	52	18:18 (T30)	18:30			17:04	17:11
31	06:25	07:30 (T28)	06:56		07:19 (T28)				08:01				07:57
	20:51	25 07:55 (T28)	20:09	66	19:45 (T27)				18:29				17:12
Potential sun hours	460		429			375			345			297	287
Total, worst case		73		1841			399			1725			
Sun reduction		0.66		0.61			0.59			0.48			
Oper. time red.		1.00		1.00			1.00			1.00			
Wind dir. red.		0.66		0.64			0.64			0.65			
Total reduction		0.44		0.39			0.38			0.31			
Total, real		32		722			150			541			

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 510 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6600)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57			07:43		16:02 (T79)	07:07		15:58 (T79)	07:16			06:30			06:02		19:38 (T60)
	17:13			17:48	59	17:01 (T79)	18:22	114	17:52 (T62)	19:56			20:27			20:56	46	20:24 (T60)
2	07:57			07:42		16:01 (T79)	07:05		15:59 (T79)	07:14			06:29			06:01		19:38 (T60)
	17:14			17:49	62	17:03 (T79)	18:23	114	17:53 (T62)	19:57			20:28			20:57	47	20:25 (T60)
3	07:57			07:41		16:00 (T79)	07:04		15:59 (T79)	07:13			06:28			06:01		19:38 (T60)
	17:15			17:50	64	17:04 (T79)	18:24	113	17:52 (T62)	19:58			20:29			20:58	47	20:25 (T60)
4	07:57			07:40		16:00 (T79)	07:02		16:01 (T79)	07:11			06:26			06:00		19:38 (T60)
	17:16			17:51	65	17:05 (T79)	18:25	111	17:53 (T62)	19:59			20:30			20:59	47	20:25 (T60)
5	07:57			07:39		15:59 (T79)	07:01		16:01 (T79)	07:09			06:25			06:00		19:39 (T60)
	17:17			17:53	67	17:06 (T79)	18:26	109	17:52 (T62)	20:00			20:31			20:59	47	20:26 (T60)
6	07:57			07:38		15:59 (T79)	06:59		16:02 (T79)	07:08			06:24			06:00		19:38 (T60)
	17:18			17:54	68	17:07 (T79)	18:27	107	17:52 (T62)	20:00			20:32			21:00	47	20:25 (T60)
7	07:57			07:37		15:58 (T79)	06:58		16:03 (T79)	07:06			06:23			05:59		19:39 (T60)
	17:19			17:55	70	17:08 (T79)	18:29	105	17:52 (T62)	20:01			20:33			21:01	47	20:26 (T60)
8	07:57			07:36		15:58 (T79)	07:56		17:04 (T79)	07:05			06:22			05:59		19:39 (T60)
	17:20			17:56	71	17:09 (T79)	19:30	102	18:51 (T62)	20:02			20:34			21:01	47	20:26 (T60)
9	07:57			07:35		15:57 (T79)	07:54		17:06 (T79)	07:03			06:20			05:59		19:39 (T60)
	17:21			17:58	72	17:09 (T79)	19:31	98	18:51 (T62)	20:03			20:35			21:02	47	20:26 (T60)
10	07:56			07:33		15:56 (T79)	07:53		17:08 (T79)	07:01			06:19		19:56 (T60)	05:59		19:40 (T60)
	17:22			17:59	73	17:09 (T79)	19:32	93	18:50 (T62)	20:04			20:36	7	20:03 (T60)	21:03	47	20:27 (T60)
11	07:56			07:32		15:56 (T79)	07:51		17:09 (T79)	07:00			06:18		19:51 (T60)	05:59		19:40 (T60)
	17:23			18:00	74	17:10 (T79)	19:33	89	18:49 (T62)	20:05			20:37	16	20:07 (T60)	21:03	47	20:27 (T60)
12	07:56			07:31		15:56 (T79)	07:49		17:12 (T79)	06:58			06:17		19:49 (T60)	05:58		19:40 (T60)
	17:24			18:01	75	17:11 (T79)	19:34	83	18:49 (T62)	20:06			20:38	21	20:10 (T60)	21:04	47	20:27 (T60)
13	07:56			07:30		15:55 (T79)	07:48		17:13 (T79)	06:57			06:16		19:47 (T60)	05:58		19:41 (T60)
	17:25			18:02	76	17:11 (T79)	19:35	77	18:47 (T62)	20:07			20:39	25	20:12 (T60)	21:04	47	20:28 (T60)
14	07:55			07:28		15:55 (T79)	07:46		17:16 (T79)	06:55			06:15		19:45 (T60)	05:58		19:40 (T60)
	17:26			18:04	76	17:11 (T79)	19:36	68	18:45 (T62)	20:09			20:40	28	20:13 (T60)	21:05	47	20:27 (T60)
15	07:55			07:27		15:55 (T79)	07:44		17:20 (T79)	06:53			06:14		19:45 (T60)	05:58		19:41 (T60)
	17:27			18:05	77	17:12 (T79)	19:37	59	18:45 (T62)	20:10			20:41	30	20:15 (T60)	21:05	47	20:28 (T60)
16	07:54			07:26		15:55 (T79)	07:43		17:25 (T79)	06:52			06:13		19:44 (T60)	05:58		19:41 (T60)
	17:28			18:06	76	17:11 (T79)	19:39	45	18:42 (T62)	20:11			20:42	32	20:16 (T60)	21:05	47	20:28 (T60)
17	07:54			07:24		15:55 (T79)	07:41		18:14 (T62)	06:50			06:12		19:43 (T60)	05:58		19:41 (T60)
	17:29			18:07	77	17:12 (T79)	19:40	26	18:40 (T62)	20:12			20:43	34	20:17 (T60)	21:06	47	20:28 (T60)
18	07:54			07:23		15:55 (T79)	07:39		18:16 (T62)	06:49			06:11		19:42 (T60)	05:58		19:41 (T60)
	17:30			18:09	83	17:35 (T62)	19:41	22	18:38 (T62)	20:13			20:44	36	20:18 (T60)	21:06	47	20:28 (T60)
19	07:53		16:25 (T79)	07:22		15:55 (T79)	07:38		18:19 (T62)	06:47			06:10		19:41 (T60)	05:59		19:41 (T60)
	17:32	7	16:32 (T79)	18:10	94	17:40 (T62)	19:42	15	18:34 (T62)	20:14			20:45	38	20:19 (T60)	21:07	47	20:28 (T60)
20	07:52		16:21 (T79)	07:20		15:55 (T79)	07:36			06:46			06:09		19:40 (T60)	05:59		19:42 (T60)
	17:33	18	16:39 (T79)	18:11	100	17:43 (T62)	19:43			20:15			20:46	39	20:19 (T60)	21:07	46	20:28 (T60)
21	07:52		16:17 (T79)	07:19		15:55 (T79)	07:34			06:44			06:09		19:40 (T60)	05:59		19:42 (T60)
	17:34	25	16:42 (T79)	18:12	104	17:44 (T62)	19:44			20:16			20:47	41	20:21 (T60)	21:07	47	20:29 (T60)
22	07:51		16:15 (T79)	07:17		15:55 (T79)	07:33			06:43			06:08		19:40 (T60)	05:59		19:42 (T60)
	17:35	30	16:45 (T79)	18:13	108	17:47 (T62)	19:45			20:17			20:48	41	20:21 (T60)	21:07	46	20:28 (T60)
23	07:51		16:13 (T79)	07:16		15:55 (T79)	07:31			06:41			06:07		19:39 (T60)	05:59		19:43 (T60)
	17:36	34	16:47 (T79)	18:15	109	17:47 (T62)	19:46			20:18			20:49	42	20:21 (T60)	21:08	46	20:29 (T60)
24	07:50		16:12 (T79)	07:14		15:56 (T79)	07:29			06:40			06:06		19:38 (T60)	06:00		19:42 (T60)
	17:38	38	16:50 (T79)	18:16	111	17:49 (T62)	19:47			20:19			20:50	43	20:21 (T60)	21:08	47	20:29 (T60)
25	07:49		16:10 (T79)	07:13		15:55 (T79)	07:28			06:38			06:06		19:39 (T60)	06:00		19:42 (T60)
	17:39	42	16:52 (T79)	18:17	114	17:50 (T62)	19:48			20:20			20:51	43	20:22 (T60)	21:08	47	20:29 (T60)
26	07:48		16:08 (T79)	07:11		15:56 (T79)	07:26			06:37			06:05		19:38 (T60)	06:00		19:43 (T60)
	17:40	45	16:53 (T79)	18:18	115	17:51 (T62)	19:49			20:21			20:51	44	20:22 (T60)	21:08	47	20:30 (T60)
27	07:48		16:07 (T79)	07:10		15:56 (T79)	07:24			06:36			06:04		19:39 (T60)	06:01		19:43 (T60)
	17:41	48	16:55 (T79)	18:19	115	17:51 (T62)	19:50			20:22			20:52	44	20:23 (T60)	21:08	47	20:30 (T60)
28	07:47		16:06 (T79)	07:08		15:57 (T79)	07:23			06:34			06:04		19:38 (T60)	06:01		19:43 (T60)
	17:43	50	16:56 (T79)	18:20	115	17:52 (T62)	19:51			20:23			20:53	45	20:23 (T60)	21:08	47	20:30 (T60)
29	07:46		16:05 (T79)				07:21			06:33			06:03		19:39 (T60)	06:01		19:44 (T60)
	17:44	53	16:58 (T79)				19:53			20:25			20:54	45	20:24 (T60)	21:08	47	20:31 (T60)
30	07:45		16:04 (T79)				07:19			06:32			06:03		19:38 (T60)	06:02		19:43 (T60)
	17:45	55	16:59 (T79)				19:54			20:26			20:55	46	20:24 (T60)	21:08	47	20:30 (T60)
31	07:44		16:03 (T79)				07:18						06:02		19:39 (T60)			
	17:46	57	17:00 (T79)				19:55						20:56	46	20:25 (T60)			
Potential sun hours	297			297			370			399			448			452		
Total, worst case		502			2370			1550						786			1406	
Sun reduction		0.31			0.40			0.44						0.57			0.64	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.73			0.72			0.71						0.55			0.55	
Total reduction		0.23			0.29			0.32						0.32			0.36	
Total, real		116			699			494						253			508	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 510 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6600)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December	
1	06:02		19:44 (T60)	06:26		20:00 (T60)	06:57			07:27		16:51 (T79)	07:02		15:26 (T79)	07:37	
	21:08	47	20:31 (T60)	20:50	20	20:20 (T60)	20:07			19:15	81	18:27 (T62)	17:28	73	16:39 (T79)	17:04	
2	06:03		19:44 (T60)	06:27		20:03 (T60)	06:58			07:28		16:48 (T79)	07:03		15:27 (T79)	07:38	
	21:08	47	20:31 (T60)	20:49	14	20:17 (T60)	20:05			19:13	87	18:27 (T62)	17:27	71	16:38 (T79)	17:04	
3	06:03		19:44 (T60)	06:28			06:59			07:29		16:46 (T79)	07:04		15:27 (T79)	07:39	
	21:08	48	20:32 (T60)	20:48			20:04			19:11	92	18:28 (T62)	17:26	70	16:37 (T79)	17:03	
4	06:04		19:44 (T60)	06:29			07:00			07:30		16:44 (T79)	07:05		15:28 (T79)	07:40	
	21:08	47	20:31 (T60)	20:46			20:02			19:10	96	18:28 (T62)	17:24	69	16:37 (T79)	17:03	
5	06:04		19:45 (T60)	06:30			07:01			07:32		16:42 (T79)	07:06		15:29 (T79)	07:41	
	21:07	47	20:32 (T60)	20:45			20:00			19:08	100	18:28 (T62)	17:23	68	16:37 (T79)	17:03	
6	06:05		19:44 (T60)	06:31			07:02			07:33		16:40 (T79)	07:08		15:29 (T79)	07:42	
	21:07	47	20:31 (T60)	20:44			19:57			19:06	104	18:28 (T62)	17:22	67	16:36 (T79)	17:03	
7	06:06		19:45 (T60)	06:32			07:03			07:34		16:38 (T79)	07:09		15:31 (T79)	07:43	
	21:07	47	20:32 (T60)	20:43			19:55			19:05	106	18:27 (T62)	17:21	65	16:36 (T79)	17:03	
8	06:06		19:46 (T60)	06:33			07:04			07:35		16:37 (T79)	07:10		15:31 (T79)	07:43	
	21:07	46	20:32 (T60)	20:42			19:54			19:03	109	18:28 (T62)	17:20	63	16:34 (T79)	17:03	
9	06:07		19:45 (T60)	06:34			07:05			07:36		16:36 (T79)	07:11		15:32 (T79)	07:44	
	21:06	47	20:32 (T60)	20:40			19:52			19:01	111	18:28 (T62)	17:19	61	16:33 (T79)	17:03	
10	06:08		19:46 (T60)	06:35			07:06			07:37		16:34 (T79)	07:12		15:33 (T79)	07:45	
	21:06	46	20:32 (T60)	20:39			19:50			19:00	112	18:27 (T62)	17:18	59	16:32 (T79)	17:03	
11	06:08		19:46 (T60)	06:36			07:07			07:38		16:33 (T79)	07:14		15:35 (T79)	07:46	
	21:06	47	20:33 (T60)	20:38			19:49			18:58	114	18:27 (T62)	17:17	57	16:32 (T79)	17:03	
12	06:09		19:46 (T60)	06:37			07:08			07:39		16:32 (T79)	07:15		15:36 (T79)	07:47	
	21:05	46	20:32 (T60)	20:37			19:47			18:57	114	18:26 (T62)	17:16	55	16:31 (T79)	17:03	
13	06:10		19:46 (T60)	06:38			07:09			07:40		16:31 (T79)	07:16		15:37 (T79)	07:48	
	21:05	46	20:32 (T60)	20:35			19:45			18:55	114	18:25 (T62)	17:15	52	16:29 (T79)	17:03	
14	06:11		19:47 (T60)	06:39			07:10			07:41		16:30 (T79)	07:17		15:39 (T79)	07:48	
	21:04	45	20:32 (T60)	20:34			19:44			18:53	114	18:24 (T62)	17:14	50	16:29 (T79)	17:03	
15	06:11		19:47 (T60)	06:40			07:11			07:42		16:29 (T79)	07:18		15:40 (T79)	07:49	
	21:04	46	20:33 (T60)	20:33			19:42			18:52	114	18:23 (T62)	17:13	48	16:28 (T79)	17:03	
16	06:12		19:47 (T60)	06:41			07:12			07:43		16:29 (T79)	07:20		15:41 (T79)	07:50	
	21:03	45	20:32 (T60)	20:31			19:40			18:50	114	18:23 (T62)	17:12	45	16:26 (T79)	17:04	
17	06:13		19:47 (T60)	06:42			07:13			07:44		16:28 (T79)	07:21		15:43 (T79)	07:51	
	21:02	45	20:32 (T60)	20:30			19:38			18:49	113	18:22 (T62)	17:12	41	16:24 (T79)	17:04	
18	06:14		19:48 (T60)	06:43			07:14			07:46		16:27 (T79)	07:22		15:46 (T79)	07:51	
	21:02	44	20:32 (T60)	20:28			19:37			18:47	111	18:20 (T62)	17:11	38	16:24 (T79)	17:04	
19	06:15		19:49 (T60)	06:44			07:15			07:47		16:26 (T79)	07:23		15:48 (T79)	07:52	
	21:01	43	20:32 (T60)	20:27			19:35			18:46	110	18:19 (T62)	17:10	34	16:22 (T79)	17:05	
20	06:15		19:49 (T60)	06:45			07:16			07:48		16:26 (T79)	07:24		15:50 (T79)	07:52	
	21:00	43	20:32 (T60)	20:25			19:33			18:44	106	18:17 (T62)	17:09	30	16:20 (T79)	17:05	
21	06:16		19:49 (T60)	06:46			07:17			07:49		16:25 (T79)	07:25		15:52 (T79)	07:53	
	21:00	42	20:31 (T60)	20:24			19:32			18:43	103	18:14 (T62)	17:09	25	16:17 (T79)	17:06	
22	06:17		19:50 (T60)	06:47			07:18			07:50		16:26 (T79)	07:27		15:57 (T79)	07:53	
	20:59	40	20:30 (T60)	20:22			19:30			18:41	99	18:13 (T62)	17:08	18	16:15 (T79)	17:06	
23	06:18		19:50 (T60)	06:48			07:19			07:51		16:25 (T79)	07:28		16:02 (T79)	07:54	
	20:58	40	20:30 (T60)	20:21			19:28			18:40	92	18:09 (T62)	17:07	8	16:10 (T79)	17:07	
24	06:19		19:51 (T60)	06:49			07:20		18:05 (T62)	07:52		16:25 (T79)	07:29			07:54	
	20:57	38	20:29 (T60)	20:19			19:26	11	18:16 (T62)	18:39	77	17:42 (T79)	17:07			17:07	
25	06:20		19:52 (T60)	06:50			07:21		18:00 (T62)	07:53		16:25 (T79)	07:30			07:55	
	20:56	37	20:29 (T60)	20:18			19:25	19	18:19 (T62)	18:37	77	17:42 (T79)	17:06			17:08	
26	06:21		19:53 (T60)	06:51			07:22		17:57 (T62)	07:55		16:24 (T79)	07:31			07:55	
	20:56	35	20:28 (T60)	20:16			19:23	25	18:22 (T62)	18:36	77	17:41 (T79)	17:06			17:08	
27	06:22		19:54 (T60)	06:52			07:23		17:09 (T79)	07:56		16:25 (T79)	07:32			07:56	
	20:55	34	20:28 (T60)	20:15			19:21	38	18:23 (T62)	18:34	76	17:41 (T79)	17:05			17:09	
28	06:23		19:55 (T60)	06:53			07:24		17:02 (T79)	07:57		16:25 (T79)	07:33			07:56	
	20:54	32	20:27 (T60)	20:13			19:20	55	18:25 (T62)	18:33	76	17:41 (T79)	17:05			17:10	
29	06:23		19:55 (T60)	06:54			07:25		16:58 (T79)	07:58		16:25 (T79)	07:34			07:56	
	20:53	30	20:25 (T60)	20:12			19:18	66	18:26 (T62)	18:32	75	17:40 (T79)	17:04			17:11	
30	06:24		19:57 (T60)	06:55			07:26		16:54 (T79)	07:59		16:25 (T79)	07:36			07:56	
	20:52	26	20:23 (T60)	20:10			19:16	73	18:26 (T62)	18:31	75	17:40 (T79)	17:04			17:11	
31	06:25		19:58 (T60)	06:56						08:00		16:26 (T79)				07:57	
	20:51	24	20:22 (T60)	20:09						18:29	74	17:40 (T79)				17:12	
Potential sun hours	459			428			375			345			298			288	
Total, worst case		1297			34			287			3023			1167			
Sun reduction		0.66			0.61			0.59			0.48			0.30			
Oper. time red.		1.00			1.00			1.00			1.00			1.00			
Wind dir. red.		0.55			0.55			0.70			0.71			0.73			
Total reduction		0.37			0.34			0.42			0.35			0.22			
Total, real		483			12			121			1061			260			

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 518 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6605)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May		June		July		August		September	October	November	December
1	07:57	07:43	07:07	07:16	06:30		06:02		06:39 (T46)	06:02	06:44 (T46)	06:26	07:06 (T46)	06:57	07:28	07:02	07:37
	17:13	17:48	18:22	19:56	20:27		20:57	68	07:47 (T46)	21:08 71	07:55 (T46)	20:50 32	07:38 (T46)	20:07	19:15	17:28	17:04
2	07:57	07:42	07:06	07:15	06:29		06:01		06:40 (T46)	06:03	06:44 (T46)	06:27	07:09 (T46)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57	20:28		20:58	68	07:48 (T46)	21:08 71	07:55 (T46)	20:49 27	07:36 (T46)	20:06	19:13	17:27	17:04
3	07:57	07:41	07:04	07:13	06:28		06:01		06:39 (T46)	06:03	06:44 (T46)	06:28	07:12 (T46)	06:59	07:30	07:04	07:39
	17:15	17:50	18:24	19:58	20:29		20:58	69	07:48 (T46)	21:08 71	07:55 (T46)	20:48 20	07:32 (T46)	20:04	19:11	17:26	17:03
4	07:57	07:40	07:03	07:11	06:26		06:00		06:39 (T46)	06:04	06:44 (T46)	06:29	07:18 (T46)	07:00	07:31	07:06	07:40
	17:16	17:51	18:25	19:59	20:30		20:59	69	07:48 (T46)	21:08 71	07:55 (T46)	20:47 9	07:27 (T46)	20:02	19:10	17:24	17:03
5	07:57	07:39	07:01	07:10	06:25		06:00		06:39 (T46)	06:04	06:45 (T46)	06:30		07:01	07:32	07:07	07:41
	17:17	17:53	18:26	20:00	20:31		21:00	70	07:49 (T46)	21:08 70	07:55 (T46)	20:46		20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08	06:24		06:00		06:40 (T46)	06:05	06:45 (T46)	06:31		07:02	07:33	07:08	07:42
	17:18	17:54	18:28	20:00	20:32		21:00	70	07:50 (T46)	21:08 70	07:55 (T46)	20:44		19:57	19:06	17:22	17:03
7	07:57	07:37	06:58	07:06	06:23		05:59		06:39 (T46)	06:06	06:45 (T46)	06:32		07:03	07:34	07:09	07:43
	17:19	17:55	18:29	20:01	20:33		21:01	70	07:49 (T46)	21:07 70	07:55 (T46)	20:43		19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05	06:22		05:59		06:39 (T46)	06:06	06:46 (T46)	06:33		07:04	07:35	07:10	07:44
	17:20	17:56	19:30	20:02	20:34		21:02	71	07:50 (T46)	21:07 70	07:56 (T46)	20:42		19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03	06:20	07:06 (T46)	05:59		06:39 (T46)	06:07	06:46 (T46)	06:34		07:05	07:36	07:12	07:45
	17:21	17:58	19:31	20:04	20:35 14	07:20 (T46)	21:02	71	07:50 (T46)	21:07 69	07:55 (T46)	20:41		19:52	19:02	17:19	17:03
10	07:57	07:34	07:53	07:01	06:19	07:01 (T46)	05:59		06:39 (T46)	06:08	06:47 (T46)	06:35		07:06	07:37	07:13	07:46
	17:22	17:59	19:32	20:05	20:36 23	07:24 (T46)	21:03	72	07:51 (T46)	21:06 68	07:55 (T46)	20:40		19:51	19:00	17:18	17:03
11	07:57	07:32	07:51	07:00	06:18	06:58 (T46)	05:59		06:40 (T46)	06:08	06:47 (T46)	06:36		07:07	07:38	07:14	07:46
	17:23	18:00	19:33	20:06	20:37 29	07:27 (T46)	21:04	71	07:51 (T46)	21:06 68	07:55 (T46)	20:38		19:49	18:58	17:17	17:03
12	07:56	07:31	07:50	06:58	06:17	06:56 (T46)	05:58		06:40 (T46)	06:09	06:47 (T46)	06:37		07:08	07:39	07:15	07:47
	17:24	18:01	19:34	20:07	20:38 34	07:30 (T46)	21:04	71	07:51 (T46)	21:06 67	07:54 (T46)	20:37		19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57	06:16	06:54 (T46)	05:58		06:40 (T46)	06:10	06:48 (T46)	06:38		07:09	07:40	07:16	07:48
	17:25	18:03	19:35	20:08	20:40 38	07:32 (T46)	21:05	72	07:52 (T46)	21:05 67	07:55 (T46)	20:36		19:46	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55	06:15	06:52 (T46)	05:58		06:40 (T46)	06:11	06:49 (T46)	06:39		07:10	07:41	07:18	07:49
	17:26	18:04	19:37	20:09	20:41 41	07:33 (T46)	21:05	72	07:52 (T46)	21:05 66	07:55 (T46)	20:34		19:44	18:54	17:14	17:03
15	07:55	07:27	07:45	06:54	06:14	06:50 (T46)	05:58		06:40 (T46)	06:11	06:49 (T46)	06:40		07:11	07:43	07:19	07:50
	17:27	18:05	19:38	20:10	20:42 45	07:35 (T46)	21:05	72	07:52 (T46)	21:04 66	07:55 (T46)	20:33		19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52	06:13	06:49 (T46)	05:58		06:40 (T46)	06:12	06:49 (T46)	06:41		07:12	07:44	07:20	07:50
	17:28	18:06	19:39	20:11	20:43 47	07:36 (T46)	21:06	72	07:52 (T46)	21:03 65	07:54 (T46)	20:31		19:40	18:51	17:12	17:04
17	07:54	07:25	07:41	06:50	06:12	06:48 (T46)	05:58		06:40 (T46)	06:13	06:50 (T46)	06:42		07:13	07:45	07:21	07:51
	17:29	18:07	19:40	20:12	20:43 49	07:37 (T46)	21:06	73	07:53 (T46)	21:03 63	07:53 (T46)	20:30		19:39	18:49	17:12	17:04
18	07:54	07:23	07:40	06:49	06:11	06:47 (T46)	05:58		06:40 (T46)	06:14	06:51 (T46)	06:43		07:14	07:46	07:22	07:52
	17:30	18:09	19:41	20:13	20:44 51	07:38 (T46)	21:07	73	07:53 (T46)	21:02 62	07:53 (T46)	20:29		19:37	18:47	17:11	17:04
19	07:53	07:22	07:38	06:47	06:10	06:45 (T46)	05:59		06:41 (T46)	06:15	06:52 (T46)	06:44		07:15	07:47	07:24	07:52
	17:32	18:10	19:42	20:14	20:45 54	07:39 (T46)	21:07	72	07:53 (T46)	21:02 61	07:53 (T46)	20:27		19:35	18:46	17:10	17:05
20	07:53	07:21	07:36	06:46	06:10	06:44 (T46)	05:59		06:41 (T46)	06:15	06:53 (T46)	06:45		07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	20:46 55	07:39 (T46)	21:07	72	07:53 (T46)	21:01 60	07:53 (T46)	20:26		19:34	18:44	17:09	17:05
21	07:52	07:19	07:35	06:44	06:09	06:44 (T46)	05:59		06:41 (T46)	06:16	06:52 (T46)	06:46		07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16	20:47 57	07:41 (T46)	21:08	72	07:53 (T46)	21:00 59	07:51 (T46)	20:24		19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43	06:08	06:43 (T46)	05:59		06:41 (T46)	06:17	06:53 (T46)	06:47		07:18	07:50	07:27	07:54
	17:35	18:14	19:45	20:17	20:48 59	07:42 (T46)	21:08	72	07:53 (T46)	20:59 58	07:51 (T46)	20:23		19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:41	06:07	06:43 (T46)	05:59		06:42 (T46)	06:18	06:54 (T46)	06:48		07:19	07:51	07:28	07:54
	17:36	18:15	19:46	20:18	20:49 59	07:42 (T46)	21:08	72	07:54 (T46)	20:59 56	07:50 (T46)	20:21		19:28	18:40	17:07	17:07
24	07:50	07:15	07:30	06:40	06:06	06:42 (T46)	06:00		06:42 (T46)	06:19	06:55 (T46)	06:49		07:20	07:53	07:29	07:55
	17:38	18:16	19:47	20:20	20:50 60	07:42 (T46)	21:08	72	07:54 (T46)	20:58 55	07:50 (T46)	20:20		19:27	18:39	17:07	17:07
25	07:49	07:13	07:28	06:39	06:06	06:42 (T46)	06:00		06:41 (T46)	06:20	06:56 (T46)	06:50		07:21	07:54	07:30	07:55
	17:39	18:17	19:49	20:21	20:51 62	07:44 (T46)	21:08	73	07:54 (T46)	20:57 53	07:49 (T46)	20:18		19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	06:05	06:41 (T46)	06:00		06:42 (T46)	06:21	06:58 (T46)	06:51		07:22	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	20:52 63	07:44 (T46)	21:08	72	07:54 (T46)	20:56 50	07:48 (T46)	20:17		19:23	18:36	17:06	17:08
27	07:48	07:10	07:25	06:36	06:04	06:41 (T46)	06:01		06:42 (T46)	06:22	06:59 (T46)	06:52		07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23	20:53 64	07:45 (T46)	21:08	72	07:54 (T46)	20:55 48	07:47 (T46)	20:15		19:22	18:35	17:05	17:09
28	07:47	07:09	07:23	06:34	06:04	06:40 (T46)	06:01		06:42 (T46)	06:23	07:00 (T46)	06:53		07:24	07:57	07:34	07:56
	17:43	18:21	19:52	20:24	20:54 65	07:45 (T46)	21:09	72	07:54 (T46)	20:54 46	07:46 (T46)	20:14		19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:03	06:41 (T46)	06:01		06:43 (T46)	06:24	07:02 (T46)	06:54		07:25	07:58	07:35	07:57
	17:44		19:53	20:25	20:54 65	07:46 (T46)	21:09	72	07:55 (T46)	20:53 43	07:45 (T46)	20:12		19:18	18:32	17:04	17:11
30	07:45		07:20	06:32	06:03	06:40 (T46)	06:02		06:43 (T46)	06:24	07:02 (T46)	06:55		07:27	08:00	07:36	07:57
	17:45		19:54	20:26	20:55 66	07:46 (T46)	21:09	71	07:54 (T46)	20:52 40	07:42 (T46)	20:10		19:16	18:31	17:04	17:11
31	07:44		07:18		06:02	06:40 (T46)				06:25	07:04 (T46)	06:56			08:01		07:57
	17:46		19:55		20:56 67	07:47 (T46)				20:51 36	07:40 (T46)	20:09			18:29		17:12
Potential sun hours	297	297	370	399	448		453		460		429		375	345	297	287	
Total, worst case					1167		2138		1890		88						
Sun reduction					0.57		0.64		0.66		0.61						
Oper. time red.					1.00		1.00		1.00		1.00						
Wind dir. red.					0.71		0.71		0.71		0.71						
Total reduction					0.40		0.45		0.47		0.43						
Total, real					471		969		883		38						

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 569 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6649)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April		May		June		July		August		September	October	November	December
1	07:57	07:43	07:07	07:16		06:30		06:58 (T36)	06:01	19:27 (T35)	06:02	19:38 (T35)	06:26	07:19 (T36)	06:57	07:27	07:02	07:37
	17:13	17:47	18:22	19:56		20:27	68	20:02 (T35)	20:57	38	20:05 (T35)	21:09	30	20:08 (T35)	20:50	58	20:18 (T35)	20:07	19:15	17:28	17:04
2	07:57	07:42	07:06	07:14		06:29		06:59 (T36)	06:01		19:28 (T35)	06:02		19:37 (T35)	06:27		07:16 (T36)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57		20:28	69	20:03 (T35)	20:58	37	20:05 (T35)	21:08	31	20:08 (T35)	20:49	63	20:18 (T35)	20:06	19:13	17:27	17:03
3	07:57	07:41	07:04	07:13		06:28		06:58 (T36)	06:00		19:28 (T35)	06:03		19:37 (T35)	06:28		07:15 (T36)	06:59	07:30	07:04	07:39
	17:15	17:50	18:24	19:58		20:29	70	20:03 (T35)	20:58	37	20:05 (T35)	21:08	32	20:09 (T35)	20:48	65	20:17 (T35)	20:04	19:11	17:25	17:03
4	07:58	07:40	07:02	07:11		06:26		06:59 (T36)	06:00		19:29 (T35)	06:04		19:37 (T35)	06:29		07:13 (T36)	07:00	07:31	07:06	07:40
	17:15	17:51	18:25	19:59		20:30	71	20:04 (T35)	20:59	36	20:05 (T35)	21:08	32	20:09 (T35)	20:47	67	20:17 (T35)	20:02	19:10	17:24	17:03
5	07:58	07:39	07:01	07:09		06:25		07:00 (T36)	06:00		19:30 (T35)	06:04		19:37 (T35)	06:30		07:12 (T36)	07:01	07:32	07:07	07:41
	17:16	17:52	18:26	20:00		20:31	70	20:05 (T35)	21:00	35	20:05 (T35)	21:08	33	20:10 (T35)	20:46	69	20:16 (T35)	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08		06:24		07:01 (T36)	05:59		19:30 (T35)	06:05		19:36 (T35)	06:31		07:11 (T36)	07:02	07:33	07:08	07:42
	17:17	17:54	18:27	20:00		20:32	70	20:06 (T35)	21:01	34	20:04 (T35)	21:08	34	20:10 (T35)	20:44	71	20:16 (T35)	19:57	19:06	17:22	17:03
7	07:57	07:37	06:58	07:06		06:23		07:02 (T36)	05:59		19:30 (T35)	06:05		19:36 (T35)	06:32		07:10 (T36)	07:03	07:34	07:09	07:43
	17:18	17:55	18:29	20:01		20:33	69	20:06 (T35)	21:01	34	20:04 (T35)	21:07	35	20:11 (T35)	20:43	70	20:15 (T35)	19:56	19:05	17:21	17:02
8	07:57	07:36	07:56	07:05		06:21		07:03 (T36)	05:59		19:31 (T35)	06:06		19:35 (T35)	06:33		07:09 (T36)	07:04	07:35	07:10	07:44
	17:19	17:56	19:30	20:02		20:34	68	20:07 (T35)	21:02	33	20:04 (T35)	21:07	36	20:11 (T35)	20:42	72	20:15 (T35)	19:54	19:03	17:20	17:02
9	07:57	07:35	07:54	07:03		06:20		07:03 (T36)	05:59		19:32 (T35)	06:07		19:35 (T35)	06:34		07:09 (T36)	07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03		20:35	66	20:06 (T35)	21:02	32	20:04 (T35)	21:08	37	20:12 (T35)	20:41	71	20:14 (T35)	19:52	19:01	17:19	17:02
10	07:57	07:34	07:53	07:01		06:19		07:05 (T36)	05:58		19:32 (T35)	06:07		19:35 (T35)	06:35		07:08 (T36)	07:06	07:37	07:13	07:46
	17:21	17:59	19:32	20:05		20:36	64	20:07 (T35)	21:03	31	20:03 (T35)	21:06	38	20:13 (T35)	20:40	70	20:13 (T35)	19:51	19:00	17:18	17:02
11	07:57	07:32	07:51	07:00		06:18		07:07 (T36)	05:58		19:32 (T35)	06:08		19:35 (T35)	06:36		07:07 (T36)	07:07	07:38	07:14	07:47
	17:22	18:00	19:33	20:06		20:38	61	20:07 (T35)	21:04	31	20:03 (T35)	21:06	37	20:12 (T35)	20:38	70	20:12 (T35)	19:49	18:58	17:17	17:03
12	07:56	07:31	07:50	06:58		06:17		07:10 (T36)	05:58		19:33 (T35)	06:09		19:35 (T35)	06:37		07:07 (T36)	07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:07		20:39	55	20:07 (T35)	21:04	30	20:03 (T35)	21:06	38	20:13 (T35)	20:37	67	20:10 (T35)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:56		06:16		19:21 (T35)	05:58		19:34 (T35)	06:09		19:35 (T35)	06:38		07:07 (T36)	07:09	07:40	07:16	07:48
	17:25	18:02	19:35	20:08		20:40	46	20:07 (T35)	21:05	29	20:03 (T35)	21:05	39	20:14 (T35)	20:36	65	20:09 (T35)	19:45	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55		06:15		19:21 (T35)	05:58		19:34 (T35)	06:10		19:35 (T35)	06:39		07:05 (T36)	07:10	07:41	07:18	07:49
	17:26	18:04	19:36	20:09		20:41	46	20:07 (T35)	21:05	29	20:03 (T35)	21:05	40	20:15 (T35)	20:34	62	20:06 (T35)	19:44	18:53	17:14	17:03
15	07:55	07:27	07:45	06:53	07:12 (T36)	06:14		19:21 (T35)	05:58		19:35 (T35)	06:11		19:34 (T35)	06:40		07:05 (T36)	07:11	07:42	07:19	07:50
	17:27	18:05	19:38	20:10	13 07:25 (T36)	20:42	46	20:07 (T35)	21:06	28	20:03 (T35)	21:04	40	20:14 (T35)	20:33	58	20:04 (T35)	19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52	07:11 (T36)	06:13		19:21 (T35)	05:58		19:35 (T35)	06:12		19:34 (T35)	06:41		07:05 (T36)	07:12	07:44	07:20	07:50
	17:28	18:06	19:39	20:11	17 07:28 (T36)	20:43	46	20:07 (T35)	21:06	27	20:02 (T35)	21:04	41	20:15 (T35)	20:31	53	20:01 (T35)	19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50	07:09 (T36)	06:12		19:22 (T35)	05:58		19:35 (T35)	06:13		19:33 (T35)	06:42		07:05 (T36)	07:13	07:45	07:21	07:51
	17:29	18:07	19:40	20:12	20 07:29 (T36)	20:44	46	20:08 (T35)	21:06	27	20:02 (T35)	21:03	43	20:16 (T35)	20:30	42	19:55 (T35)	19:39	18:49	17:11	17:04
18	07:54	07:23	07:40	06:49	07:08 (T36)	06:11		19:22 (T35)	05:58		19:36 (T35)	06:13		19:33 (T35)	06:43		07:05 (T36)	07:14	07:46	07:22	07:52
	17:30	18:09	19:41	20:13	23 07:31 (T36)	20:45	46	20:08 (T35)	21:07	26	20:02 (T35)	21:02	43	20:16 (T35)	20:29	35	07:40 (T36)	19:37	18:47	17:11	17:04
19	07:53	07:22	07:38	06:47	07:06 (T36)	06:10		19:22 (T35)	05:58		19:37 (T35)	06:14		19:33 (T35)	06:44		07:05 (T36)	07:15	07:47	07:24	07:52
	17:31	18:10	19:42	20:14	26 07:32 (T36)	20:45	46	20:08 (T35)	21:07	26	20:03 (T35)	21:02	44	20:17 (T35)	20:27	35	07:40 (T36)	19:35	18:46	17:10	17:04
20	07:53	07:20	07:36	06:46	07:05 (T36)	06:09		19:22 (T35)	05:58		19:37 (T35)	06:15		19:32 (T35)	06:45		07:06 (T36)	07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	28 07:33 (T36)	20:46	45	20:07 (T35)	21:07	26	20:03 (T35)	21:01	44	20:16 (T35)	20:26	33	07:39 (T36)	19:33	18:44	17:09	17:05
21	07:52	07:19	07:35	06:44	07:03 (T36)	06:08		19:22 (T35)	05:59		19:37 (T35)	06:16		19:32 (T35)	06:46		07:07 (T36)	07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16	30 07:33 (T36)	20:47	45	20:07 (T35)	21:08	26	20:03 (T35)	21:00	45	20:17 (T35)	20:24	32	07:39 (T36)	19:32	18:43	17:08	17:05
22	07:52	07:18	07:33	06:43	07:02 (T36)	06:08		19:23 (T35)	05:59		19:37 (T35)	06:17		19:32 (T35)	06:47		07:08 (T36)	07:18	07:50	07:27	07:54
	17:35	18:13	19:45	20:17	32 07:34 (T36)	20:48	45	20:08 (T35)	21:08	26	20:03 (T35)	20:59	45	20:17 (T35)	20:23	30	07:38 (T36)	19:30	18:41	17:08	17:06
23	07:51	07:16	07:31	06:41	07:01 (T36)	06:07		19:23 (T35)	05:59		19:37 (T35)	06:18		19:32 (T35)	06:48		07:09 (T36)	07:19	07:51	07:28	07:54
	17:36	18:15	19:46	20:18	34 07:35 (T36)	20:49	44	20:07 (T35)	21:08	26	20:03 (T35)	20:59	46	20:18 (T35)	20:21	28	07:37 (T36)	19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:40	06:59 (T36)	06:06		19:23 (T35)	05:59		19:38 (T35)	06:19		19:32 (T35)	06:49		07:10 (T36)	07:20	07:53	07:29	07:55
	17:37	18:16	19:47	20:20	35 07:34 (T36)	20:50	44	20:07 (T35)	21:08	26	20:04 (T35)	20:58	46	20:18 (T35)	20:20	25	07:35 (T36)	19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:38	06:59 (T36)	06:05		19:24 (T35)	06:00		19:37 (T35)	06:20		19:32 (T35)	06:50		07:11 (T36)	07:21	07:54	07:30	07:55
	17:39	18:17	19:48	20:21	36 07:35 (T36)	20:51	43	20:07 (T35)	21:08	27	20:04 (T35)	20:57	46	20:18 (T35)	20:18	23	07:34 (T36)	19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	06:58 (T36)	06:05		19:24 (T35)	06:00		19:37 (T35)	06:20		19:32 (T35)	06:51		07:12 (T36)	07:22	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	45 19:50 (T35)	20:52	43	20:07 (T35)	21:08	27	20:04 (T35)	20:56	47	20:19 (T35)	20:17	20	07:32 (T36)	19:23	18:36	17:06	17:08
27	07:48	07:10	07:24	06:36	06:58 (T36)	06:04		19:24 (T35)	06:00		19:38 (T35)	06:21		19:31 (T35)	06:52		07:13 (T36)	07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23	54 19:55 (T35)	20:53	42	20:06 (T35)	21:09	28	20:06 (T35)	20:55	47	20:18 (T35)	20:15	17	07:30 (T36)	19:21	18:34	17:05	17:09
28	07:47	07:09	07:23	06:34	06:58 (T36)	06:03		19:25 (T35)	06:01		19:37 (T35)	06:22		19:31 (T35)	06:53		07:15 (T36)	07:24	07:57	07:34	07:56
	17:42	18:20	19:52	20:24	60 19:58 (T35)	20:54	41	20:06 (T35)	21:09	29	20:06 (T35)	20:54	47	20:18 (T35)	20:14	11	07:26 (T36)	19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:58 (T36)	06:03		19:25 (T35)	06:01		19:38 (T35)	06:23		19:31 (T35)	06:54			07:25	07:58	07:35	07:57
	17:44		19:53	20:25	63 19:59 (T35)	20:55	41	20:06 (T35)	21:09	29	20:07 (T35)	20:53	47	20:18 (T35)	20:12			19:18	18:32	17:04	17:10
30	07:45		07:19	06:31	06:58 (T36)	06:02		19:26 (T35)	06:01		19:37 (T35)	06:24		19:32 (T35)	06:55			07:26	08:00	07:36	07:57
	17:45		19:54	20:26	66 20:01 (T35)	20:55	40	20:06 (T35)	21:09	30	20:07 (T35)	20:52	46	20:18 (T35)	20:10			19:16	18:30	17:04	17:11
31	07:44		07:18			06:02		19:26 (T35)				06:25		19:32 (T35)	06:56				08:01		07:57
	17:46		19:55			20:56	39	20:05 (T35)				20:51	46	20:18 (T35)	20:09				18:29		17:12
Potential sun hours	297	297	370	399		449			453		460		429		375	345	297	287
Total, worst case					582		1635		900		1255		1382					
Sun reduction					0.52		0.57		0.64		0.66		0.61					
Oper. time red.					1.00		1.00		1.00		1.00		1.00					
Wind dir. red.					0.65		0.58		0.57		0.57		0.62					
Total reduction					0.34		0.33		0.36		0.37		0.38					
Total, real					197		546		326		469		528					

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 570 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6650)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March	April			May			June		
1	07:58			07:44		16:35 (T37)	07:07	07:16			06:30			06:01		19:44 (T87)
	17:13			17:48	42	17:17 (T37)	18:22	19:56			20:27			20:57	45	20:29 (T87)
2	07:58			07:43		16:34 (T37)	07:06	07:15			06:29			06:01		19:45 (T87)
	17:14			17:49	44	17:18 (T37)	18:23	19:57			20:28			20:58	45	20:30 (T87)
3	07:58			07:42		16:34 (T37)	07:04	07:13			06:28			06:01		19:44 (T87)
	17:15			17:50	45	17:19 (T37)	18:24	19:58			20:29			20:59	45	20:29 (T87)
4	07:58			07:41		16:34 (T37)	07:03	07:11		19:30 (T34)	06:26			06:00		19:44 (T87)
	17:16			17:51	46	17:20 (T37)	18:25	19:59	7	19:37 (T34)	20:30			20:59	46	20:30 (T87)
5	07:58			07:40		16:34 (T37)	07:01	07:10		19:27 (T34)	06:25			06:00		19:45 (T87)
	17:17			17:53	46	17:20 (T37)	18:26	20:00	12	19:39 (T34)	20:31			21:00	46	20:31 (T87)
6	07:58			07:38		16:34 (T37)	07:00	07:08		19:24 (T34)	06:24			06:00		19:44 (T87)
	17:18			17:54	47	17:21 (T37)	18:28	20:00	16	19:40 (T34)	20:33			21:01	46	20:30 (T87)
7	07:58			07:37		16:33 (T37)	06:58	07:06		19:22 (T34)	06:23			05:59		19:44 (T87)
	17:19			17:55	47	17:20 (T37)	18:29	20:02	18	19:40 (T34)	20:34			21:01	47	20:31 (T87)
8	07:58			07:36		16:33 (T37)	07:56	07:05		19:21 (T34)	06:22			05:59		19:45 (T87)
	17:20			17:56	48	17:21 (T37)	19:30	20:03	21	19:42 (T34)	20:35			21:02	46	20:31 (T87)
9	07:57			07:35		16:33 (T37)	07:55	07:03		19:20 (T34)	06:20			05:59		19:45 (T87)
	17:21			17:58	48	17:21 (T37)	19:31	20:04	23	19:43 (T34)	20:36			21:03	47	20:32 (T87)
10	07:57			07:34		16:34 (T37)	07:53	07:02		19:19 (T34)	06:19			05:59		19:45 (T87)
	17:22			17:59	54	17:36 (T38)	19:32	20:05	25	19:44 (T34)	20:37			21:03	47	20:32 (T87)
11	07:57			07:33		16:34 (T37)	07:51	07:00		19:18 (T34)	06:18			05:58		19:45 (T87)
	17:23			18:00	57	17:37 (T38)	19:33	20:06	27	19:45 (T34)	20:38			21:04	47	20:32 (T87)
12	07:57			07:31		16:34 (T37)	07:50	06:58		19:17 (T34)	06:17			05:58		19:46 (T87)
	17:24			18:01	60	17:38 (T38)	19:34	20:07	29	19:46 (T34)	20:39			21:04	47	20:33 (T87)
13	07:56			07:30		16:34 (T37)	07:48	06:57		19:17 (T34)	06:16			05:58		19:45 (T87)
	17:25			18:03	63	17:40 (T38)	19:36	20:08	30	19:47 (T34)	20:40			21:05	47	20:32 (T87)
14	07:56			07:29		16:35 (T37)	07:46	06:55		19:16 (T34)	06:15		19:59 (T87)	05:58		19:45 (T87)
	17:26			18:04	63	17:41 (T38)	19:37	20:09	31	19:47 (T34)	20:41	13	20:12 (T87)	21:05	47	20:32 (T87)
15	07:56			07:28		16:35 (T37)	07:45	06:54		19:17 (T34)	06:14		19:56 (T87)	05:58		19:45 (T87)
	17:27			18:05	65	17:42 (T38)	19:38	20:10	30	19:47 (T34)	20:42	19	20:15 (T87)	21:06	48	20:33 (T87)
16	07:55			07:26		16:36 (T37)	07:43	06:52		19:16 (T34)	06:13		19:54 (T87)	05:58		19:46 (T87)
	17:28			18:06	64	17:43 (T38)	19:39	20:11	30	19:46 (T34)	20:43	23	20:17 (T87)	21:06	48	20:34 (T87)
17	07:55			07:25		16:37 (T37)	07:41	06:50		19:17 (T34)	06:12		19:53 (T87)	05:58		19:47 (T87)
	17:29			18:08	65	17:45 (T38)	19:40	20:12	29	19:46 (T34)	20:44	26	20:19 (T87)	21:07	47	20:34 (T87)
18	07:54			07:24		16:37 (T37)	07:40	06:49		19:17 (T34)	06:11		19:51 (T87)	05:58		19:47 (T87)
	17:30			18:09	66	17:46 (T38)	19:41	20:13	28	19:45 (T34)	20:45	29	20:20 (T87)	21:07	47	20:34 (T87)
19	07:54			07:22		16:38 (T37)	07:38	06:47		19:18 (T34)	06:10		19:50 (T87)	05:58		19:47 (T87)
	17:32			18:10	64	17:47 (T38)	19:42	20:14	26	19:44 (T34)	20:46	31	20:21 (T87)	21:07	47	20:34 (T87)
20	07:53		16:49 (T37)	07:21		16:39 (T37)	07:36	06:46		19:18 (T34)	06:09		19:49 (T87)	05:59		19:47 (T87)
	17:33	8	16:57 (T37)	18:11	62	17:47 (T38)	19:43	20:15	24	19:42 (T34)	20:47	33	20:22 (T87)	21:08	47	20:34 (T87)
21	07:53		16:46 (T37)	07:19		16:41 (T37)	07:35	06:44		19:19 (T34)	06:09		19:49 (T87)	05:59		19:47 (T87)
	17:34	16	17:02 (T37)	18:12	59	17:47 (T38)	19:44	20:17	23	19:42 (T34)	20:48	34	20:23 (T87)	21:08	47	20:34 (T87)
22	07:52		16:44 (T37)	07:18		16:42 (T37)	07:33	06:43		19:20 (T34)	06:08		19:48 (T87)	05:59		19:47 (T87)
	17:35	20	17:04 (T37)	18:14	53	17:45 (T38)	19:45	20:18	19	19:39 (T34)	20:49	36	20:24 (T87)	21:08	47	20:34 (T87)
23	07:51		16:42 (T37)	07:16		16:44 (T37)	07:31	06:41		19:22 (T34)	06:07		19:47 (T87)	05:59		19:48 (T87)
	17:36	24	17:06 (T37)	18:15	49	17:45 (T38)	19:46	20:19	16	19:38 (T34)	20:49	37	20:24 (T87)	21:08	47	20:35 (T87)
24	07:50		16:40 (T37)	07:15		16:47 (T37)	07:30	06:40		19:24 (T34)	06:06		19:46 (T87)	05:59		19:48 (T87)
	17:38	28	17:08 (T37)	18:16	41	17:44 (T38)	19:48	20:20	10	19:34 (T34)	20:50	39	20:25 (T87)	21:08	47	20:35 (T87)
25	07:50		16:40 (T37)	07:13		16:49 (T37)	07:28	06:39			06:06		19:46 (T87)	06:00		19:48 (T87)
	17:39	30	17:10 (T37)	18:17	32	17:42 (T38)	19:49	20:21			20:51	40	20:26 (T87)	21:09	47	20:35 (T87)
26	07:49		16:39 (T37)	07:12		17:27 (T38)	07:26	06:37			06:05		19:45 (T87)	06:00		19:49 (T87)
	17:40	32	17:11 (T37)	18:18	12	17:39 (T38)	19:50	20:22			20:52	41	20:26 (T87)	21:09	47	20:36 (T87)
27	07:48		16:38 (T37)	07:10			07:25	06:36			06:04		19:46 (T87)	06:00		19:48 (T87)
	17:41	35	17:13 (T37)	18:20			19:51	20:23			20:53	41	20:27 (T87)	21:09	48	20:36 (T87)
28	07:47		16:37 (T37)	07:09			07:23	06:34			06:04		19:45 (T87)	06:01		19:48 (T87)
	17:43	37	17:14 (T37)	18:21			19:52	20:24			20:54	42	20:27 (T87)	21:09	47	20:35 (T87)
29	07:46		16:36 (T37)				07:21	06:33			06:03		19:45 (T87)	06:01		19:49 (T87)
	17:44	39	17:15 (T37)				19:53	20:25			20:55	43	20:28 (T87)	21:09	47	20:36 (T87)
30	07:46		16:36 (T37)				07:20	06:32			06:03		19:45 (T87)	06:02		19:49 (T87)
	17:45	40	17:16 (T37)				19:54	20:26			20:56	43	20:28 (T87)	21:09	47	20:36 (T87)
31	07:45		16:35 (T37)				07:18				06:02		19:45 (T87)			
	17:46	42	17:17 (T37)				19:55				20:56	44	20:29 (T87)			
Potential sun hours	297			297			370	399			449			453		
Total, worst case		351			1342				474			614			1403	
Sun reduction		0.31			0.40				0.52			0.57			0.64	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.72			0.72				0.59			0.55			0.55	
Total reduction		0.23			0.30				0.32			0.32			0.36	
Total, real		81			397				151			197			506	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 570 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6650)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December	
1	06:02		19:50 (T87)	06:26			06:57		19:17 (T34)	07:28			07:02		16:03 (T37)	07:37	
	21:09	47	20:37 (T87)	20:50			20:07	27	19:44 (T34)	19:15			17:28	53	17:05 (T38)	17:04	
2	06:03		19:49 (T87)	06:27			06:58		19:17 (T34)	07:29			07:03		16:03 (T37)	07:38	
	21:09	47	20:36 (T87)	20:49			20:06	25	19:42 (T34)	19:13			17:27	48	16:51 (T37)	17:03	
3	06:03		19:50 (T87)	06:28			06:59		19:18 (T34)	07:30			07:05		16:03 (T37)	07:39	
	21:09	47	20:37 (T87)	20:48			20:04	23	19:41 (T34)	19:12			17:26	47	16:50 (T37)	17:03	
4	06:04		19:50 (T87)	06:29			07:00		19:18 (T34)	07:31			07:06		16:03 (T37)	07:40	
	21:08	46	20:36 (T87)	20:47			20:02	21	19:39 (T34)	19:10			17:24	47	16:50 (T37)	17:03	
5	06:04		19:50 (T87)	06:30			07:01		19:19 (T34)	07:32			07:07		16:04 (T37)	07:41	
	21:08	47	20:37 (T87)	20:46			20:01	18	19:37 (T34)	19:08			17:23	46	16:50 (T37)	17:03	
6	06:05		19:50 (T87)	06:31			07:02		19:20 (T34)	07:33			07:08		16:04 (T37)	07:42	
	21:08	46	20:36 (T87)	20:45			19:58	16	19:36 (T34)	19:07			17:22	46	16:50 (T37)	17:03	
7	06:06		19:51 (T87)	06:32			07:03		19:22 (T34)	07:34			07:09		16:04 (T37)	07:43	
	21:08	46	20:37 (T87)	20:44			19:56	12	19:34 (T34)	19:05			17:21	45	16:49 (T37)	17:03	
8	06:06		19:51 (T87)	06:33			07:04		19:25 (T34)	07:35			07:11		16:05 (T37)	07:44	
	21:07	46	20:37 (T87)	20:42			19:54	8	19:33 (T34)	19:03			17:20	45	16:50 (T37)	17:03	
9	06:07		19:51 (T87)	06:34			07:05			07:36			07:12		16:05 (T37)	07:45	
	21:07	46	20:37 (T87)	20:41			19:52			19:02			17:19	44	16:49 (T37)	17:03	
10	06:08		19:52 (T87)	06:35			07:06			07:37			07:13		16:06 (T37)	07:46	
	21:07	45	20:37 (T87)	20:40			19:51			19:00			17:18	42	16:48 (T37)	17:03	
11	06:08		19:52 (T87)	06:36			07:07			07:38			07:14		16:06 (T37)	07:47	
	21:06	45	20:37 (T87)	20:38			19:49			18:58			17:17	41	16:47 (T37)	17:03	
12	06:09		19:52 (T87)	06:37			07:08			07:39			07:15		16:08 (T37)	07:48	
	21:06	45	20:37 (T87)	20:37			19:47			18:57			17:16	40	16:48 (T37)	17:03	
13	06:10		19:53 (T87)	06:38			07:09			07:40			07:17		16:08 (T37)	07:48	
	21:05	44	20:37 (T87)	20:36			19:46			18:55			17:15	39	16:47 (T37)	17:03	
14	06:10		19:53 (T87)	06:39			07:10			07:42			07:18		16:09 (T37)	07:49	
	21:05	44	20:37 (T87)	20:34			19:44			18:54			17:14	37	16:46 (T37)	17:03	
15	06:11		19:54 (T87)	06:40			07:11			07:43		18:02 (T38)	07:19		16:11 (T37)	07:50	
	21:04	43	20:37 (T87)	20:33			19:42			18:52	8	18:10 (T38)	17:13	34	16:45 (T37)	17:03	
16	06:12		19:54 (T87)	06:41			07:12			07:44		17:24 (T37)	07:20		16:12 (T37)	07:51	
	21:04	42	20:36 (T87)	20:32			19:41			18:51	24	18:13 (T38)	17:12	32	16:44 (T37)	17:04	
17	06:13		19:54 (T87)	06:42			07:13			07:45		17:19 (T37)	07:21		16:13 (T37)	07:51	
	21:03	42	20:36 (T87)	20:30			19:39			18:49	36	18:14 (T38)	17:12	30	16:43 (T37)	17:04	
18	06:14		19:55 (T87)	06:43			07:14			07:46		17:16 (T37)	07:23		16:14 (T37)	07:52	
	21:02	41	20:36 (T87)	20:29			19:37			18:48	45	18:15 (T38)	17:11	28	16:42 (T37)	17:04	
19	06:14		19:56 (T87)	06:44		19:30 (T34)	07:15			07:47		17:15 (T37)	07:24		16:17 (T37)	07:53	
	21:02	39	20:35 (T87)	20:27	12	19:42 (T34)	19:35			18:46	50	18:17 (T38)	17:10	24	16:41 (T37)	17:05	
20	06:15		19:57 (T87)	06:45		19:26 (T34)	07:16			07:48		17:13 (T37)	07:25		16:19 (T37)	07:53	
	21:01	38	20:35 (T87)	20:26	17	19:43 (T34)	19:34			18:45	55	18:17 (T38)	17:09	20	16:39 (T37)	17:05	
21	06:16		19:57 (T87)	06:46		19:24 (T34)	07:17			07:49		17:11 (T37)	07:26		16:21 (T37)	07:54	
	21:00	37	20:34 (T87)	20:25	20	19:44 (T34)	19:32			18:43	59	18:17 (T38)	17:09	16	16:37 (T37)	17:06	
22	06:17		19:58 (T87)	06:47		19:23 (T34)	07:18			07:51		17:09 (T37)	07:27		16:25 (T37)	07:54	
	21:00	35	20:33 (T87)	20:23	23	19:46 (T34)	19:30			18:42	62	18:17 (T38)	17:08	8	16:33 (T37)	17:06	
23	06:18		19:59 (T87)	06:48		19:22 (T34)	07:19			07:52		17:08 (T37)	07:28			07:55	
	20:59	34	20:33 (T87)	20:22	24	19:46 (T34)	19:29			18:40	65	18:17 (T38)	17:07			17:07	
24	06:19		20:00 (T87)	06:49		19:20 (T34)	07:20			07:53		17:07 (T37)	07:30			07:55	
	20:58	32	20:32 (T87)	20:20	27	19:47 (T34)	19:27			18:39	66	18:16 (T38)	17:07			17:07	
25	06:20		20:01 (T87)	06:50		19:20 (T34)	07:22			07:54		17:06 (T37)	07:31			07:56	
	20:57	30	20:31 (T87)	20:18	27	19:47 (T34)	19:25			18:37	65	18:14 (T38)	17:06			17:08	
26	06:21		20:02 (T87)	06:51		19:19 (T34)	07:23			07:55		17:05 (T37)	07:32			07:56	
	20:56	28	20:30 (T87)	20:17	29	19:48 (T34)	19:23			18:36	65	18:13 (T38)	17:06			17:08	
27	06:22		20:04 (T87)	06:52		19:18 (T34)	07:24			07:56		17:04 (T37)	07:33			07:56	
	20:55	25	20:29 (T87)	20:15	30	19:48 (T34)	19:22			18:35	64	18:11 (T38)	17:05			17:09	
28	06:23		20:06 (T87)	06:53		19:18 (T34)	07:25			07:58		17:05 (T37)	07:34			07:57	
	20:54	21	20:27 (T87)	20:14	30	19:48 (T34)	19:20			18:33	62	18:11 (T38)	17:05			17:10	
29	06:23		20:08 (T87)	06:54		19:17 (T34)	07:26			07:59		17:04 (T37)	07:35			07:57	
	20:53	17	20:25 (T87)	20:12	31	19:48 (T34)	19:18			18:32	61	18:09 (T38)	17:04			17:10	
30	06:24		20:11 (T87)	06:55		19:17 (T34)	07:27			08:00		17:03 (T37)	07:36			07:57	
	20:52	9	20:20 (T87)	20:11	30	19:47 (T34)	19:17			18:31	59	18:07 (T38)	17:04			17:11	
31	06:25			06:56		19:17 (T34)				08:01		17:03 (T37)				07:57	
	20:51			20:09	28	19:45 (T34)				18:29	56	18:06 (T38)				17:12	
Potential sun hours	460			429			375			345			297			287	
Total, worst case		1154			328			150			902			812			
Sun reduction		0.66			0.61			0.59			0.48			0.30			
Oper. time red.		1.00			1.00			1.00			1.00			1.00			
Wind dir. red.		0.55			0.59			0.59			0.72			0.72			
Total reduction		0.37			0.37			0.36			0.35			0.22			
Total, real		429			122			54			319			182			

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

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

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US-SYRACUSE, NY 13202
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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 580 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6660)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April	May	June
1	07:57			07:43		08:28 (T63)	07:07		08:10 (T63)	07:16	06:31	06:02
	17:13			17:48	52	09:20 (T63)	18:22	86	09:36 (T63)	19:56	20:27	20:57
2	07:57			07:42		08:27 (T63)	07:06		08:10 (T63)	07:15	06:29	06:01
	17:14			17:49	55	09:22 (T63)	18:23	85	09:35 (T63)	19:57	20:28	20:57
3	07:57			07:41		08:26 (T63)	07:04		08:10 (T63)	07:13	06:28	06:01
	17:15			17:50	57	09:23 (T63)	18:24	85	09:35 (T63)	19:58	20:29	20:58
4	07:57			07:40		08:25 (T63)	07:03		08:10 (T63)	07:11	06:27	06:01
	17:16			17:52	60	09:25 (T63)	18:25	83	09:33 (T63)	19:59	20:30	20:59
5	07:57			07:39		08:23 (T63)	07:01		08:10 (T63)	07:10	06:25	06:00
	17:17			17:53	62	09:25 (T63)	18:27	82	09:32 (T63)	20:00	20:31	21:00
6	07:57			07:38		08:22 (T63)	06:59		08:11 (T63)	07:08	06:24	06:00
	17:18			17:54	65	09:27 (T63)	18:28	81	09:32 (T63)	20:00	20:32	21:00
7	07:57			07:37		08:21 (T63)	06:58		08:10 (T63)	07:06	06:23	06:00
	17:19			17:55	67	09:28 (T63)	18:29	81	09:31 (T63)	20:01	20:33	21:01
8	07:57			07:36		08:20 (T63)	07:56		09:10 (T63)	07:05	06:22	05:59
	17:20			17:57	70	09:30 (T63)	19:30	79	10:29 (T63)	20:02	20:34	21:02
9	07:57			07:35		08:19 (T63)	07:55		09:11 (T63)	07:03	06:21	05:59
	17:21			17:58	72	09:31 (T63)	19:31	78	10:29 (T63)	20:04	20:35	21:02
10	07:57			07:34		08:19 (T63)	07:53		09:11 (T63)	07:02	06:20	05:59
	17:22			17:59	73	09:32 (T63)	19:32	76	10:27 (T63)	20:05	20:36	21:03
11	07:57			07:32		08:17 (T63)	07:51		09:12 (T63)	07:00	06:19	05:59
	17:23			18:00	75	09:32 (T63)	19:33	75	10:27 (T63)	20:06	20:37	21:03
12	07:56			07:31		08:17 (T63)	07:50		09:12 (T63)	06:58	06:17	05:59
	17:24			18:02	76	09:33 (T63)	19:34	73	10:25 (T63)	20:07	20:38	21:04
13	07:56			07:30		08:16 (T63)	07:48		09:13 (T63)	06:57	06:16	05:59
	17:25			18:03	78	09:34 (T63)	19:36	70	10:23 (T63)	20:08	20:39	21:04
14	07:56			07:29		08:15 (T63)	07:46		09:14 (T63)	06:55	06:15	05:59
	17:26			18:04	79	09:34 (T63)	19:37	68	10:22 (T63)	20:09	20:40	21:05
15	07:55			07:27		08:15 (T63)	07:45		09:14 (T63)	06:54	06:14	05:59
	17:27			18:05	80	09:35 (T63)	19:38	66	10:20 (T63)	20:10	20:41	21:05
16	07:55			07:26		08:14 (T63)	07:43		09:15 (T63)	06:52	06:13	05:59
	17:28			18:06	82	09:36 (T63)	19:39	63	10:18 (T63)	20:11	20:42	21:06
17	07:54			07:25		08:13 (T63)	07:41		09:17 (T63)	06:51	06:12	05:59
	17:30			18:08	83	09:36 (T63)	19:40	60	10:17 (T63)	20:12	20:43	21:06
18	07:54			07:23		08:13 (T63)	07:40		09:17 (T63)	06:49	06:12	05:59
	17:31			18:09	83	09:36 (T63)	19:41	57	10:14 (T63)	20:13	20:44	21:06
19	07:53			07:22		08:13 (T63)	07:38		09:18 (T63)	06:48	06:11	05:59
	17:32			18:10	84	09:37 (T63)	19:42	54	10:12 (T63)	20:14	20:45	21:07
20	07:53			07:21		08:12 (T63)	07:36		09:20 (T63)	06:46	06:10	05:59
	17:33			18:11	85	09:37 (T63)	19:43	49	10:09 (T63)	20:15	20:46	21:07
21	07:52			07:19		08:12 (T63)	07:35		09:22 (T63)	06:45	06:09	05:59
	17:34			18:13	85	09:37 (T63)	19:44	45	10:07 (T63)	20:16	20:47	21:07
22	07:52			07:18		08:11 (T63)	07:33		09:23 (T63)	06:43	06:08	05:59
	17:35			18:14	86	09:37 (T63)	19:45	41	10:04 (T63)	20:17	20:48	21:08
23	07:51			07:16		08:11 (T63)	07:31		09:25 (T63)	06:42	06:07	06:00
	17:37			18:15	86	09:37 (T63)	19:46	35	10:00 (T63)	20:18	20:49	21:08
24	07:50			07:15		08:10 (T63)	07:30		09:29 (T63)	06:40	06:07	06:00
	17:38			18:16	87	09:37 (T63)	19:48	28	09:57 (T63)	20:19	20:50	21:08
25	07:49		08:45 (T63)	07:13		08:11 (T63)	07:28		09:33 (T63)	06:39	06:06	06:00
	17:39	14	08:59 (T63)	18:17	86	09:37 (T63)	19:49	18	09:51 (T63)	20:21	20:51	21:08
26	07:49		08:40 (T63)	07:12		08:10 (T63)	07:26			06:37	06:05	06:01
	17:40	24	09:04 (T63)	18:18	86	09:36 (T63)	19:50			20:22	20:52	21:08
27	07:48		08:37 (T63)	07:10		08:10 (T63)	07:25			06:36	06:05	06:01
	17:42	31	09:08 (T63)	18:20	86	09:36 (T63)	19:51			20:23	20:53	21:08
28	07:47		08:36 (T63)	07:09		08:10 (T63)	07:23			06:35	06:04	06:01
	17:43	35	09:11 (T63)	18:21	86	09:36 (T63)	19:52			20:24	20:53	21:08
29	07:46		08:33 (T63)				07:21			06:33	06:03	06:02
	17:44	41	09:14 (T63)				19:53			20:25	20:54	21:08
30	07:45		08:32 (T63)				07:20			06:32	06:03	06:02
	17:45	44	09:16 (T63)				19:54			20:26	20:55	21:08
31	07:44		08:30 (T63)				07:18				06:02	
	17:47	48	09:18 (T63)				19:55				20:56	
Potential sun hours	297			297			370			399	448	452
Total, worst case		237			2126			1618				
Sun reduction		0.31			0.40			0.44				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.53			0.53			0.53				
Total reduction		0.16			0.21			0.23				
Total, real		39			451			378				

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 580 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6660)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September			October			November			December
1	06:03	06:27	06:58			07:28		08:51 (T63)	07:02		07:48 (T63)	07:37
	21:08	20:50	20:07			19:15	72	10:03 (T63)	17:28	73	09:01 (T63)	17:04
2	06:03	06:28	06:59			07:29		08:50 (T63)	07:03		07:49 (T63)	07:38
	21:08	20:49	20:06			19:13	74	10:04 (T63)	17:27	71	09:00 (T63)	17:04
3	06:04	06:29	07:00			07:30		08:50 (T63)	07:04		07:50 (T63)	07:39
	21:08	20:48	20:04			19:12	75	10:05 (T63)	17:26	69	08:59 (T63)	17:04
4	06:04	06:30	07:01			07:31		08:49 (T63)	07:06		07:51 (T63)	07:40
	21:08	20:47	20:02			19:10	77	10:06 (T63)	17:25	67	08:58 (T63)	17:03
5	06:05	06:31	07:02			07:32		08:48 (T63)	07:07		07:52 (T63)	07:41
	21:08	20:46	20:01			19:08	79	10:07 (T63)	17:24	65	08:57 (T63)	17:03
6	06:05	06:32	07:03			07:33		08:47 (T63)	07:08		07:54 (T63)	07:42
	21:07	20:44	19:57			19:07	80	10:07 (T63)	17:22	62	08:56 (T63)	17:03
7	06:06	06:33	07:04			07:34		08:46 (T63)	07:09		07:55 (T63)	07:43
	21:07	20:43	19:56			19:05	81	10:07 (T63)	17:21	60	08:55 (T63)	17:03
8	06:07	06:34	07:05			07:35		08:46 (T63)	07:10		07:56 (T63)	07:44
	21:07	20:42	19:54			19:03	82	10:08 (T63)	17:20	57	08:53 (T63)	17:03
9	06:07	06:35	07:06			07:36		08:45 (T63)	07:12		07:57 (T63)	07:45
	21:07	20:41	19:52			19:02	83	10:08 (T63)	17:19	54	08:51 (T63)	17:03
10	06:08	06:36	07:06			07:37		08:44 (T63)	07:13		07:59 (T63)	07:45
	21:06	20:39	19:51			19:00	84	10:08 (T63)	17:18	52	08:51 (T63)	17:03
11	06:09	06:37	07:07			07:38		08:44 (T63)	07:14		08:01 (T63)	07:46
	21:06	20:38	19:49			18:59	84	10:08 (T63)	17:17	48	08:49 (T63)	17:03
12	06:09	06:38	07:08			07:39		08:43 (T63)	07:15		08:03 (T63)	07:47
	21:05	20:37	19:47			18:57	85	10:08 (T63)	17:16	44	08:47 (T63)	17:03
13	06:10	06:39	07:09			07:40		08:43 (T63)	07:16		08:06 (T63)	07:48
	21:05	20:36	19:46			18:55	85	10:08 (T63)	17:15	40	08:46 (T63)	17:03
14	06:11	06:40	07:10			07:41		08:43 (T63)	07:18		08:08 (T63)	07:49
	21:04	20:34	19:44			18:54	86	10:09 (T63)	17:14	35	08:43 (T63)	17:04
15	06:12	06:41	07:11			07:43		08:43 (T63)	07:19		08:10 (T63)	07:49
	21:04	20:33	19:42			18:52	86	10:09 (T63)	17:13	30	08:40 (T63)	17:04
16	06:12	06:42	07:12			07:44		08:43 (T63)	07:20		08:13 (T63)	07:50
	21:03	20:31	19:40			18:51	86	10:09 (T63)	17:13	24	08:37 (T63)	17:04
17	06:13	06:43	07:13			07:45		08:42 (T63)	07:21		08:19 (T63)	07:51
	21:03	20:30	19:39			18:49	86	10:08 (T63)	17:12	14	08:33 (T63)	17:04
18	06:14	06:44	07:14		09:22 (T63)	07:46		08:42 (T63)	07:22			07:51
	21:02	20:29	19:37	15	09:37 (T63)	18:48	86	10:08 (T63)	17:11			17:05
19	06:15	06:45	07:15		09:16 (T63)	07:47		08:42 (T63)	07:23			07:52
	21:01	20:27	19:35	26	09:42 (T63)	18:46	86	10:08 (T63)	17:10			17:05
20	06:16	06:46	07:16		09:13 (T63)	07:48		08:43 (T63)	07:25			07:53
	21:01	20:26	19:34	33	09:46 (T63)	18:45	85	10:08 (T63)	17:10			17:06
21	06:17	06:47	07:17		09:09 (T63)	07:49		08:43 (T63)	07:26			07:53
	21:00	20:24	19:32	39	09:48 (T63)	18:43	85	10:08 (T63)	17:09			17:06
22	06:17	06:48	07:18		09:07 (T63)	07:50		08:43 (T63)	07:27			07:54
	20:59	20:23	19:30	44	09:51 (T63)	18:42	84	10:07 (T63)	17:08			17:06
23	06:18	06:49	07:19		09:04 (T63)	07:51		08:43 (T63)	07:28			07:54
	20:58	20:21	19:28	49	09:53 (T63)	18:40	84	10:07 (T63)	17:08			17:07
24	06:19	06:50	07:20		09:02 (T63)	07:53		08:43 (T63)	07:29			07:55
	20:58	20:20	19:27	53	09:55 (T63)	18:39	83	10:06 (T63)	17:07			17:08
25	06:20	06:51	07:21		09:00 (T63)	07:54		08:44 (T63)	07:30			07:55
	20:57	20:18	19:25	56	09:56 (T63)	18:38	82	10:06 (T63)	17:07			17:08
26	06:21	06:52	07:23		08:59 (T63)	07:55		08:44 (T63)	07:31			07:55
	20:56	20:17	19:23	59	09:58 (T63)	18:36	81	10:05 (T63)	17:06			17:09
27	06:22	06:53	07:24		08:57 (T63)	07:56		08:44 (T63)	07:33			07:56
	20:55	20:15	19:22	62	09:59 (T63)	18:35	81	10:05 (T63)	17:06			17:09
28	06:23	06:54	07:25		08:55 (T63)	07:57		08:45 (T63)	07:34			07:56
	20:54	20:14	19:20	65	10:00 (T63)	18:33	79	10:04 (T63)	17:05			17:10
29	06:24	06:55	07:26		08:54 (T63)	07:58		08:45 (T63)	07:35			07:56
	20:53	20:12	19:18	67	10:01 (T63)	18:32	78	10:03 (T63)	17:05			17:11
30	06:25	06:56	07:27		08:53 (T63)	08:00		08:47 (T63)	07:36			07:57
	20:52	20:10	19:17	69	10:02 (T63)	18:31	76	10:03 (T63)	17:04			17:12
31	06:26	06:57				08:01		08:47 (T63)				07:57
	20:51	20:09				18:30	75	10:02 (T63)				17:12
Potential sun hours	459	428	375			345			298			288
Total, worst case				637			2530			865		
Sun reduction				0.59			0.48			0.30		
Oper. time red.				1.00			1.00			1.00		
Wind dir. red.				0.53			0.53			0.53		
Total reduction				0.31			0.25			0.16		
Total, real				200			645			138		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 596 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6673)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58			07:44		16:29 (T13)	07:07		17:32 (T12)	07:16		06:30			06:01		19:44 (T10)
	17:13			17:47	46	17:15 (T13)	18:22	28	18:00 (T12)	19:56		20:27			20:57	38	20:22 (T10)
2	07:58			07:43		16:29 (T13)	07:06		17:31 (T12)	07:14		06:29			06:01		19:44 (T10)
	17:13			17:48	47	17:16 (T13)	18:23	30	18:01 (T12)	19:57		20:28			20:58	37	20:21 (T10)
3	07:58			07:42		16:29 (T13)	07:04		17:31 (T12)	07:13		06:27			06:00		19:45 (T10)
	17:14			17:50	47	17:16 (T13)	18:24	30	18:01 (T12)	19:58		20:29			20:59	36	20:21 (T10)
4	07:58			07:41		16:28 (T13)	07:03		17:31 (T12)	07:11		06:26			06:00		19:45 (T10)
	17:15			17:51	49	17:17 (T13)	18:25	30	18:01 (T12)	19:59		20:30			20:59	37	20:22 (T10)
5	07:58			07:40		16:28 (T13)	07:01		17:30 (T12)	07:09		06:25			05:59		19:45 (T10)
	17:16			17:52	49	17:17 (T13)	18:26	30	18:00 (T12)	20:00		20:31			21:00	36	20:21 (T10)
6	07:58			07:38		16:28 (T13)	06:59		17:31 (T12)	07:08		06:24		19:57 (T10)	05:59		19:46 (T10)
	17:17			17:54	50	17:18 (T13)	18:27	29	18:00 (T12)	20:00		20:33	10	20:07 (T10)	21:01	35	20:21 (T10)
7	07:58			07:37		16:27 (T13)	06:58		17:31 (T12)	07:06		06:22		19:54 (T10)	05:59		19:46 (T10)
	17:18			17:55	50	17:17 (T13)	18:29	28	17:59 (T12)	20:01		20:34	16	20:10 (T10)	21:01	39	20:37 (T9)
8	07:58			07:36		16:28 (T13)	07:56		18:31 (T12)	07:05		06:21		19:51 (T10)	05:59		19:47 (T10)
	17:19			17:56	50	17:18 (T13)	19:30	26	18:57 (T12)	20:02		20:35	20	20:11 (T10)	21:02	40	20:38 (T9)
9	07:57			07:35		16:28 (T13)	07:55		18:33 (T12)	07:03		06:20		19:49 (T10)	05:58		19:46 (T10)
	17:20			17:57	50	17:18 (T13)	19:31	24	18:57 (T12)	20:04		20:36	24	20:13 (T10)	21:03	41	20:37 (T9)
10	07:57			07:34		16:28 (T13)	07:53		18:34 (T12)	07:01		06:19		19:48 (T10)	05:58		19:47 (T10)
	17:21			17:59	50	17:18 (T13)	19:32	21	18:55 (T12)	20:05		20:37	26	20:14 (T10)	21:03	42	20:38 (T9)
11	07:57			07:33		16:29 (T13)	07:51		18:36 (T12)	07:00		06:18		19:47 (T10)	05:58		19:47 (T10)
	17:22			18:00	50	17:19 (T13)	19:33	18	18:54 (T12)	20:06		20:38	28	20:15 (T10)	21:04	43	20:39 (T9)
12	07:57			07:31		16:28 (T13)	07:50		18:38 (T12)	06:58		06:17		19:46 (T10)	05:58		19:48 (T10)
	17:23			18:01	50	17:18 (T13)	19:34	12	18:50 (T12)	20:07		20:39	30	20:16 (T10)	21:04	42	20:39 (T9)
13	07:56			07:30		16:29 (T13)	07:48			06:56		06:16		19:45 (T10)	05:58		19:48 (T10)
	17:24			18:02	49	17:18 (T13)	19:35			20:08		20:40	31	20:16 (T10)	21:05	44	20:40 (T9)
14	07:56			07:29		16:30 (T13)	07:46			06:55		06:15		19:44 (T10)	05:58		19:49 (T10)
	17:25			18:04	48	17:18 (T13)	19:36			20:09		20:41	33	20:17 (T10)	21:05	43	20:40 (T9)
15	07:56			07:27		16:29 (T13)	07:45			06:53		06:14		19:44 (T10)	05:58		19:49 (T10)
	17:27			18:05	48	17:17 (T13)	19:38			20:10		20:42	34	20:18 (T10)	21:06	43	20:40 (T9)
16	07:55			07:26		16:30 (T13)	07:43			06:52		06:13		19:43 (T10)	05:58		19:49 (T10)
	17:28			18:06	47	17:17 (T13)	19:39			20:11		20:43	36	20:19 (T10)	21:06	45	20:41 (T9)
17	07:55			07:25		16:31 (T13)	07:41			06:50		06:12		19:43 (T10)	05:58		19:50 (T10)
	17:29			18:07	46	17:17 (T13)	19:40			20:12		20:44	36	20:19 (T10)	21:07	44	20:41 (T9)
18	07:54		16:48 (T13)	07:23		16:31 (T13)	07:40			06:49		06:11		19:43 (T10)	05:58		19:50 (T10)
	17:30	2	16:50 (T13)	18:08	44	17:15 (T13)	19:41			20:13		20:45	37	20:20 (T10)	21:07	44	20:41 (T9)
19	07:54		16:42 (T13)	07:22		16:33 (T13)	07:38			06:47		06:10		19:43 (T10)	05:58		19:50 (T10)
	17:31	14	16:56 (T13)	18:10	42	17:15 (T13)	19:42			20:14		20:46	37	20:20 (T10)	21:07	44	20:41 (T9)
20	07:53		16:39 (T13)	07:21		16:33 (T13)	07:36			06:46		06:09		19:43 (T10)	05:58		19:51 (T10)
	17:32	19	16:58 (T13)	18:11	40	17:13 (T13)	19:43			20:15		20:47	37	20:20 (T10)	21:08	45	20:43 (T9)
21	07:53		16:38 (T13)	07:19		16:35 (T13)	07:35			06:44		06:08		19:42 (T10)	05:58		19:51 (T10)
	17:34	23	17:01 (T13)	18:12	37	17:12 (T13)	19:44			20:16		20:48	38	20:20 (T10)	21:08	45	20:43 (T9)
22	07:52		16:37 (T13)	07:18		16:36 (T13)	07:33			06:43		06:07		19:42 (T10)	05:59		19:51 (T10)
	17:35	26	17:03 (T13)	18:13	43	17:51 (T12)	19:45			20:18		20:49	38	20:20 (T10)	21:08	45	20:43 (T9)
23	07:51		16:35 (T13)	07:16		16:38 (T13)	07:31			06:41		06:07		19:43 (T10)	05:59		19:51 (T10)
	17:36	30	17:05 (T13)	18:15	44	17:52 (T12)	19:46			20:19		20:50	38	20:21 (T10)	21:08	45	20:43 (T9)
24	07:50		16:34 (T13)	07:15		16:39 (T13)	07:30			06:40		06:06		19:42 (T10)	05:59		19:52 (T10)
	17:37	32	17:06 (T13)	18:16	45	17:53 (T12)	19:47			20:20		20:50	39	20:21 (T10)	21:09	44	20:43 (T9)
25	07:50		16:34 (T13)	07:13		16:42 (T13)	07:28			06:38		06:05		19:42 (T10)	05:59		19:52 (T10)
	17:38	34	17:08 (T13)	18:17	43	17:55 (T12)	19:48			20:21		20:51	39	20:21 (T10)	21:09	44	20:43 (T9)
26	07:49		16:33 (T13)	07:12		16:45 (T13)	07:26			06:37		06:05		19:43 (T10)	06:00		19:51 (T10)
	17:40	36	17:09 (T13)	18:18	38	17:56 (T12)	19:50			20:22		20:52	38	20:21 (T10)	21:09	45	20:43 (T9)
27	07:48		16:32 (T13)	07:10		17:33 (T12)	07:24			06:35		06:04		19:43 (T10)	06:00		19:52 (T10)
	17:41	38	17:10 (T13)	18:19	24	17:57 (T12)	19:51			20:23		20:53	38	20:21 (T10)	21:09	45	20:44 (T9)
28	07:47		16:31 (T13)	07:09		17:32 (T12)	07:23			06:34		06:03		19:43 (T10)	06:00		19:52 (T10)
	17:42	40	17:11 (T13)	18:20	26	17:58 (T12)	19:52			20:24		20:54	39	20:22 (T10)	21:09	43	20:43 (T9)
29	07:46		16:31 (T13)				07:21			06:33		06:03		19:43 (T10)	06:01		19:52 (T10)
	17:43	41	17:12 (T13)				19:53			20:25		20:55	38	20:21 (T10)	21:09	43	20:43 (T9)
30	07:46		16:30 (T13)				07:19			06:31		06:02		19:44 (T10)	06:01		19:52 (T10)
	17:45	43	17:13 (T13)				19:54			20:26		20:56	38	20:22 (T10)	21:09	42	20:43 (T9)
31	07:45		16:30 (T13)				07:18					06:02		19:44 (T10)			
	17:46	44	17:14 (T13)				19:55					20:56	37	20:21 (T10)			
Potential sun hours	297			297			370			399		449			453		
Total, worst case		422			1252			306					855			1259	
Sun reduction		0.31			0.40			0.44					0.57			0.64	
Oper. time red.		1.00			1.00			1.00					1.00			1.00	
Wind dir. red.		0.72			0.72			0.68					0.56			0.55	
Total reduction		0.23			0.30			0.31					0.33			0.36	
Total, real		98			372			94					279			457	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 596 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6673)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September	October		November		December
1	06:02		19:52 (T10)	06:26	19:57 (T10)	06:57	07:28	18:18 (T12)	07:02	15:58 (T13)	07:37
	21:09	42	20:43 (T9)	20:50 29	20:26 (T10)	20:07	19:15 9	18:27 (T12)	17:28 50	16:48 (T13)	17:03
2	06:02		19:52 (T10)	06:27	19:58 (T10)	06:58	07:29	18:14 (T12)	07:03	15:58 (T13)	07:38
	21:09	42	20:43 (T9)	20:49 27	20:25 (T10)	20:06	19:13 16	18:30 (T12)	17:27 50	16:48 (T13)	17:03
3	06:03		19:52 (T10)	06:28	19:59 (T10)	06:59	07:30	18:13 (T12)	07:05	15:57 (T13)	07:39
	21:09	41	20:43 (T9)	20:48 25	20:24 (T10)	20:04	19:11 20	18:33 (T12)	17:25 51	16:48 (T13)	17:03
4	06:03		19:52 (T10)	06:29	20:00 (T10)	07:00	07:31	18:11 (T12)	07:06	15:57 (T13)	07:40
	21:08	41	20:43 (T9)	20:47 23	20:23 (T10)	20:02	19:10 23	18:34 (T12)	17:24 50	16:47 (T13)	17:03
5	06:04		19:52 (T10)	06:30	20:02 (T10)	07:01	07:32	18:10 (T12)	07:07	15:58 (T13)	07:41
	21:08	39	20:42 (T9)	20:46 19	20:21 (T10)	20:01	19:08 25	18:35 (T12)	17:23 50	16:48 (T13)	17:03
6	06:05		19:52 (T10)	06:31	20:04 (T10)	07:02	07:33	18:08 (T12)	07:08	15:58 (T13)	07:42
	21:08	36	20:42 (T9)	20:45 15	20:19 (T10)	19:57	19:06 27	18:35 (T12)	17:22 49	16:47 (T13)	17:02
7	06:05		19:52 (T10)	06:32	20:09 (T10)	07:03	07:34	18:07 (T12)	07:09	15:58 (T13)	07:43
	21:08	36	20:28 (T10)	20:43 6	20:15 (T10)	19:56	19:05 28	18:35 (T12)	17:21 49	16:47 (T13)	17:02
8	06:06		19:52 (T10)	06:33		07:04	07:35	18:06 (T12)	07:11	15:59 (T13)	07:44
	21:07	36	20:28 (T10)	20:42		19:54	19:03 29	18:35 (T12)	17:20 48	16:47 (T13)	17:02
9	06:06		19:52 (T10)	06:34		07:05	07:36	18:06 (T12)	07:12	16:00 (T13)	07:45
	21:07	37	20:29 (T10)	20:41		19:52	19:01 29	18:35 (T12)	17:19 46	16:46 (T13)	17:02
10	06:07		19:52 (T10)	06:35		07:06	07:37	18:05 (T12)	07:13	16:00 (T13)	07:46
	21:07	37	20:29 (T10)	20:40		19:51	19:00 30	18:35 (T12)	17:18 46	16:46 (T13)	17:02
11	06:08		19:52 (T10)	06:36		07:07	07:38	18:05 (T12)	07:14	16:00 (T13)	07:47
	21:06	37	20:29 (T10)	20:38		19:49	18:58 30	18:35 (T12)	17:17 45	16:45 (T13)	17:02
12	06:09		19:52 (T10)	06:37		07:08	07:39	18:05 (T12)	07:15	16:02 (T13)	07:48
	21:06	37	20:29 (T10)	20:37		19:47	18:57 29	18:34 (T12)	17:16 43	16:45 (T13)	17:02
13	06:09		19:52 (T10)	06:38		07:09	07:40	18:06 (T12)	07:17	16:03 (T13)	07:48
	21:05	38	20:30 (T10)	20:36		19:46	18:55 27	18:33 (T12)	17:15 41	16:44 (T13)	17:03
14	06:10		19:52 (T10)	06:39		07:10	07:41	18:06 (T12)	07:18	16:03 (T13)	07:49
	21:05	39	20:31 (T10)	20:34		19:44	18:53 25	18:31 (T12)	17:14 40	16:43 (T13)	17:03
15	06:11		19:52 (T10)	06:40		07:11	07:43	17:22 (T13)	07:19	16:05 (T13)	07:50
	21:04	38	20:30 (T10)	20:33		19:42	18:52 31	18:29 (T12)	17:13 38	16:43 (T13)	17:03
16	06:12		19:52 (T10)	06:41		07:12	07:44	17:16 (T13)	07:20	16:06 (T13)	07:51
	21:04	38	20:30 (T10)	20:32		19:40	18:50 40	18:28 (T12)	17:12 36	16:42 (T13)	17:03
17	06:12		19:52 (T10)	06:42		07:13	07:45	17:13 (T13)	07:21	16:07 (T13)	07:51
	21:03	39	20:31 (T10)	20:30		19:39	18:49 43	18:26 (T12)	17:11 34	16:41 (T13)	17:04
18	06:13		19:52 (T10)	06:43		07:14	07:46	17:10 (T13)	07:23	16:08 (T13)	07:52
	21:03	39	20:31 (T10)	20:29		19:37	18:47 44	18:24 (T12)	17:10 32	16:40 (T13)	17:04
19	06:14		19:52 (T10)	06:44		07:15	07:47	17:08 (T13)	07:24	16:10 (T13)	07:53
	21:02	38	20:30 (T10)	20:27		19:35	18:46 44	18:22 (T12)	17:10 30	16:40 (T13)	17:04
20	06:15		19:52 (T10)	06:45		07:16	07:48	17:07 (T13)	07:25	16:12 (T13)	07:53
	21:01	39	20:31 (T10)	20:26		19:34	18:44 42	18:22 (T12)	17:09 26	16:38 (T13)	17:05
21	06:16		19:52 (T10)	06:46		07:17	07:49	17:05 (T13)	07:26	16:13 (T13)	07:54
	21:00	39	20:31 (T10)	20:24		19:32	18:43 38	17:43 (T13)	17:08 23	16:36 (T13)	17:05
22	06:17		19:53 (T10)	06:47		07:18	07:50	17:03 (T13)	07:27	16:15 (T13)	07:54
	21:00	38	20:31 (T10)	20:23		19:30	18:41 41	17:44 (T13)	17:08 19	16:34 (T13)	17:06
23	06:18		19:53 (T10)	06:48		07:19	07:52	17:02 (T13)	07:28	16:19 (T13)	07:55
	20:59	38	20:31 (T10)	20:21		19:28	18:40 43	17:45 (T13)	17:07 14	16:33 (T13)	17:06
24	06:18		19:53 (T10)	06:49		07:20	07:53	17:02 (T13)	07:30	16:24 (T13)	07:55
	20:58	38	20:31 (T10)	20:20		19:27	18:38 44	17:46 (T13)	17:06 4	16:28 (T13)	17:07
25	06:19		19:54 (T10)	06:50		07:21	07:54	17:01 (T13)	07:31		07:56
	20:57	37	20:31 (T10)	20:18		19:25	18:37 45	17:46 (T13)	17:06		17:07
26	06:20		19:53 (T10)	06:51		07:22	07:55	17:00 (T13)	07:32		07:56
	20:56	37	20:30 (T10)	20:17		19:23	18:36 47	17:47 (T13)	17:05		17:08
27	06:21		19:54 (T10)	06:52		07:23	07:56	16:59 (T13)	07:33		07:56
	20:55	35	20:29 (T10)	20:15		19:22	18:34 48	17:47 (T13)	17:05		17:09
28	06:22		19:54 (T10)	06:53		07:24	07:57	16:58 (T13)	07:34		07:57
	20:54	35	20:29 (T10)	20:14		19:20	18:33 49	17:47 (T13)	17:04		17:09
29	06:23		19:55 (T10)	06:54		07:25	07:59	16:58 (T13)	07:35		07:57
	20:53	33	20:28 (T10)	20:12		19:18	18:32 50	17:48 (T13)	17:04		17:10
30	06:24		19:55 (T10)	06:55		07:27	08:00	16:58 (T13)	07:36		07:57
	20:52	33	20:28 (T10)	20:11		19:16	18:30 50	17:48 (T13)	17:04		17:11
31	06:25		19:56 (T10)	06:56			08:01	16:57 (T13)			07:57
	20:51	31	20:27 (T10)	20:09			18:29 50	17:47 (T13)			17:12
Potential sun hours	460			429		375	345		297		287
Total, worst case		1163			144			1096		914	
Sun reduction		0.66			0.61			0.48		0.30	
Oper. time red.		1.00			1.00			1.00		1.00	
Wind dir. red.		0.55			0.56			0.71		0.72	
Total reduction		0.38			0.35			0.35		0.22	
Total, real		439			50			383		205	

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

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

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EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 611 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6686)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:43	07:07	07:16	06:30	06:54 (T5)	06:01	06:37 (T4)	06:01	06:45 (T4)	06:26	06:51 (T4)	06:57	07:27	07:02	07:37
	17:12	17:47	18:21	19:56	20:27 31	07:25 (T5) 20:57 46	07:23 (T4) 21:09 42	07:27 (T4) 20:50 38	07:29 (T4) 20:07	19:14	17:27	17:03
2	07:57	07:42	07:05	07:14	06:28	06:54 (T5) 06:00	06:38 (T4) 06:02	06:45 (T4) 06:27	06:51 (T4) 06:58	07:28	07:03	07:38
	17:13	17:48	18:22	19:57	20:28 31	07:25 (T5) 20:58 45	07:23 (T4) 21:08 42	07:27 (T4) 20:49 38	07:29 (T4) 20:05	19:13	17:26	17:03
3	07:57	07:41	07:04	07:12	06:27	06:55 (T4) 06:00	06:38 (T4) 06:02	06:45 (T4) 06:28	06:52 (T4) 06:59	07:29	07:04	07:39
	17:14	17:49	18:24	19:58	20:29 29	07:24 (T5) 20:58 45	07:23 (T4) 21:08 43	07:28 (T4) 20:48 36	07:28 (T4) 20:04	19:11	17:25	17:02
4	07:58	07:40	07:02	07:11	06:26	06:51 (T4) 05:59	06:38 (T4) 06:03	06:46 (T4) 06:29	06:52 (T4) 07:00	07:30	07:05	07:40
	17:15	17:51	18:25	19:59	20:30 33	07:24 (T5) 20:59 45	07:23 (T4) 21:08 43	07:29 (T4) 20:47 37	07:29 (T5) 20:02	19:09	17:24	17:02
5	07:58	07:39	07:01	07:09	06:25	06:48 (T4) 05:59	06:39 (T4) 06:04	06:45 (T4) 06:30	06:53 (T4) 07:01	07:31	07:07	07:41
	17:16	17:52	18:26	20:00	20:31 34	07:22 (T5) 21:00 44	07:23 (T4) 21:08 44	07:29 (T4) 20:46 37	07:30 (T5) 20:00	19:08	17:23	17:02
6	07:57	07:38	06:59	07:07	06:23	06:46 (T4) 05:59	06:39 (T4) 06:04	06:46 (T4) 06:31	06:55 (T4) 07:02	07:32	07:08	07:42
	17:17	17:53	18:27	20:00	20:32 36	07:22 (T5) 21:01 44	07:23 (T4) 21:08 43	07:29 (T4) 20:44 36	07:31 (T5) 19:57	19:06	17:21	17:02
7	07:57	07:37	06:57	07:06	06:22	06:44 (T4) 05:58	06:39 (T4) 06:05	06:45 (T4) 06:32	06:56 (T4) 07:03	07:34	07:09	07:43
	17:18	17:54	18:28	20:01	20:33 37	07:21 (T5) 21:01 44	07:23 (T4) 21:07 44	07:29 (T4) 20:43 36	07:32 (T5) 19:55	19:04	17:20	17:02
8	07:57	07:36	07:56	07:04	06:21	06:43 (T4) 05:58	06:39 (T4) 06:05	06:45 (T4) 06:33	06:58 (T4) 07:04	07:35	07:10	07:44
	17:19	17:56	19:29	20:02	20:34 37	07:20 (T5) 21:02 44	07:23 (T4) 21:07 45	07:30 (T4) 20:42 34	07:32 (T5) 19:54	19:03	17:19	17:02
9	07:57	07:35	07:54	07:03	06:20	06:42 (T4) 05:58	06:40 (T4) 06:06	06:46 (T4) 06:34	07:01 (T4) 07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03	20:35 36	07:18 (T5) 21:02 43	07:23 (T4) 21:07 45	07:31 (T4) 20:41 32	07:33 (T5) 19:52	19:01	17:18	17:02
10	07:57	07:34	07:53	07:01	06:19	06:41 (T4) 05:58	06:40 (T4) 06:07	06:45 (T4) 06:35	07:03 (T5) 07:06	07:37	07:13	07:46
	17:21	17:58	19:32	20:04	20:36 37	07:18 (T4) 21:03 43	07:23 (T4) 21:06 45	07:30 (T4) 20:39 30	07:33 (T5) 19:50	18:59	17:17	17:02
11	07:57	07:32	07:51	06:59	06:18	06:40 (T4) 05:58	06:41 (T4) 06:07	06:45 (T4) 06:36	07:03 (T5) 07:07	07:38	07:14	07:47
	17:22	17:59	19:33	20:05	20:37 38	07:18 (T4) 21:04 42	07:23 (T4) 21:06 46	07:31 (T4) 20:38 31	07:34 (T5) 19:49	18:58	17:16	17:02
12	07:56	07:31	07:49	06:58	06:16	06:40 (T4) 05:58	06:41 (T4) 06:08	06:46 (T4) 06:37	07:03 (T5) 07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:06	20:38 39	07:19 (T4) 21:04 43	07:24 (T4) 21:06 45	07:31 (T4) 20:37 31	07:34 (T5) 19:47	18:56	17:15	17:02
13	07:56	07:30	07:48	06:56	06:15	06:39 (T4) 05:57	06:42 (T4) 06:09	06:45 (T4) 06:38	07:02 (T5) 07:09	07:40	07:16	07:48
	17:24	18:02	19:35	20:08	20:39 41	07:20 (T4) 21:05 42	07:24 (T4) 21:05 46	07:31 (T4) 20:36 32	07:34 (T5) 19:45	18:55	17:14	17:02
14	07:56	07:28	07:46	06:55	06:14	06:38 (T4) 05:57	06:42 (T4) 06:10	06:45 (T4) 06:39	07:02 (T5) 07:10	07:41	07:18	07:49
	17:25	18:03	19:36	20:09	20:41 42	07:20 (T4) 21:05 42	07:24 (T4) 21:05 46	07:31 (T4) 20:34 32	07:34 (T5) 19:44	18:53	17:13	17:02
15	07:55	07:27	07:44	06:53	06:13	06:38 (T4) 05:57	06:42 (T4) 06:10	06:46 (T4) 06:40	07:02 (T5) 07:11	07:42	07:19	07:50
	17:26	18:04	19:37	20:10	20:42 43	07:21 (T4) 21:06 42	07:24 (T4) 21:04 46	07:32 (T4) 20:33 32	07:34 (T5) 19:42	18:52	17:12	17:03
16	07:55	07:26	07:43	06:51	06:12	06:37 (T4) 05:57	06:42 (T4) 06:11	06:46 (T4) 06:41	07:02 (T5) 07:12	07:43	07:20	07:50
	17:27	18:06	19:38	20:11	20:43 44	07:21 (T4) 21:06 42	07:24 (T4) 21:03 46	07:32 (T4) 20:31 31	07:33 (T5) 19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50 07:10 (T5)	06:11	06:37 (T4) 05:57	06:43 (T4) 06:12	06:45 (T4) 06:42	07:03 (T5) 07:13	07:44	07:21	07:51
	17:29	18:07	19:39	20:12 6 07:16 (T5)	20:44 44	07:21 (T4) 21:06 41	07:24 (T4) 21:03 47	07:32 (T4) 20:30 30	07:33 (T5) 19:38	18:48	17:11	17:03
18	07:54	07:23	07:39	06:48 07:07 (T5)	06:10	06:37 (T4) 05:58	06:43 (T4) 06:13	06:46 (T4) 06:43	07:04 (T5) 07:14	07:46	07:22	07:52
	17:30	18:08	19:41	20:13 12 07:19 (T5)	20:44 44	07:21 (T4) 21:07 41	07:24 (T4) 21:02 46	07:32 (T4) 20:29 28	07:32 (T5) 19:37	18:47	17:10	17:04
19	07:53	07:22	07:38	06:47 07:06 (T5)	06:10	06:36 (T4) 05:58	06:43 (T4) 06:14	06:46 (T4) 06:44	07:05 (T5) 07:15	07:47	07:23	07:52
	17:31	18:09	19:42	20:14 16 07:22 (T5)	20:45 45	07:21 (T4) 21:07 41	07:24 (T4) 21:02 46	07:32 (T4) 20:27 27	07:32 (T5) 19:35	18:45	17:09	17:04
20	07:53	07:20	07:36	06:45 07:05 (T5)	06:09	06:37 (T4) 05:58	06:43 (T4) 06:15	06:46 (T4) 06:45	07:06 (T5) 07:16	07:48	07:25	07:53
	17:32	18:11	19:43	20:15 19 07:24 (T5)	20:46 45	07:22 (T4) 21:07 41	07:24 (T4) 21:01 46	07:32 (T4) 20:26 25	07:31 (T5) 19:33	18:44	17:09	17:04
21	07:52	07:19	07:34	06:44 07:03 (T5)	06:08	06:36 (T4) 05:58	06:43 (T4) 06:15	06:47 (T4) 06:46	07:07 (T5) 07:17	07:49	07:26	07:53
	17:33	18:12	19:44	20:16 21 07:24 (T5)	20:47 46	07:22 (T4) 21:08 41	07:24 (T4) 21:00 46	07:33 (T4) 20:24 23	07:30 (T5) 19:31	18:42	17:08	17:05
22	07:52	07:17	07:33	06:42 07:02 (T5)	06:07	06:36 (T4) 05:58	06:44 (T4) 06:16	06:47 (T4) 06:47	07:08 (T5) 07:18	07:50	07:27	07:54
	17:34	18:13	19:45	20:17 23 07:25 (T5)	20:48 46	07:22 (T4) 21:08 41	07:25 (T4) 20:59 46	07:33 (T4) 20:23 21	07:29 (T5) 19:30	18:41	17:07	17:05
23	07:51	07:16	07:31	06:41 07:00 (T5)	06:06	06:36 (T4) 05:58	06:44 (T4) 06:17	06:46 (T4) 06:48	07:09 (T5) 07:19	07:51	07:28	07:54
	17:36	18:14	19:46	20:18 25 07:25 (T5)	20:49 46	07:22 (T4) 21:08 41	07:25 (T4) 20:59 46	07:32 (T4) 20:21 18	07:27 (T5) 19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:39 06:59 (T5)	06:06	06:37 (T4) 05:59	06:44 (T4) 06:18	06:47 (T4) 06:49	07:10 (T5) 07:20	07:52	07:29	07:55
	17:37	18:15	19:47	20:19 27 07:26 (T5)	20:50 46	07:23 (T4) 21:08 41	07:25 (T4) 20:58 45	07:32 (T4) 20:20 15	07:25 (T5) 19:26	18:38	17:06	17:06
25	07:49	07:13	07:28	06:38 06:57 (T5)	06:05	06:36 (T4) 05:59	06:45 (T4) 06:19	06:47 (T4) 06:50	07:11 (T5) 07:21	07:54	07:30	07:55
	17:38	18:17	19:48	20:20 29 07:26 (T5)	20:51 47	07:23 (T4) 21:08 41	07:26 (T4) 20:57 45	07:32 (T4) 20:18 12	07:23 (T5) 19:25	18:37	17:05	17:07
26	07:49	07:12	07:26	06:36 06:56 (T5)	06:04	06:36 (T4) 05:59	06:45 (T4) 06:20	06:47 (T4) 06:51	07:13 (T5) 07:22	07:55	07:32	07:56
	17:39	18:18	19:49	20:22 30 07:26 (T5)	20:52 46	07:22 (T4) 21:09 41	07:26 (T4) 20:56 45	07:32 (T4) 20:17 5	07:18 (T5) 19:23	18:35	17:05	17:08
27	07:48	07:10	07:24	06:35 06:55 (T5)	06:04	06:37 (T4) 06:00	06:44 (T4) 06:21	06:48 (T4) 06:52	07:23	07:56	07:33	07:56
	17:41	18:19	19:50	20:23 32 07:27 (T5)	20:53 46	07:23 (T4) 21:09 42	07:26 (T4) 20:55 44	07:32 (T4) 20:15	19:21	18:34	17:05	17:08
28	07:47	07:08	07:22	06:34 06:54 (T5)	06:03	06:36 (T4) 06:00	06:45 (T4) 06:22	06:48 (T4) 06:53	07:24	07:57	07:34	07:56
	17:42	18:20	19:51	20:24 32 07:26 (T5)	20:54 47	07:23 (T4) 21:09 42	07:27 (T4) 20:54 43	07:31 (T4) 20:13	19:19	18:33	17:04	17:09
29	07:46		07:21	06:32 06:54 (T5)	06:02	06:37 (T4) 06:00	06:45 (T4) 06:23	06:49 (T4) 06:54	07:25	07:58	07:35	07:57
	17:43		19:52	20:25 32 07:26 (T5)	20:55 46	07:23 (T4) 21:09 42	07:27 (T4) 20:53 42	07:31 (T4) 20:12	19:18	18:31	17:04	17:10
30	07:45		07:19	06:31 06:55 (T5)	06:02	06:37 (T4) 06:01	06:45 (T4) 06:24	06:49 (T4) 06:55	07:26	08:00	07:36	07:57
	17:44		19:54	20:26 31 07:26 (T5)	20:55 46	07:23 (T4) 21:09 43	07:28 (T4) 20:52 42	07:31 (T4) 20:10	19:16	18:30	17:03	17:10
31	07:44		07:17		06:01	06:37 (T4)	06:25	06:50 (T4) 06:56		08:01		07:57
	17:46		19:55		20:56 46	07:23 (T4)	20:51 40	07:30 (T4) 20:09		18:29		17:11
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				335	1274	1275	1380	747				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.67	0.70	0.70	0.70	0.68				
Total reduction				0.35	0.40	0.45	0.46	0.42				
Total, real				117	506	572	639	310				

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

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

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EDR
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 614 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6689)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May	June
1	07:57		15:35 (T59)	07:43		07:07		16:54 (T78)	07:16	18:55 (T57)	06:31	06:02
	17:13	39	16:14 (T59)	17:48		18:22	46	17:40 (T78)	19:56	37	19:32 (T57)	20:27	20:57
2	07:57		15:36 (T59)	07:42		07:06		16:54 (T78)	07:15	18:55 (T57)	06:29	06:01
	17:14	38	16:14 (T59)	17:49		18:23	44	17:38 (T78)	19:57	38	19:33 (T57)	20:28	20:58
3	07:57		15:37 (T59)	07:41		07:04		16:55 (T78)	07:13	18:54 (T57)	06:28	06:01
	17:15	37	16:14 (T59)	17:50		18:24	43	17:38 (T78)	19:58	38	19:32 (T57)	20:29	20:58
4	07:57		15:38 (T59)	07:40		07:03		16:56 (T78)	07:11	18:53 (T57)	06:27	06:01
	17:16	36	16:14 (T59)	17:52		18:25	41	17:37 (T78)	19:59	39	19:32 (T57)	20:30	20:59
5	07:57		15:38 (T59)	07:39		07:01		16:56 (T78)	07:10	18:53 (T57)	06:25	06:00
	17:17	37	16:15 (T59)	17:53		18:27	39	17:35 (T78)	20:00	40	19:33 (T57)	20:31	21:00
6	07:57		15:39 (T59)	07:38		06:59		16:58 (T78)	07:08	18:53 (T57)	06:24	06:00
	17:18	36	16:15 (T59)	17:54		18:28	37	17:35 (T78)	20:00	39	19:32 (T57)	20:32	21:00
7	07:57		15:39 (T59)	07:37		06:58		16:59 (T78)	07:06	18:52 (T57)	06:23	06:00
	17:19	35	16:14 (T59)	17:55		18:29	34	17:33 (T78)	20:01	39	19:31 (T57)	20:33	21:01
8	07:57		15:41 (T59)	07:36	17:12 (T78)	07:56		18:00 (T78)	07:05	18:53 (T57)	06:22	05:59
	17:20	33	16:14 (T59)	17:57	11 17:23 (T78)	19:30	30	18:30 (T78)	20:03	38	19:31 (T57)	20:34	21:02
9	07:57		15:42 (T59)	07:35	17:08 (T78)	07:55		18:02 (T78)	07:03	18:53 (T57)	06:21	05:59
	17:21	32	16:14 (T59)	17:58	19 17:27 (T78)	19:31	27	18:29 (T78)	20:04	37	19:30 (T57)	20:35	21:02
10	07:57		15:43 (T59)	07:34	17:06 (T78)	07:53		18:04 (T78)	07:02	18:53 (T57)	06:20	05:59
	17:22	31	16:14 (T59)	17:59	24 17:30 (T78)	19:32	22	18:26 (T78)	20:05	37	19:30 (T57)	20:36	21:03
11	07:57		15:44 (T59)	07:32	17:03 (T78)	07:51		18:08 (T78)	07:00	18:53 (T57)	06:18	05:59
	17:23	29	16:13 (T59)	18:00	28 17:31 (T78)	19:33	15	18:23 (T78)	20:06	36	19:29 (T57)	20:37	21:03
12	07:56		15:45 (T59)	07:31	17:02 (T78)	07:50			06:58	18:54 (T57)	06:17	05:59
	17:24	28	16:13 (T59)	18:02	31 17:33 (T78)	19:34			20:07	33	19:27 (T57)	20:38	21:04
13	07:56		15:47 (T59)	07:30	17:01 (T78)	07:48			06:57	18:55 (T57)	06:16	05:59
	17:25	26	16:13 (T59)	18:03	34 17:35 (T78)	19:36			20:08	35	19:47 (T53)	20:40	21:05
14	07:56		15:48 (T59)	07:29	16:59 (T78)	07:46			06:55	18:55 (T57)	06:15	05:59
	17:26	24	16:12 (T59)	18:04	37 17:36 (T78)	19:37			20:09	38	19:48 (T53)	20:41	21:05
15	07:55		15:50 (T59)	07:27	16:58 (T78)	07:45			06:54	18:57 (T57)	06:14	05:59
	17:27	21	16:11 (T59)	18:05	39 17:37 (T78)	19:38			20:10	38	19:49 (T53)	20:42	21:05
16	07:55		15:52 (T59)	07:26	16:57 (T78)	07:43			06:52	18:58 (T57)	06:13	05:59
	17:28	17	16:09 (T59)	18:06	41 17:38 (T78)	19:39			20:11	37	19:50 (T53)	20:43	21:06
17	07:54		15:55 (T59)	07:25	16:56 (T78)	07:41			06:51	19:00 (T57)	06:12	05:59
	17:30	13	16:08 (T59)	18:08	42 17:38 (T78)	19:40			20:12	34	19:51 (T53)	20:43	21:06
18	07:54		16:00 (T59)	07:23	16:56 (T78)	07:40			06:49	19:03 (T57)	06:11	05:59
	17:31	3	16:03 (T59)	18:09	43 17:39 (T78)	19:41			20:13	30	19:52 (T53)	20:44	21:07
19	07:53			07:22	16:55 (T78)	07:38			06:48	19:34 (T53)	06:11	05:59
	17:32			18:10	45 17:40 (T78)	19:42			20:14	19	19:53 (T53)	20:45	21:07
20	07:53			07:21	16:54 (T78)	07:36			06:46	19:33 (T53)	06:10	05:59
	17:33			18:11	46 17:40 (T78)	19:43			20:15	21	19:54 (T53)	20:46	21:07
21	07:52			07:19	16:54 (T78)	07:35			06:45	19:33 (T53)	06:09	05:59
	17:34			18:12	47 17:41 (T78)	19:44			20:16	22	19:55 (T53)	20:47	21:07
22	07:52			07:18	16:53 (T78)	07:33			06:43	19:33 (T53)	06:08	05:59
	17:35			18:14	48 17:41 (T78)	19:45			20:17	22	19:55 (T53)	20:48	21:08
23	07:51			07:16	16:54 (T78)	07:31			06:42	19:33 (T53)	06:07	06:00
	17:37			18:15	47 17:41 (T78)	19:46			20:18	23	19:56 (T53)	20:49	21:08
24	07:50			07:15	16:53 (T78)	07:30		19:13 (T57)	06:40	19:34 (T53)	06:07	06:00
	17:38			18:16	48 17:41 (T78)	19:48	7	19:20 (T57)	20:20	22	19:56 (T53)	20:50	21:08
25	07:49			07:13	16:53 (T78)	07:28		19:08 (T57)	06:39	19:34 (T53)	06:06	06:00
	17:39			18:17	48 17:41 (T78)	19:49	16	19:24 (T57)	20:21	20	19:54 (T53)	20:51	21:08
26	07:49			07:12	16:53 (T78)	07:26		19:04 (T57)	06:37	19:35 (T53)	06:05	06:00
	17:40			18:18	47 17:40 (T78)	19:50	22	19:26 (T57)	20:22	19	19:54 (T53)	20:52	21:08
27	07:48			07:10	16:54 (T78)	07:25		19:03 (T57)	06:36	19:35 (T53)	06:05	06:01
	17:42			18:20	46 17:40 (T78)	19:51	26	19:29 (T57)	20:23	17	19:52 (T53)	20:53	21:08
28	07:47			07:09	16:53 (T78)	07:23		19:00 (T57)	06:35	19:37 (T53)	06:04	06:01
	17:43			18:21	47 17:40 (T78)	19:52	30	19:30 (T57)	20:24	13	19:50 (T53)	20:54	21:08
29	07:46					07:21		18:59 (T57)	06:33	19:39 (T53)	06:03	06:02
	17:44					19:53	31	19:30 (T57)	20:25	9	19:48 (T53)	20:54	21:08
30	07:45					07:20		18:58 (T57)	06:32			06:03	06:02
	17:45					19:54	34	19:32 (T57)	20:26			20:55	21:08
31	07:44					07:18		18:56 (T57)				06:02	
	17:47					19:55	36	19:32 (T57)				20:56	
Potential sun hours	297		297			370			399			448	452
Total, worst case		515		818			580			870			
Sun reduction		0.31		0.40			0.44			0.52			
Oper. time red.		1.00		1.00			1.00			1.00			
Wind dir. red.		0.75		0.71			0.68			0.61			
Total reduction		0.24		0.29			0.30			0.32			
Total, real		122		236			177			281			

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

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

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SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 614 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6689)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September			October			November			December		
1	06:03		06:27			06:58		18:52 (T57)	07:28			07:02		16:35 (T78)	07:37		15:26 (T59)
	21:08		20:50			20:07	36	19:28 (T57)	19:15			17:28	23	16:58 (T78)	17:04	29	15:55 (T59)
2	06:03		06:28			06:59		18:51 (T57)	07:29		17:48 (T78)	07:03		16:39 (T78)	07:38		15:25 (T59)
	21:08		20:49			20:06	37	19:28 (T57)	19:13	10	17:58 (T78)	17:27	17	16:56 (T78)	17:04	31	15:56 (T59)
3	06:04		06:29			07:00		18:51 (T57)	07:30		17:44 (T78)	07:04		16:43 (T78)	07:39		15:25 (T59)
	21:08		20:48			20:04	37	19:28 (T57)	19:12	19	18:03 (T78)	17:26	8	16:51 (T78)	17:04	32	15:57 (T59)
4	06:04		06:30			07:01		18:50 (T57)	07:31		17:41 (T78)	07:06			07:40		15:25 (T59)
	21:08		20:47			20:02	38	19:28 (T57)	19:10	25	18:06 (T78)	17:25			17:03	33	15:58 (T59)
5	06:05		06:31			07:02		18:49 (T57)	07:32		17:38 (T78)	07:07			07:41		15:25 (T59)
	21:08		20:46			20:01	39	19:28 (T57)	19:08	29	18:07 (T78)	17:23			17:03	34	15:59 (T59)
6	06:05		06:32			07:03		18:49 (T57)	07:33		17:36 (T78)	07:08			07:42		15:24 (T59)
	21:08		20:44			19:57	39	19:28 (T57)	19:07	33	18:09 (T78)	17:22			17:03	36	16:00 (T59)
7	06:06		06:33			07:04		18:48 (T57)	07:34		17:34 (T78)	07:09			07:43		15:25 (T59)
	21:07		20:43			19:56	40	19:28 (T57)	19:05	36	18:10 (T78)	17:21			17:03	36	16:01 (T59)
8	06:06		06:33			07:05		18:48 (T57)	07:35		17:32 (T78)	07:10			07:44		15:25 (T59)
	21:07		20:42			19:54	39	19:27 (T57)	19:03	38	18:10 (T78)	17:20			17:03	36	16:01 (T59)
9	06:07		06:34			07:06		18:48 (T57)	07:36		17:31 (T78)	07:12			07:45		15:25 (T59)
	21:07		20:41			19:52	39	19:27 (T57)	19:02	40	18:11 (T78)	17:19			17:03	37	16:02 (T59)
10	06:08		06:35			07:06		18:48 (T57)	07:37		17:30 (T78)	07:13			07:46		15:25 (T59)
	21:06		20:40			19:51	38	19:26 (T57)	19:00	42	18:12 (T78)	17:18			17:03	38	16:03 (T59)
11	06:09		06:36			07:07		18:48 (T57)	07:38		17:28 (T78)	07:14			07:46		15:25 (T59)
	21:06		20:38			19:49	37	19:25 (T57)	18:59	44	18:12 (T78)	17:17			17:03	39	16:04 (T59)
12	06:09		06:37			07:08		18:48 (T57)	07:39		17:27 (T78)	07:15			07:47		15:26 (T59)
	21:05		20:37			19:47	36	19:24 (T57)	18:57	45	18:12 (T78)	17:16			17:03	39	16:05 (T59)
13	06:10		06:38			07:09		18:49 (T57)	07:40		17:27 (T78)	07:16			07:48		15:26 (T59)
	21:05		20:36			19:46	34	19:23 (T57)	18:55	45	18:12 (T78)	17:15			17:03	40	16:06 (T59)
14	06:11		06:39		19:46 (T53)	07:10		18:50 (T57)	07:41		17:27 (T78)	07:18			07:49		15:26 (T59)
	21:05		20:34	11	19:57 (T53)	19:44	32	19:22 (T57)	18:54	46	18:13 (T78)	17:14			17:04	40	16:06 (T59)
15	06:12		06:40		19:44 (T53)	07:11		18:49 (T57)	07:43		17:26 (T78)	07:19			07:50		15:26 (T59)
	21:04		20:33	15	19:59 (T53)	19:42	30	19:19 (T57)	18:52	47	18:13 (T78)	17:13			17:04	40	16:06 (T59)
16	06:12		06:41		19:43 (T53)	07:12		18:51 (T57)	07:44		17:25 (T78)	07:20			07:50		15:27 (T59)
	21:03		20:32	17	20:00 (T53)	19:40	26	19:17 (T57)	18:51	48	18:13 (T78)	17:13			17:04	40	16:07 (T59)
17	06:13		06:42		19:41 (T53)	07:13		18:52 (T57)	07:45		17:25 (T78)	07:21			07:51		15:27 (T59)
	21:03		20:30	20	20:01 (T53)	19:39	23	19:15 (T57)	18:49	47	18:12 (T78)	17:12			17:04	40	16:07 (T59)
18	06:14		06:44		19:40 (T53)	07:14		18:54 (T57)	07:46		17:25 (T78)	07:22			07:52		15:27 (T59)
	21:02		20:29	21	20:01 (T53)	19:37	18	19:12 (T57)	18:48	47	18:12 (T78)	17:11			17:05	41	16:08 (T59)
19	06:15		06:45		19:40 (T53)	07:15		18:58 (T57)	07:47		17:24 (T78)	07:24			07:52		15:28 (T59)
	21:01		20:27	22	20:02 (T53)	19:35	10	19:08 (T57)	18:46	48	18:12 (T78)	17:10			17:05	41	16:09 (T59)
20	06:16		06:46		19:39 (T53)	07:16			07:48		17:25 (T78)	07:25			07:53		15:28 (T59)
	21:01		20:26	23	20:02 (T53)	19:34			18:45	47	18:12 (T78)	17:10			17:05	41	16:09 (T59)
21	06:16		06:47		19:39 (T53)	07:17			07:49		17:25 (T78)	07:26			07:53		15:29 (T59)
	21:00		20:24	22	20:01 (T53)	19:32			18:43	46	18:11 (T78)	17:09			17:06	41	16:10 (T59)
22	06:17		06:48		19:38 (T53)	07:18			07:50		17:25 (T78)	07:27			07:54		15:29 (T59)
	20:59		20:23	22	20:00 (T53)	19:30			18:42	46	18:11 (T78)	17:08			17:06	41	16:10 (T59)
23	06:18		06:49		19:37 (T53)	07:19			07:52		17:25 (T78)	07:28			07:54		15:29 (T59)
	20:59		20:21	20	19:57 (T53)	19:29			18:40	45	18:10 (T78)	17:08			17:07	41	16:10 (T59)
24	06:19		06:50		19:37 (T53)	07:20			07:53		17:25 (T78)	07:29		15:38 (T59)	07:55		15:30 (T59)
	20:58		20:20	19	19:56 (T53)	19:27			18:39	44	18:09 (T78)	17:07	1	15:39 (T59)	17:07	41	16:11 (T59)
25	06:20		06:51		19:05 (T57)	07:22			07:54		17:27 (T78)	07:30		15:33 (T59)	07:55		15:30 (T59)
	20:57		20:18	31	19:54 (T53)	19:25			18:37	42	18:09 (T78)	17:06	13	15:46 (T59)	17:08	41	16:11 (T59)
26	06:21		06:52		19:02 (T57)	07:23			07:55		17:27 (T78)	07:32		15:31 (T59)	07:56		15:32 (T59)
	20:56		20:17	34	19:53 (T53)	19:23			18:36	41	18:08 (T78)	17:06	17	15:48 (T59)	17:09	40	16:12 (T59)
27	06:22		06:53		19:00 (T57)	07:24			07:56		17:28 (T78)	07:33		15:29 (T59)	07:56		15:32 (T59)
	20:55		20:15	36	19:51 (T53)	19:22			18:35	38	18:06 (T78)	17:06	21	15:50 (T59)	17:09	40	16:12 (T59)
28	06:23		06:54		18:58 (T57)	07:25			07:57		17:29 (T78)	07:34		15:28 (T59)	07:56		15:32 (T59)
	20:54		20:14	38	19:50 (T53)	19:20			18:33	36	18:05 (T78)	17:05	24	15:52 (T59)	17:10	40	16:12 (T59)
29	06:24		06:55		18:56 (T57)	07:26			07:58		17:31 (T78)	07:35		15:27 (T59)	07:57		15:33 (T59)
	20:53		20:12	37	19:48 (T53)	19:18			18:32	33	18:04 (T78)	17:05	26	15:53 (T59)	17:11	39	16:12 (T59)
30	06:25		06:56		18:55 (T57)	07:27			08:00		17:32 (T78)	07:36		15:26 (T59)	07:57		15:33 (T59)
	20:52		20:10	34	19:47 (T53)	19:17			18:31	31	18:03 (T78)	17:04	28	15:54 (T59)	17:12	40	16:13 (T59)
31	06:26		06:57		18:53 (T57)				08:01		17:33 (T78)				07:57		15:35 (T59)
	20:51		20:09	34	19:27 (T57)				18:30	28	18:01 (T78)				17:12	39	16:14 (T59)
Potential sun hours	459		428			375			345			297			287		
Total, worst case				456			628			1166			178			1186	
Sun reduction				0.61			0.59			0.48			0.30			0.22	
Oper. time red.				1.00			1.00			1.00			1.00			1.00	
Wind dir. red.				0.59			0.62			0.71			0.73			0.75	
Total reduction				0.37			0.38			0.35			0.23			0.17	
Total, real				169			236			404			40			199	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 653 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6714)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February	March	April	May			June		
1	07:57		09:03 (T21)	07:44	07:07	07:16	06:30			06:01		06:33 (T18)
	17:13	26	09:29 (T21)	17:47	18:22	19:56	20:27			20:57	49	07:22 (T18)
2	07:58		09:04 (T21)	07:43	07:06	07:14	06:29			06:01		06:33 (T18)
	17:13	25	09:29 (T21)	17:48	18:23	19:57	20:28			20:58	48	07:21 (T18)
3	07:58		09:05 (T21)	07:42	07:04	07:13	06:27			06:00		06:33 (T18)
	17:14	24	09:29 (T21)	17:50	18:24	19:58	20:29			20:59	49	07:22 (T18)
4	07:58		09:06 (T21)	07:41	07:03	07:11	06:26			06:00		06:34 (T18)
	17:15	23	09:29 (T21)	17:51	18:25	19:59	20:30			20:59	48	07:22 (T18)
5	07:58		09:07 (T21)	07:39	07:01	07:09	06:25		06:54 (T18)	05:59		06:33 (T18)
	17:16	22	09:29 (T21)	17:52	18:26	20:00	20:31	6	07:00 (T18)	21:00	49	07:22 (T18)
6	07:58		09:09 (T21)	07:38	06:59	07:08	06:24		06:49 (T18)	05:59		06:34 (T18)
	17:17	19	09:28 (T21)	17:54	18:27	20:00	20:32	16	07:05 (T18)	21:01	48	07:22 (T18)
7	07:58		09:10 (T21)	07:37	06:58	07:06	06:22		06:46 (T18)	05:59		06:34 (T18)
	17:18	18	09:28 (T21)	17:55	18:29	20:01	20:33	22	07:08 (T18)	21:01	48	07:22 (T18)
8	07:57		09:12 (T21)	07:36	07:56	07:04	06:21		06:43 (T18)	05:59		06:35 (T18)
	17:19	14	09:26 (T21)	17:56	19:30	20:02	20:35	26	07:09 (T18)	21:02	48	07:23 (T18)
9	07:57		09:14 (T21)	07:35	07:54	07:03	06:20		06:41 (T18)	05:58		06:34 (T18)
	17:20	10	09:24 (T21)	17:57	19:31	20:04	20:36	29	07:10 (T18)	21:03	48	07:22 (T18)
10	07:57			07:34	07:53	07:01	06:19		06:40 (T18)	05:58		06:34 (T18)
	17:21			17:59	19:32	20:05	20:37	32	07:12 (T18)	21:03	48	07:22 (T18)
11	07:57			07:33	07:51	07:00	06:18		06:39 (T18)	05:58		06:35 (T18)
	17:22			18:00	19:33	20:06	20:38	34	07:13 (T18)	21:04	47	07:22 (T18)
12	07:57			07:31	07:50	06:58	06:17		06:38 (T18)	05:58		06:35 (T18)
	17:23			18:01	19:34	20:07	20:39	36	07:14 (T18)	21:04	48	07:23 (T18)
13	07:56			07:30	07:48	06:56	06:16		06:37 (T18)	05:58		06:35 (T18)
	17:24			18:02	19:35	20:08	20:40	38	07:15 (T18)	21:05	48	07:23 (T18)
14	07:56			07:29	07:46	06:55	06:15		06:36 (T18)	05:58		06:36 (T18)
	17:25			18:04	19:36	20:09	20:41	40	07:16 (T18)	21:05	47	07:23 (T18)
15	07:56			07:27	07:45	06:53	06:14		06:35 (T18)	05:58		06:36 (T18)
	17:27			18:05	19:38	20:10	20:42	41	07:16 (T18)	21:06	47	07:23 (T18)
16	07:55			07:26	07:43	06:52	06:13		06:34 (T18)	05:58		06:36 (T18)
	17:28			18:06	19:39	20:11	20:43	43	07:17 (T18)	21:06	47	07:23 (T18)
17	07:55			07:25	07:41	06:50	06:12		06:34 (T18)	05:58		06:36 (T18)
	17:29			18:07	19:40	20:12	20:44	43	07:17 (T18)	21:07	47	07:23 (T18)
18	07:54			07:23	07:40	06:49	06:11		06:34 (T18)	05:58		06:36 (T18)
	17:30			18:08	19:41	20:13	20:45	45	07:19 (T18)	21:07	47	07:23 (T18)
19	07:54			07:22	07:38	06:47	06:10		06:34 (T18)	05:58		06:36 (T18)
	17:31			18:10	19:42	20:14	20:46	45	07:19 (T18)	21:07	47	07:23 (T18)
20	07:53			07:21	07:36	06:46	06:09		06:33 (T18)	05:58		06:38 (T18)
	17:32			18:11	19:43	20:15	20:47	46	07:19 (T18)	21:08	47	07:25 (T18)
21	07:52			07:19	07:35	06:44	06:08		06:33 (T18)	05:58		06:38 (T18)
	17:34			18:12	19:44	20:16	20:48	46	07:19 (T18)	21:08	47	07:25 (T18)
22	07:52			07:18	07:33	06:43	06:07		06:32 (T18)	05:59		06:38 (T18)
	17:35			18:13	19:45	20:17	20:48	47	07:19 (T18)	21:08	47	07:25 (T18)
23	07:51			07:16	07:31	06:41	06:07		06:33 (T18)	05:59		06:38 (T18)
	17:36			18:14	19:46	20:19	20:49	47	07:20 (T18)	21:08	46	07:24 (T18)
24	07:50			07:15	07:29	06:40	06:06		06:32 (T18)	05:59		06:38 (T18)
	17:37			18:16	19:47	20:20	20:50	48	07:20 (T18)	21:08	47	07:25 (T18)
25	07:50			07:13	07:28	06:38	06:05		06:32 (T18)	05:59		06:38 (T18)
	17:38			18:17	19:48	20:21	20:51	48	07:20 (T18)	21:09	47	07:25 (T18)
26	07:49			07:12	07:26	06:37	06:05		06:32 (T18)	06:00		06:38 (T18)
	17:40			18:18	19:50	20:22	20:52	49	07:21 (T18)	21:09	47	07:25 (T18)
27	07:48			07:10	07:24	06:35	06:04		06:32 (T18)	06:00		06:39 (T18)
	17:41			18:19	19:51	20:23	20:53	49	07:21 (T18)	21:09	47	07:26 (T18)
28	07:47			07:09	07:23	06:34	06:03		06:33 (T18)	06:00		06:39 (T18)
	17:42			18:20	19:52	20:24	20:54	48	07:21 (T18)	21:09	47	07:26 (T18)
29	07:46				07:21	06:33	06:03		06:32 (T18)	06:01		06:38 (T18)
	17:43				19:53	20:25	20:55	49	07:21 (T18)	21:09	48	07:26 (T18)
30	07:45				07:19	06:31	06:02		06:33 (T18)	06:01		06:39 (T18)
	17:45				19:54	20:26	20:56	49	07:22 (T18)	21:09	48	07:27 (T18)
31	07:45				07:18		06:02		06:32 (T18)			
	17:46				19:55		20:56	49	07:21 (T18)			
Potential sun hours	297			297	370	399	449			453		
Total, worst case		181						1071			1426	
Sun reduction		0.31						0.57			0.64	
Oper. time red.		1.00						1.00			1.00	
Wind dir. red.		0.53						0.71			0.71	
Total reduction		0.16						0.39			0.44	
Total, real		29						419			626	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 653 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6714)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September	October	November	December		
1	06:02		06:39 (T18)	06:26		06:49 (T18)	06:57	07:27	07:02	07:37		
	21:09	48	07:27 (T18)	20:50	35	07:24 (T18)	20:07	19:15	17:28	17:03		
2	06:02		06:40 (T18)	06:27		06:50 (T18)	06:58	07:29	07:03	07:38		
	21:09	47	07:27 (T18)	20:49	33	07:23 (T18)	20:06	19:13	17:27	17:03		
3	06:03		06:39 (T18)	06:28		06:51 (T18)	06:59	07:30	07:04	07:39		08:59 (T21)
	21:08	48	07:27 (T18)	20:48	31	07:22 (T18)	20:04	19:11	17:25	17:03	9	09:08 (T21)
4	06:03		06:40 (T18)	06:29		06:53 (T18)	07:00	07:31	07:06	07:40		08:57 (T21)
	21:08	48	07:28 (T18)	20:47	27	07:20 (T18)	20:02	19:10	17:24	17:03	14	09:11 (T21)
5	06:04		06:39 (T18)	06:30		06:54 (T18)	07:01	07:32	07:07	07:41		08:56 (T21)
	21:08	48	07:27 (T18)	20:46	25	07:19 (T18)	20:01	19:08	17:23	17:03	16	09:12 (T21)
6	06:05		06:40 (T18)	06:31		06:56 (T18)	07:02	07:33	07:08	07:42		08:55 (T21)
	21:08	48	07:28 (T18)	20:45	20	07:16 (T18)	19:57	19:06	17:22	17:02	19	09:14 (T21)
7	06:05		06:40 (T18)	06:32		07:00 (T18)	07:03	07:34	07:09	07:43		08:54 (T21)
	21:08	49	07:29 (T18)	20:43	13	07:13 (T18)	19:56	19:05	17:21	17:02	22	09:16 (T21)
8	06:06		06:40 (T18)	06:33			07:04	07:35	07:11	07:44		08:54 (T21)
	21:07	48	07:28 (T18)	20:42			19:54	19:03	17:20	17:02	23	09:17 (T21)
9	06:06		06:40 (T18)	06:34			07:05	07:36	07:12	07:45		08:54 (T21)
	21:07	49	07:29 (T18)	20:41			19:52	19:01	17:19	17:02	24	09:18 (T21)
10	06:07		06:41 (T18)	06:35			07:06	07:37	07:13	07:46		08:53 (T21)
	21:07	48	07:29 (T18)	20:40			19:51	19:00	17:18	17:02	25	09:18 (T21)
11	06:08		06:40 (T18)	06:36			07:07	07:38	07:14	07:47		08:53 (T21)
	21:06	49	07:29 (T18)	20:38			19:49	18:58	17:17	17:02	26	09:19 (T21)
12	06:09		06:41 (T18)	06:37			07:08	07:39	07:15	07:48		08:53 (T21)
	21:06	48	07:29 (T18)	20:37			19:47	18:57	17:16	17:02	27	09:20 (T21)
13	06:09		06:41 (T18)	06:38			07:09	07:40	07:17	07:48		08:53 (T21)
	21:05	49	07:30 (T18)	20:36			19:45	18:55	17:15	17:03	29	09:22 (T21)
14	06:10		06:42 (T18)	06:39			07:10	07:41	07:18	07:49		08:54 (T21)
	21:05	48	07:30 (T18)	20:34			19:44	18:53	17:14	17:03	29	09:23 (T21)
15	06:11		06:41 (T18)	06:40			07:11	07:43	07:19	07:50		08:53 (T21)
	21:04	49	07:30 (T18)	20:33			19:42	18:52	17:13	17:03	30	09:23 (T21)
16	06:12		06:41 (T18)	06:41			07:12	07:44	07:20	07:51		08:54 (T21)
	21:04	49	07:30 (T18)	20:32			19:40	18:50	17:12	17:03	30	09:24 (T21)
17	06:12		06:42 (T18)	06:42			07:13	07:45	07:21	07:51		08:54 (T21)
	21:03	48	07:30 (T18)	20:30			19:39	18:49	17:11	17:04	31	09:25 (T21)
18	06:13		06:42 (T18)	06:43			07:14	07:46	07:23	07:52		08:54 (T21)
	21:02	48	07:30 (T18)	20:29			19:37	18:47	17:10	17:04	31	09:25 (T21)
19	06:14		06:42 (T18)	06:44			07:15	07:47	07:24	07:52		08:55 (T21)
	21:02	48	07:30 (T18)	20:27			19:35	18:46	17:10	17:04	31	09:26 (T21)
20	06:15		06:42 (T18)	06:45			07:16	07:48	07:25	07:53		08:55 (T21)
	21:01	48	07:30 (T18)	20:26			19:33	18:44	17:09	17:05	31	09:26 (T21)
21	06:16		06:42 (T18)	06:46			07:17	07:49	07:26	07:54		08:56 (T21)
	21:00	48	07:30 (T18)	20:24			19:32	18:43	17:08	17:05	31	09:27 (T21)
22	06:17		06:43 (T18)	06:47			07:18	07:50	07:27	07:54		08:56 (T21)
	21:00	47	07:30 (T18)	20:23			19:30	18:41	17:08	17:06	31	09:27 (T21)
23	06:18		06:43 (T18)	06:48			07:19	07:52	07:28	07:55		08:57 (T21)
	20:59	47	07:30 (T18)	20:21			19:28	18:40	17:07	17:06	31	09:28 (T21)
24	06:18		06:44 (T18)	06:49			07:20	07:53	07:30	07:55		08:57 (T21)
	20:58	45	07:29 (T18)	20:20			19:27	18:38	17:06	17:07	31	09:28 (T21)
25	06:19		06:44 (T18)	06:50			07:21	07:54	07:31	07:56		08:58 (T21)
	20:57	45	07:29 (T18)	20:18			19:25	18:37	17:06	17:07	31	09:29 (T21)
26	06:20		06:44 (T18)	06:51			07:22	07:55	07:32	07:56		08:58 (T21)
	20:56	44	07:28 (T18)	20:17			19:23	18:36	17:05	17:08	31	09:29 (T21)
27	06:21		06:45 (T18)	06:52			07:23	07:56	07:33	07:56		08:59 (T21)
	20:55	43	07:28 (T18)	20:15			19:21	18:34	17:05	17:09	30	09:29 (T21)
28	06:22		06:45 (T18)	06:53			07:24	07:57	07:34	07:57		08:59 (T21)
	20:54	42	07:27 (T18)	20:14			19:20	18:33	17:04	17:09	30	09:29 (T21)
29	06:23		06:46 (T18)	06:54			07:25	07:59	07:35	07:57		09:01 (T21)
	20:53	41	07:27 (T18)	20:12			19:18	18:32	17:04	17:10	29	09:30 (T21)
30	06:24		06:47 (T18)	06:55			07:26	08:00	07:36	07:57		09:01 (T21)
	20:52	39	07:26 (T18)	20:10			19:16	18:30	17:04	17:11	29	09:30 (T21)
31	06:25		06:48 (T18)	06:56				08:01		07:57		09:02 (T21)
	20:51	37	07:25 (T18)	20:09				18:29		17:12	27	09:29 (T21)
Potential sun hours	460			429			375	345	297	287		
Total, worst case		1443			184						778	
Sun reduction		0.66			0.61						0.22	
Oper. time red.		1.00			1.00						1.00	
Wind dir. red.		0.71			0.71						0.53	
Total reduction		0.45			0.42						0.11	
Total, real		654			77						88	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 668 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6727)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March	April	May	June	July	August	September	October		November		December
1	07:57	07:43		07:07	07:16	06:30	06:01	06:02	06:26	06:57	07:27		07:02	07:23 (T14)	07:37
	17:12	17:47		18:21	19:56	20:27	20:57	21:09	20:50	20:07	19:14		17:28 16	07:39 (T14)	17:03
2	07:57	07:42		07:05	07:14	06:28	06:00	06:02	06:27	06:58	07:28		07:03	07:25 (T14)	07:38
	17:13	17:48		18:23	19:57	20:28	20:58	21:08	20:49	20:05	19:13		17:26 13	07:38 (T14)	17:03
3	07:58	07:41		07:04	07:12	06:27	06:00	06:03	06:28	06:59	07:29		07:04	07:26 (T14)	07:39
	17:14	17:49		18:24	19:58	20:29	20:58	21:08	20:48	20:04	19:11		17:25 10	07:36 (T14)	17:03
4	07:58	07:40		07:02	07:11	06:26	06:00	06:03	06:29	07:00	07:30		07:06	07:27 (T14)	07:40
	17:15	17:51		18:25	19:59	20:30	20:59	21:08	20:47	20:02	19:09		17:24 6	07:33 (T14)	17:02
5	07:58	07:39		07:01	07:09	06:25	05:59	06:04	06:30	07:01	07:31		07:07		07:41
	17:16	17:52		18:26	20:00	20:31	21:00	21:08	20:46	20:00	19:08		17:23		17:02
6	07:57	07:38		06:59	07:08	06:23	05:59	06:04	06:31	07:02	07:33		07:08		07:42
	17:17	17:53		18:27	20:00	20:32	21:01	21:08	20:44	19:57	19:06		17:22		17:02
7	07:57	07:37	07:57 (T14)	06:58	07:06	06:22	05:59	06:05	06:32	07:03	07:34		07:09		07:43
	17:18	17:55 7	08:04 (T14)	18:28	20:01	20:33	21:01	21:07	20:43	19:55	19:04		17:20		17:02
8	07:57	07:36	07:56 (T14)	07:56	07:04	06:21	05:58	06:06	06:33	07:04	07:35		07:10		07:44
	17:19	17:56 11	08:07 (T14)	19:29	20:02	20:34	21:02	21:07	20:42	19:54	19:03		17:19		17:02
9	07:57	07:35	07:55 (T14)	07:54	07:03	06:20	05:58	06:06	06:34	07:05	07:36		07:12		07:45
	17:20	17:57 14	08:09 (T14)	19:31	20:03	20:35	21:02	21:07	20:41	19:52	19:01		17:18		17:02
10	07:57	07:34	07:54 (T14)	07:53	07:01	06:19	05:58	06:07	06:35	07:06	07:37		07:13		07:46
	17:21	17:58 17	08:11 (T14)	19:32	20:04	20:36	21:03	21:06	20:39	19:50	19:00		17:17		17:02
11	07:57	07:32	07:52 (T14)	07:51	06:59	06:18	05:58	06:08	06:36	07:07	07:38		07:14		07:47
	17:22	18:00 19	08:11 (T14)	19:33	20:05	20:37	21:04	21:06	20:38	19:49	18:58		17:16		17:02
12	07:56	07:31	07:51 (T14)	07:49	06:58	06:17	05:58	06:08	06:37	07:08	07:39		07:15		07:47
	17:23	18:01 21	08:12 (T14)	19:34	20:07	20:39	21:04	21:06	20:37	19:47	18:56		17:15		17:02
13	07:56	07:30	07:50 (T14)	07:48	06:56	06:16	05:58	06:09	06:38	07:09	07:40		07:16		07:48
	17:24	18:02 23	08:13 (T14)	19:35	20:08	20:40	21:05	21:05	20:36	19:45	18:55		17:14		17:02
14	07:56	07:29	07:48 (T14)	07:46	06:55	06:14	05:58	06:10	06:39	07:10	07:41		07:18		07:49
	17:25	18:03 25	08:13 (T14)	19:36	20:09	20:41	21:05	21:05	20:34	19:44	18:53		17:13		17:03
15	07:55	07:27	07:47 (T14)	07:44	06:53	06:13	05:58	06:11	06:40	07:11	07:42		07:19		07:50
	17:26	18:05 26	08:13 (T14)	19:37	20:10	20:42	21:06	21:04	20:33	19:42	18:52		17:13		17:03
16	07:55	07:26	07:46 (T14)	07:43	06:51	06:12	05:58	06:11	06:41	07:12	07:43	08:25 (T14)	07:20		07:50
	17:28	18:06 28	08:14 (T14)	19:38	20:11	20:43	21:06	21:04	20:31	19:40	18:50 12	08:37 (T14)	17:12		17:03
17	07:54	07:25	07:45 (T14)	07:41	06:50	06:12	05:58	06:12	06:42	07:13	07:45	08:22 (T14)	07:21		07:51
	17:29	18:07 28	08:13 (T14)	19:40	20:12	20:44	21:06	21:03	20:30	19:38	18:49 17	08:39 (T14)	17:11		17:03
18	07:54	07:23	07:45 (T14)	07:39	06:48	06:11	05:58	06:13	06:43	07:14	07:46	08:20 (T14)	07:22		07:52
	17:30	18:08 29	08:14 (T14)	19:41	20:13	20:45	21:07	21:02	20:29	19:37	18:47 20	08:40 (T14)	17:10		17:04
19	07:53	07:22	07:46 (T14)	07:38	06:47	06:10	05:58	06:14	06:44	07:15	07:47	08:18 (T14)	07:24		07:52
	17:31	18:09 28	08:14 (T14)	19:42	20:14	20:45	21:07	21:02	20:27	19:35	18:46 23	08:41 (T14)	17:09		17:04
20	07:53	07:20	07:46 (T14)	07:36	06:45	06:09	05:58	06:15	06:45	07:16	07:48	08:17 (T14)	07:25		07:53
	17:32	18:11 27	08:13 (T14)	19:43	20:15	20:46	21:07	21:01	20:26	19:33	18:44 25	08:42 (T14)	17:09		17:04
21	07:52	07:19	07:47 (T14)	07:34	06:44	06:08	05:58	06:16	06:46	07:17	07:49	08:17 (T14)	07:26		07:53
	17:33	18:12 25	08:12 (T14)	19:44	20:16	20:47	21:08	21:00	20:24	19:32	18:43 26	08:43 (T14)	17:08		17:05
22	07:52	07:18	07:47 (T14)	07:33	06:42	06:07	05:58	06:16	06:47	07:18	07:50	08:16 (T14)	07:27		07:54
	17:35	18:13 24	08:11 (T14)	19:45	20:17	20:48	21:08	20:59	20:23	19:30	18:41 27	08:43 (T14)	17:07		17:05
23	07:51	07:16	07:48 (T14)	07:31	06:41	06:06	05:59	06:17	06:48	07:19	07:51	08:15 (T14)	07:28		07:54
	17:36	18:14 22	08:10 (T14)	19:46	20:18	20:49	21:08	20:59	20:21	19:28	18:40 28	08:43 (T14)	17:07		17:06
24	07:50	07:15	07:49 (T14)	07:29	06:39	06:06	05:59	06:18	06:49	07:20	07:53	08:15 (T14)	07:29		07:55
	17:37	18:15 19	08:08 (T14)	19:47	20:19	20:50	21:08	20:58	20:20	19:26	18:38 28	08:43 (T14)	17:06		17:06
25	07:49	07:13	07:51 (T14)	07:28	06:38	06:05	05:59	06:19	06:50	07:21	07:54	08:15 (T14)	07:30		07:55
	17:38	18:17 16	08:07 (T14)	19:48	20:21	20:51	21:08	20:57	20:18	19:25	18:37 28	08:43 (T14)	17:06		17:07
26	07:49	07:12	07:54 (T14)	07:26	06:37	06:04	05:59	06:20	06:51	07:22	07:55	08:16 (T14)	07:32		07:56
	17:39	18:18 9	08:03 (T14)	19:49	20:22	20:52	21:09	20:56	20:17	19:23	18:35 28	08:44 (T14)	17:05		17:08
27	07:48	07:10		07:24	06:35	06:04	06:00	06:21	06:52	07:23	07:56	08:17 (T14)	07:33		07:56
	17:41	18:19		19:50	20:23	20:53	21:09	20:55	20:15	19:21	18:34 26	08:43 (T14)	17:05		17:08
28	07:47	07:09		07:23	06:34	06:03	06:00	06:22	06:53	07:24	07:57	08:18 (T14)	07:34		07:56
	17:42	18:20		19:51	20:24	20:54	21:09	20:54	20:13	19:20	18:33 24	08:42 (T14)	17:04		17:09
29	07:46			07:21	06:32	06:02	06:01	06:23	06:54	07:25	07:58	08:19 (T14)	07:35		07:57
	17:43			19:53	20:25	20:55	21:09	20:53	20:12	19:18	18:31 23	08:42 (T14)	17:04		17:10
30	07:45			07:19	06:31	06:02	06:01	06:24	06:55	07:26	08:00	08:21 (T14)	07:36		07:57
	17:44			19:54	20:26	20:55	21:09	20:52	20:10	19:16	18:30 21	08:42 (T14)	17:03		17:11
31	07:44			07:17		06:01		06:25	06:56		08:01	08:22 (T14)			07:57
	17:46			19:55		20:56		20:51	20:09		18:29 18	08:40 (T14)			17:11
Potential sun hours	297	297		370	399	449	453	460	429	375	345		297		287
Total, worst case			418									374		45	
Sun reduction			0.40									0.48		0.30	
Oper. time red.			1.00									1.00		1.00	
Wind dir. red.			0.56									0.56		0.56	
Total reduction			0.22									0.27		0.17	
Total, real			93									100		7	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 693 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6746)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February			March			April			May			June		
1	07:58	07:44			07:07		17:08 (T37)	07:16		17:58 (T37)	06:30			06:02		19:50 (T34)
	17:13	17:48			18:22	52	18:00 (T38)	19:56	44	18:42 (T37)	20:27			20:57	28	20:18 (T34)
2	07:58	07:43			07:06		17:05 (T37)	07:15		18:01 (T37)	06:29			06:01		19:51 (T34)
	17:14	17:49			18:23	56	18:01 (T38)	19:57	39	18:40 (T37)	20:28			20:58	27	20:18 (T34)
3	07:58	07:42			07:04		17:04 (T37)	07:13		18:02 (T37)	06:28			06:01		19:51 (T34)
	17:15	17:50			18:24	59	18:03 (T38)	19:58	36	18:38 (T37)	20:29			20:59	26	20:17 (T34)
4	07:58	07:41			07:03		17:02 (T37)	07:11		18:04 (T37)	06:26		19:58 (T34)	06:00		19:51 (T34)
	17:16	17:51			18:25	62	18:04 (T38)	19:59	31	18:35 (T37)	20:30	10	20:08 (T34)	20:59	27	20:18 (T34)
5	07:58	07:40			07:01		17:00 (T37)	07:10		18:07 (T37)	06:25		19:55 (T34)	06:00		19:52 (T34)
	17:17	17:53			18:26	64	18:04 (T38)	20:00	26	18:33 (T37)	20:31	14	20:09 (T34)	21:00	26	20:18 (T34)
6	07:58	07:39			07:00		16:59 (T37)	07:08		18:10 (T37)	06:24		19:53 (T34)	06:00		19:52 (T34)
	17:18	17:54			18:28	67	18:06 (T38)	20:00	18	18:28 (T37)	20:33	17	20:10 (T34)	21:01	25	20:17 (T34)
7	07:58	07:37			06:58		16:58 (T37)	07:06			06:23		19:52 (T34)	05:59		19:53 (T34)
	17:19	17:55			18:29	69	18:07 (T38)	20:02			20:34	19	20:11 (T34)	21:01	24	20:17 (T34)
8	07:58	07:36			07:56		17:57 (T37)	07:05			06:22		19:50 (T34)	05:59		19:54 (T34)
	17:20	17:56			19:30	70	19:07 (T38)	20:03			20:35	22	20:12 (T34)	21:02	23	20:17 (T34)
9	07:57	07:35			07:55		17:56 (T37)	07:03			06:20		19:50 (T34)	05:59		19:55 (T34)
	17:21	17:58			19:31	71	19:07 (T38)	20:04			20:36	23	20:13 (T34)	21:03	21	20:16 (T34)
10	07:57	07:34			07:53		17:55 (T37)	07:02			06:19		19:49 (T34)	05:59		19:55 (T34)
	17:22	17:59			19:32	71	19:06 (T38)	20:05			20:37	25	20:14 (T34)	21:03	21	20:16 (T34)
11	07:57	07:33			07:51		17:55 (T37)	07:00			06:18		19:48 (T34)	05:58		19:56 (T34)
	17:23	18:00			19:33	71	19:06 (T38)	20:06			20:38	27	20:15 (T34)	21:04	20	20:16 (T34)
12	07:57	07:31			07:50		17:54 (T37)	06:58			06:17		19:48 (T34)	05:58		19:57 (T34)
	17:24	18:01			19:34	71	19:05 (T38)	20:07			20:39	28	20:16 (T34)	21:04	19	20:16 (T34)
13	07:56	07:30			07:48		17:53 (T37)	06:57			06:16		19:47 (T34)	05:58		19:57 (T34)
	17:25	18:03			19:36	70	19:03 (T38)	20:08			20:40	30	20:17 (T34)	21:05	18	20:15 (T34)
14	07:56	07:29			07:46		17:53 (T37)	06:55			06:15		19:47 (T34)	05:58		19:57 (T34)
	17:26	18:04			19:37	70	19:03 (T38)	20:09			20:41	31	20:18 (T34)	21:05	18	20:15 (T34)
15	07:56	07:28			07:45		17:52 (T37)	06:54			06:14		19:46 (T34)	05:58		19:58 (T34)
	17:27	18:05			19:38	69	19:01 (T38)	20:10			20:42	33	20:19 (T34)	21:06	17	20:15 (T34)
16	07:55	07:26			07:43		17:52 (T37)	06:52			06:13		19:46 (T34)	05:58		19:59 (T34)
	17:28	18:06			19:39	66	18:58 (T38)	20:11			20:43	34	20:20 (T34)	21:06	17	20:16 (T34)
17	07:55	07:25			07:41		17:52 (T37)	06:50			06:12		19:46 (T34)	05:58		20:00 (T34)
	17:29	18:08			19:40	64	18:56 (T37)	20:12			20:44	34	20:20 (T34)	21:07	16	20:16 (T34)
18	07:54	07:24			07:40		17:52 (T37)	06:49			06:11		19:46 (T34)	05:58		20:00 (T34)
	17:30	18:09			19:41	64	18:56 (T37)	20:13			20:45	34	20:20 (T34)	21:07	15	20:15 (T34)
19	07:54	07:22			07:38		17:51 (T37)	06:47			06:10		19:45 (T34)	05:58		20:00 (T34)
	17:32	18:10			19:42	64	18:55 (T37)	20:14			20:46	35	20:20 (T34)	21:07	15	20:15 (T34)
20	07:53	07:21			07:36		17:52 (T37)	06:46			06:09		19:45 (T34)	05:59		20:00 (T34)
	17:33	18:11			19:43	63	18:55 (T37)	20:15			20:47	35	20:20 (T34)	21:08	15	20:15 (T34)
21	07:53	07:19			07:35		17:52 (T37)	06:44			06:09		19:46 (T34)	05:59		20:00 (T34)
	17:34	18:12			19:44	62	18:54 (T37)	20:17			20:48	34	20:20 (T34)	21:08	15	20:15 (T34)
22	07:52	07:18			07:33		17:52 (T37)	06:43			06:08		19:46 (T34)	05:59		20:00 (T34)
	17:35	18:14			19:45	61	18:53 (T37)	20:18			20:49	34	20:20 (T34)	21:08	15	20:15 (T34)
23	07:51	07:16			07:31		17:52 (T37)	06:41			06:07		19:46 (T34)	05:59		20:01 (T34)
	17:36	18:15			19:46	60	18:52 (T37)	20:19			20:49	34	20:20 (T34)	21:08	15	20:16 (T34)
24	07:50	07:15			07:30		17:53 (T37)	06:40			06:06		19:46 (T34)	05:59		20:01 (T34)
	17:38	18:16			19:48	59	18:52 (T37)	20:20			20:50	33	20:19 (T34)	21:08	15	20:16 (T34)
25	07:50	07:13		17:21 (T37)	07:28		17:53 (T37)	06:39			06:06		19:47 (T34)	06:00		20:01 (T34)
	17:39	18:17	14	17:35 (T37)	19:49	58	18:51 (T37)	20:21			20:51	33	20:20 (T34)	21:09	16	20:17 (T34)
26	07:49	07:12		17:15 (T37)	07:26		17:53 (T37)	06:37			06:05		19:47 (T34)	06:00		20:01 (T34)
	17:40	18:18	24	17:39 (T37)	19:50	57	18:50 (T37)	20:22			20:52	32	20:19 (T34)	21:09	17	20:18 (T34)
27	07:48	07:10		17:12 (T37)	07:25		17:54 (T37)	06:36			06:04		19:48 (T34)	06:00		20:01 (T34)
	17:41	18:20	39	17:58 (T38)	19:51	56	18:50 (T37)	20:23			20:53	32	20:20 (T34)	21:09	17	20:18 (T34)
28	07:47	07:09		17:09 (T37)	07:23		17:55 (T37)	06:34			06:04		19:48 (T34)	06:01		20:00 (T34)
	17:43	18:21	48	17:58 (T38)	19:52	53	18:48 (T37)	20:24			20:54	31	20:19 (T34)	21:09	18	20:18 (T34)
29	07:46				07:21		17:55 (T37)	06:33			06:03		19:49 (T34)	06:01		20:01 (T34)
	17:44				19:53	51	18:46 (T37)	20:25			20:55	30	20:19 (T34)	21:09	18	20:19 (T34)
30	07:46				07:20		17:57 (T37)	06:32			06:03		19:49 (T34)	06:02		20:00 (T34)
	17:45				19:54	49	18:46 (T37)	20:26			20:56	30	20:19 (T34)	21:09	19	20:19 (T34)
31	07:45				07:18		17:58 (T37)				06:02		19:50 (T34)			
	17:46				19:55	46	18:44 (T37)				20:56	29	20:19 (T34)			
Potential sun hours	297	297			370			399			449			453		
Total, worst case			125			1925			194			803			583	
Sun reduction			0.40			0.44			0.52			0.57			0.64	
Oper. time red.			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.			0.67			0.67			0.67			0.56			0.56	
Total reduction			0.27			0.30			0.35			0.32			0.36	
Total, real			34			576			69			258			210	

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

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

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 693 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6746)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		20:01 (T34)	06:26	19:57 (T34)	06:57		07:28	17:33 (T37)	07:02	07:37
	21:09	19	20:20 (T34)	20:50 28	20:25 (T34)	20:07		19:15 71	18:44 (T38)	17:28	17:04
2	06:03		20:00 (T34)	06:27	19:58 (T34)	06:58		07:29	17:33 (T37)	07:03	07:38
	21:09	20	20:20 (T34)	20:49 27	20:25 (T34)	20:06		19:13 71	18:44 (T38)	17:27	17:04
3	06:03		20:00 (T34)	06:28	19:59 (T34)	06:59		07:30	17:33 (T37)	07:05	07:39
	21:09	21	20:21 (T34)	20:48 25	20:24 (T34)	20:04		19:12 71	18:44 (T38)	17:26	17:03
4	06:04		19:59 (T34)	06:29	19:59 (T34)	07:00		07:31	17:33 (T37)	07:06	07:40
	21:08	23	20:22 (T34)	20:47 23	20:22 (T34)	20:02		19:10 71	18:44 (T38)	17:24	17:03
5	06:04		19:59 (T34)	06:30	20:00 (T34)	07:01		07:32	17:34 (T37)	07:07	07:41
	21:08	24	20:23 (T34)	20:46 21	20:21 (T34)	20:01		19:08 70	18:44 (T38)	17:23	17:03
6	06:05		19:59 (T34)	06:31	20:02 (T34)	07:02	18:07 (T37)	07:33	17:34 (T37)	07:08	07:42
	21:08	24	20:23 (T34)	20:45 18	20:20 (T34)	19:58 17	18:24 (T37)	19:07 70	18:44 (T38)	17:22	17:03
7	06:06		19:59 (T34)	06:32	20:03 (T34)	07:03	18:02 (T37)	07:34	17:35 (T37)	07:09	07:43
	21:08	25	20:24 (T34)	20:44 16	20:19 (T34)	19:56 26	18:28 (T37)	19:05 68	18:43 (T38)	17:21	17:03
8	06:06		19:59 (T34)	06:33	20:05 (T34)	07:04	17:59 (T37)	07:35	17:35 (T37)	07:11	07:44
	21:07	26	20:25 (T34)	20:42 13	20:18 (T34)	19:54 31	18:30 (T37)	19:03 66	18:41 (T38)	17:20	17:03
9	06:07		19:58 (T34)	06:34	20:09 (T34)	07:05	17:56 (T37)	07:36	17:36 (T37)	07:12	07:45
	21:07	27	20:25 (T34)	20:41 7	20:16 (T34)	19:52 36	18:32 (T37)	19:02 63	18:39 (T38)	17:19	17:03
10	06:08		19:58 (T34)	06:35		07:06	17:54 (T37)	07:37	17:37 (T37)	07:13	07:46
	21:07	27	20:25 (T34)	20:40		19:51 39	18:33 (T37)	19:00 60	18:37 (T38)	17:18	17:03
11	06:08		19:58 (T34)	06:36		07:07	17:52 (T37)	07:38	17:38 (T37)	07:14	07:47
	21:06	28	20:26 (T34)	20:38		19:49 43	18:35 (T37)	18:58 58	18:36 (T38)	17:17	17:03
12	06:09		19:57 (T34)	06:37		07:08	17:50 (T37)	07:39	17:39 (T37)	07:15	07:48
	21:06	29	20:26 (T34)	20:37		19:47 46	18:36 (T37)	18:57 55	18:34 (T38)	17:16	17:03
13	06:10		19:57 (T34)	06:38		07:09	17:48 (T37)	07:40	17:42 (T37)	07:17	07:48
	21:05	30	20:27 (T34)	20:36		19:46 49	18:37 (T37)	18:55 51	18:33 (T38)	17:15	17:03
14	06:10		19:57 (T34)	06:39		07:10	17:47 (T37)	07:42	17:44 (T37)	07:18	07:49
	21:05	31	20:28 (T34)	20:34		19:44 50	18:37 (T37)	18:54 44	18:31 (T38)	17:14	17:03
15	06:11		19:57 (T34)	06:40		07:11	17:44 (T37)	07:43	17:46 (T37)	07:19	07:50
	21:04	31	20:28 (T34)	20:33		19:42 53	18:37 (T37)	18:52 28	18:14 (T37)	17:13	17:03
16	06:12		19:56 (T34)	06:41		07:12	17:43 (T37)	07:44	17:49 (T37)	07:20	07:51
	21:04	32	20:28 (T34)	20:32		19:41 55	18:38 (T37)	18:51 21	18:10 (T37)	17:12	17:04
17	06:13		19:56 (T34)	06:42		07:13	17:41 (T37)	07:45	17:56 (T37)	07:21	07:51
	21:03	33	20:29 (T34)	20:30		19:39 57	18:38 (T37)	18:49 7	18:03 (T37)	17:12	17:04
18	06:14		19:56 (T34)	06:43		07:14	17:40 (T37)	07:46		07:23	07:52
	21:02	33	20:29 (T34)	20:29		19:37 58	18:38 (T37)	18:48		17:11	17:04
19	06:14		19:56 (T34)	06:44		07:15	17:39 (T37)	07:47		07:24	07:53
	21:02	34	20:30 (T34)	20:27		19:35 60	18:39 (T37)	18:46		17:10	17:05
20	06:15		19:56 (T34)	06:45		07:16	17:38 (T37)	07:48		07:25	07:53
	21:01	34	20:30 (T34)	20:26		19:34 61	18:39 (T37)	18:45		17:09	17:05
21	06:16		19:56 (T34)	06:46		07:17	17:37 (T37)	07:49		07:26	07:54
	21:00	33	20:29 (T34)	20:25		19:32 62	18:39 (T37)	18:43		17:09	17:06
22	06:17		19:56 (T34)	06:47		07:18	17:36 (T37)	07:51		07:27	07:54
	21:00	34	20:30 (T34)	20:23		19:30 63	18:39 (T37)	18:42		17:08	17:06
23	06:18		19:56 (T34)	06:48		07:19	17:36 (T37)	07:52		07:28	07:55
	20:59	34	20:30 (T34)	20:22		19:29 63	18:39 (T37)	18:40		17:07	17:07
24	06:19		19:56 (T34)	06:49		07:21	17:35 (T37)	07:53		07:30	07:55
	20:58	34	20:30 (T34)	20:20		19:27 63	18:38 (T37)	18:39		17:07	17:07
25	06:20		19:56 (T34)	06:50		07:22	17:34 (T37)	07:54		07:31	17:56
	20:57	34	20:30 (T34)	20:18		19:25 64	18:38 (T37)	18:37		17:06	17:08
26	06:21		19:56 (T34)	06:51		07:23	17:34 (T37)	07:55		07:32	07:56
	20:56	34	20:30 (T34)	20:17		19:23 64	18:38 (T37)	18:36		17:06	17:08
27	06:22		19:56 (T34)	06:52		07:24	17:33 (T37)	07:56		07:33	07:56
	20:55	34	20:30 (T34)	20:15		19:22 66	18:39 (T38)	18:35		17:05	17:09
28	06:23		19:57 (T34)	06:53		07:25	17:33 (T37)	07:58		07:34	07:57
	20:54	33	20:30 (T34)	20:14		19:20 67	18:40 (T38)	18:33		17:05	17:10
29	06:24		19:57 (T34)	06:54		07:26	17:33 (T37)	07:59		07:35	07:57
	20:53	32	20:29 (T34)	20:12		19:18 69	18:42 (T38)	18:32		17:04	17:10
30	06:24		19:56 (T34)	06:55		07:27	17:32 (T37)	08:00		07:36	07:57
	20:52	31	20:27 (T34)	20:11		19:17 70	18:42 (T38)	18:31		17:04	17:11
31	06:25		19:57 (T34)	06:56				08:01			07:57
	20:51	29	20:26 (T34)	20:09				18:29			17:12
Potential sun hours	460		429		375			345		297	287
Total, worst case		913		178		1332		945			
Sun reduction		0.66		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.56		0.56		0.67		0.67			
Total reduction		0.37		0.34		0.40		0.33			
Total, real		339		61		535		308			

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 718 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6764)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		07:07		07:16		06:30		06:01	
	17:13	17:47		18:22	28	17:27 (T77)	17:55 (T77)	19:56		20:27	43	19:11 (T42)	19:54 (T42)	20:57	25	20:07 (T41)	20:32 (T41)
2	07:57	07:42		07:06		07:14		06:29		06:01	
	17:14	17:49		18:23	32	17:24 (T77)	17:56 (T77)	19:57		20:28	43	19:11 (T42)	19:54 (T42)	20:58	25	20:08 (T41)	20:33 (T41)
3	07:57	07:41		07:04		07:13		06:28		06:01	
	17:15	17:50		18:24	35	17:22 (T77)	17:57 (T77)	19:58		20:29	42	19:11 (T42)	19:53 (T42)	20:58	26	20:07 (T41)	20:33 (T41)
4	07:57	07:40		07:02		07:11		06:26		06:00	
	17:16	17:51		18:25	38	17:21 (T77)	17:59 (T77)	19:59		20:30	42	19:11 (T42)	19:53 (T42)	20:59	27	20:07 (T41)	20:34 (T41)
5	07:57	07:39		07:01		07:09		06:25		06:00	
	17:17	17:52		18:26	39	17:20 (T77)	17:59 (T77)	20:00		20:31	40	19:12 (T42)	19:52 (T42)	21:00	27	20:08 (T41)	20:35 (T41)
6	07:57	07:38		06:59		07:08		06:24		05:59	
	17:17	17:54		18:27	41	17:19 (T77)	18:00 (T77)	20:00		20:32	40	19:12 (T42)	19:52 (T42)	21:00	28	20:07 (T41)	20:35 (T41)
7	07:57	07:37		06:58		07:06		06:23		05:59	
	17:18	17:55		18:29	43	17:18 (T77)	18:01 (T77)	20:01		20:33	38	19:13 (T42)	19:51 (T42)	21:01	28	20:08 (T41)	20:36 (T41)
8	07:57	07:36		07:56		07:05		06:22		05:59	
	17:19	17:56		19:30	44	18:17 (T77)	19:01 (T77)	20:02		20:34	37	19:14 (T42)	19:51 (T42)	21:02	29	20:08 (T41)	20:37 (T41)
9	07:57	07:35		07:54		07:03		06:20		05:59	
	17:20	17:57		19:31	48	08:19 (T76)	19:02 (T77)	20:03		20:35	36	19:14 (T42)	19:50 (T42)	21:02	29	20:08 (T41)	20:37 (T41)
10	07:57	07:34		07:53		07:01		06:19		05:59	
	17:21	17:59		19:32	59	08:13 (T76)	19:01 (T77)	20:05		20:36	35	19:14 (T42)	19:49 (T42)	21:03	29	20:09 (T41)	20:38 (T41)
11	07:57	07:32		07:51		07:00		06:18		05:58	
	17:23	18:00		19:33	65	08:10 (T76)	19:01 (T77)	20:06		20:37	33	19:15 (T42)	19:48 (T42)	21:03	29	20:09 (T41)	20:38 (T41)
12	07:56	07:31		07:50		06:58		06:17		05:58	
	17:24	18:01		19:34	70	08:09 (T76)	19:02 (T77)	20:07		20:38	31	19:16 (T42)	19:47 (T42)	21:04	29	20:08 (T41)	20:37 (T41)
13	07:56	07:30		07:48		06:57		06:16		05:58	
	17:25	18:02		19:35	72	08:07 (T76)	19:01 (T77)	20:08		20:39	29	19:17 (T42)	19:46 (T42)	21:05	29	20:09 (T41)	20:38 (T41)
14	07:56	07:29		07:46		06:55		06:15		05:58	
	17:26	18:04		19:36	75	08:05 (T76)	19:01 (T77)	20:09	9	19:31 (T42)	19:40 (T42)	20:40	26	19:18 (T42)	19:44 (T42)	21:05	29	20:09 (T41)	20:38 (T41)
15	07:55	07:27		07:45		06:53		06:14		05:58	
	17:27	18:05		19:38	76	08:04 (T76)	19:01 (T77)	20:10	18	19:26 (T42)	19:44 (T42)	20:41	23	19:20 (T42)	19:43 (T42)	21:05	29	20:09 (T41)	20:38 (T41)
16	07:55	07:26		07:43		06:52		06:13		05:58	
	17:28	18:06		19:39	78	08:02 (T76)	19:00 (T77)	20:11	23	19:24 (T42)	19:47 (T42)	20:42	20	19:22 (T42)	19:42 (T42)	21:06	29	20:09 (T41)	20:38 (T41)
17	07:54	07:25		07:41		06:50		06:12		05:58	
	17:29	18:07		19:40	78	08:01 (T76)	18:59 (T77)	20:12	27	19:21 (T42)	19:48 (T42)	20:43	16	19:24 (T42)	19:40 (T42)	21:06	29	20:10 (T41)	20:39 (T41)
18	07:54	07:23		07:40		06:49		06:11		05:58	
	17:30	18:09		19:41	78	08:01 (T76)	18:59 (T77)	20:13	30	19:20 (T42)	19:50 (T42)	20:44	10	19:27 (T42)	19:37 (T42)	21:07	28	20:11 (T41)	20:39 (T41)
19	07:53	07:22		07:38		06:47		06:10		05:58	
	17:32	18:10		19:42	76	08:01 (T76)	18:58 (T77)	20:14	33	19:17 (T42)	19:50 (T42)	20:45	7	20:15 (T41)	20:22 (T41)	21:07	28	20:11 (T41)	20:39 (T41)
20	07:53	07:20		07:36		06:46		06:09		05:59	
	17:33	18:11		19:43	75	08:00 (T76)	18:56 (T77)	20:15	35	19:17 (T42)	19:52 (T42)	20:46	10	20:13 (T41)	20:23 (T41)	21:07	28	20:11 (T41)	20:39 (T41)
21	07:52	07:19		07:35		06:44		06:09		05:59	
	17:34	18:12		19:44	72	08:01 (T76)	18:56 (T77)	20:16	37	19:16 (T42)	19:53 (T42)	20:47	12	20:11 (T41)	20:23 (T41)	21:08	29	20:11 (T41)	20:40 (T41)
22	07:52	07:18		07:33		06:43		06:08		05:59	
	17:35	18:13		19:45	70	08:00 (T76)	18:54 (T77)	20:17	39	19:14 (T42)	19:53 (T42)	20:48	14	20:11 (T41)	20:25 (T41)	21:08	28	20:11 (T41)	20:39 (T41)
23	07:51	07:16		07:31		06:41		06:07		05:59	
	17:36	18:15		19:46	66	08:00 (T76)	18:52 (T77)	20:18	40	19:14 (T42)	19:54 (T42)	20:49	15	20:10 (T41)	20:25 (T41)	21:08	28	20:12 (T41)	20:40 (T41)
24	07:50	07:15		07:30		06:40		06:06		05:59	
	17:38	18:16		19:47	62	08:01 (T76)	18:51 (T77)	20:19	41	19:13 (T42)	19:54 (T42)	20:50	17	20:09 (T41)	20:26 (T41)	21:08	28	20:12 (T41)	20:40 (T41)
25	07:49	07:13		07:28		06:38		06:06		06:00	
	17:39	18:17		19:48	57	08:01 (T76)	18:49 (T77)	20:21	41	19:13 (T42)	19:54 (T42)	20:51	18	20:09 (T41)	20:27 (T41)	21:08	29	20:11 (T41)	20:40 (T41)
26	07:49	07:12	17:39 (T77)	07:26		06:37		06:05		06:00	
	17:40	18:18	3	17:42 (T77)	19:50	51	08:01 (T76)	18:46 (T77)	20:22	43	19:11 (T42)	19:54 (T42)	20:52	20	20:08 (T41)	20:28 (T41)	21:08	29	20:12 (T41)	20:41 (T41)
27	07:48	07:10	17:33 (T77)	07:24		06:36		06:04		06:00	
	17:41	18:19	16	17:49 (T77)	19:51	41	08:02 (T76)	18:42 (T77)	20:23	43	19:11 (T42)	19:54 (T42)	20:53	20	20:09 (T41)	20:29 (T41)	21:08	29	20:12 (T41)	20:41 (T41)
28	07:47	07:09	17:29 (T77)	07:23		06:34		06:04		06:01	
	17:42	18:21	23	17:52 (T77)	19:52	21	08:04 (T76)	08:25 (T76)	20:24	42	19:12 (T42)	19:54 (T42)	20:54	21	20:08 (T41)	20:29 (T41)	21:09	29	20:12 (T41)	20:41 (T41)
29	07:46				07:21		06:33		19:11 (T42)	19:54 (T42)	06:03		06:01	
	17:44				19:53	16	08:06 (T76)	08:22 (T76)	20:25	43	19:11 (T42)	19:54 (T42)	20:54	23	20:07 (T41)	20:30 (T41)	21:09	29	20:13 (T41)	20:42 (T41)
30	07:45				07:19		06:32		19:11 (T42)	19:54 (T42)	06:02		06:02	
	17:45				19:54	9	08:09 (T76)	08:18 (T76)	20:26	43	19:11 (T42)	19:54 (T42)	20:55	24	20:07 (T41)	20:31 (T41)	21:08	30	20:12 (T41)	20:42 (T41)
31	07:44				07:18						06:02		06:01	
	17:46				19:55						06:02		06:02	
											20:56	24	20:07 (T41)	20:31 (T41)				
Potential sun hours	297	297		370		399		448		453	
Total, worst case		42		1615		587		809		848	
Sun reduction		0.40		0.44		0.52		0.57		0.64	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.67		0.64		0.57		0.56		0.54	
Total reduction		0.27		0.29		0.30		0.32		0.35	
Total, real		11		461		177		263		297	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 718 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6764)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		20:13 (T41)	06:26	19:26 (T42)	06:57		07:27	07:47 (T76)	07:02	07:37
	21:08	29	20:42 (T41)	20:50 32	19:58 (T42)	20:07		19:15 70	18:40 (T77)	17:28	17:04
2	06:03		20:13 (T41)	06:27	19:25 (T42)	06:58		07:29	07:48 (T76)	07:03	07:38
	21:08	29	20:42 (T41)	20:49 34	19:59 (T42)	20:06		19:13 68	18:40 (T77)	17:27	17:03
3	06:03		20:14 (T41)	06:28	19:24 (T42)	06:59		07:30	07:49 (T76)	07:04	07:39
	21:08	29	20:43 (T41)	20:48 35	19:59 (T42)	20:04		19:11 63	18:39 (T77)	17:26	17:03
4	06:04		20:13 (T41)	06:29	19:24 (T42)	07:00		07:31	07:52 (T76)	07:06	07:40
	21:08	29	20:42 (T41)	20:47 36	20:00 (T42)	20:02		19:10 55	18:38 (T77)	17:24	17:03
5	06:04		20:14 (T41)	06:30	19:23 (T42)	07:01		07:32	17:54 (T77)	07:07	07:41
	21:08	29	20:43 (T41)	20:46 38	20:01 (T42)	20:01		19:08 45	18:39 (T77)	17:23	17:03
6	06:05		20:13 (T41)	06:31	19:22 (T42)	07:02		07:33	17:54 (T77)	07:08	07:42
	21:08	29	20:42 (T41)	20:44 39	20:01 (T42)	19:57		19:06 44	18:38 (T77)	17:22	17:03
7	06:05		20:14 (T41)	06:32	19:22 (T42)	07:03		07:34	17:54 (T77)	07:09	07:43
	21:07	28	20:42 (T41)	20:43 40	20:02 (T42)	19:56		19:05 43	18:37 (T77)	17:21	17:03
8	06:06		20:15 (T41)	06:33	19:21 (T42)	07:04		07:35	17:55 (T77)	07:10	07:44
	21:07	27	20:42 (T41)	20:42 41	20:02 (T42)	19:54		19:03 40	18:35 (T77)	17:20	17:03
9	06:07		20:14 (T41)	06:34	19:21 (T42)	07:05		07:36	17:55 (T77)	07:12	07:45
	21:07	27	20:41 (T41)	20:41 41	20:02 (T42)	19:52		19:01 39	18:34 (T77)	17:19	17:03
10	06:07		20:15 (T41)	06:35	19:20 (T42)	07:06		07:37	17:56 (T77)	07:13	07:46
	21:06	26	20:41 (T41)	20:39 42	20:02 (T42)	19:51		19:00 36	18:32 (T77)	17:18	17:03
11	06:08		20:15 (T41)	06:36	19:20 (T42)	07:07		07:38	17:57 (T77)	07:14	07:46
	21:06	26	20:41 (T41)	20:38 43	20:03 (T42)	19:49		18:58 34	18:31 (T77)	17:17	17:03
12	06:09		20:15 (T41)	06:37	19:20 (T42)	07:08		07:39	17:59 (T77)	07:15	07:47
	21:06	25	20:40 (T41)	20:37 43	20:03 (T42)	19:47		18:57 30	18:29 (T77)	17:16	17:03
13	06:10		20:16 (T41)	06:38	19:20 (T42)	07:09	08:01 (T76)	07:40	18:00 (T77)	07:16	07:48
	21:05	24	20:40 (T41)	20:36 43	20:03 (T42)	19:45 8	08:09 (T76)	18:55 26	18:26 (T77)	17:15	17:03
14	06:10		20:16 (T41)	06:39	19:19 (T42)	07:10	07:56 (T76)	07:41	18:02 (T77)	07:18	07:49
	21:05	23	20:39 (T41)	20:34 43	20:02 (T42)	19:44 16	08:12 (T76)	18:54 21	18:23 (T77)	17:14	17:03
15	06:11		20:17 (T41)	06:40	19:19 (T42)	07:11	07:54 (T76)	07:42	18:07 (T77)	07:19	07:50
	21:04	22	20:39 (T41)	20:33 43	20:02 (T42)	19:42 20	08:14 (T76)	18:52 13	18:20 (T77)	17:13	17:03
16	06:12		20:17 (T41)	06:41	19:18 (T42)	07:12	07:52 (T76)	07:44		07:20	07:50
	21:03	21	20:38 (T41)	20:31 43	20:01 (T42)	19:40 38	18:30 (T77)	18:50		17:12	17:04
17	06:13		20:17 (T41)	06:42	19:18 (T42)	07:13	07:50 (T76)	07:45		07:21	07:51
	21:03	20	20:37 (T41)	20:30 42	20:00 (T42)	19:39 48	18:33 (T77)	18:49		17:11	17:04
18	06:14		20:18 (T41)	06:43	19:18 (T42)	07:14	07:49 (T76)	07:46		07:22	07:52
	21:02	19	20:37 (T41)	20:29 42	20:00 (T42)	19:37 54	18:35 (T77)	18:47		17:11	17:04
19	06:14		20:19 (T41)	06:44	19:19 (T42)	07:15	07:47 (T76)	07:47		07:23	07:52
	21:01	18	20:37 (T41)	20:27 40	19:59 (T42)	19:35 61	18:37 (T77)	18:46		17:10	17:05
20	06:15		20:20 (T41)	06:45	19:19 (T42)	07:16	07:46 (T76)	07:48		07:25	07:53
	21:01	16	20:36 (T41)	20:26 40	19:59 (T42)	19:33 65	18:38 (T77)	18:44		17:09	17:05
21	06:16		20:20 (T41)	06:46	19:19 (T42)	07:17	07:46 (T76)	07:49		07:26	07:53
	21:00	15	20:35 (T41)	20:24 39	19:58 (T42)	19:32 68	18:39 (T77)	18:43		17:08	17:06
22	06:17		20:21 (T41)	06:47	19:20 (T42)	07:18	07:45 (T76)	07:50		07:27	07:54
	20:59	13	20:34 (T41)	20:23 37	19:57 (T42)	19:30 72	18:40 (T77)	18:41		17:08	17:06
23	06:18		20:23 (T41)	06:48	19:21 (T42)	07:19	07:44 (T76)	07:51		07:28	07:54
	20:58	10	20:33 (T41)	20:21 35	19:56 (T42)	19:28 74	18:40 (T77)	18:40		17:07	17:07
24	06:19		20:24 (T41)	06:49	19:21 (T42)	07:20	07:44 (T76)	07:53		07:29	07:55
	20:58	9	20:33 (T41)	20:20 33	19:54 (T42)	19:27 76	18:41 (T77)	18:39		17:07	17:07
25	06:20		19:40 (T42)	06:50	19:23 (T42)	07:21	07:44 (T76)	07:54		07:30	07:55
	20:57	10	20:32 (T41)	20:18 30	19:53 (T42)	19:25 76	18:41 (T77)	18:37		17:06	17:08
26	06:21		19:36 (T42)	06:51	19:24 (T42)	07:22	07:44 (T76)	07:55		07:32	07:56
	20:56	13	19:49 (T42)	20:17 27	19:51 (T42)	19:23 77	18:41 (T77)	18:36		17:06	17:08
27	06:22		19:34 (T42)	06:52	19:26 (T42)	07:23	07:44 (T76)	07:56		07:33	07:56
	20:55	18	19:52 (T42)	20:15 23	19:49 (T42)	19:21 77	18:41 (T77)	18:34		17:05	17:09
28	06:22		19:32 (T42)	06:53	19:28 (T42)	07:24	07:44 (T76)	07:57		07:34	07:56
	20:54	22	19:54 (T42)	20:14 18	19:46 (T42)	19:20 77	18:41 (T77)	18:33		17:05	17:10
29	06:23		19:30 (T42)	06:54	19:32 (T42)	07:25	07:45 (T76)	07:58		07:35	07:57
	20:53	24	19:54 (T42)	20:12 9	19:41 (T42)	19:18 76	18:41 (T77)	18:32		17:04	17:10
30	06:24		19:28 (T42)	06:55		07:26	07:46 (T76)	08:00		07:36	07:57
	20:52	27	19:55 (T42)	20:10		19:16 73	18:41 (T77)	18:30		17:04	17:11
31	06:25		19:27 (T42)	06:56				08:01			07:57
	20:51	30	19:57 (T42)	20:09				18:29			17:12
Potential sun hours	460		429		375		345		297	287	
Total, worst case		687		1051		1056		627			
Sun reduction		0.66		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.55		0.57		0.63		0.66			
Total reduction		0.36		0.35		0.38		0.32			
Total, real		251		371		399		201			

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 728 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6771)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May	June
1	07:57	07:43		07:07		07:40 (T31)	07:16	07:39 (T28)	06:30	06:01
	17:13	17:47		18:22	67	17:30 (T30)	19:56	63	19:34 (T27)	20:27	20:57
2	07:57	07:43		07:06		07:40 (T31)	07:14		07:37 (T28)	06:29	06:01
	17:14	17:49		18:23	64	17:28 (T30)	19:57	68	19:35 (T27)	20:28	20:58
3	07:58	07:41	17:05 (T30)	07:04		07:40 (T31)	07:13		07:36 (T28)	06:28	06:00
	17:15	17:50	14 17:19 (T30)	18:24	59	17:26 (T30)	19:58	74	19:37 (T27)	20:29	20:58
4	07:58	07:40	17:02 (T30)	07:02		07:42 (T31)	07:11		07:35 (T28)	06:26	06:00
	17:15	17:51	20 17:22 (T30)	18:25	52	17:25 (T30)	19:59	76	19:37 (T27)	20:30	20:59
5	07:58	07:39	17:00 (T30)	07:01		07:43 (T31)	07:09		07:33 (T28)	06:25	06:00
	17:16	17:52	24 17:24 (T30)	18:26	43	17:22 (T30)	20:00	80	19:38 (T27)	20:31	21:00
6	07:58	07:38	16:57 (T30)	06:59		07:46 (T31)	07:08		07:33 (T28)	06:24	05:59
	17:17	17:54	29 17:26 (T30)	18:27	32	17:19 (T30)	20:00	82	19:39 (T27)	20:32	21:01
7	07:57	07:37	16:56 (T30)	06:58		07:49 (T31)	07:06		07:32 (T28)	06:23	05:59
	17:18	17:55	31 17:27 (T30)	18:29	9	07:58 (T31)	20:01	83	19:38 (T27)	20:33	21:01
8	07:57	07:36	16:55 (T30)	07:56			07:05		07:32 (T28)	06:21	05:59
	17:19	17:56	34 17:29 (T30)	19:30			20:02	83	19:39 (T27)	20:34	21:02
9	07:57	07:35	16:54 (T30)	07:54			07:03		07:31 (T28)	06:20	05:59
	17:20	17:57	36 17:30 (T30)	19:31			20:03	84	19:38 (T27)	20:35	21:02
10	07:57	07:34	16:53 (T30)	07:53			07:01		07:30 (T28)	06:19	05:58
	17:21	17:59	39 17:32 (T30)	19:32			20:05	83	19:37 (T27)	20:37	21:03
11	07:57	07:32	16:52 (T30)	07:51			07:00		07:30 (T28)	06:18	05:58
	17:22	18:00	40 17:32 (T30)	19:33			20:06	83	19:37 (T27)	20:38	21:04
12	07:56	07:31	07:51 (T31)	07:50			06:58		07:29 (T28)	06:17	05:58
	17:23	18:01	53 17:33 (T30)	19:34			20:07	83	19:36 (T27)	20:39	21:04
13	07:56	07:30	07:50 (T31)	07:48			06:56		07:30 (T28)	06:16	05:58
	17:25	18:02	58 17:34 (T30)	19:35			20:08	79	19:35 (T27)	20:40	21:05
14	07:56	07:29	07:49 (T31)	07:46			06:55		07:29 (T28)	06:15	05:58
	17:26	18:04	63 17:35 (T30)	19:36			20:09	77	19:33 (T27)	20:41	21:05
15	07:55	07:27	07:47 (T31)	07:45			06:53		07:29 (T28)	06:14	05:58
	17:27	18:05	67 17:35 (T30)	19:38			20:10	75	19:32 (T27)	20:42	21:06
16	07:55	07:26	07:46 (T31)	07:43			06:52		07:29 (T28)	06:13	05:58
	17:28	18:06	69 17:35 (T30)	19:39			20:11	71	19:30 (T27)	20:43	21:06
17	07:55	07:25	07:44 (T31)	07:41			06:50		07:29 (T28)	06:12	05:58
	17:29	18:07	73 17:35 (T30)	19:40			20:12	67	19:28 (T27)	20:44	21:06
18	07:54	07:23	07:43 (T31)	07:40			06:49		07:30 (T28)	06:11	05:58
	17:30	18:09	76 17:36 (T30)	19:41			20:13	60	19:25 (T27)	20:45	21:07
19	07:53	07:22	07:42 (T31)	07:38			06:47		07:29 (T28)	06:10	05:58
	17:31	18:10	78 17:36 (T30)	19:42			20:14	47	08:16 (T28)	20:46	21:07
20	07:53	07:21	07:40 (T31)	07:36			06:46		07:30 (T28)	06:09	05:58
	17:33	18:11	79 17:35 (T30)	19:43			20:15	46	08:16 (T28)	20:46	21:07
21	07:52	07:19	07:39 (T31)	07:35			06:44		07:30 (T28)	06:08	05:59
	17:34	18:12	82 17:36 (T30)	19:44			20:16	44	08:14 (T28)	20:47	21:08
22	07:52	07:18	07:38 (T31)	07:33			06:43		07:31 (T28)	06:08	05:59
	17:35	18:13	81 17:35 (T30)	19:45			20:17	42	08:13 (T28)	20:48	21:08
23	07:51	07:16	07:38 (T31)	07:31			06:41		07:32 (T28)	06:07	05:59
	17:36	18:15	81 17:35 (T30)	19:46			20:18	41	08:13 (T28)	20:49	21:08
24	07:50	07:15	07:38 (T31)	07:30			06:40		07:33 (T28)	06:06	05:59
	17:37	18:16	80 17:34 (T30)	19:47			20:20	38	08:11 (T28)	20:50	21:08
25	07:50	07:13	07:38 (T31)	07:28			06:38		07:34 (T28)	06:05	06:00
	17:39	18:17	79 17:34 (T30)	19:48			20:21	35	08:09 (T28)	20:51	21:08
26	07:49	07:12	07:38 (T31)	07:26		07:59 (T28)	06:37		07:35 (T28)	06:05	06:00
	17:40	18:18	78 17:33 (T30)	19:50	3	08:02 (T28)	20:22	32	08:07 (T28)	20:52	21:09
27	07:48	07:10	07:39 (T31)	07:24		07:51 (T28)	06:36		07:37 (T28)	06:04	06:00
	17:41	18:19	74 17:32 (T30)	19:51	18	08:09 (T28)	20:23	29	08:06 (T28)	20:53	21:09
28	07:47	07:09	07:38 (T31)	07:23		07:48 (T28)	06:34		07:39 (T28)	06:03	06:01
	17:42	18:20	72 17:31 (T30)	19:52	31	19:28 (T27)	20:24	25	08:04 (T28)	20:54	21:09
29	07:46			07:21		07:45 (T28)	06:33		07:41 (T28)	06:03	06:01
	17:44			19:53	44	19:31 (T27)	20:25	19	08:00 (T28)	20:55	21:09
30	07:45			07:19		07:42 (T28)	06:31		07:44 (T28)	06:02	06:01
	17:45			19:54	52	19:32 (T27)	20:26	13	07:57 (T28)	20:55	21:09
31	07:44			07:18		07:41 (T28)				06:02	
	17:46			19:55	58	19:34 (T27)				20:56	
Potential sun hours	297	297		370			399			449	453
Total, worst case			1510		532			1782			
Sun reduction			0.40		0.44			0.52			
Oper. time red.			1.00		1.00			1.00			
Wind dir. red.			0.66		0.64			0.63			
Total reduction			0.27		0.28			0.33			
Total, real			402		149			588			

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 728 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6771)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August			September			October			November			December
1	06:02	06:26			06:57		07:29 (T28)	07:27			07:02		16:22 (T30)	07:37
	21:09	20:50			20:07	83	19:36 (T27)	19:15			17:28	38	17:00 (T30)	17:04
2	06:02	06:27			06:58		07:29 (T28)	07:29			07:03		16:24 (T30)	07:38
	21:08	20:49			20:06	83	19:36 (T27)	19:13			17:27	36	17:00 (T30)	17:03
3	06:03	06:28			06:59		07:29 (T28)	07:30			07:04		16:25 (T30)	07:39
	21:08	20:48			20:04	84	19:36 (T27)	19:11			17:25	34	16:59 (T30)	17:03
4	06:03	06:29			07:00		07:29 (T28)	07:31			07:06		16:26 (T30)	07:40
	21:08	20:47			20:02	83	19:36 (T27)	19:10			17:24	31	16:57 (T30)	17:03
5	06:04	06:30			07:01		07:29 (T28)	07:32			07:07		16:27 (T30)	07:41
	21:08	20:46			20:01	83	19:35 (T27)	19:08			17:23	28	16:55 (T30)	17:03
6	06:05	06:31			07:02		07:29 (T28)	07:33			07:08		16:30 (T30)	07:42
	21:08	20:45			19:57	82	19:35 (T27)	19:06			17:22	24	16:54 (T30)	17:03
7	06:05	06:32			07:03		07:29 (T28)	07:34		08:23 (T31)	07:09		16:32 (T30)	07:43
	21:07	20:43			19:56	80	19:34 (T27)	19:05	24	17:52 (T30)	17:21	19	16:51 (T30)	17:02
8	06:06	06:33			07:04		07:30 (T28)	07:35		08:20 (T31)	07:10		16:35 (T30)	07:44
	21:07	20:42			19:54	77	19:33 (T27)	19:03	38	17:56 (T30)	17:20	13	16:48 (T30)	17:02
9	06:07	06:34			07:05		07:29 (T28)	07:36		08:18 (T31)	07:12			07:45
	21:07	20:41			19:52	73	19:30 (T27)	19:01	47	17:58 (T30)	17:19			17:02
10	06:07	06:35			07:06		07:30 (T28)	07:37		08:16 (T31)	07:13			07:46
	21:06	20:40			19:51	69	19:28 (T27)	19:00	55	18:00 (T30)	17:18			17:02
11	06:08	06:36			07:07		07:31 (T28)	07:38		08:14 (T31)	07:14			07:47
	21:06	20:38			19:49	64	19:27 (T27)	18:58	61	18:01 (T30)	17:17			17:02
12	06:09	06:37			07:08		07:32 (T28)	07:39		08:13 (T31)	07:15			07:47
	21:06	20:37			19:47	58	19:25 (T27)	18:57	65	18:02 (T30)	17:16			17:03
13	06:09	06:38		07:52 (T28)	07:09		07:33 (T28)	07:40		08:12 (T31)	07:16			07:48
	21:05	20:36	15	08:07 (T28)	19:45	52	19:23 (T27)	18:55	70	18:03 (T30)	17:15			17:03
14	06:10	06:39		07:48 (T28)	07:10		07:35 (T28)	07:41		08:12 (T31)	07:18			07:49
	21:05	20:34	21	08:09 (T28)	19:44	45	19:22 (T27)	18:53	73	18:05 (T30)	17:14			17:03
15	06:11	06:40		07:45 (T28)	07:11		07:37 (T28)	07:42		08:11 (T31)	07:19			07:50
	21:04	20:33	26	08:11 (T28)	19:42	35	19:19 (T27)	18:52	75	18:05 (T30)	17:13			17:03
16	06:12	06:41		07:43 (T28)	07:12		07:39 (T28)	07:44		08:10 (T31)	07:20			07:50
	21:04	20:32	30	08:13 (T28)	19:40	20	07:59 (T28)	18:50	77	18:05 (T30)	17:12			17:03
17	06:13	06:42		07:41 (T28)	07:13		07:44 (T28)	07:45		08:10 (T31)	07:21			07:51
	21:03	20:30	33	08:14 (T28)	19:39	9	07:53 (T28)	18:49	79	18:06 (T30)	17:11			17:04
18	06:13	06:43		07:40 (T28)	07:14			07:46		08:09 (T31)	07:22			07:52
	21:02	20:29	36	08:16 (T28)	19:37			18:47	81	18:06 (T30)	17:10			17:04
19	06:14	06:44		07:38 (T28)	07:15			07:47		08:09 (T31)	07:24			07:52
	21:02	20:27	39	08:17 (T28)	19:35			18:46	81	18:06 (T30)	17:10			17:04
20	06:15	06:45		07:37 (T28)	07:16			07:48		08:10 (T31)	07:25			07:53
	21:01	20:26	41	08:18 (T28)	19:33			18:44	81	18:06 (T30)	17:09			17:05
21	06:16	06:46		07:36 (T28)	07:17			07:49		08:10 (T31)	07:26			07:53
	21:00	20:24	42	08:18 (T28)	19:32			18:43	80	18:06 (T30)	17:08			17:05
22	06:17	06:47		07:35 (T28)	07:18			07:50		08:11 (T31)	07:27			07:54
	20:59	20:23	44	08:19 (T28)	19:30			18:41	79	18:06 (T30)	17:08			17:06
23	06:18	06:48		07:34 (T28)	07:19			07:51		08:12 (T31)	07:28			07:54
	20:59	20:21	46	08:20 (T28)	19:28			18:40	77	18:06 (T30)	17:07			17:06
24	06:19	06:49		07:33 (T28)	07:20			07:53		08:13 (T31)	07:29			07:55
	20:58	20:20	47	08:20 (T28)	19:27			18:39	74	18:05 (T30)	17:07			17:07
25	06:20	06:50		07:32 (T28)	07:21			07:54		08:15 (T31)	07:31			07:55
	20:57	20:18	61	19:29 (T27)	19:25			18:37	72	18:06 (T30)	17:06			17:07
26	06:20	06:51		07:32 (T28)	07:22			07:55		08:16 (T31)	07:32			07:56
	20:56	20:17	67	19:31 (T27)	19:23			18:36	70	18:05 (T30)	17:05			17:08
27	06:21	06:52		07:31 (T28)	07:23			07:56		08:17 (T31)	07:33			07:56
	20:55	20:15	71	19:32 (T27)	19:21			18:34	66	18:04 (T30)	17:05			17:09
28	06:22	06:53		07:31 (T28)	07:24			07:57		08:18 (T31)	07:34			07:56
	20:54	20:14	75	19:34 (T27)	19:20			18:33	61	18:03 (T30)	17:05			17:09
29	06:23	06:54		07:30 (T28)	07:25			07:58		08:20 (T31)	07:35			07:57
	20:53	20:12	77	19:34 (T27)	19:18			18:32	57	18:04 (T30)	17:04			17:10
30	06:24	06:55		07:30 (T28)	07:26			08:00		08:22 (T31)	07:36			07:57
	20:52	20:10	80	19:35 (T27)	19:16			18:30	51	18:03 (T30)	17:04			17:11
31	06:25	06:56		07:29 (T28)				08:01		17:22 (T30)				07:57
	20:51	20:09	83	19:36 (T27)				18:29	39	18:01 (T30)				17:12
Potential sun hours	460	429			375			345			297			287
Total, worst case			934			1080			1633			223		
Sun reduction			0.61			0.59			0.48			0.30		
Oper. time red.			1.00			1.00			1.00			1.00		
Wind dir. red.			0.64			0.63			0.65			0.71		
Total reduction			0.39			0.37			0.31			0.21		
Total, real			363			403			513			48		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 740 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6781)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57 17:13	07:43 17:47	07:07 18:22	07:16 19:56	06:30 20:27 34	06:50 (T36) 07:24 (T36) 20:57 44	06:01 19:34 (T35) 06:02 20:18 (T35) 21:09 41	19:42 (T35) 06:26 20:23 (T35) 20:50 72	06:58 (T36) 06:57 20:23 (T35) 20:07	07:27 19:15	07:02 17:28	07:37 17:04
2	07:57 17:14	07:42 17:49	07:06 18:23	07:14 19:57	06:29 20:28 35	06:49 (T36) 06:01 07:24 (T36) 20:58 43	19:35 (T35) 06:02 20:18 (T35) 21:08 41	19:42 (T35) 06:27 20:23 (T35) 20:49 71	06:58 (T36) 06:58 20:22 (T35) 20:06	07:29 19:13	07:03 17:27	07:38 17:03
3	07:57 17:15	07:41 17:50	07:04 18:24	07:13 19:58	06:28 20:29 36	06:48 (T36) 06:00 07:24 (T36) 20:58 43	19:35 (T35) 06:03 20:18 (T35) 21:08 42	19:42 (T35) 06:28 20:24 (T35) 20:48 69	06:58 (T36) 06:59 20:21 (T35) 20:04	07:30 19:11	07:04 17:25	07:39 17:03
4	07:58 17:15	07:40 17:51	07:02 18:25	07:11 19:59	06:26 20:30 48	06:48 (T36) 06:00 20:01 (T35) 20:59 43	19:35 (T35) 06:04 20:18 (T35) 21:08 41	19:42 (T35) 06:29 20:23 (T35) 20:47 68	06:57 (T36) 07:00 20:20 (T35) 20:02	07:31 19:10	07:06 17:24	07:40 17:03
5	07:58 17:16	07:39 17:52	07:01 18:26	07:09 20:00	06:25 20:31 55	06:47 (T36) 06:00 20:04 (T35) 21:00 43	19:36 (T35) 06:04 20:19 (T35) 21:08 42	19:42 (T35) 06:30 20:24 (T35) 20:46 66	06:57 (T36) 07:01 20:19 (T35) 20:01	07:32 19:08	07:07 17:23	07:41 17:03
6	07:57 17:17	07:38 17:54	06:59 18:27	07:08 20:00	06:24 20:32 61	06:47 (T36) 05:59 20:07 (T35) 21:01 43	19:35 (T35) 06:05 20:18 (T35) 21:08 42	19:42 (T35) 06:31 20:24 (T35) 20:44 63	06:57 (T36) 07:02 20:18 (T35) 19:57	07:33 19:06	07:08 17:22	07:42 17:03
7	07:57 17:18	07:37 17:55	06:58 18:29	07:06 20:01	06:23 20:33 64	06:47 (T36) 05:59 20:08 (T35) 21:01 42	19:36 (T35) 06:05 20:18 (T35) 21:07 43	19:42 (T35) 06:32 20:25 (T35) 20:43 59	06:57 (T36) 07:03 20:16 (T35) 19:56	07:34 19:05	07:09 17:21	07:43 17:02
8	07:57 17:19	07:36 17:56	07:56 19:30	07:05 20:02	06:21 20:34 66	06:48 (T36) 05:59 20:10 (T35) 21:02 41	19:37 (T35) 06:06 20:18 (T35) 21:07 43	19:41 (T35) 06:33 20:24 (T35) 20:42 54	06:57 (T36) 07:04 20:13 (T35) 19:54	07:35 19:03	07:10 17:20	07:44 17:02
9	07:57 17:20	07:35 17:57	07:54 19:31	07:03 20:03	06:20 20:35 68	06:47 (T36) 05:59 20:10 (T35) 21:02 42	19:37 (T35) 06:07 20:19 (T35) 21:07 43	19:42 (T35) 06:34 20:25 (T35) 20:41 46	06:57 (T36) 07:05 20:09 (T35) 19:52	07:36 19:01	07:12 17:19	07:45 17:02
10	07:57 17:21	07:34 17:59	07:53 19:32	07:01 20:05	06:19 20:36 70	06:47 (T36) 05:58 20:11 (T35) 21:03 41	19:37 (T35) 06:07 20:18 (T35) 21:06 44	19:42 (T35) 06:35 20:26 (T35) 20:40 36	06:57 (T36) 07:06 07:33 (T36) 19:51	07:37 19:00	07:13 17:18	07:46 17:02
11	07:57 17:22	07:32 18:00	07:51 19:33	07:00 20:06	06:18 20:38 72	06:47 (T36) 05:58 20:12 (T35) 21:04 41	19:37 (T35) 06:08 20:18 (T35) 21:06 44	19:41 (T35) 06:36 20:25 (T35) 20:38 35	06:58 (T36) 07:07 07:33 (T36) 19:49	07:38 18:58	07:14 17:17	07:47 17:03
12	07:56 17:23	07:31 18:01	07:50 19:34	06:58 20:07	06:17 20:39 72	06:48 (T36) 05:58 20:13 (T35) 21:04 41	19:37 (T35) 06:09 20:18 (T35) 21:06 44	19:42 (T35) 06:37 20:26 (T35) 20:37 33	06:59 (T36) 07:08 07:32 (T36) 19:47	07:39 18:57	07:15 17:16	07:47 17:03
13	07:56 17:25	07:30 18:02	07:48 19:35	06:56 20:08	06:16 20:40 72	06:48 (T36) 05:58 20:13 (T35) 21:05 40	19:38 (T35) 06:09 20:18 (T35) 21:05 44	19:42 (T35) 06:38 20:26 (T35) 20:36 32	07:00 (T36) 07:09 07:32 (T36) 19:45	07:40 18:55	07:16 17:15	07:48 17:03
14	07:56 17:26	07:29 18:04	07:46 19:36	06:55 20:09	06:15 20:41 74	06:48 (T36) 05:58 20:14 (T35) 21:05 40	19:38 (T35) 06:10 20:18 (T35) 21:05 45	19:42 (T35) 06:39 20:27 (T35) 20:34 30	07:00 (T36) 07:10 07:30 (T36) 19:44	07:41 18:53	07:18 17:14	07:49 17:03
15	07:55 17:27	07:27 18:05	07:45 19:38	06:53 20:10	06:14 20:42 72	06:49 (T36) 05:58 20:14 (T35) 21:06 40	19:38 (T35) 06:11 20:18 (T35) 21:04 44	19:42 (T35) 06:40 20:26 (T35) 20:33 28	07:01 (T36) 07:11 07:29 (T36) 19:42	07:42 18:52	07:19 17:13	07:50 17:03
16	07:55 17:28	07:26 18:06	07:43 19:39	06:52 20:11	06:13 20:43 73	06:49 (T36) 05:58 20:15 (T35) 21:06 40	19:39 (T35) 06:12 20:19 (T35) 21:03 45	19:42 (T35) 06:41 20:27 (T35) 20:31 26	07:02 (T36) 07:12 07:28 (T36) 19:40	07:44 18:50	07:20 17:12	07:50 17:03
17	07:54 17:29	07:25 18:07	07:41 19:40	06:50 20:12	06:12 20:44 71	06:51 (T36) 05:58 20:16 (T35) 21:06 40	19:39 (T35) 06:13 20:19 (T35) 21:03 45	19:42 (T35) 06:42 20:27 (T35) 20:30 23	07:03 (T36) 07:13 07:26 (T36) 19:39	07:45 18:49	07:21 17:11	07:51 17:04
18	07:54 17:30	07:23 18:09	07:40 19:41	06:49 20:13	06:11 20:45 72	06:51 (T36) 05:58 20:16 (T35) 21:07 40	19:39 (T35) 06:13 20:19 (T35) 21:02 51	07:12 (T36) 06:43 20:27 (T35) 20:29 20	07:04 (T36) 07:14 07:24 (T36) 19:37	07:46 18:47	07:22 17:11	07:52 17:04
19	07:53 17:31	07:22 18:10	07:38 19:42	06:47 20:14	06:10 20:45 70	06:52 (T36) 05:58 20:16 (T35) 21:07 40	19:40 (T35) 06:14 20:20 (T35) 21:02 56	07:10 (T36) 06:44 20:27 (T35) 20:27 17	07:05 (T36) 07:15 07:22 (T36) 19:35	07:47 18:46	07:24 17:10	07:52 17:04
20	07:53 17:33	07:20 18:11	07:36 19:43	06:46 20:15	06:09 20:46 67	06:53 (T36) 05:58 20:16 (T35) 21:07 40	19:40 (T35) 06:15 20:20 (T35) 21:01 61	07:07 (T36) 06:45 20:27 (T35) 20:26 12	07:07 (T36) 07:16 07:19 (T36) 19:33	07:48 18:44	07:25 17:09	07:53 17:05
21	07:52 17:34	07:19 18:12	07:35 19:44	06:44 20:16	06:08 20:47 66	06:54 (T36) 05:59 20:16 (T35) 21:08 40	19:40 (T35) 06:16 20:20 (T35) 21:00 64	07:06 (T36) 06:46 20:27 (T35) 20:24	07:17 19:32	07:49 18:43	07:26 17:08	07:53 17:05
22	07:52 17:35	07:18 18:13	07:33 19:45	06:43 20:17	06:08 20:48 64	06:56 (T36) 05:59 20:17 (T35) 21:08 40	19:40 (T35) 06:17 20:20 (T35) 20:59 65	07:05 (T36) 06:47 20:27 (T35) 20:23	07:18 19:30	07:50 18:41	07:27 17:08	07:54 17:06
23	07:51 17:36	07:16 18:15	07:31 19:46	06:41 20:18 14	07:01 (T36) 06:07 07:15 (T36) 20:49 61	06:57 (T36) 05:59 20:17 (T35) 21:08 40	19:40 (T35) 06:18 20:20 (T35) 20:59 67	07:04 (T36) 06:48 20:27 (T35) 20:21	07:19 19:28	07:51 18:40	07:28 17:07	07:54 17:06
24	07:50 17:37	07:15 18:16	07:29 19:47	06:40 20:20 18	06:59 (T36) 06:06 07:17 (T36) 20:50 59	06:58 (T36) 05:59 20:17 (T35) 21:08 40	19:41 (T35) 06:19 20:21 (T35) 20:58 69	07:03 (T36) 06:49 20:27 (T35) 20:20	07:20 19:27	07:53 18:39	07:29 17:07	07:55 17:07
25	07:50 17:39	07:13 18:17	07:28 19:48	06:38 20:21 21	06:58 (T36) 06:05 07:19 (T36) 20:51 55	07:01 (T36) 06:00 20:18 (T35) 21:08 40	19:41 (T35) 06:20 20:21 (T35) 20:57 71	07:02 (T36) 06:50 20:27 (T35) 20:18	07:21 19:25	07:54 18:37	07:30 17:06	07:55 17:08
26	07:49 17:40	07:12 18:18	07:26 19:49	06:37 20:22 24	06:56 (T36) 06:05 07:20 (T36) 20:52 45	19:33 (T35) 06:00 20:18 (T35) 21:08 40	19:41 (T35) 06:20 20:21 (T35) 20:56 71	07:02 (T36) 06:51 20:27 (T35) 20:17	07:22 19:23	07:55 18:36	07:32 17:06	07:56 17:08
27	07:48 17:41	07:10 18:19	07:24 19:51	06:36 20:23 26	06:55 (T36) 06:04 07:21 (T36) 20:53 44	19:33 (T35) 06:00 20:17 (T35) 21:09 40	19:42 (T35) 06:21 20:22 (T35) 20:55 72	07:00 (T36) 06:52 20:25 (T35) 20:15	07:23 19:21	07:56 18:34	07:33 17:05	07:56 17:09
28	07:47 17:42	07:09 18:20	07:23 19:52	06:34 20:24 28	06:54 (T36) 06:03 07:22 (T36) 20:54 45	19:33 (T35) 06:01 20:18 (T35) 21:09 40	19:41 (T35) 06:22 20:21 (T35) 20:54 72	07:00 (T36) 06:53 20:25 (T35) 20:14	07:24 19:20	07:57 18:33	07:34 17:05	07:56 17:10
29	07:46 17:44		07:21 19:53	06:33 20:25 30	06:52 (T36) 06:03 07:22 (T36) 20:55 44	19:33 (T35) 06:01 20:17 (T35) 21:09 40	19:42 (T35) 06:23 20:22 (T35) 20:53 74	06:59 (T36) 06:54 20:25 (T35) 20:12	07:25 19:18	07:58 18:32	07:35 17:04	07:57 17:10
30	07:45 17:45		07:19 19:54	06:31 20:26 32	06:51 (T36) 06:02 07:23 (T36) 20:55 44	19:34 (T35) 06:01 20:18 (T35) 21:09 40	19:42 (T35) 06:24 20:22 (T35) 20:52 72	06:59 (T36) 06:55 20:24 (T35) 20:10	07:26 19:16	08:00 18:30	07:36 17:04	07:57 17:11
31	07:44 17:46		07:18 19:55		06:02 20:56 44	19:33 (T35) 20:17 (T35)	06:25 20:51 73	06:58 (T36) 06:56 20:24 (T35) 20:09		08:01 18:29		07:57 17:12
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				193	1823	1227	1671	860				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.69	0.61	0.56	0.58	0.65				
Total reduction				0.36	0.35	0.36	0.39	0.40				
Total, real				69	636	439	646	342				

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 752 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6791)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February		March			April			May			June		
1	07:57		15:40 (T45)	07:43		07:07			07:16		18:48 (T44)	06:30		18:32 (T44)	06:01		
	17:13	49	16:29 (T45)	17:47		18:22			19:56	33	19:21 (T44)	20:27	53	19:25 (T44)	20:57		
2	07:57		15:41 (T45)	07:42		07:06			07:14		18:45 (T44)	06:29		18:32 (T44)	06:01		
	17:14	48	16:29 (T45)	17:49		18:23			19:57	38	19:23 (T44)	20:28	53	19:25 (T44)	20:58		
3	07:57		15:41 (T45)	07:41		07:04			07:13		18:43 (T44)	06:28		18:32 (T44)	06:01		
	17:15	49	16:30 (T45)	17:50		18:24			19:58	42	19:25 (T44)	20:29	51	19:23 (T44)	20:58		
4	07:57		15:42 (T45)	07:40		07:02			07:11		18:41 (T44)	06:26		18:34 (T44)	06:00		
	17:16	48	16:30 (T45)	17:51		18:25			19:59	45	19:26 (T44)	20:30	48	19:22 (T44)	20:59		
5	07:57		15:42 (T45)	07:39		07:01			07:09		18:39 (T44)	06:25		18:35 (T44)	06:00		
	17:17	49	16:31 (T45)	17:52		18:26			20:00	48	19:27 (T44)	20:31	47	19:22 (T44)	21:00		
6	07:57		15:43 (T45)	07:38		06:59			07:08		18:38 (T44)	06:24		18:36 (T44)	06:00		
	17:17	48	16:31 (T45)	17:54		18:27			20:00	50	19:28 (T44)	20:32	45	19:21 (T44)	21:00		
7	07:57		15:42 (T45)	07:37		06:58			07:06		18:36 (T44)	06:23		18:37 (T44)	05:59		
	17:18	49	16:31 (T45)	17:55		18:29			20:01	53	19:29 (T44)	20:33	43	19:20 (T44)	21:01		
8	07:57		15:43 (T45)	07:36		07:56			07:05		18:36 (T44)	06:22		18:38 (T44)	05:59		
	17:19	48	16:31 (T45)	17:56		19:30			20:02	54	19:30 (T44)	20:34	41	19:19 (T44)	21:02		
9	07:57		15:44 (T45)	07:35		07:54			07:03		18:34 (T44)	06:20		18:40 (T44)	05:59		06:21 (T76)
	17:20	48	16:32 (T45)	17:58		19:31			20:03	56	19:30 (T44)	20:35	37	19:17 (T44)	21:02	5	06:26 (T76)
10	07:57		15:45 (T45)	07:34		07:53			07:01		18:33 (T44)	06:19		18:40 (T44)	05:59		06:21 (T76)
	17:21	47	16:32 (T45)	17:59		19:32			20:05	57	19:30 (T44)	20:36	35	19:15 (T44)	21:03	7	06:28 (T76)
11	07:57		15:45 (T45)	07:32		07:51			07:00		18:32 (T44)	06:18		18:42 (T44)	05:58		06:21 (T76)
	17:23	47	16:32 (T45)	18:00		19:33			20:06	59	19:31 (T44)	20:37	31	19:13 (T44)	21:03	8	06:29 (T76)
12	07:56		15:46 (T45)	07:31		07:50			06:58		18:31 (T44)	06:17		18:44 (T44)	05:58		06:20 (T76)
	17:24	46	16:32 (T45)	18:01		19:34			20:07	60	19:31 (T44)	20:38	27	19:11 (T44)	21:04	9	06:29 (T76)
13	07:56		15:47 (T45)	07:30		07:48			06:57		18:31 (T44)	06:16		18:46 (T44)	05:58		06:20 (T76)
	17:25	46	16:33 (T45)	18:02		19:35			20:08	61	19:32 (T44)	20:39	23	19:09 (T44)	21:05	10	06:30 (T76)
14	07:56		15:47 (T45)	07:29		07:46			06:55		18:30 (T44)	06:15		18:49 (T44)	05:58		06:20 (T76)
	17:26	46	16:33 (T45)	18:04		19:36			20:09	62	19:32 (T44)	20:40	17	19:06 (T44)	21:05	11	06:31 (T76)
15	07:55		15:48 (T45)	07:27		07:45			06:53		18:29 (T44)	06:14		18:54 (T44)	05:58		06:20 (T76)
	17:27	45	16:33 (T45)	18:05		19:38			20:10	62	19:31 (T44)	20:41	9	19:03 (T44)	21:05	11	06:31 (T76)
16	07:55		15:48 (T45)	07:26		07:43			06:52		18:29 (T44)	06:13			05:58		06:20 (T76)
	17:28	45	16:33 (T45)	18:06		19:39			20:11	63	19:32 (T44)	20:42			21:06	12	06:32 (T76)
17	07:54		15:49 (T45)	07:25		07:41			06:50		18:28 (T44)	06:12			05:58		06:21 (T76)
	17:29	44	16:33 (T45)	18:07		19:40			20:12	63	19:31 (T44)	20:43			21:06	12	06:33 (T76)
18	07:54		15:50 (T45)	07:23		07:40			06:49		18:29 (T44)	06:11			05:58		06:21 (T76)
	17:30	43	16:33 (T45)	18:09		19:41			20:13	63	19:32 (T44)	20:44			21:07	12	06:33 (T76)
19	07:53		15:51 (T45)	07:22		07:38			06:47		18:28 (T44)	06:10			05:58		06:21 (T76)
	17:32	42	16:33 (T45)	18:10		19:42			20:14	63	19:31 (T44)	20:45			21:07	13	06:34 (T76)
20	07:53		15:52 (T45)	07:20		07:36			06:46		18:28 (T44)	06:09			05:59		06:21 (T76)
	17:33	41	16:33 (T45)	18:11		19:43			20:15	63	19:31 (T44)	20:46			21:07	13	06:34 (T76)
21	07:52		15:52 (T45)	07:19		07:35			06:44		18:29 (T44)	06:09			05:59		06:21 (T76)
	17:34	40	16:32 (T45)	18:12		19:44			20:16	62	19:31 (T44)	20:47			21:08	13	06:34 (T76)
22	07:52		15:54 (T45)	07:18		07:33			06:43		18:28 (T44)	06:08			05:59		06:21 (T76)
	17:35	38	16:32 (T45)	18:13		19:45			20:17	63	19:31 (T44)	20:48			21:08	13	06:34 (T76)
23	07:51		15:55 (T45)	07:16		07:31			06:41		18:29 (T44)	06:07			05:59		06:22 (T76)
	17:36	36	16:31 (T45)	18:15		19:46			20:18	62	19:31 (T44)	20:49			21:08	13	06:35 (T76)
24	07:50		15:56 (T45)	07:15		07:30			06:40		18:28 (T44)	06:06			05:59		06:22 (T76)
	17:38	35	16:31 (T45)	18:16		19:47			20:19	62	19:30 (T44)	20:50			21:08	13	06:35 (T76)
25	07:49		15:57 (T45)	07:13		07:28			06:38		18:29 (T44)	06:06			06:00		06:22 (T76)
	17:39	33	16:30 (T45)	18:17		19:48			20:21	61	19:30 (T44)	20:51			21:08	12	06:34 (T76)
26	07:49		15:58 (T45)	07:12		07:26			06:37		18:28 (T44)	06:05			06:00		06:23 (T76)
	17:40	31	16:29 (T45)	18:18		19:50			20:22	60	19:28 (T44)	20:52			21:08	12	06:35 (T76)
27	07:48		16:01 (T45)	07:10		07:24			06:36		18:29 (T44)	06:04			06:00		06:23 (T76)
	17:41	27	16:28 (T45)	18:19		19:51			20:23	59	19:28 (T44)	20:53			21:08	12	06:35 (T76)
28	07:47		16:03 (T45)	07:09		07:23			06:34		18:30 (T44)	06:04			06:01		06:23 (T76)
	17:42	24	16:27 (T45)	18:21		19:52			20:24	58	19:28 (T44)	20:54			21:08	11	06:34 (T76)
29	07:46		16:05 (T45)			07:21		19:04 (T44)	06:33		18:30 (T44)	06:03			06:01		06:24 (T76)
	17:44	20	16:25 (T45)			19:53	3	19:07 (T44)	20:25	56	19:26 (T44)	20:54			21:08	10	06:34 (T76)
30	07:45		16:09 (T45)			07:19		18:55 (T44)	06:32		18:31 (T44)	06:02			06:02		06:24 (T76)
	17:45	13	16:22 (T45)			19:54	20	19:15 (T44)	20:26	55	19:26 (T44)	20:55			21:08	10	06:34 (T76)
31	07:44					07:18		18:51 (T44)				06:02					
	17:46					19:55	28	19:19 (T44)				20:56					
Potential sun hours	297			297		370			399			448			453		
Total, worst case		1225					51			1693			560			242	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.74					0.61			0.61			0.61			0.73	
Total reduction		0.24					0.28			0.33			0.36			0.48	
Total, real		291					14			555			201			116	

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 752 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6791)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November			December		
1	06:02		06:25 (T76)	06:26		18:54 (T44)	06:57		18:31 (T44)	07:27	07:02			07:37		15:27 (T45)
	21:08	9	06:34 (T76)	20:50	29	19:23 (T44)	20:07	59	19:30 (T44)	19:15	17:28			17:04	47	16:14 (T45)
2	06:03		06:25 (T76)	06:27		18:52 (T44)	06:58		18:32 (T44)	07:29	07:03			07:38		15:27 (T45)
	21:08	8	06:33 (T76)	20:49	32	19:24 (T44)	20:06	57	19:29 (T44)	19:13	17:27			17:03	47	16:14 (T45)
3	06:03		06:26 (T76)	06:28		18:50 (T44)	06:59		18:32 (T44)	07:30	07:04			07:39		15:27 (T45)
	21:08	6	06:32 (T76)	20:48	36	19:26 (T44)	20:04	56	19:28 (T44)	19:11	17:26			17:03	48	16:15 (T45)
4	06:04		06:26 (T76)	06:29		18:49 (T44)	07:00		18:33 (T44)	07:31	07:06			07:40		15:27 (T45)
	21:08	4	06:30 (T76)	20:47	38	19:27 (T44)	20:02	54	19:27 (T44)	19:10	17:24			17:03	48	16:15 (T45)
5	06:04			06:30		18:48 (T44)	07:01		18:33 (T44)	07:32	07:07			07:41		15:28 (T45)
	21:08			20:46	41	19:29 (T44)	20:01	53	19:26 (T44)	19:08	17:23			17:03	48	16:16 (T45)
6	06:05			06:31		18:46 (T44)	07:02		18:34 (T44)	07:33	07:08			07:42		15:28 (T45)
	21:08			20:44	44	19:30 (T44)	19:57	51	19:25 (T44)	19:06	17:22			17:03	48	16:16 (T45)
7	06:05			06:32		18:45 (T44)	07:03		18:35 (T44)	07:34	07:09			07:43		15:28 (T45)
	21:07			20:43	46	19:31 (T44)	19:56	48	19:23 (T44)	19:05	17:21			17:03	49	16:17 (T45)
8	06:06			06:33		18:44 (T44)	07:04		18:36 (T44)	07:35	07:10			07:44		15:29 (T45)
	21:07			20:42	48	19:32 (T44)	19:54	45	19:21 (T44)	19:03	17:20			17:03	48	16:17 (T45)
9	06:07			06:34		18:43 (T44)	07:05		18:37 (T44)	07:36	07:12			07:45		15:29 (T45)
	21:07			20:41	49	19:32 (T44)	19:52	42	19:19 (T44)	19:02	17:19			17:03	49	16:18 (T45)
10	06:07			06:35		18:42 (T44)	07:06		18:38 (T44)	07:37	07:13			07:46		15:30 (T45)
	21:06			20:39	51	19:33 (T44)	19:51	38	19:16 (T44)	19:00	17:18			17:03	48	16:18 (T45)
11	06:08			06:36		18:41 (T44)	07:07		18:40 (T44)	07:38	07:14			07:46		15:30 (T45)
	21:06			20:38	53	19:34 (T44)	19:49	34	19:14 (T44)	18:58	17:17			17:03	49	16:19 (T45)
12	06:09			06:37		18:40 (T44)	07:08		18:42 (T44)	07:39	07:15		15:39 (T45)	07:47		15:31 (T45)
	21:05			20:37	54	19:34 (T44)	19:47	29	19:11 (T44)	18:57	17:16	14	15:53 (T45)	17:03	49	16:20 (T45)
13	06:10			06:38		18:39 (T44)	07:09		18:45 (T44)	07:40	07:16		15:37 (T45)	07:48		15:31 (T45)
	21:05			20:36	56	19:35 (T44)	19:45	22	19:07 (T44)	18:55	17:15	20	15:57 (T45)	17:03	49	16:20 (T45)
14	06:10			06:39		18:38 (T44)	07:10		18:51 (T44)	07:41	07:18		15:35 (T45)	07:49		15:31 (T45)
	21:05			20:34	57	19:35 (T44)	19:44	9	19:00 (T44)	18:54	17:14	24	15:59 (T45)	17:03	49	16:20 (T45)
15	06:11			06:40		18:38 (T44)	07:11			07:42	07:19		15:33 (T45)	07:50		15:32 (T45)
	21:04			20:33	58	19:36 (T44)	19:42			18:52	17:13	27	16:00 (T45)	17:03	49	16:21 (T45)
16	06:12			06:41		18:37 (T44)	07:12			07:44	07:20		15:31 (T45)	07:50		15:33 (T45)
	21:03			20:31	59	19:36 (T44)	19:40			18:50	17:12	31	16:02 (T45)	17:04	48	16:21 (T45)
17	06:13			06:42		18:35 (T44)	07:13			07:45	07:21		15:31 (T45)	07:51		15:32 (T45)
	21:03			20:30	60	19:35 (T44)	19:39			18:49	17:11	33	16:04 (T45)	17:04	49	16:21 (T45)
18	06:14			06:43		18:35 (T44)	07:14			07:46	07:22		15:30 (T45)	07:52		15:33 (T45)
	21:02			20:29	60	19:35 (T44)	19:37			18:47	17:11	35	16:05 (T45)	17:04	49	16:22 (T45)
19	06:14			06:44		18:34 (T44)	07:15			07:47	07:23		15:29 (T45)	07:52		15:34 (T45)
	21:01			20:27	61	19:35 (T44)	19:35			18:46	17:10	36	16:05 (T45)	17:05	49	16:23 (T45)
20	06:15			06:45		18:33 (T44)	07:16			07:48	07:25		15:28 (T45)	07:53		15:34 (T45)
	21:01			20:26	62	19:35 (T44)	19:33			18:44	17:09	38	16:06 (T45)	17:05	49	16:23 (T45)
21	06:16			06:46		18:33 (T44)	07:17			07:49	07:26		15:28 (T45)	07:53		15:35 (T45)
	21:00			20:24	62	19:35 (T44)	19:32			18:43	17:09	40	16:08 (T45)	17:06	49	16:24 (T45)
22	06:17			06:47		18:32 (T44)	07:18			07:50	07:27		15:28 (T45)	07:54		15:35 (T45)
	20:59			20:23	63	19:35 (T44)	19:30			18:41	17:08	41	16:09 (T45)	17:06	49	16:24 (T45)
23	06:18			06:48		18:32 (T44)	07:19			07:51	07:28		15:27 (T45)	07:54		15:36 (T45)
	20:58			20:21	63	19:35 (T44)	19:28			18:40	17:07	42	16:09 (T45)	17:07	49	16:25 (T45)
24	06:19			06:49		18:32 (T44)	07:20			07:53	07:29		15:27 (T45)	07:55		15:36 (T45)
	20:58			20:20	63	19:35 (T44)	19:27			18:39	17:07	43	16:10 (T45)	17:07	49	16:25 (T45)
25	06:20			06:50		18:32 (T44)	07:21			07:54	07:30		15:27 (T45)	07:55		15:36 (T45)
	20:57			20:18	63	19:35 (T44)	19:25			18:37	17:06	44	16:11 (T45)	17:08	49	16:25 (T45)
26	06:21			06:51		18:31 (T44)	07:22			07:55	07:32		15:27 (T45)	07:56		15:37 (T45)
	20:56			20:17	63	19:34 (T44)	19:23			18:36	17:06	45	16:12 (T45)	17:08	49	16:26 (T45)
27	06:22			06:52		18:31 (T44)	07:23			07:56	07:33		15:27 (T45)	07:56		15:38 (T45)
	20:55			20:15	63	19:34 (T44)	19:22			18:34	17:05	45	16:12 (T45)	17:09	48	16:26 (T45)
28	06:22			06:53		18:31 (T44)	07:24			07:57	07:34		15:27 (T45)	07:56		15:38 (T45)
	20:54			20:14	62	19:33 (T44)	19:20			18:33	17:05	46	16:13 (T45)	17:10	49	16:27 (T45)
29	06:23		19:02 (T44)	06:54		18:31 (T44)	07:25			07:58	07:35		15:27 (T45)	07:57		15:38 (T45)
	20:53	13	19:15 (T44)	20:12	62	19:33 (T44)	19:18			18:32	17:04	46	16:13 (T45)	17:10	49	16:27 (T45)
30	06:24		18:58 (T44)	06:55		18:31 (T44)	07:26			08:00	07:36		15:27 (T45)	07:57		15:38 (T45)
	20:52	20	19:18 (T44)	20:10	61	19:32 (T44)	19:16			18:31	17:04	47	16:14 (T45)	17:11	49	16:27 (T45)
31	06:25		18:56 (T44)	06:56		18:31 (T44)				08:01				07:57		15:40 (T45)
	20:51	25	19:21 (T44)	20:09	60	19:31 (T44)				18:29				17:12	48	16:28 (T45)
Potential sun hours	460			429			375			345	297			287		
Total, worst case		85			1679			597				697			1506	
Sun reduction		0.66			0.61			0.59				0.30			0.22	
Oper. time red.		1.00			1.00			1.00				1.00			1.00	
Wind dir. red.		0.65			0.61			0.61				0.74			0.74	
Total reduction		0.44			0.38			0.37				0.23			0.17	
Total, real		37			646			222				160			254	

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

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

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EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 770 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6804)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May	June
1	07:57			07:43		08:22 (T68)	07:07		08:12 (T68)	07:16		07:49 (T67)	06:30	06:02
	17:13			17:48	99	17:09 (T69)	18:22	64	09:16 (T68)	19:56	24	08:13 (T67)	20:27	20:57
2	07:57			07:42		08:21 (T68)	07:06		08:12 (T68)	07:15		07:52 (T67)	06:29	06:01
	17:14			17:49	102	17:09 (T69)	18:23	63	09:15 (T68)	19:57	20	08:12 (T67)	20:28	20:57
3	07:57			07:41		08:19 (T68)	07:04		08:12 (T68)	07:13		07:53 (T67)	06:28	06:01
	17:15			17:50	104	17:08 (T69)	18:24	61	09:13 (T68)	19:58	15	08:08 (T67)	20:29	20:58
4	07:57			07:40		08:18 (T68)	07:02		08:13 (T68)	07:11		07:58 (T67)	06:27	06:01
	17:16			17:51	107	17:09 (T69)	18:25	59	09:12 (T68)	19:59	5	08:03 (T67)	20:30	20:59
5	07:57			07:39		08:17 (T68)	07:01		08:13 (T68)	07:10			06:25	06:00
	17:17			17:53	110	17:09 (T69)	18:26	58	09:11 (T68)	20:00			20:31	20:59
6	07:57			07:38		08:17 (T68)	06:59		08:15 (T68)	07:08			06:24	06:00
	17:18			17:54	111	17:09 (T69)	18:28	55	09:10 (T68)	20:00			20:32	21:00
7	07:57			07:37		08:16 (T68)	06:58		08:15 (T68)	07:06			06:23	06:00
	17:19			17:55	113	17:10 (T69)	18:29	53	09:08 (T68)	20:01			20:33	21:01
8	07:57			07:36		08:16 (T68)	07:56		09:16 (T68)	07:05			06:22	05:59
	17:20			17:56	114	17:10 (T69)	19:30	50	10:06 (T68)	20:02			20:34	21:01
9	07:57			07:35		08:15 (T68)	07:54		09:18 (T68)	07:03			06:21	05:59
	17:21			17:58	116	17:10 (T69)	19:31	46	10:04 (T68)	20:03			20:35	21:02
10	07:57		16:30 (T69)	07:33		08:14 (T68)	07:53		09:19 (T68)	07:02			06:20	05:59
	17:22	9	16:39 (T69)	17:59	116	17:09 (T69)	19:32	43	10:02 (T68)	20:04			20:36	21:03
11	07:56		16:28 (T69)	07:32		08:13 (T68)	07:51		09:20 (T68)	07:00			06:18	05:59
	17:23	15	16:43 (T69)	18:00	117	17:09 (T69)	19:33	39	09:59 (T68)	20:06			20:37	21:03
12	07:56		16:27 (T69)	07:31		08:13 (T68)	07:50		09:23 (T68)	06:58			06:17	05:59
	17:24	19	16:46 (T69)	18:01	118	17:09 (T69)	19:34	34	09:57 (T68)	20:07			20:38	21:04
13	07:56		16:25 (T69)	07:30		08:13 (T68)	07:48		09:25 (T68)	06:57			06:16	05:59
	17:25	22	16:47 (T69)	18:03	117	17:09 (T69)	19:35	29	09:54 (T68)	20:08			20:39	21:04
14	07:55		16:24 (T69)	07:28		08:12 (T68)	07:46		08:05 (T67)	06:55			06:15	05:59
	17:26	26	16:50 (T69)	18:04	117	17:08 (T69)	19:37	30	09:49 (T68)	20:09			20:40	21:05
15	07:55		16:22 (T69)	07:27		08:12 (T68)	07:45		08:04 (T67)	06:54			06:14	05:59
	17:27	29	16:51 (T69)	18:05	116	17:07 (T69)	19:38	22	09:43 (T68)	20:10			20:41	21:05
16	07:55		16:22 (T69)	07:26		08:12 (T68)	07:43		08:02 (T67)	06:52			06:13	05:59
	17:28	31	16:53 (T69)	18:06	114	17:07 (T69)	19:39	16	08:18 (T67)	20:11			20:42	21:06
17	07:54		16:21 (T69)	07:25		08:11 (T68)	07:41		08:00 (T67)	06:51			06:12	05:59
	17:30	33	16:54 (T69)	18:08	113	17:05 (T69)	19:40	19	08:19 (T67)	20:12			20:43	21:06
18	07:54		16:21 (T69)	07:23		08:11 (T68)	07:40		07:59 (T67)	06:49			06:11	05:59
	17:31	35	16:56 (T69)	18:09	112	17:05 (T69)	19:41	22	08:21 (T67)	20:13			20:44	21:06
19	07:53		16:20 (T69)	07:22		08:10 (T68)	07:38		07:57 (T67)	06:47			06:11	05:59
	17:32	37	16:57 (T69)	18:10	110	17:03 (T69)	19:42	24	08:21 (T67)	20:14			20:45	21:07
20	07:53		16:20 (T69)	07:20		08:10 (T68)	07:36		07:55 (T67)	06:46			06:10	05:59
	17:33	39	16:59 (T69)	18:11	107	17:02 (T69)	19:43	26	08:21 (T67)	20:15			20:46	21:07
21	07:52		16:19 (T69)	07:19		08:11 (T68)	07:35		07:54 (T67)	06:44			06:09	05:59
	17:34	40	16:59 (T69)	18:12	103	17:01 (T69)	19:44	28	08:22 (T67)	20:16			20:47	21:07
22	07:51		16:18 (T69)	07:18		08:10 (T68)	07:33		07:52 (T67)	06:43			06:08	05:59
	17:35	42	17:00 (T69)	18:14	100	16:58 (T69)	19:45	30	08:22 (T67)	20:17			20:48	21:07
23	07:51		16:18 (T69)	07:16		08:11 (T68)	07:31		07:50 (T67)	06:42			06:07	06:00
	17:37	44	17:02 (T69)	18:15	94	16:56 (T69)	19:46	31	08:21 (T67)	20:18			20:49	21:08
24	07:50		16:17 (T69)	07:15		08:10 (T68)	07:30		07:49 (T67)	06:40			06:07	06:00
	17:38	46	17:03 (T69)	18:16	87	16:52 (T69)	19:47	33	08:22 (T67)	20:19			20:50	21:08
25	07:49		08:36 (T68)	07:13		08:11 (T68)	07:28		07:47 (T67)	06:39			06:06	06:00
	17:39	60	17:03 (T69)	18:17	75	16:47 (T69)	19:48	34	08:21 (T67)	20:20			20:51	21:08
26	07:48		08:33 (T68)	07:12		08:10 (T68)	07:26		07:46 (T67)	06:37			06:05	06:00
	17:40	69	17:04 (T69)	18:18	68	09:18 (T68)	19:50	34	08:20 (T67)	20:21			20:52	21:08
27	07:48		08:30 (T68)	07:10		08:11 (T68)	07:25		07:47 (T67)	06:36			06:05	06:01
	17:42	76	17:05 (T69)	18:20	66	09:17 (T68)	19:51	33	08:20 (T67)	20:23			20:52	21:08
28	07:47		08:28 (T68)	07:09		08:11 (T68)	07:23		07:47 (T67)	06:34			06:04	06:01
	17:43	82	17:05 (T69)	18:21	65	09:16 (T68)	19:52	32	08:19 (T67)	20:24			20:53	21:08
29	07:46		08:27 (T68)				07:21		07:47 (T67)	06:33			06:03	06:02
	17:44	87	17:07 (T69)				19:53	31	08:18 (T67)	20:25			20:54	21:08
30	07:45		08:25 (T68)				07:20		07:48 (T67)	06:32			06:03	06:02
	17:45	92	17:08 (T69)				19:54	29	08:17 (T67)	20:26			20:55	21:08
31	07:44		08:24 (T68)				07:18		07:49 (T67)				06:02	
	17:46	95	17:08 (T69)				19:55	26	08:15 (T67)				20:56	
Potential sun hours	297			297			370			399			448	452
Total, worst case		1028			2891			1154			64			
Sun reduction		0.31			0.40			0.44			0.52			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.69			0.61			0.57			0.61			
Total reduction		0.22			0.25			0.25			0.32			
Total, real		221			709			290			21			

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

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

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1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 770 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6804)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September			October			November			December		
1	06:03	06:27	06:57			07:28		09:02 (T68)	07:02		07:44 (T68)	07:37		16:10 (T69)
	21:08	20:50	20:07			19:15	33	09:35 (T68)	17:28	116	16:39 (T69)	17:04	15	16:25 (T69)
2	06:03	06:28	06:58			07:29		08:59 (T68)	07:03		07:44 (T68)	07:38		16:13 (T69)
	21:08	20:49	20:05			19:13	38	09:37 (T68)	17:27	116	16:39 (T69)	17:04	10	16:23 (T69)
3	06:04	06:29	06:59			07:30		08:57 (T68)	07:04		07:45 (T68)	07:39		
	21:08	20:48	20:04			19:11	42	09:39 (T68)	17:26	115	16:40 (T69)	17:04		
4	06:04	06:30	07:00			07:31		08:55 (T68)	07:05		07:46 (T68)	07:40		
	21:08	20:47	20:02			19:10	45	09:40 (T68)	17:25	113	16:39 (T69)	17:03		
5	06:05	06:30	07:01			07:32		08:54 (T68)	07:07		07:47 (T68)	07:41		
	21:08	20:45	20:01			19:08	49	09:43 (T68)	17:23	111	16:39 (T69)	17:03		
6	06:05	06:31	07:02			07:33		08:52 (T68)	07:08		07:47 (T68)	07:42		
	21:07	20:44	19:57			19:07	52	09:44 (T68)	17:22	109	16:39 (T69)	17:03		
7	06:06	06:32	07:03			07:34		08:51 (T68)	07:09		07:49 (T68)	07:43		
	21:07	20:43	19:56			19:05	54	09:45 (T68)	17:21	107	16:40 (T69)	17:03		
8	06:06	06:33	07:04		07:53 (T67)	07:35		08:50 (T68)	07:10		07:50 (T68)	07:44		
	21:07	20:42	19:54	4	07:57 (T67)	19:03	56	09:46 (T68)	17:20	104	16:39 (T69)	17:03		
9	06:07	06:34	07:05		07:48 (T67)	07:36		08:48 (T68)	07:11		07:51 (T68)	07:44		
	21:06	20:41	19:52	14	08:02 (T67)	19:02	59	09:47 (T68)	17:19	101	16:39 (T69)	17:03		
10	06:08	06:35	07:06		07:45 (T67)	07:37		08:47 (T68)	07:13		07:53 (T68)	07:45		
	21:06	20:39	19:51	20	08:05 (T67)	19:00	60	09:47 (T68)	17:18	98	16:39 (T69)	17:03		
11	06:09	06:36	07:07		07:43 (T67)	07:38		08:46 (T68)	07:14		07:55 (T68)	07:46		
	21:06	20:38	19:49	23	08:06 (T67)	18:58	62	09:48 (T68)	17:17	94	16:39 (T69)	17:03		
12	06:09	06:37	07:08		07:40 (T67)	07:39		08:45 (T68)	07:15		07:56 (T68)	07:47		
	21:05	20:37	19:47	26	08:06 (T67)	18:57	63	09:48 (T68)	17:16	91	16:38 (T69)	17:03		
13	06:10	06:38	07:09		07:39 (T67)	07:40		08:44 (T68)	07:16		07:58 (T68)	07:48		
	21:05	20:35	19:45	28	08:07 (T67)	18:55	65	09:49 (T68)	17:15	87	16:38 (T69)	17:03		
14	06:11	06:39	07:10		07:37 (T67)	07:41		08:43 (T68)	07:17		08:01 (T68)	07:49		
	21:04	20:34	19:44	31	08:08 (T67)	18:54	66	09:49 (T68)	17:14	82	16:38 (T69)	17:04		
15	06:12	06:40	07:11		07:36 (T67)	07:42		08:43 (T68)	07:19		08:03 (T68)	07:49		
	21:04	20:33	19:42	32	08:08 (T67)	18:52	67	09:50 (T68)	17:13	76	16:38 (T69)	17:04		
16	06:12	06:41	07:12		07:35 (T67)	07:43		08:43 (T68)	07:20		08:06 (T68)	07:50		
	21:03	20:31	19:40	33	08:08 (T67)	18:51	67	09:50 (T68)	17:13	69	16:37 (T69)	17:04		
17	06:13	06:42	07:13		07:35 (T67)	07:45		08:42 (T68)	07:21		08:10 (T68)	07:51		
	21:03	20:30	19:39	34	08:09 (T67)	18:49	80	17:21 (T69)	17:12	59	16:36 (T69)	17:04		
18	06:14	06:43	07:14		07:34 (T67)	07:46		08:42 (T68)	07:22		15:51 (T69)	07:51		
	21:02	20:28	19:37	34	08:08 (T67)	18:48	89	17:25 (T69)	17:11	46	16:37 (T69)	17:05		
19	06:15	06:44	07:15		07:35 (T67)	07:47		08:41 (T68)	07:23		15:52 (T69)	07:52		
	21:01	20:27	19:35	33	08:08 (T67)	18:46	96	17:28 (T69)	17:10	44	16:36 (T69)	17:05		
20	06:16	06:45	07:16		07:36 (T67)	07:48		08:41 (T68)	07:24		15:53 (T69)	07:53		
	21:01	20:26	19:34	32	08:08 (T67)	18:45	100	17:29 (T69)	17:10	42	16:35 (T69)	17:05		
21	06:16	06:46	07:17		07:37 (T67)	07:49		08:41 (T68)	07:26		15:54 (T69)	07:53		
	21:00	20:24	19:32	30	08:07 (T67)	18:43	105	17:32 (T69)	17:09	40	16:34 (T69)	17:06		
22	06:17	06:47	07:18		07:38 (T67)	07:50		08:41 (T68)	07:27		15:56 (T69)	07:54		
	20:59	20:23	19:30	29	08:07 (T67)	18:42	108	17:33 (T69)	17:08	39	16:35 (T69)	17:06		
23	06:18	06:48	07:19		07:39 (T67)	07:51		08:41 (T68)	07:28		15:57 (T69)	07:54		
	20:58	20:21	19:28	27	08:06 (T67)	18:40	110	17:34 (T69)	17:08	37	16:34 (T69)	17:07		
24	06:19	06:49	07:20		07:40 (T67)	07:52		08:41 (T68)	07:29		15:58 (T69)	07:55		
	20:57	20:20	19:27	25	08:05 (T67)	18:39	112	17:35 (T69)	17:07	35	16:33 (T69)	17:07		
25	06:20	06:50	07:21		07:41 (T67)	07:54		08:40 (T68)	07:30		15:59 (T69)	07:55		
	20:57	20:18	19:25	23	08:04 (T67)	18:37	114	17:35 (T69)	17:06	33	16:32 (T69)	17:08		
26	06:21	06:51	07:22		07:42 (T67)	07:55		08:41 (T68)	07:31		16:00 (T69)	07:55		
	20:56	20:17	19:23	20	08:02 (T67)	18:36	116	17:37 (T69)	17:06	31	16:31 (T69)	17:09		
27	06:22	06:52	07:23		07:43 (T67)	07:56		08:41 (T68)	07:32		16:02 (T69)	07:56		
	20:55	20:15	19:22	17	08:00 (T67)	18:35	116	17:37 (T69)	17:06	29	16:31 (T69)	17:09		
28	06:23	06:53	07:24		07:44 (T67)	07:57		08:42 (T68)	07:34		16:04 (T69)	07:56		
	20:54	20:13	19:20	14	07:58 (T67)	18:33	116	17:37 (T69)	17:05	26	16:30 (T69)	17:10		
29	06:24	06:54	07:25		07:45 (T67)	07:58		08:42 (T68)	07:35		16:06 (T69)	07:56		
	20:53	20:12	19:18	29	09:28 (T68)	18:32	117	17:38 (T69)	17:05	22	16:28 (T69)	17:11		
30	06:25	06:55	07:26		07:46 (T67)	07:59		08:43 (T68)	07:36		16:08 (T69)	07:56		
	20:52	20:10	19:17	32	09:32 (T68)	18:31	117	17:39 (T69)	17:04	19	16:27 (T69)	17:12		
31	06:26	06:56				08:01		08:43 (T68)				07:57		
	20:51	20:09				18:29	117	17:39 (T69)				17:12		
Potential sun hours	459	428	375			345			298			288		
Total, worst case				590			2491			2091			25	
Sun reduction				0.59			0.48			0.30			0.22	
Oper. time red.				1.00			1.00			1.00			1.00	
Wind dir. red.				0.61			0.58			0.66			0.73	
Total reduction				0.36			0.28			0.20			0.16	
Total, real				214			699			416			4	

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

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

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1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 779 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6811)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

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N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57		15:41 (T77)	07:43		08:04 (T76)	07:07		16:58 (T42)	07:16		19:21 (T41)	06:30			06:01		20:01 (T40)
	17:13	35	16:16 (T77)	17:47	29	08:33 (T76)	18:22	37	17:35 (T42)	19:56	13	19:34 (T41)	20:27			20:57	31	20:32 (T40)
2	07:57		15:42 (T77)	07:42		08:04 (T76)	07:06		16:58 (T42)	07:14		19:18 (T41)	06:29			06:01		20:02 (T40)
	17:14	34	16:16 (T77)	17:49	29	08:33 (T76)	18:23	36	17:34 (T42)	19:57	17	19:35 (T41)	20:28			20:58	31	20:33 (T40)
3	07:57		15:42 (T77)	07:41		08:05 (T76)	07:04		16:59 (T42)	07:13		19:16 (T41)	06:28			06:01		20:01 (T40)
	17:15	35	16:17 (T77)	17:50	29	08:34 (T76)	18:24	33	17:32 (T42)	19:58	21	19:37 (T41)	20:29			20:58	31	20:32 (T40)
4	07:57		15:43 (T77)	07:40		08:05 (T76)	07:02		17:01 (T42)	07:11		19:14 (T41)	06:26			06:00		20:02 (T40)
	17:16	34	16:17 (T77)	17:51	29	08:34 (T76)	18:25	30	17:31 (T42)	19:59	23	19:37 (T41)	20:30			20:59	31	20:33 (T40)
5	07:57		15:44 (T77)	07:39		08:05 (T76)	07:01		17:02 (T42)	07:09		19:13 (T41)	06:25			06:00		20:02 (T40)
	17:16	33	16:17 (T77)	17:52	29	08:34 (T76)	18:26	26	17:28 (T42)	20:00	25	19:38 (T41)	20:31			21:00	31	20:33 (T40)
6	07:57		15:45 (T77)	07:38		08:05 (T76)	06:59		17:05 (T42)	07:08		19:12 (T41)	06:24			05:59		20:02 (T40)
	17:17	32	16:17 (T77)	17:54	42	17:23 (T42)	18:27	21	17:26 (T42)	20:00	28	19:40 (T41)	20:32			21:00	31	20:33 (T40)
7	07:57		15:45 (T77)	07:37		08:06 (T76)	06:58		17:08 (T42)	07:06		19:11 (T41)	06:23			05:59		20:02 (T40)
	17:18	31	16:16 (T77)	17:55	46	17:27 (T42)	18:29	14	17:22 (T42)	20:01	29	19:40 (T41)	20:33			21:01	31	20:33 (T40)
8	07:57		15:46 (T77)	07:36		08:07 (T76)	07:56			07:05		19:11 (T41)	06:22			05:59		20:03 (T40)
	17:19	30	16:16 (T77)	17:56	49	17:29 (T42)	19:30			20:02	31	19:42 (T41)	20:34			21:02	31	20:34 (T40)
9	07:57		15:48 (T77)	07:35		08:08 (T76)	07:54			07:03		19:10 (T41)	06:20			05:59		20:03 (T40)
	17:20	28	16:16 (T77)	17:57	51	17:31 (T42)	19:31			20:03	32	19:42 (T41)	20:35			21:02	31	20:34 (T40)
10	07:57		15:49 (T77)	07:34		08:09 (T76)	07:53			07:01		19:09 (T41)	06:19			05:59		20:03 (T40)
	17:21	27	16:16 (T77)	17:59	53	17:33 (T42)	19:32			20:05	32	19:41 (T41)	20:36			21:03	31	20:34 (T40)
11	07:57		15:50 (T77)	07:32		08:10 (T76)	07:51			07:00		19:09 (T41)	06:18			05:58		20:04 (T40)
	17:23	25	16:15 (T77)	18:00	53	17:34 (T42)	19:33			20:06	32	19:41 (T41)	20:37			21:04	31	20:35 (T40)
12	07:56		15:51 (T77)	07:31		08:12 (T76)	07:50			06:58		19:09 (T41)	06:17			05:58		20:03 (T40)
	17:24	24	16:15 (T77)	18:01	51	17:35 (T42)	19:34			20:07	32	19:41 (T41)	20:38			21:04	31	20:34 (T40)
13	07:56		15:53 (T77)	07:30		08:15 (T76)	07:48			06:57		19:10 (T41)	06:16			05:58		20:04 (T40)
	17:25	22	16:15 (T77)	18:02	47	17:36 (T42)	19:35			20:08	31	19:41 (T41)	20:39			21:05	30	20:34 (T40)
14	07:56		15:55 (T77)	07:29		16:57 (T42)	07:46			06:55		19:09 (T41)	06:15			05:58		20:04 (T40)
	17:26	18	16:13 (T77)	18:04	39	17:36 (T42)	19:36			20:09	30	19:39 (T41)	20:41			21:05	30	20:34 (T40)
15	07:55		15:57 (T77)	07:27		16:57 (T42)	07:45			06:53		19:09 (T41)	06:14		20:13 (T40)	05:58		20:04 (T40)
	17:27	15	16:12 (T77)	18:05	40	17:37 (T42)	19:38			20:10	29	19:38 (T41)	20:42	4	20:17 (T40)	21:05	30	20:34 (T40)
16	07:55		16:00 (T77)	07:26		16:56 (T42)	07:43			06:52		19:10 (T41)	06:13		20:10 (T40)	05:58		20:04 (T40)
	17:28	9	16:09 (T77)	18:06	42	17:38 (T42)	19:39			20:11	28	19:38 (T41)	20:43	10	20:20 (T40)	21:06	30	20:34 (T40)
17	07:54			07:25		16:55 (T42)	07:41			06:50		19:11 (T41)	06:12		20:08 (T40)	05:58		20:05 (T40)
	17:29			18:07	43	17:38 (T42)	19:40			20:12	25	19:36 (T41)	20:43	12	20:20 (T40)	21:06	31	20:36 (T40)
18	07:54			07:23		16:55 (T42)	07:40			06:49		19:12 (T41)	06:11		20:07 (T40)	05:58		20:06 (T40)
	17:30			18:09	44	17:39 (T42)	19:41			20:13	23	19:35 (T41)	20:44	14	20:21 (T40)	21:07	30	20:36 (T40)
19	07:53			07:22		16:56 (T42)	07:38			06:47		19:13 (T41)	06:10		20:05 (T40)	05:58		20:06 (T40)
	17:32			18:10	43	17:39 (T42)	19:42			20:14	20	19:33 (T41)	20:45	17	20:22 (T40)	21:07	30	20:36 (T40)
20	07:53		08:15 (T76)	07:20		16:55 (T42)	07:36			06:46		19:15 (T41)	06:09		20:04 (T40)	05:59		20:06 (T40)
	17:33	2	08:17 (T76)	18:11	44	17:39 (T42)	19:43			20:15	16	19:31 (T41)	20:46	19	20:23 (T40)	21:07	30	20:36 (T40)
21	07:52		08:13 (T76)	07:19		16:55 (T42)	07:35			06:44		19:18 (T41)	06:09		20:03 (T40)	05:59		20:06 (T40)
	17:34	8	08:21 (T76)	18:12	44	17:39 (T42)	19:44			20:16	10	19:28 (T41)	20:47	20	20:23 (T40)	21:08	30	20:36 (T40)
22	07:52		08:13 (T76)	07:18		16:54 (T42)	07:33			06:43			06:08		20:03 (T40)	05:59		20:06 (T40)
	17:35	11	08:24 (T76)	18:13	45	17:39 (T42)	19:45			20:17			20:48	22	20:25 (T40)	21:08	30	20:36 (T40)
23	07:51		08:12 (T76)	07:16		16:55 (T42)	07:31			06:41			06:07		20:03 (T40)	05:59		20:07 (T40)
	17:36	13	08:25 (T76)	18:15	44	17:39 (T42)	19:46			20:18			20:49	22	20:25 (T40)	21:08	30	20:37 (T40)
24	07:50		08:11 (T76)	07:15		16:55 (T42)	07:30			06:40			06:06		20:02 (T40)	05:59		20:07 (T40)
	17:38	16	08:27 (T76)	18:16	43	17:38 (T42)	19:47			20:19			20:50	24	20:26 (T40)	21:08	30	20:37 (T40)
25	07:49		08:10 (T76)	07:13		16:55 (T42)	07:28			06:38			06:06		20:02 (T40)	06:00		20:06 (T40)
	17:39	18	08:28 (T76)	18:17	43	17:38 (T42)	19:48			20:21			20:51	25	20:27 (T40)	21:08	31	20:37 (T40)
26	07:49		08:09 (T76)	07:12		16:55 (T42)	07:26			06:37			06:05		20:02 (T40)	06:00		20:07 (T40)
	17:40	20	08:29 (T76)	18:18	42	17:37 (T42)	19:50			20:22			20:52	26	20:28 (T40)	21:08	30	20:37 (T40)
27	07:48		08:09 (T76)	07:10		16:56 (T42)	07:24			06:36			06:04		20:02 (T40)	06:00		20:07 (T40)
	17:41	21	08:30 (T76)	18:19	41	17:37 (T42)	19:51			20:23			20:53	27	20:29 (T40)	21:08	30	20:37 (T40)
28	07:47		08:08 (T76)	07:09		16:57 (T42)	07:23			06:34			06:04		20:01 (T40)	06:01		20:07 (T40)
	17:42	23	08:31 (T76)	18:21	39	17:36 (T42)	19:52			20:24			20:54	29	20:30 (T40)	21:09	30	20:37 (T40)
29	07:46		08:07 (T76)				07:21			06:33			06:03		20:01 (T40)	06:01		20:08 (T40)
	17:44	25	08:32 (T76)				19:53			20:25			20:54	29	20:30 (T40)	21:09	30	20:38 (T40)
30	07:45		08:06 (T76)				07:19			06:32			06:02		20:01 (T40)	06:02		20:07 (T40)
	17:45	26	08:32 (T76)				19:54			20:26			20:55	30	20:31 (T40)	21:09	31	20:38 (T40)
31	07:44		08:05 (T76)				07:18		19:26 (T41)				06:02		20:01 (T40)			
	17:46	28	08:33 (T76)				19:55	5	19:31 (T41)				20:56	30	20:31 (T40)			
Potential sun hours	297			297			370			399			448			453		
Total, worst case		643			1173			202			527			360			915	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.68			0.66			0.71			0.60			0.55			0.55	
Total reduction		0.22			0.27			0.32			0.32			0.32			0.36	
Total, real		139			320			65			170			115			329	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 779 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6811)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September		October			November		December		
1	06:02		20:08 (T40)	06:26		06:57		19:08 (T41)	07:27		07:02		07:38 (T76)	07:37	15:32 (T77)
	21:08	31	20:39 (T40)	20:50		20:07	32	19:40 (T41)	19:15		17:28	52	17:01 (T42)	17:04	25	15:57 (T77)
2	06:03		20:08 (T40)	06:27		06:58		19:08 (T41)	07:29		07:03		07:37 (T76)	07:38	15:31 (T77)
	21:08	30	20:38 (T40)	20:49		20:06	32	19:40 (T41)	19:13		17:27	52	17:01 (T42)	17:03	27	15:58 (T77)
3	06:03		20:08 (T40)	06:28		06:59		19:08 (T41)	07:30		07:04		07:36 (T76)	07:39	15:32 (T77)
	21:08	31	20:39 (T40)	20:48		20:04	32	19:40 (T41)	19:11		17:26	50	16:59 (T42)	17:03	28	16:00 (T77)
4	06:04		20:08 (T40)	06:29		07:00		19:08 (T41)	07:31		07:06		07:35 (T76)	07:40	15:31 (T77)
	21:08	31	20:39 (T40)	20:47		20:02	31	19:39 (T41)	19:10		17:24	46	16:56 (T42)	17:03	30	16:01 (T77)
5	06:04		20:08 (T40)	06:30		07:01		19:08 (T41)	07:32		07:07		07:35 (T76)	07:41	15:31 (T77)
	21:08	31	20:39 (T40)	20:46		20:01	29	19:37 (T41)	19:08		17:23	41	16:53 (T42)	17:03	31	16:02 (T77)
6	06:05		20:08 (T40)	06:31		07:02		19:08 (T41)	07:33		17:47 (T42)	07:08	07:35 (T76)	07:42	15:31 (T77)
	21:08	31	20:39 (T40)	20:44		19:57	28	19:36 (T41)	19:06	10	17:57 (T42)	17:22	29	08:04 (T76)	17:03	32	16:03 (T77)
7	06:05		20:09 (T40)	06:32		07:03		19:09 (T41)	07:34		17:42 (T42)	07:09	07:35 (T76)	07:43	15:30 (T77)
	21:07	31	20:40 (T40)	20:43		19:56	25	19:34 (T41)	19:05	19	18:01 (T42)	17:21	29	08:04 (T76)	17:03	33	16:03 (T77)
8	06:06		20:09 (T40)	06:33		07:04		19:09 (T41)	07:35		17:39 (T42)	07:10	07:34 (T76)	07:44	15:30 (T77)
	21:07	31	20:40 (T40)	20:42		19:54	24	19:33 (T41)	19:03	24	18:03 (T42)	17:20	30	08:04 (T76)	17:03	34	16:04 (T77)
9	06:07		20:09 (T40)	06:34		07:05		19:10 (T41)	07:36		17:37 (T42)	07:12	07:35 (T76)	07:45	15:30 (T77)
	21:07	31	20:40 (T40)	20:41		19:52	21	19:31 (T41)	19:01	28	18:05 (T42)	17:19	29	08:04 (T76)	17:03	35	16:05 (T77)
10	06:07		20:09 (T40)	06:35		07:06		19:11 (T41)	07:37		17:35 (T42)	07:13	07:35 (T76)	07:46	15:31 (T77)
	21:06	31	20:40 (T40)	20:39		19:51	17	19:28 (T41)	19:00	31	18:06 (T42)	17:18	29	08:04 (T76)	17:03	34	16:05 (T77)
11	06:08		20:10 (T40)	06:36		07:07		19:13 (T41)	07:38		17:33 (T42)	07:14	07:36 (T76)	07:46	15:31 (T77)
	21:06	31	20:41 (T40)	20:38		19:49	14	19:27 (T41)	18:58	34	18:07 (T42)	17:17	28	08:04 (T76)	17:03	35	16:06 (T77)
12	06:09		20:09 (T40)	06:37		07:08		19:16 (T41)	07:39		17:31 (T42)	07:15	07:37 (T76)	07:47	15:31 (T77)
	21:06	31	20:40 (T40)	20:37		19:47	7	19:23 (T41)	18:57	37	18:08 (T42)	17:16	26	08:03 (T76)	17:03	36	16:07 (T77)
13	06:10		20:10 (T40)	06:38		07:09			07:40		17:30 (T42)	07:16	07:39 (T76)	07:48	15:32 (T77)
	21:05	30	20:40 (T40)	20:36		19:45			18:55	38	18:08 (T42)	17:15	25	08:04 (T76)	17:03	36	16:08 (T77)
14	06:10		20:10 (T40)	06:39		07:10			07:41		17:29 (T42)	07:18	07:40 (T76)	07:49	15:31 (T77)
	21:05	29	20:39 (T40)	20:34		19:44			18:54	39	18:08 (T42)	17:14	23	08:03 (T76)	17:03	37	16:08 (T77)
15	06:11		20:11 (T40)	06:40		07:11			07:42		17:29 (T42)	07:19	07:41 (T76)	07:50	15:32 (T77)
	21:04	28	20:39 (T40)	20:33		19:42			18:52	41	18:10 (T42)	17:13	21	08:02 (T76)	17:03	37	16:09 (T77)
16	06:12		20:10 (T40)	06:41		07:12			07:44		17:28 (T42)	07:20	07:42 (T76)	07:50	15:33 (T77)
	21:03	28	20:38 (T40)	20:31		19:40			18:50	42	18:10 (T42)	17:12	20	08:02 (T76)	17:04	37	16:10 (T77)
17	06:13		20:11 (T40)	06:42		07:13			07:45		17:27 (T42)	07:21	07:44 (T76)	07:51	15:32 (T77)
	21:03	26	20:37 (T40)	20:30		19:39			18:49	43	18:10 (T42)	17:11	18	08:02 (T76)	17:04	38	16:10 (T77)
18	06:14		20:11 (T40)	06:43		07:14			07:46		17:26 (T42)	07:22	07:45 (T76)	07:52	15:33 (T77)
	21:02	26	20:37 (T40)	20:29		19:37			18:47	44	18:10 (T42)	17:11	16	08:01 (T76)	17:04	37	16:10 (T77)
19	06:14		20:12 (T40)	06:44		07:15			07:47		17:26 (T42)	07:23	07:46 (T76)	07:52	15:34 (T77)
	21:02	25	20:37 (T40)	20:27		19:35			18:46	44	18:10 (T42)	17:10	13	07:59 (T76)	17:05	37	16:11 (T77)
20	06:15		20:13 (T40)	06:45		07:16			07:48		17:25 (T42)	07:25	07:48 (T76)	07:53	15:34 (T77)
	21:01	23	20:36 (T40)	20:26		19:33			18:44	44	18:09 (T42)	17:09	11	07:59 (T76)	17:05	37	16:11 (T77)
21	06:16		20:12 (T40)	06:46		07:17			07:49		17:26 (T42)	07:26	07:49 (T76)	07:53	15:35 (T77)
	21:00	23	20:35 (T40)	20:24		19:32			18:43	44	18:10 (T42)	17:08	8	07:57 (T76)	17:05	37	16:12 (T77)
22	06:17		20:13 (T40)	06:47	19:22 (T41)	07:18			07:50		17:25 (T42)	07:27	07:50 (T76)	07:54	15:35 (T77)
	20:59	21	20:34 (T40)	20:23	11 19:33 (T41)	19:30			18:41	45	18:10 (T42)	17:08	3	07:53 (T76)	17:06	37	16:12 (T77)
23	06:18		20:14 (T40)	06:48	19:19 (T41)	07:19			07:51		17:25 (T42)	07:28			07:54		15:36 (T77)
	20:59	19	20:33 (T40)	20:21	16 19:35 (T41)	19:28			18:40	44	18:09 (T42)	17:07			17:07	37	16:13 (T77)
24	06:19		20:15 (T40)	06:49	19:16 (T41)	07:20			07:53		17:25 (T42)	07:29			07:55		15:36 (T77)
	20:58	18	20:33 (T40)	20:20	21 19:37 (T41)	19:27			18:39	43	18:08 (T42)	17:07			17:07	37	16:13 (T77)
25	06:20		20:16 (T40)	06:50	19:15 (T41)	07:21			07:54		17:26 (T42)	07:30			07:55		15:36 (T77)
	20:57	16	20:32 (T40)	20:18	23 19:38 (T41)	19:25			18:37	43	18:09 (T42)	17:06			17:08	37	16:13 (T77)
26	06:21		20:18 (T40)	06:51	19:13 (T41)	07:22			07:55		17:26 (T42)	07:32	15:39 (T77)	07:56	15:37 (T77)
	20:56	13	20:31 (T40)	20:17	26 19:39 (T41)	19:23			18:36	42	18:08 (T42)	17:06	9	15:48 (T77)	17:08	38	16:15 (T77)
27	06:22		20:20 (T40)	06:52	19:12 (T41)	07:23			07:56		17:27 (T42)	07:33	15:36 (T77)	07:56	15:37 (T77)
	20:55	11	20:31 (T40)	20:15	28 19:40 (T41)	19:22			18:34	40	18:07 (T42)	17:05	15	15:51 (T77)	17:09	38	16:15 (T77)
28	06:22		20:21 (T40)	06:53	19:11 (T41)	07:24			07:57		17:27 (T42)	07:34	15:35 (T77)	07:56	15:38 (T77)
	20:54	8	20:29 (T40)	20:14	29 19:40 (T41)	19:20			18:33	39	18:06 (T42)	17:05	18	15:53 (T77)	17:10	37	16:15 (T77)
29	06:23			06:54	19:10 (T41)	07:25			07:58		08:43 (T76)	07:35	15:33 (T77)	07:57	15:38 (T77)
	20:53			20:12	30 19:40 (T41)	19:18			18:32	49	18:05 (T42)	17:04	22	15:55 (T77)	17:10	37	16:15 (T77)
30	06:24			06:55	19:09 (T41)	07:26			08:00		08:41 (T76)	07:36	15:32 (T77)	07:57	15:40 (T77)
	20:52			20:10	32 19:41 (T41)	19:16			18:30	51	18:04 (T42)	17:04	24	15:56 (T77)	17:11	36	16:16 (T77)
31	06:25			06:56	19:09 (T41)				08:01		08:39 (T76)				07:57		15:40 (T77)
	20:51			20:09	32 19:41 (T41)				18:29	53	18:03 (T42)				17:12	36	16:16 (T77)
Potential sun hours	460		429			375			345			297			287		
Total, worst case		715		248			292			1011			687			1083	
Sun reduction		0.66		0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00		1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.55		0.60			0.60			0.70			0.59			0.75	
Total reduction		0.37		0.38			0.37			0.35			0.18			0.17	
Total, real		265		94			107			350			125			183	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 785 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6817)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February		March			April			May			June		
1	07:57		15:29 (T44)	07:43		07:07			07:16		07:35 (T76)	06:30		18:48 (T77)	06:01		19:54 (T42)
	17:13	50	16:19 (T44)	17:47		18:22			19:56	57	19:26 (T77)	20:27	27	19:15 (T77)	20:57	36	20:30 (T42)
2	07:57		15:29 (T44)	07:42		07:06			07:14		07:33 (T76)	06:29		18:51 (T77)	06:01		19:54 (T42)
	17:14	50	16:19 (T44)	17:49		18:23			19:57	63	19:27 (T77)	20:28	22	19:13 (T77)	20:58	37	20:31 (T42)
3	07:57		15:30 (T44)	07:41		07:04			07:13		07:32 (T76)	06:28		18:53 (T77)	06:01		19:53 (T42)
	17:15	49	16:19 (T44)	17:50		18:24			19:58	68	19:29 (T77)	20:29	17	19:10 (T77)	20:58	38	20:31 (T42)
4	07:57		15:30 (T44)	07:40		07:02			07:11		07:30 (T76)	06:26		18:58 (T77)	06:00		19:53 (T42)
	17:16	50	16:20 (T44)	17:51		18:25			19:59	72	19:29 (T77)	20:30	7	19:05 (T77)	20:59	39	20:32 (T42)
5	07:57		15:31 (T44)	07:39		07:01			07:09		07:28 (T76)	06:25			06:00		19:53 (T42)
	17:17	49	16:20 (T44)	17:52		18:26			20:00	77	19:30 (T77)	20:31			21:00	40	20:33 (T42)
6	07:57		15:32 (T44)	07:38		06:59			07:08		07:28 (T76)	06:24			05:59		19:52 (T42)
	17:17	49	16:21 (T44)	17:54		18:27			20:00	79	19:31 (T77)	20:32			21:00	40	20:32 (T42)
7	07:57		15:32 (T44)	07:37		06:58			07:06		07:27 (T76)	06:23			05:59		19:52 (T42)
	17:18	48	16:20 (T44)	17:55		18:29			20:01	80	19:31 (T77)	20:33			21:01	41	20:33 (T42)
8	07:57		15:32 (T44)	07:36		07:56			07:05		07:27 (T76)	06:22			05:59		19:53 (T42)
	17:19	48	16:20 (T44)	17:56		19:30			20:02	83	19:32 (T77)	20:34			21:02	41	20:34 (T42)
9	07:57		15:33 (T44)	07:35		07:54			07:03		07:26 (T76)	06:20			05:59		19:53 (T42)
	17:20	48	16:21 (T44)	17:57		19:31			20:03	84	19:32 (T77)	20:35			21:02	41	20:34 (T42)
10	07:57		15:34 (T44)	07:34		07:53			07:01		07:26 (T76)	06:19			05:59		19:53 (T42)
	17:21	47	16:21 (T44)	17:59		19:32			20:05	83	19:31 (T77)	20:36			21:03	42	20:35 (T42)
11	07:57		15:34 (T44)	07:32		07:51			07:00		07:26 (T76)	06:18			05:58		19:53 (T42)
	17:23	47	16:21 (T44)	18:00		19:33			20:06	84	19:32 (T77)	20:37			21:03	42	20:35 (T42)
12	07:56		15:36 (T44)	07:31		07:50			06:58		07:26 (T76)	06:17			05:58		19:52 (T42)
	17:24	45	16:21 (T44)	18:01		19:34			20:07	84	19:32 (T77)	20:38			21:04	43	20:35 (T42)
13	07:56		15:37 (T44)	07:30		07:48			06:57		07:27 (T76)	06:16			05:58		19:52 (T42)
	17:25	44	16:21 (T44)	18:02		19:35			20:08	82	19:32 (T77)	20:39			21:05	43	20:35 (T42)
14	07:56		15:37 (T44)	07:29		07:46			06:55		07:27 (T76)	06:15			05:58		19:53 (T42)
	17:26	44	16:21 (T44)	18:04		19:36			20:09	80	19:31 (T77)	20:40			21:05	42	20:35 (T42)
15	07:55		15:38 (T44)	07:27		07:45			06:53		07:27 (T76)	06:14			05:58		19:53 (T42)
	17:27	43	16:21 (T44)	18:05		19:38			20:10	79	19:31 (T77)	20:41			21:05	43	20:36 (T42)
16	07:55		15:39 (T44)	07:26		07:43			06:52		07:29 (T76)	06:13			05:58		19:53 (T42)
	17:28	41	16:20 (T44)	18:06		19:39			20:11	75	19:31 (T77)	20:42			21:06	43	20:36 (T42)
17	07:54		15:40 (T44)	07:25		07:41			06:50		07:30 (T76)	06:12			05:58		19:54 (T42)
	17:29	41	16:21 (T44)	18:07		19:40			20:12	72	19:30 (T77)	20:43			21:06	43	20:37 (T42)
18	07:54		15:41 (T44)	07:23		07:40			06:49		07:32 (T76)	06:11			05:58		19:54 (T42)
	17:30	39	16:20 (T44)	18:09		19:41			20:13	67	19:30 (T77)	20:44			21:07	43	20:37 (T42)
19	07:53		15:43 (T44)	07:22		07:38			06:47		07:36 (T76)	06:10			05:58		19:54 (T42)
	17:32	37	16:20 (T44)	18:10		19:42			20:14	58	19:29 (T77)	20:45			21:07	43	20:37 (T42)
20	07:53		15:44 (T44)	07:20		07:36			06:46		18:38 (T77)	06:09			05:59		19:54 (T42)
	17:33	35	16:19 (T44)	18:11		19:43			20:15	51	19:29 (T77)	20:46			21:07	43	20:37 (T42)
21	07:52		15:45 (T44)	07:19		07:35			06:44		18:39 (T77)	06:09		20:04 (T42)	05:59		19:54 (T42)
	17:34	33	16:18 (T44)	18:12		19:44			20:16	49	19:28 (T77)	20:47	12	20:16 (T42)	21:08	43	20:37 (T42)
22	07:52		15:47 (T44)	07:18		07:33			06:43		18:39 (T77)	06:08		20:02 (T42)	05:59		19:54 (T42)
	17:35	31	16:18 (T44)	18:13		19:45			20:17	48	19:27 (T77)	20:48	18	20:20 (T42)	21:08	43	20:37 (T42)
23	07:51		15:48 (T44)	07:16		07:31			06:41		18:40 (T77)	06:07		20:00 (T42)	05:59		19:55 (T42)
	17:36	29	16:17 (T44)	18:15		19:46			20:18	47	19:27 (T77)	20:49	21	20:21 (T42)	21:08	43	20:38 (T42)
24	07:50		15:50 (T44)	07:15		07:30			06:40		18:40 (T77)	06:06		19:59 (T42)	05:59		19:55 (T42)
	17:38	25	16:15 (T44)	18:16		19:47			20:19	45	19:25 (T77)	20:50	24	20:23 (T42)	21:08	43	20:38 (T42)
25	07:49		15:52 (T44)	07:13		07:28			06:38		18:41 (T77)	06:06		19:58 (T42)	06:00		19:55 (T42)
	17:39	21	16:13 (T44)	18:17		19:48			20:21	43	19:24 (T77)	20:51	27	20:25 (T42)	21:08	43	20:38 (T42)
26	07:49		15:55 (T44)	07:12		07:26			06:37		18:41 (T77)	06:05		19:57 (T42)	06:00		19:56 (T42)
	17:40	16	16:11 (T44)	18:18		19:50			20:22	42	19:23 (T77)	20:52	28	20:25 (T42)	21:08	43	20:39 (T42)
27	07:48		16:01 (T44)	07:10		07:24			06:36		18:43 (T77)	06:04		19:57 (T42)	06:00		19:56 (T42)
	17:41	6	16:07 (T44)	18:19		19:51			20:23	39	19:22 (T77)	20:53	30	20:27 (T42)	21:08	43	20:39 (T42)
28	07:47			07:09		07:23		19:03 (T77)	06:34		18:44 (T77)	06:04		19:56 (T42)	06:01		19:56 (T42)
	17:42			18:21		19:52	13	19:16 (T77)	20:24	37	19:21 (T77)	20:54	31	20:27 (T42)	21:09	42	20:38 (T42)
29	07:46					07:21		07:43 (T76)	06:33		18:45 (T77)	06:03		19:54 (T42)	06:01		19:56 (T42)
	17:44					19:53	27	19:20 (T77)	20:25	34	19:19 (T77)	20:54	34	20:28 (T42)	21:09	43	20:39 (T42)
30	07:45					07:19		07:38 (T76)	06:32		18:46 (T77)	06:02		19:54 (T42)	06:02		19:56 (T42)
	17:45					19:54	42	19:22 (T77)	20:26	31	19:17 (T77)	20:55	35	20:29 (T42)	21:08	43	20:39 (T42)
31	07:44					07:18		07:37 (T76)				06:02		19:53 (T42)			
	17:46					19:55	51	19:25 (T77)				20:56	36	20:29 (T42)			
Potential sun hours	297			297		370			399			448			453		
Total, worst case		1065					133			1893			369			1252	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.75					0.62			0.62			0.56			0.54	
Total reduction		0.24					0.29			0.34			0.33			0.36	
Total, real		256					38			638			121			450	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 785 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6817)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November			December		
1	06:02		19:57 (T42)	06:26			06:57			07:25 (T76)	07:27			07:37		15:17 (T44)
	21:08	42	20:39 (T42)	20:50			20:07	84		19:31 (T77)	19:15			17:04	46	16:03 (T44)
2	06:03		19:57 (T42)	06:27			06:58			07:25 (T76)	07:29			07:38		15:16 (T44)
	21:08	42	20:39 (T42)	20:49			20:06	83		19:30 (T77)	19:13			17:03	47	16:03 (T44)
3	06:03		19:58 (T42)	06:28			06:59			07:24 (T76)	07:30			07:39		15:16 (T44)
	21:08	41	20:39 (T42)	20:48			20:04	84		19:30 (T77)	19:11			17:03	48	16:04 (T44)
4	06:04		19:58 (T42)	06:29			07:00			07:24 (T76)	07:31			07:40		15:18 (T44)
	21:08	41	20:39 (T42)	20:47			20:02	83		19:29 (T77)	19:10			17:03	47	16:05 (T44)
5	06:04		19:59 (T42)	06:30			07:01			07:24 (T76)	07:32			07:41		15:18 (T44)
	21:08	40	20:39 (T42)	20:46			20:01	81		19:28 (T77)	19:08			17:03	48	16:06 (T44)
6	06:05		19:58 (T42)	06:31			07:02			07:24 (T76)	07:33			07:42		15:17 (T44)
	21:08	41	20:39 (T42)	20:44			19:57	79		19:27 (T77)	19:06			17:03	49	16:06 (T44)
7	06:05		19:59 (T42)	06:32			07:03			07:24 (T76)	07:34			07:43		15:17 (T44)
	21:07	40	20:39 (T42)	20:43			19:56	77		19:26 (T77)	19:05			17:03	49	16:06 (T44)
8	06:06		20:00 (T42)	06:33			07:04			07:25 (T76)	07:35			07:44		15:18 (T44)
	21:07	39	20:39 (T42)	20:42			19:54	73		19:25 (T77)	19:03			17:03	49	16:07 (T44)
9	06:07		20:00 (T42)	06:34		19:06 (T77)	07:05			07:26 (T76)	07:36			07:45		15:18 (T44)
	21:07	38	20:38 (T42)	20:41	11	19:17 (T77)	19:52	68		19:23 (T77)	19:01			17:03	49	16:07 (T44)
10	06:07		20:01 (T42)	06:35		19:02 (T77)	07:06			07:26 (T76)	07:37			07:46		15:18 (T44)
	21:06	38	20:39 (T42)	20:39	18	19:20 (T77)	19:51	63		19:20 (T77)	19:00			17:03	50	16:08 (T44)
11	06:08		20:02 (T42)	06:36		18:59 (T77)	07:07			07:27 (T76)	07:38			07:46		15:19 (T44)
	21:06	37	20:39 (T42)	20:38	24	19:23 (T77)	19:49	58		19:19 (T77)	18:58			17:03	50	16:09 (T44)
12	06:09		20:02 (T42)	06:37		18:57 (T77)	07:08			07:28 (T76)	07:39			07:47		15:19 (T44)
	21:05	36	20:38 (T42)	20:37	28	19:25 (T77)	19:47	52		19:17 (T77)	18:57			17:03	50	16:09 (T44)
13	06:10		20:02 (T42)	06:38		18:55 (T77)	07:09			07:29 (T76)	07:40			07:48		15:20 (T44)
	21:05	35	20:37 (T42)	20:36	31	19:26 (T77)	19:45	44		19:14 (T77)	18:55			17:03	50	16:10 (T44)
14	06:10		20:03 (T42)	06:39		18:53 (T77)	07:10			07:32 (T76)	07:41			07:49		15:20 (T44)
	21:05	34	20:37 (T42)	20:34	35	19:28 (T77)	19:44	31		19:11 (T77)	18:54			17:03	50	16:10 (T44)
15	06:11		20:04 (T42)	06:40		18:51 (T77)	07:11			18:51 (T77)	07:42			07:50		15:20 (T44)
	21:04	33	20:37 (T42)	20:33	38	19:29 (T77)	19:42	16		19:07 (T77)	18:52			17:03	51	16:11 (T44)
16	06:12		20:05 (T42)	06:41		18:49 (T77)	07:12				07:44			07:50		15:21 (T44)
	21:03	31	20:36 (T42)	20:31	40	19:29 (T77)	19:40				18:50			17:04	51	16:12 (T44)
17	06:13		20:06 (T42)	06:42		18:48 (T77)	07:13				07:45			07:51		15:21 (T44)
	21:03	29	20:35 (T42)	20:30	42	19:30 (T77)	19:39				18:49			17:04	50	16:11 (T44)
18	06:14		20:07 (T42)	06:43		18:47 (T77)	07:14				07:46			07:52		15:22 (T44)
	21:02	27	20:34 (T42)	20:29	43	19:30 (T77)	19:37				18:47			17:04	50	16:12 (T44)
19	06:14		20:08 (T42)	06:44		18:45 (T77)	07:15				07:47			07:52		15:22 (T44)
	21:01	26	20:34 (T42)	20:27	46	19:31 (T77)	19:35				18:46			17:05	51	16:13 (T44)
20	06:15		20:10 (T42)	06:45		18:44 (T77)	07:16				07:48			07:53		15:22 (T44)
	21:01	23	20:33 (T42)	20:26	48	19:32 (T77)	19:33				18:44			17:05	51	16:13 (T44)
21	06:16		20:11 (T42)	06:46		18:44 (T77)	07:17				07:49			07:53		15:23 (T44)
	21:00	19	20:30 (T42)	20:24	48	19:32 (T77)	19:32				18:43			17:06	51	16:14 (T44)
22	06:17		20:13 (T42)	06:47		18:43 (T77)	07:18				07:50			07:54		15:23 (T44)
	20:59	15	20:28 (T42)	20:23	49	19:32 (T77)	19:30				18:41			17:06	51	16:14 (T44)
23	06:18		20:16 (T42)	06:48		18:42 (T77)	07:19				07:51			07:54		15:24 (T44)
	20:58	9	20:25 (T42)	20:21	51	19:33 (T77)	19:28				18:40			17:07	51	16:15 (T44)
24	06:19			06:49		07:39 (T76)	07:20				07:53			07:55		15:24 (T44)
	20:58			20:20	60	19:33 (T77)	19:27				18:39			17:07	51	16:15 (T44)
25	06:20			06:50		07:35 (T76)	07:21				07:54			07:55		15:24 (T44)
	20:57			20:18	67	19:33 (T77)	19:25				18:37			17:08	51	16:15 (T44)
26	06:21			06:51		07:33 (T76)	07:22				07:55			07:56		15:26 (T44)
	20:56			20:17	72	19:33 (T77)	19:23				18:36			17:08	50	16:16 (T44)
27	06:22			06:52		07:31 (T76)	07:23				07:56			07:56		15:26 (T44)
	20:55			20:15	75	19:33 (T77)	19:22				18:34			17:09	50	16:16 (T44)
28	06:22			06:53		07:29 (T76)	07:24				07:57			07:56		15:26 (T44)
	20:54			20:14	78	19:32 (T77)	19:20				18:33			17:10	51	16:17 (T44)
29	06:23			06:54		07:28 (T76)	07:25				07:58			07:57		15:26 (T44)
	20:53			20:12	80	19:32 (T77)	19:18				18:32			17:10	51	16:17 (T44)
30	06:24			06:55		07:27 (T76)	07:26				08:00			07:57		15:28 (T44)
	20:52			20:10	83	19:32 (T77)	19:16				18:31			17:11	50	16:18 (T44)
31	06:25			06:56		07:26 (T76)					08:01			07:57		15:28 (T44)
	20:51			20:09	83	19:31 (T77)					18:29			17:12	50	16:18 (T44)
Potential sun hours	460			429			375				345	297		287		
Total, worst case		756			1150			976					530		1543	
Sun reduction		0.66			0.61			0.59					0.30		0.22	
Oper. time red.		1.00			1.00			1.00					1.00		1.00	
Wind dir. red.		0.54			0.62			0.63					0.75		0.75	
Total reduction		0.37			0.39			0.38					0.23		0.17	
Total, real		280			452			375					123		263	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 824 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6849)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March			April			May			June		
1	07:57		07:43		07:07			07:16		18:30 (T5)	06:30			06:01		19:57 (T3)
	17:12		17:47		18:21			19:56	61	19:31 (T4)	20:27			20:57	18	20:15 (T3)
2	07:57		07:42		07:05			07:14		18:29 (T5)	06:28			06:00		19:58 (T3)
	17:13		17:48		18:22			19:57	61	19:30 (T4)	20:28			20:58	16	20:14 (T3)
3	07:57		07:41		07:04			07:12		18:28 (T5)	06:27			06:00		20:00 (T3)
	17:14		17:49		18:24			19:58	62	19:30 (T4)	20:29			20:58	14	20:14 (T3)
4	07:57		07:40		07:02			07:11		18:28 (T5)	06:26		20:03 (T3)	05:59		20:00 (T3)
	17:15		17:51		18:25			19:59	62	19:30 (T4)	20:30	5	20:08 (T3)	20:59	13	20:13 (T3)
5	07:57		07:39		07:01			07:09		18:27 (T5)	06:24		19:58 (T3)	05:59		20:02 (T3)
	17:16		17:52		18:26			20:00	62	19:29 (T4)	20:31	10	20:08 (T3)	21:00	10	20:12 (T3)
6	07:57		07:38		06:59			07:07		18:26 (T5)	06:23		19:57 (T3)	05:59		20:04 (T3)
	17:17		17:53		18:27			20:00	62	19:28 (T4)	20:32	12	20:09 (T3)	21:00	7	20:11 (T3)
7	07:57		07:37		06:57			07:06		18:26 (T5)	06:22		19:55 (T3)	05:58		20:05 (T3)
	17:18		17:54		18:28			20:01	62	19:28 (T4)	20:33	15	20:10 (T3)	21:01	3	20:08 (T3)
8	07:57		07:36		07:56			07:04		18:25 (T5)	06:21		19:54 (T3)	05:58		
	17:19		17:56		19:29			20:02	62	19:27 (T4)	20:34	18	20:12 (T3)	21:02		
9	07:57		07:35		07:54			07:02		18:25 (T5)	06:20		19:53 (T3)	05:58		
	17:20		17:57		19:30			20:03	60	19:25 (T4)	20:35	20	20:13 (T3)	21:02		
10	07:57		07:33		07:53			07:01		18:25 (T5)	06:19		19:52 (T3)	05:58		
	17:21		17:58		19:32			20:04	59	19:24 (T4)	20:36	22	20:14 (T3)	21:03		
11	07:57		07:32		07:51			06:59		18:25 (T5)	06:17		19:52 (T3)	05:58		
	17:22		17:59		19:33			20:05	58	19:23 (T4)	20:37	23	20:15 (T3)	21:04		
12	07:56		07:31		07:49			06:58		18:25 (T5)	06:16		19:51 (T3)	05:57		
	17:23		18:01		19:34			20:06	57	19:22 (T5)	20:38	25	20:16 (T3)	21:04		
13	07:56		07:30		07:48			06:56		18:25 (T5)	06:15		19:51 (T3)	05:57		
	17:24		18:02		19:35			20:07	56	19:21 (T5)	20:39	26	20:17 (T3)	21:05		
14	07:56		07:28		07:46			06:54		18:26 (T5)	06:14		19:51 (T3)	05:57		
	17:25		18:03		19:36			20:09	55	19:21 (T5)	20:40	26	20:17 (T3)	21:05		
15	07:55		07:27		07:44			06:53		18:26 (T5)	06:13		19:50 (T3)	05:57		
	17:26		18:04		19:37			20:10	54	19:20 (T5)	20:41	28	20:18 (T3)	21:06		
16	07:55		07:26		07:43			06:51		18:25 (T5)	06:12		19:50 (T3)	05:57		
	17:27		18:06		19:38			20:11	54	19:19 (T5)	20:42	29	20:19 (T3)	21:06		
17	07:54		07:24		07:41			06:50		18:26 (T5)	06:11		19:50 (T3)	05:57		
	17:28		18:07		19:39			20:12	53	19:19 (T5)	20:43	29	20:19 (T3)	21:06		
18	07:54		07:23		07:39			06:48		18:26 (T5)	06:10		19:50 (T3)	05:57		
	17:30		18:08		19:40			20:13	51	19:17 (T5)	20:44	29	20:19 (T3)	21:07		
19	07:53		07:22		07:38			06:47		18:28 (T5)	06:10		19:50 (T3)	05:58		
	17:31		18:09		19:42			20:14	49	19:17 (T5)	20:45	29	20:19 (T3)	21:07		
20	07:53		07:20		07:36			06:45		18:28 (T5)	06:09		19:51 (T3)	05:58		
	17:32		18:10		19:43			20:15	47	19:15 (T5)	20:46	29	20:20 (T3)	21:07		
21	07:52		07:19		07:34			06:44		18:29 (T5)	06:08		19:51 (T3)	05:58		
	17:33		18:12		19:44			20:16	46	19:15 (T5)	20:47	28	20:19 (T3)	21:08		
22	07:52		07:17		07:33		18:50 (T5)	06:42		18:30 (T5)	06:07		19:51 (T3)	05:58		
	17:34		18:13		19:45	19	19:09 (T5)	20:17	44	19:14 (T5)	20:48	28	20:19 (T3)	21:08		
23	07:51		07:16		07:31		18:46 (T5)	06:41		18:31 (T5)	06:06		19:51 (T3)	05:58		
	17:36		18:14		19:46	36	19:22 (T4)	20:18	41	19:12 (T5)	20:49	27	20:18 (T3)	21:08		
24	07:50		07:14		07:29		18:43 (T5)	06:39		18:33 (T5)	06:05		19:52 (T3)	05:59		
	17:37		18:15		19:47	41	19:24 (T4)	20:19	38	19:11 (T5)	20:50	27	20:19 (T3)	21:08		
25	07:49		07:13		07:27		18:40 (T5)	06:38		18:33 (T5)	06:05		19:52 (T3)	05:59		
	17:38		18:16		19:48	46	19:26 (T4)	20:20	35	19:08 (T5)	20:51	26	20:18 (T3)	21:08		
26	07:49		07:11		07:26		18:38 (T5)	06:36		18:35 (T5)	06:04		19:53 (T3)	05:59		
	17:39		18:18		19:49	50	19:28 (T4)	20:21	32	19:07 (T5)	20:52	24	20:17 (T3)	21:08		
27	07:48		07:10		07:24		18:36 (T5)	06:35		18:38 (T5)	06:03		19:54 (T3)	06:00		
	17:41		18:19		19:50	52	19:28 (T4)	20:23	27	19:05 (T5)	20:53	24	20:18 (T3)	21:09		
28	07:47		07:08		07:22		18:34 (T5)	06:34		18:40 (T5)	06:03		19:54 (T3)	06:00		
	17:42		18:20		19:51	55	19:29 (T4)	20:24	22	19:02 (T5)	20:54	23	20:17 (T3)	21:09		
29	07:46				07:21		18:34 (T5)	06:32		18:43 (T5)	06:02		19:55 (T3)	06:00		
	17:43				19:52	56	19:30 (T4)	20:25	15	18:58 (T5)	20:54	22	20:17 (T3)	21:09		
30	07:45				07:19		18:32 (T5)	06:31			06:02		19:55 (T3)	06:01		
	17:44				19:53	58	19:30 (T4)	20:26			20:55	21	20:16 (T3)	21:09		
31	07:44				07:17		18:30 (T5)				06:01		19:57 (T3)			
	17:46				19:55	60	19:30 (T4)				20:56	19	20:16 (T3)			
Potential sun hours	297		297		370			399			449			453		
Total, worst case					473				1447			644			81	
Sun reduction					0.44				0.52			0.57			0.64	
Oper. time red.					1.00				1.00			1.00			1.00	
Wind dir. red.					0.63				0.63			0.56			0.56	
Total reduction					0.28				0.33			0.32			0.36	
Total, real					132				476			205			29	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 824 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6849)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November	December
1	06:01			06:26		20:02 (T3)	06:57		18:24 (T5)	07:27	07:02	07:37
	21:08			20:50	24	20:26 (T3)	20:07	58	19:22 (T4)	19:14	17:27	17:03
2	06:02			06:27		20:02 (T3)	06:58		18:23 (T5)	07:28	07:03	07:38
	21:08			20:49	22	20:24 (T3)	20:05	59	19:22 (T4)	19:13	17:26	17:03
3	06:02			06:28		20:02 (T3)	06:59		18:23 (T5)	07:29	07:04	07:39
	21:08			20:48	21	20:23 (T3)	20:04	60	19:23 (T4)	19:11	17:25	17:02
4	06:03			06:29		20:03 (T3)	07:00		18:22 (T5)	07:30	07:05	07:40
	21:08			20:47	19	20:22 (T3)	20:02	62	19:24 (T4)	19:09	17:24	17:02
5	06:03			06:30		20:04 (T3)	07:01		18:22 (T5)	07:31	07:07	07:41
	21:08			20:46	17	20:21 (T3)	20:00	62	19:24 (T4)	19:08	17:23	17:02
6	06:04		20:11 (T3)	06:31		20:05 (T3)	07:02		18:22 (T5)	07:32	07:08	07:42
	21:08	5	20:16 (T3)	20:44	15	20:20 (T3)	19:57	62	19:24 (T4)	19:06	17:21	17:02
7	06:05		20:08 (T3)	06:32		20:07 (T3)	07:03		18:22 (T5)	07:33	07:09	07:43
	21:07	10	20:18 (T3)	20:43	12	20:19 (T3)	19:55	62	19:24 (T4)	19:04	17:20	17:02
8	06:05		20:08 (T3)	06:33		20:09 (T3)	07:04		18:22 (T5)	07:35	07:10	07:44
	21:07	11	20:19 (T3)	20:42	8	20:17 (T3)	19:54	62	19:24 (T4)	19:03	17:19	17:02
9	06:06		20:07 (T3)	06:34			07:05		18:22 (T5)	07:36	07:11	07:45
	21:07	14	20:21 (T3)	20:41			19:52	62	19:24 (T4)	19:01	17:18	17:02
10	06:07		20:06 (T3)	06:35			07:06		18:22 (T5)	07:37	07:13	07:46
	21:06	15	20:21 (T3)	20:39			19:50	61	19:23 (T4)	18:59	17:17	17:02
11	06:07		20:06 (T3)	06:36			07:07		18:22 (T5)	07:38	07:14	07:46
	21:06	17	20:23 (T3)	20:38			19:49	61	19:23 (T4)	18:58	17:16	17:02
12	06:08		20:05 (T3)	06:37			07:08		18:23 (T5)	07:39	07:15	07:47
	21:06	19	20:24 (T3)	20:37			19:47	59	19:22 (T4)	18:56	17:15	17:02
13	06:09		20:04 (T3)	06:38		18:57 (T5)	07:09		18:23 (T5)	07:40	07:16	07:48
	21:05	20	20:24 (T3)	20:35	4	19:01 (T5)	19:45	58	19:21 (T4)	18:55	17:14	17:02
14	06:10		20:04 (T3)	06:39		18:50 (T5)	07:10		18:24 (T5)	07:41	07:17	07:49
	21:05	21	20:25 (T3)	20:34	17	19:07 (T5)	19:43	56	19:20 (T4)	18:53	17:13	17:02
15	06:10		20:03 (T3)	06:40		18:47 (T5)	07:11		18:24 (T5)	07:42	07:19	07:50
	21:04	23	20:26 (T3)	20:33	23	19:10 (T5)	19:42	55	19:19 (T4)	18:51	17:12	17:03
16	06:11		20:03 (T3)	06:41		18:44 (T5)	07:12		18:25 (T5)	07:43	07:20	07:50
	21:03	24	20:27 (T3)	20:31	28	19:12 (T5)	19:40	53	19:18 (T4)	18:50	17:12	17:03
17	06:12		20:02 (T3)	06:42		18:42 (T5)	07:13		18:26 (T5)	07:44	07:21	07:51
	21:03	24	20:26 (T3)	20:30	32	19:14 (T5)	19:38	50	19:16 (T4)	18:48	17:11	17:03
18	06:13		20:02 (T3)	06:43		18:40 (T5)	07:14		18:28 (T5)	07:46	07:22	07:52
	21:02	25	20:27 (T3)	20:28	35	19:15 (T5)	19:37	47	19:15 (T4)	18:47	17:10	17:03
19	06:14		20:02 (T3)	06:44		18:38 (T5)	07:15		18:29 (T5)	07:47	07:23	07:52
	21:01	26	20:28 (T3)	20:27	39	19:17 (T5)	19:35	43	19:12 (T4)	18:45	17:09	17:04
20	06:14		20:02 (T3)	06:45		18:37 (T5)	07:16		18:32 (T5)	07:48	07:25	07:53
	21:01	27	20:29 (T3)	20:26	41	19:18 (T5)	19:33	37	19:09 (T4)	18:44	17:08	17:04
21	06:15		20:02 (T3)	06:46		18:35 (T5)	07:17		18:35 (T5)	07:49	07:26	07:53
	21:00	27	20:29 (T3)	20:24	44	19:19 (T5)	19:31	28	19:04 (T4)	18:42	17:08	17:05
22	06:16		20:02 (T3)	06:47		18:34 (T5)	07:18		18:40 (T5)	07:50	07:27	07:54
	20:59	28	20:30 (T3)	20:23	46	19:20 (T5)	19:30	10	18:50 (T5)	18:41	17:07	17:05
23	06:17		20:01 (T3)	06:48		18:32 (T5)	07:19			07:51	07:28	07:54
	20:58	28	20:29 (T3)	20:21	48	19:20 (T5)	19:28			18:39	17:07	17:06
24	06:18		20:01 (T3)	06:49		18:31 (T5)	07:20			07:52	07:29	07:55
	20:58	28	20:29 (T3)	20:20	50	19:21 (T5)	19:26			18:38	17:06	17:06
25	06:19		20:01 (T3)	06:50		18:30 (T5)	07:21			07:54	07:30	07:55
	20:57	28	20:29 (T3)	20:18	51	19:21 (T5)	19:25			18:37	17:05	17:07
26	06:20		20:01 (T3)	06:51		18:29 (T5)	07:22			07:55	07:32	07:56
	20:56	29	20:30 (T3)	20:16	53	19:22 (T5)	19:23			18:35	17:05	17:08
27	06:21		20:01 (T3)	06:52		18:28 (T5)	07:23			07:56	07:33	07:56
	20:55	29	20:30 (T3)	20:15	54	19:22 (T5)	19:21			18:34	17:04	17:08
28	06:22		20:01 (T3)	06:53		18:27 (T5)	07:24			07:57	07:34	07:56
	20:54	28	20:29 (T3)	20:13	55	19:22 (T5)	19:19			18:33	17:04	17:09
29	06:23		20:01 (T3)	06:54		18:26 (T5)	07:25			07:58	07:35	07:57
	20:53	28	20:29 (T3)	20:12	55	19:21 (T5)	19:18			18:31	17:04	17:10
30	06:24		20:01 (T3)	06:55		18:25 (T5)	07:26			07:59	07:36	07:57
	20:52	27	20:28 (T3)	20:10	56	19:21 (T5)	19:16			18:30	17:03	17:10
31	06:25		20:02 (T3)	06:56		18:24 (T5)				08:01		07:57
	20:51	25	20:27 (T3)	20:09	57	19:21 (T5)				18:29		17:11
Potential sun hours	460			429			375			345	297	287
Total, worst case		586			926			1167				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.56			0.62			0.63				
Total reduction		0.37			0.38			0.37				
Total, real		216			352			435				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 827 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6852)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58		08:38 (T25)	07:44		08:04 (T26)	07:07		08:53 (T25)	07:16		06:30		06:01		06:37 (T24)
	17:13	31	09:09 (T25)	17:48	83	09:38 (T25)	18:22	17	09:10 (T25)	19:56		20:27		20:57	60	07:37 (T24)
2	07:58		08:38 (T25)	07:43		08:03 (T26)	07:06			07:15	07:34 (T75)	06:29		06:01		06:37 (T24)
	17:14	33	09:11 (T25)	17:49	86	09:38 (T25)	18:23			19:57	12 07:46 (T75)	20:28		20:58	60	07:37 (T24)
3	07:58		08:38 (T25)	07:42		08:02 (T26)	07:04			07:13	07:32 (T75)	06:28		06:01		06:37 (T24)
	17:15	34	09:12 (T25)	17:50	90	09:39 (T25)	18:24			19:58	16 07:48 (T75)	20:29		20:59	60	07:37 (T24)
4	07:58		08:38 (T25)	07:41		08:01 (T26)	07:03			07:11	07:30 (T75)	06:26		06:00		06:37 (T24)
	17:16	35	09:13 (T25)	17:51	92	09:39 (T25)	18:25			19:59	19 07:49 (T75)	20:30		20:59	60	07:37 (T24)
5	07:58		08:37 (T25)	07:40		08:00 (T26)	07:01			07:10	07:29 (T75)	06:25		06:00		06:37 (T24)
	17:17	37	09:14 (T25)	17:53	94	09:39 (T25)	18:26			20:00	22 07:51 (T75)	20:32		21:00	61	07:38 (T24)
6	07:58		08:37 (T25)	07:39		07:59 (T26)	07:00			07:08	07:27 (T75)	06:24		05:59		06:37 (T24)
	17:17	39	09:16 (T25)	17:54	97	09:39 (T25)	18:28			20:00	24 07:51 (T75)	20:33		21:01	61	07:38 (T24)
7	07:58		08:37 (T25)	07:37		07:58 (T26)	06:58			07:06	07:25 (T75)	06:23		05:59		06:37 (T24)
	17:18	40	09:17 (T25)	17:55	98	09:40 (T25)	18:29			20:02	26 07:51 (T75)	20:34		21:01	61	07:38 (T24)
8	07:58		08:37 (T25)	07:36		07:56 (T26)	07:56			07:05	07:24 (T75)	06:22	06:59 (T24)	05:59		06:37 (T24)
	17:19	41	09:18 (T25)	17:56	100	09:39 (T25)	19:30			20:03	28 07:52 (T75)	20:35	14 07:13 (T24)	21:02	62	07:39 (T24)
9	07:57		08:36 (T25)	07:35		07:56 (T26)	07:55			07:03	07:22 (T75)	06:20	06:55 (T24)	05:59		06:38 (T24)
	17:20	43	09:19 (T25)	17:58	101	09:39 (T25)	19:31			20:04	30 07:52 (T75)	20:36	22 07:17 (T24)	21:03	61	07:39 (T24)
10	07:57		08:35 (T25)	07:34		07:56 (T26)	07:53			07:01	07:21 (T75)	06:19	06:53 (T24)	05:59		06:38 (T24)
	17:21	45	09:20 (T25)	17:59	100	09:39 (T25)	19:32			20:05	31 07:52 (T75)	20:37	27 07:20 (T24)	21:03	61	07:39 (T24)
11	07:57		08:35 (T25)	07:33		07:56 (T26)	07:51			07:00	07:21 (T75)	06:18	06:50 (T24)	05:58		06:38 (T24)
	17:23	47	09:22 (T25)	18:00	101	09:39 (T25)	19:33			20:06	31 07:52 (T75)	20:38	31 07:21 (T24)	21:04	62	07:40 (T24)
12	07:57		08:34 (T25)	07:31		07:55 (T26)	07:50			06:58	07:20 (T75)	06:17	06:48 (T24)	05:58		06:38 (T24)
	17:24	48	09:22 (T25)	18:01	100	09:38 (T25)	19:34			20:07	31 07:51 (T75)	20:39	35 07:23 (T24)	21:04	61	07:39 (T24)
13	07:56		08:34 (T25)	07:30		07:55 (T26)	07:48			06:57	07:21 (T75)	06:16	06:47 (T24)	05:58		06:38 (T24)
	17:25	50	09:24 (T25)	18:03	99	09:37 (T25)	19:36			20:08	30 07:51 (T75)	20:40	37 07:24 (T24)	21:05	61	07:39 (T24)
14	07:56		08:34 (T25)	07:29		07:56 (T26)	07:46			06:55	07:20 (T75)	06:15	06:45 (T24)	05:58		06:38 (T24)
	17:26	51	09:25 (T25)	18:04	98	09:37 (T25)	19:37			20:09	30 07:50 (T75)	20:41	40 07:25 (T24)	21:05	61	07:39 (T24)
15	07:56		08:34 (T25)	07:28		07:56 (T26)	07:45			06:54	07:21 (T75)	06:14	06:45 (T24)	05:58		06:38 (T24)
	17:27	52	09:26 (T25)	18:05	96	09:36 (T25)	19:38			20:10	29 07:50 (T75)	20:42	42 07:27 (T24)	21:06	62	07:40 (T24)
16	07:55		08:34 (T25)	07:26		07:56 (T26)	07:43			06:52	07:21 (T75)	06:13	06:44 (T24)	05:58		06:38 (T24)
	17:28	53	09:27 (T25)	18:06	94	09:35 (T25)	19:39			20:11	28 07:49 (T75)	20:43	44 07:28 (T24)	21:06	62	07:40 (T24)
17	07:55		08:33 (T25)	07:25		07:57 (T26)	07:41			06:50	07:22 (T75)	06:12	06:43 (T24)	05:58		06:39 (T24)
	17:29	55	09:28 (T25)	18:07	91	09:35 (T25)	19:40			20:12	26 07:48 (T75)	20:44	46 07:29 (T24)	21:07	62	07:41 (T24)
18	07:54		08:33 (T25)	07:24		07:57 (T26)	07:40			06:49	07:22 (T75)	06:11	06:42 (T24)	05:58		06:39 (T24)
	17:30	56	09:29 (T25)	18:09	88	09:33 (T25)	19:41			20:13	24 07:46 (T75)	20:45	48 07:30 (T24)	21:07	62	07:41 (T24)
19	07:54		08:32 (T25)	07:22		07:59 (T26)	07:38			06:47	07:24 (T75)	06:10	06:41 (T24)	05:58		06:40 (T24)
	17:32	58	09:30 (T25)	18:10	84	09:33 (T25)	19:42			20:14	21 07:45 (T75)	20:46	49 07:30 (T24)	21:07	61	07:41 (T24)
20	07:53		08:32 (T25)	07:21		07:59 (T26)	07:36			06:46	07:24 (T75)	06:09	06:40 (T24)	05:58		06:40 (T24)
	17:33	58	09:30 (T25)	18:11	79	09:31 (T25)	19:43			20:15	19 07:43 (T75)	20:47	51 07:31 (T24)	21:08	61	07:41 (T24)
21	07:53		08:32 (T25)	07:19		08:01 (T26)	07:35			06:44	07:27 (T75)	06:09	06:40 (T24)	05:59		06:40 (T24)
	17:34	60	09:32 (T25)	18:12	74	09:30 (T25)	19:44			20:17	14 07:41 (T75)	20:48	52 07:32 (T24)	21:08	61	07:41 (T24)
22	07:52		08:32 (T25)	07:18		08:03 (T26)	07:33			06:43	07:29 (T75)	06:08	06:40 (T24)	05:59		06:40 (T24)
	17:35	60	09:32 (T25)	18:14	68	09:29 (T25)	19:45			20:18	8 07:37 (T75)	20:49	53 07:33 (T24)	21:08	61	07:41 (T24)
23	07:51		08:31 (T25)	07:16		08:06 (T26)	07:31			06:41		06:07	06:39 (T24)	05:59		06:41 (T24)
	17:36	62	09:33 (T25)	18:15	59	09:27 (T25)	19:46			20:19		20:50	54 07:33 (T24)	21:08	61	07:42 (T24)
24	07:51		08:31 (T25)	07:15		08:41 (T25)	07:30			06:40		06:06	06:38 (T24)	05:59		06:40 (T24)
	17:38	63	09:34 (T25)	18:16	45	09:26 (T25)	19:48			20:20		20:50	55 07:33 (T24)	21:09	62	07:42 (T24)
25	07:50		08:31 (T25)	07:13		08:42 (T25)	07:28			06:39		06:06	06:38 (T24)	06:00		06:40 (T24)
	17:39	64	09:35 (T25)	18:17	41	09:23 (T25)	19:49			20:21		20:51	56 07:34 (T24)	21:09	62	07:42 (T24)
26	07:49		08:31 (T25)	07:12		08:44 (T25)	07:26			06:37		06:05	06:38 (T24)	06:00		06:41 (T24)
	17:40	65	09:36 (T25)	18:18	37	09:21 (T25)	19:50			20:22		20:52	56 07:34 (T24)	21:09	62	07:43 (T24)
27	07:48		08:31 (T25)	07:10		08:46 (T25)	07:25			06:36		06:04	06:38 (T24)	06:00		06:41 (T24)
	17:41	65	09:36 (T25)	18:19	32	09:18 (T25)	19:51			20:23		20:53	57 07:35 (T24)	21:09	62	07:43 (T24)
28	07:47		08:30 (T25)	07:09		08:49 (T25)	07:23			06:34		06:04	06:38 (T24)	06:01		06:41 (T24)
	17:42	67	09:37 (T25)	18:21	25	09:14 (T25)	19:52			20:24		20:54	57 07:35 (T24)	21:09	62	07:43 (T24)
29	07:47		08:30 (T25)				07:21			06:33		06:03	06:37 (T24)	06:01		06:42 (T24)
	17:44	67	09:37 (T25)				19:53			20:25		20:55	58 07:35 (T24)	21:09	61	07:43 (T24)
30	07:46		08:30 (T25)				07:20			06:32		06:02	06:37 (T24)	06:02		06:42 (T24)
	17:45	67	09:37 (T25)				19:54			20:26		20:56	59 07:36 (T24)	21:09	61	07:43 (T24)
31	07:45		08:05 (T26)				07:18					06:02	06:38 (T24)			
	17:46	80	09:38 (T25)				19:55					20:56	59 07:37 (T24)			
Potential sun hours	297			297			370			399		449		453		
Total, worst case		1626			2252			17			499		1102		1837	
Sun reduction		0.31			0.40			0.44			0.52		0.57		0.64	
Oper. time red.		1.00			1.00			1.00			1.00		1.00		1.00	
Wind dir. red.		0.52			0.53			0.52			0.65		0.71		0.71	
Total reduction		0.15			0.20			0.22			0.32		0.39		0.43	
Total, real		252			456			4			162		426		797	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 827 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6852)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		06:42 (T24)	06:26		06:59 (T24)	06:57		07:20 (T75)	07:28			07:02		07:26 (T26)	07:37		08:17 (T25)
	21:09	62	07:44 (T24)	20:50	34	07:33 (T24)	20:07	31	07:51 (T75)	19:15			17:28	100	09:09 (T25)	17:04	47	09:04 (T25)
2	06:03		06:42 (T24)	06:27		07:01 (T24)	06:58		07:20 (T75)	07:29			07:03		07:26 (T26)	07:38		08:18 (T25)
	21:09	61	07:43 (T24)	20:49	30	07:31 (T24)	20:06	30	07:50 (T75)	19:13			17:27	101	09:09 (T25)	17:03	45	09:03 (T25)
3	06:03		06:43 (T24)	06:28		07:03 (T24)	06:59		07:20 (T75)	07:30			07:05		07:26 (T26)	07:39		08:20 (T25)
	21:09	61	07:44 (T24)	20:48	26	07:29 (T24)	20:04	30	07:50 (T75)	19:12			17:26	100	09:09 (T25)	17:03	43	09:03 (T25)
4	06:04		06:43 (T24)	06:29		07:06 (T24)	07:00		07:21 (T75)	07:31			07:06		07:27 (T26)	07:40		08:21 (T25)
	21:08	61	07:44 (T24)	20:47	20	07:26 (T24)	20:03	28	07:49 (T75)	19:10			17:24	97	09:08 (T25)	17:03	41	09:02 (T25)
5	06:04		06:43 (T24)	06:30		07:11 (T24)	07:01		07:22 (T75)	07:32			07:07		07:29 (T26)	07:41		08:22 (T25)
	21:08	61	07:44 (T24)	20:46	10	07:21 (T24)	20:01	26	07:48 (T75)	19:08			17:23	96	09:09 (T25)	17:03	40	09:02 (T25)
6	06:05		06:43 (T24)	06:31			07:02		07:23 (T75)	07:33			07:08		07:30 (T26)	07:42		08:23 (T25)
	21:08	61	07:44 (T24)	20:45			19:58	24	07:47 (T75)	19:07			17:22	94	09:09 (T25)	17:03	39	09:02 (T25)
7	06:05		06:44 (T24)	06:32			07:03		07:24 (T75)	07:34			07:09		07:31 (T26)	07:43		08:24 (T25)
	21:08	60	07:44 (T24)	20:44			19:56	22	07:46 (T75)	19:05			17:21	92	09:09 (T25)	17:03	37	09:01 (T25)
8	06:06		06:44 (T24)	06:33			07:04		07:25 (T75)	07:35			07:11		07:33 (T26)	07:44		08:25 (T25)
	21:07	61	07:45 (T24)	20:42			19:54	19	07:44 (T75)	19:03			17:20	90	09:10 (T25)	17:03	36	09:01 (T25)
9	06:07		06:44 (T24)	06:34			07:05		07:26 (T75)	07:36			07:12		07:34 (T26)	07:45		08:27 (T25)
	21:07	60	07:44 (T24)	20:41			19:52	16	07:42 (T75)	19:02			17:19	86	09:09 (T25)	17:03	34	09:01 (T25)
10	06:07		06:45 (T24)	06:35			07:06		07:27 (T75)	07:37			07:13		07:35 (T26)	07:46		08:28 (T25)
	21:07	60	07:45 (T24)	20:40			19:51	12	07:39 (T75)	19:00			17:18	83	09:09 (T25)	17:03	33	09:01 (T25)
11	06:08		06:45 (T24)	06:36			07:07			07:38			07:14		07:36 (T26)	07:47		08:28 (T25)
	21:06	60	07:45 (T24)	20:39			19:49			18:58			17:17	79	09:09 (T25)	17:03	31	08:59 (T25)
12	06:09		06:45 (T24)	06:37			07:08			07:39		09:31 (T25)	07:15		08:02 (T25)	07:48		08:30 (T25)
	21:06	59	07:44 (T24)	20:37			19:47			18:57	7	09:38 (T25)	17:16	67	09:09 (T25)	17:03	29	08:59 (T25)
13	06:10		06:45 (T24)	06:38			07:09			07:40		09:25 (T25)	07:17		08:02 (T25)	07:48		08:31 (T25)
	21:05	59	07:44 (T24)	20:36			19:46			18:55	20	09:45 (T25)	17:15	67	09:09 (T25)	17:03	28	08:59 (T25)
14	06:10		06:46 (T24)	06:39			07:10			07:42		09:21 (T25)	07:18		08:02 (T25)	07:49		08:32 (T25)
	21:05	59	07:45 (T24)	20:35			19:44			18:54	28	09:49 (T25)	17:14	66	09:08 (T25)	17:03	27	08:59 (T25)
15	06:11		06:47 (T24)	06:40			07:11			07:43		09:18 (T25)	07:19		08:04 (T25)	07:50		08:33 (T25)
	21:04	58	07:45 (T24)	20:33			19:42			18:52	33	09:51 (T25)	17:13	65	09:09 (T25)	17:03	26	08:59 (T25)
16	06:12		06:46 (T24)	06:41			07:12			07:44		09:15 (T25)	07:20		08:04 (T25)	07:51		08:34 (T25)
	21:04	58	07:44 (T24)	20:32			19:41			18:51	38	09:53 (T25)	17:12	65	09:09 (T25)	17:04	25	08:59 (T25)
17	06:13		06:47 (T24)	06:42			07:13			07:45		09:13 (T25)	07:21		08:04 (T25)	07:51		08:35 (T25)
	21:03	57	07:44 (T24)	20:30			19:39			18:49	42	09:55 (T25)	17:11	64	09:08 (T25)	17:04	24	08:59 (T25)
18	06:14		06:48 (T24)	06:43			07:14			07:46		09:11 (T25)	07:23		08:05 (T25)	07:52		08:35 (T25)
	21:03	56	07:44 (T24)	20:29			19:37			18:47	46	09:57 (T25)	17:11	63	09:08 (T25)	17:04	24	08:59 (T25)
19	06:14		06:48 (T24)	06:44			07:15			07:47		08:36 (T26)	07:24		08:06 (T25)	07:53		08:37 (T25)
	21:02	56	07:44 (T24)	20:27			19:35			18:46	63	09:59 (T25)	17:10	62	09:08 (T25)	17:05	22	08:59 (T25)
20	06:15		06:49 (T24)	06:45			07:16			07:48		08:33 (T26)	07:25		08:07 (T25)	07:53		08:38 (T25)
	21:01	55	07:44 (T24)	20:26			19:34			18:44	70	10:00 (T25)	17:09	60	09:07 (T25)	17:05	22	09:00 (T25)
21	06:16		06:49 (T24)	06:46		07:33 (T75)	07:17			07:49		08:31 (T26)	07:26		08:07 (T25)	07:54		08:38 (T25)
	21:00	53	07:42 (T24)	20:25	9	07:42 (T75)	19:32			18:43	76	10:01 (T25)	17:09	60	09:07 (T25)	17:06	22	09:00 (T25)
22	06:17		06:49 (T24)	06:47		07:30 (T75)	07:18			07:51		08:29 (T26)	07:27		08:08 (T25)	07:54		08:39 (T25)
	21:00	53	07:42 (T24)	20:23	15	07:45 (T75)	19:30			18:42	81	10:02 (T25)	17:08	58	09:06 (T25)	17:06	22	09:01 (T25)
23	06:18		06:50 (T24)	06:48		07:28 (T75)	07:19			07:52		08:28 (T26)	07:28		08:10 (T25)	07:55		08:39 (T25)
	20:59	52	07:42 (T24)	20:22	19	07:47 (T75)	19:29			18:40	85	10:03 (T25)	17:07	57	09:07 (T25)	17:07	22	09:01 (T25)
24	06:19		06:51 (T24)	06:49		07:26 (T75)	07:20			07:53		08:28 (T26)	07:30		08:10 (T25)	07:55		08:39 (T25)
	20:58	50	07:41 (T24)	20:20	22	07:48 (T75)	19:27			18:39	88	10:04 (T25)	17:07	56	09:06 (T25)	17:07	22	09:01 (T25)
25	06:20		06:52 (T24)	06:50		07:25 (T75)	07:22			07:54		08:27 (T26)	07:31		08:11 (T25)	07:56		08:40 (T25)
	20:57	49	07:41 (T24)	20:18	24	07:49 (T75)	19:25			18:37	91	10:05 (T25)	17:06	55	09:06 (T25)	17:08	22	09:02 (T25)
26	06:21		06:53 (T24)	06:51		07:24 (T75)	07:23			07:55		08:26 (T26)	07:32		08:12 (T25)	07:56		08:39 (T25)
	20:56	47	07:40 (T24)	20:17	26	07:50 (T75)	19:23			18:36	93	10:05 (T25)	17:06	53	09:05 (T25)	17:08	24	09:03 (T25)
27	06:22		06:54 (T24)	06:52		07:23 (T75)	07:24			07:56		08:25 (T26)	07:33		08:13 (T25)	07:56		08:39 (T25)
	20:55	45	07:39 (T24)	20:15	28	07:51 (T75)	19:22			18:35	96	10:06 (T25)	17:05	52	09:05 (T25)	17:09	25	09:04 (T25)
28	06:22		06:55 (T24)	06:53		07:22 (T75)	07:25			07:58		08:26 (T26)	07:34		08:13 (T25)	07:57		08:40 (T25)
	20:54	43	07:38 (T24)	20:14	29	07:51 (T75)	19:20			18:33	97	10:07 (T25)	17:05	51	09:04 (T25)	17:10	25	09:05 (T25)
29	06:23		06:55 (T24)	06:54		07:21 (T75)	07:26			07:59		08:25 (T26)	07:35		08:15 (T25)	07:57		08:39 (T25)
	20:53	41	07:36 (T24)	20:12	30	07:51 (T75)	19:18			18:32	99	10:07 (T25)	17:04	50	09:05 (T25)	17:10	27	09:06 (T25)
30	06:24		06:56 (T24)	06:55		07:21 (T75)	07:27			08:00		08:25 (T26)	07:36		08:16 (T25)	07:57		08:39 (T25)
	20:52	39	07:35 (T24)	20:11	30	07:51 (T75)	19:17			18:31	99	10:07 (T25)	17:04	48	09:04 (T25)	17:11	28	09:07 (T25)
31	06:25		06:58 (T24)	06:56		07:20 (T75)				08:01		08:25 (T26)				07:57		08:39 (T25)
	20:51	36	07:34 (T24)	20:09	31	07:51 (T75)				18:29	101	10:08 (T25)				17:12	29	09:08 (T25)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		1693			383			238			1353			2137			921	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.71			0.67			0.65			0.53			0.52			0.52	
Total reduction		0.45			0.39			0.37			0.24			0.15			0.11	
Total, real		757			150			88			328			322			101	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 834 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6858)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		08:04 (T44)		07:07		07:16		07:36 (T77)		06:30		06:02		06:28 (T42)
	17:13		17:48	24	08:28 (T44)		18:22		19:56	34	08:10 (T77)		20:27		20:57	41	07:09 (T42)
2	07:57		07:42		08:03 (T44)		07:06		07:15		07:35 (T77)		06:29		06:01		06:28 (T42)
	17:14		17:49	26	08:29 (T44)		18:23		19:57	35	08:10 (T77)		20:28		20:58	41	07:09 (T42)
3	07:57		07:41		08:02 (T44)		07:04		07:13		07:35 (T77)		06:28		06:01		06:28 (T42)
	17:15		17:50	27	08:29 (T44)		18:24		19:58	36	08:11 (T77)		20:29		20:58	41	07:09 (T42)
4	07:57		07:40		08:01 (T44)		07:03		07:11		07:34 (T77)		06:26		06:00		06:28 (T42)
	17:16		17:51	29	08:30 (T44)		18:25		19:59	37	08:11 (T77)		20:30		20:59	41	07:09 (T42)
5	07:57		07:39		08:00 (T44)		07:01		07:10		07:34 (T77)		06:25		06:00		06:28 (T42)
	17:17		17:53	30	08:30 (T44)		18:26		20:00	37	08:11 (T77)		20:31		21:00	42	07:10 (T42)
6	07:57		07:38		07:59 (T44)		06:59		07:08		07:33 (T77)		06:24		06:00		06:28 (T42)
	17:18		17:54	31	08:30 (T44)		18:28		20:00	38	08:11 (T77)		20:32		21:01	41	07:09 (T42)
7	07:57		07:37		07:59 (T44)		06:58		07:06		07:32 (T77)		06:23		05:59		06:28 (T42)
	17:19		17:55	31	08:30 (T44)		18:29		20:01	38	08:10 (T77)		20:33		21:01	42	07:10 (T42)
8	07:57		07:36		08:00 (T44)		07:56		07:05		07:33 (T77)		06:22		05:59		06:29 (T42)
	17:19		17:56	30	08:30 (T44)		19:30		20:02	37	08:10 (T77)		20:34		21:02	41	07:10 (T42)
9	07:57		07:35		08:00 (T44)		07:55		07:03		07:32 (T77)		06:20		05:59		06:29 (T42)
	17:21		17:58	31	08:31 (T44)		19:31		20:04	37	08:09 (T77)		20:35		21:02	42	07:11 (T42)
10	07:57		07:34		08:01 (T44)		07:53		07:01		07:32 (T77)		06:19		05:59		06:29 (T42)
	17:22		17:59	30	08:31 (T44)		19:32		20:05	36	08:08 (T77)		20:36		21:03	42	07:11 (T42)
11	07:57		07:32		08:00 (T44)		07:51		07:00		07:33 (T77)		06:18		05:58		06:30 (T42)
	17:23		18:00	30	08:30 (T44)		19:33		20:06	35	08:08 (T77)		20:38		21:04	41	07:11 (T42)
12	07:56		07:31		08:01 (T44)		07:50		06:58		07:33 (T77)		06:17		06:42 (T42)		05:58		06:30 (T42)
	17:24		18:01	28	08:29 (T44)		19:34		20:07	33	08:06 (T77)		20:39	9	06:51 (T42)		21:04	41	07:11 (T42)
13	07:56		07:30		08:02 (T44)		07:48		06:57		07:34 (T77)		06:16		06:39 (T42)		05:58		06:29 (T42)
	17:25		18:03	27	08:29 (T44)		19:35		20:08	32	08:06 (T77)		20:40	16	06:55 (T42)		21:05	42	07:11 (T42)
14	07:56		07:29		08:03 (T44)		07:46		06:55		07:34 (T77)		06:15		06:37 (T42)		05:58		06:29 (T42)
	17:26		18:04	25	08:28 (T44)		19:37		20:09	30	08:04 (T77)		20:41	21	06:58 (T42)		21:05	42	07:11 (T42)
15	07:55		07:27		08:04 (T44)		07:45		06:53		07:36 (T77)		06:14		06:36 (T42)		05:58		06:30 (T42)
	17:27		18:05	22	08:26 (T44)		19:38		20:10	27	08:03 (T77)		20:42	23	06:59 (T42)		21:06	41	07:11 (T42)
16	07:55		07:26		08:05 (T44)		07:43		06:52		07:36 (T77)		06:13		06:34 (T42)		05:58		06:31 (T42)
	17:28		18:06	20	08:25 (T44)		19:39		20:11	25	08:01 (T77)		20:43	26	07:00 (T42)		21:06	41	07:12 (T42)
17	07:54		07:25		08:07 (T44)		07:41		06:50		07:39 (T77)		06:12		06:33 (T42)		05:58		06:31 (T42)
	17:29		18:07	16	08:23 (T44)		19:40		20:12	20	07:59 (T77)		20:44	28	07:01 (T42)		21:06	41	07:12 (T42)
18	07:54		07:23		08:10 (T44)		07:40		06:49		07:40 (T77)		06:11		06:32 (T42)		05:58		06:31 (T42)
	17:30		18:09	10	08:20 (T44)		19:41		20:13	16	07:56 (T77)		20:45	30	07:02 (T42)		21:07	41	07:12 (T42)
19	07:53		07:22				07:38		06:47		07:45 (T77)		06:10		06:31 (T42)		05:58		06:31 (T42)
	17:32		18:10				19:42		20:14	7	07:52 (T77)		20:45	32	07:03 (T42)		21:07	41	07:12 (T42)
20	07:53		07:21				07:36		06:46				06:09		06:30 (T42)		05:59		06:31 (T42)
	17:33		18:11				19:43		20:15				20:46	34	07:04 (T42)		21:07	41	07:12 (T42)
21	07:52		07:19				07:35		06:44				06:09		06:30 (T42)		05:59		06:31 (T42)
	17:34		18:12				19:44		20:16				20:47	35	07:05 (T42)		21:08	41	07:12 (T42)
22	07:52		07:18				07:33		06:43				06:08		06:30 (T42)		05:59		06:31 (T42)
	17:35		18:14				19:45		20:17				20:48	35	07:05 (T42)		21:08	41	07:12 (T42)
23	07:51		07:16				07:31		06:41				06:07		06:29 (T42)		05:59		06:32 (T42)
	17:36		18:15				19:46		20:18				20:49	37	07:06 (T42)		21:08	41	07:13 (T42)
24	07:50		07:15				07:30		06:40				06:06		06:28 (T42)		05:59		06:32 (T42)
	17:38		18:16				19:47		20:20				20:50	38	07:06 (T42)		21:08	41	07:13 (T42)
25	07:50		07:13				07:28		06:39				06:06		06:29 (T42)		06:00		06:32 (T42)
	17:39		18:17				19:49		20:21				20:51	38	07:07 (T42)		21:08	41	07:13 (T42)
26	07:49		08:09 (T44)		07:12		07:26		07:48 (T77)		06:37		06:05		06:28 (T42)		06:00		06:33 (T42)
	17:40	8	08:17 (T44)		18:18		19:50	14	08:02 (T77)		20:22		20:52	39	07:07 (T42)		21:08	41	07:14 (T42)
27	07:48		08:09 (T44)		07:10		07:25		07:45 (T77)		06:36		06:04		06:28 (T42)		06:00		06:33 (T42)
	17:41	12	08:21 (T44)		18:19		19:51	21	08:06 (T77)		20:23		20:53	40	07:08 (T42)		21:09	41	07:14 (T42)
28	07:47		08:08 (T44)		07:09		07:23		07:43 (T77)		06:34		06:04		06:28 (T42)		06:01		06:33 (T42)
	17:43	15	08:23 (T44)		18:21		19:52	24	08:07 (T77)		20:24		20:54	40	07:08 (T42)		21:09	41	07:14 (T42)
29	07:46		08:07 (T44)				07:21		07:40 (T77)		06:33		06:03		06:28 (T42)		06:01		06:33 (T42)
	17:44	17	08:24 (T44)				19:53	28	08:08 (T77)		20:25		20:54	40	07:08 (T42)		21:09	42	07:15 (T42)
30	07:45		08:06 (T44)				07:20		07:38 (T77)		06:32		06:03		06:28 (T42)		06:02		06:33 (T42)
	17:45	20	08:26 (T44)				19:54	31	08:09 (T77)		20:26		20:55	40	07:08 (T42)		21:09	42	07:15 (T42)
31	07:44		08:05 (T44)				07:18		07:38 (T77)				06:02		06:28 (T42)				
	17:46	22	08:27 (T44)				19:55	32	08:10 (T77)				20:56	41	07:09 (T42)				
Potential sun hours	297			297			370			399			448			453			
Total, worst case		94			467			150			590			642			1238		
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64		
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.54			0.54			0.64			0.64			0.71			0.71		
Total reduction		0.16			0.21			0.28			0.33			0.40			0.45		
Total, real		15			99			41			192			256			554		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 834 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6858)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		06:34 (T42)	06:26		06:55 (T42)	06:57		07:32 (T77)	07:28		07:29 (T44)	07:37
	21:08	41	07:15 (T42)	20:50	5	07:00 (T42)	20:07	35	08:07 (T77)	19:15		17:28	30	07:59 (T44)	17:04
2	06:03		06:33 (T42)	06:27			06:58		07:31 (T77)	07:29		07:03		07:30 (T44)	07:38
	21:08	42	07:15 (T42)	20:49			20:06	36	08:07 (T77)	19:13		17:27	30	08:00 (T44)	17:03
3	06:03		06:34 (T42)	06:28			06:59		07:30 (T77)	07:30		07:04		07:29 (T44)	07:39
	21:08	42	07:16 (T42)	20:48			20:04	37	08:07 (T77)	19:11		17:26	31	08:00 (T44)	17:03
4	06:04		06:34 (T42)	06:29			07:00		07:30 (T77)	07:31		07:06		07:29 (T44)	07:40
	21:08	41	07:15 (T42)	20:47			20:02	37	08:07 (T77)	19:10		17:24	31	08:00 (T44)	17:03
5	06:04		06:34 (T42)	06:30			07:01		07:29 (T77)	07:32		07:07		07:29 (T44)	07:41
	21:08	42	07:16 (T42)	20:46			20:01	38	08:07 (T77)	19:08		17:23	31	08:00 (T44)	17:03
6	06:05		06:34 (T42)	06:31			07:02		07:29 (T77)	07:33		07:08		07:30 (T44)	07:42
	21:08	42	07:16 (T42)	20:44			19:57	38	08:07 (T77)	19:06		17:22	30	08:00 (T44)	17:03
7	06:06		06:35 (T42)	06:32			07:03		07:29 (T77)	07:34		07:09		07:31 (T44)	07:43
	21:07	41	07:16 (T42)	20:43			19:56	37	08:06 (T77)	19:05		17:21	29	08:00 (T44)	17:03
8	06:06		06:35 (T42)	06:33			07:04		07:29 (T77)	07:35		07:10		07:32 (T44)	07:44
	21:07	42	07:17 (T42)	20:42			19:54	37	08:06 (T77)	19:03		17:20	27	07:59 (T44)	17:03
9	06:07		06:35 (T42)	06:34			07:05		07:29 (T77)	07:36		07:12		07:34 (T44)	07:45
	21:07	41	07:16 (T42)	20:41			19:52	36	08:05 (T77)	19:02		17:19	25	07:59 (T44)	17:03
10	06:08		06:35 (T42)	06:35			07:06		07:29 (T77)	07:37		07:13		07:35 (T44)	07:46
	21:06	42	07:17 (T42)	20:40			19:51	36	08:05 (T77)	19:00		17:18	24	07:59 (T44)	17:03
11	06:08		06:36 (T42)	06:36			07:07		07:29 (T77)	07:38		07:14		07:36 (T44)	07:47
	21:06	41	07:17 (T42)	20:38			19:49	35	08:04 (T77)	18:58		17:17	22	07:58 (T44)	17:03
12	06:09		06:35 (T42)	06:37			07:08		07:29 (T77)	07:39		07:15		07:37 (T44)	07:47
	21:06	41	07:16 (T42)	20:37			19:47	32	08:01 (T77)	18:57		17:16	19	07:56 (T44)	17:03
13	06:10		06:36 (T42)	06:38			07:09		07:29 (T77)	07:40		07:16		07:39 (T44)	07:48
	21:05	41	07:17 (T42)	20:36			19:46	31	08:00 (T77)	18:55		17:15	17	07:56 (T44)	17:03
14	06:10		06:37 (T42)	06:39			07:10		07:30 (T77)	07:41		07:18		07:40 (T44)	07:49
	21:05	40	07:17 (T42)	20:34			19:44	29	07:59 (T77)	18:54		17:14	15	07:55 (T44)	17:03
15	06:11		06:37 (T42)	06:40			07:11		07:32 (T77)	07:43		07:19		07:41 (T44)	07:50
	21:04	40	07:17 (T42)	20:33			19:42	25	07:57 (T77)	18:52		17:13	12	07:53 (T44)	17:03
16	06:12		06:37 (T42)	06:41			07:12		07:33 (T77)	07:44		07:20		07:43 (T44)	07:50
	21:03	39	07:16 (T42)	20:32			19:40	21	07:54 (T77)	18:50		17:12	8	07:51 (T44)	17:04
17	06:13		06:37 (T42)	06:42			07:13		07:36 (T77)	07:45		07:21			07:51
	21:03	39	07:16 (T42)	20:30			19:39	15	07:51 (T77)	18:49		17:11			17:04
18	06:14		06:38 (T42)	06:43			07:14		07:41 (T77)	07:46		07:22			07:52
	21:02	38	07:16 (T42)	20:29			19:37	4	07:45 (T77)	18:47		17:11			17:04
19	06:14		06:38 (T42)	06:44			07:15			07:47		07:24			07:52
	21:02	38	07:16 (T42)	20:27			19:35			18:46		17:10			17:05
20	06:15		06:39 (T42)	06:45			07:16			07:48		07:25			07:53
	21:01	37	07:16 (T42)	20:26			19:34			18:44		17:09			17:05
21	06:16		06:39 (T42)	06:46			07:17			07:49		07:26			07:53
	21:00	36	07:15 (T42)	20:24			19:32			18:43		17:09			17:06
22	06:17		06:39 (T42)	06:47			07:18			07:50		07:27			07:54
	20:59	36	07:15 (T42)	20:23			19:30			18:42		17:08			17:06
23	06:18		06:40 (T42)	06:48			07:19			07:52		07:28			07:54
	20:59	34	07:14 (T42)	20:21			19:28			18:40		17:07			17:07
24	06:19		06:41 (T42)	06:49		07:47 (T77)	07:20			07:53	08:39 (T44)	07:29			07:55
	20:58	33	07:14 (T42)	20:20	9	07:56 (T77)	19:27			18:39	12 08:51 (T44)	17:07			17:07
25	06:20		06:42 (T42)	06:50		07:43 (T77)	07:21			07:54	08:37 (T44)	07:30			07:55
	20:57	31	07:13 (T42)	20:18	16	07:59 (T77)	19:25			18:37	17 08:54 (T44)	17:06			17:08
26	06:21		06:43 (T42)	06:51		07:40 (T77)	07:22			07:55	08:35 (T44)	07:32			07:56
	20:56	30	07:13 (T42)	20:17	21	08:01 (T77)	19:23			18:36	20 08:55 (T44)	17:06			17:08
27	06:22		06:44 (T42)	06:52		07:38 (T77)	07:23			07:56	08:33 (T44)	07:33			07:56
	20:55	28	07:12 (T42)	20:15	25	08:03 (T77)	19:22			18:35	23 08:56 (T44)	17:05			17:09
28	06:23		06:45 (T42)	06:53		07:36 (T77)	07:24			07:57	08:32 (T44)	07:34			07:56
	20:54	26	07:11 (T42)	20:14	28	08:04 (T77)	19:20			18:33	25 08:57 (T44)	17:05			17:10
29	06:23		06:46 (T42)	06:54		07:35 (T77)	07:25			07:58	08:32 (T44)	07:35			07:57
	20:53	22	07:08 (T42)	20:12	30	08:05 (T77)	19:18			18:32	27 08:59 (T44)	17:04			17:10
30	06:24		06:48 (T42)	06:55		07:34 (T77)	07:27			08:00	08:31 (T44)	07:36			07:57
	20:52	18	07:06 (T42)	20:10	32	08:06 (T77)	19:16			18:31	28 08:59 (T44)	17:04			17:11
31	06:25		06:50 (T42)	06:56		07:33 (T77)				08:01	08:30 (T44)				07:57
	20:51	14	07:04 (T42)	20:09	33	08:06 (T77)				18:29	29 08:59 (T44)				17:12
Potential sun hours	460			429			375			345		297			287
Total, worst case		1118			199			559			181		381		
Sun reduction		0.66			0.61			0.59			0.48		0.30		
Oper. time red.		1.00			1.00			1.00			1.00		1.00		
Wind dir. red.		0.71			0.64			0.64			0.54		0.54		
Total reduction		0.46			0.38			0.37			0.25		0.16		
Total, real		516			76			206			46		61		

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 855 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6876)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		14:40 (T20)	07:43		07:07		17:15 (T19)	07:16		18:02 (T19)	06:30		19:16 (T17)	06:01
	17:13	41	15:21 (T20)	17:47		18:21	32	17:47 (T19)	19:56	43	18:45 (T19)	20:27	41	19:57 (T17)	20:57
2	07:57		14:41 (T20)	07:42		07:06		17:12 (T19)	07:14		18:03 (T19)	06:29		19:15 (T17)	06:01
	17:13	40	15:21 (T20)	17:48		18:23	37	17:49 (T19)	19:57	39	18:42 (T19)	20:28	41	19:56 (T17)	20:58
3	07:58		14:42 (T20)	07:41		07:04		17:09 (T19)	07:13		18:06 (T19)	06:27		19:15 (T17)	06:00
	17:14	39	15:21 (T20)	17:50		18:24	41	17:50 (T19)	19:58	35	18:41 (T19)	20:29	41	19:56 (T17)	20:59
4	07:58		14:43 (T20)	07:40		07:02		17:08 (T19)	07:11		18:07 (T19)	06:26		19:16 (T17)	06:00
	17:15	38	15:21 (T20)	17:51		18:25	44	17:52 (T19)	19:59	31	18:38 (T19)	20:30	39	19:55 (T17)	20:59
5	07:58		14:45 (T20)	07:39		07:01		17:06 (T19)	07:09		18:10 (T19)	06:25		19:16 (T17)	05:59
	17:16	36	15:21 (T20)	17:52		18:26	47	17:53 (T19)	20:00	25	18:35 (T19)	20:31	39	19:55 (T17)	21:00
6	07:58		14:46 (T20)	07:38		06:59		17:05 (T19)	07:08		18:14 (T19)	06:24		19:17 (T17)	05:59
	17:17	35	15:21 (T20)	17:53		18:27	50	17:55 (T19)	20:00	17	18:31 (T19)	20:32	38	19:55 (T17)	21:01
7	07:57		14:48 (T20)	07:37		06:58		17:03 (T19)	07:06			06:22		19:16 (T17)	05:59
	17:18	32	15:20 (T20)	17:55		18:28	52	17:55 (T19)	20:01			20:33	37	19:53 (T17)	21:01
8	07:57		14:48 (T20)	07:36		07:56		18:02 (T19)	07:04			06:21		19:17 (T17)	05:58
	17:19	31	15:19 (T20)	17:56		19:30	54	18:56 (T19)	20:02			20:34	36	19:53 (T17)	21:02
9	07:57		14:50 (T20)	07:35		07:54		18:01 (T19)	07:03			06:20		19:18 (T17)	05:58
	17:20	28	15:18 (T20)	17:57		19:31	56	18:57 (T19)	20:03			20:35	34	19:52 (T17)	21:03
10	07:57		14:52 (T20)	07:34		07:53		18:00 (T19)	07:01			06:19		19:18 (T17)	05:58
	17:21	26	15:18 (T20)	17:58		19:32	57	18:57 (T19)	20:04			20:36	34	19:52 (T17)	21:03
11	07:57		14:55 (T20)	07:32		07:51		17:59 (T19)	06:59			06:18		19:19 (T17)	05:58
	17:22	22	15:17 (T20)	18:00		19:33	58	18:57 (T19)	20:06			20:38	32	19:51 (T17)	21:04
12	07:56		14:57 (T20)	07:31		07:49		17:59 (T19)	06:58			06:17		19:20 (T17)	05:58
	17:23	17	15:14 (T20)	18:01		19:34	59	18:58 (T19)	20:07			20:39	30	19:50 (T17)	21:04
13	07:56		15:01 (T20)	07:30		07:48		17:58 (T19)	06:56			06:16		19:21 (T17)	05:58
	17:24	11	15:12 (T20)	18:02		19:35	60	18:58 (T19)	20:08			20:40	28	19:49 (T17)	21:05
14	07:56			07:29		07:46		17:57 (T19)	06:55			06:15		19:22 (T17)	05:58
	17:25			18:03		19:36	61	18:58 (T19)	20:09			20:41	26	19:48 (T17)	21:05
15	07:55			07:27		07:44		17:57 (T19)	06:53			06:14		19:24 (T17)	05:58
	17:26			18:05		19:37	61	18:58 (T19)	20:10			20:42	22	19:46 (T17)	21:06
16	07:55			07:26		07:43		17:56 (T19)	06:52		19:32 (T17)	06:13		19:25 (T17)	05:58
	17:28			18:06		19:38	62	18:58 (T19)	20:11	14	19:46 (T17)	20:43	20	19:45 (T17)	21:06
17	07:55			07:25		07:41		17:56 (T19)	06:50		19:28 (T17)	06:12		19:27 (T17)	05:58
	17:29			18:07		19:40	62	18:58 (T19)	20:12	20	19:48 (T17)	20:44	16	19:43 (T17)	21:06
18	07:54			07:23		07:39		17:56 (T19)	06:48		19:26 (T17)	06:11		19:30 (T17)	05:58
	17:30			18:08		19:41	62	18:58 (T19)	20:13	25	19:51 (T17)	20:45	10	19:40 (T17)	21:07
19	07:53			07:22		07:38		17:56 (T19)	06:47		19:24 (T17)	06:10			05:58
	17:31			18:10		19:42	61	18:57 (T19)	20:14	28	19:52 (T17)	20:46			21:07
20	07:53			07:20		07:36		17:55 (T19)	06:45		19:23 (T17)	06:09			05:58
	17:32			18:11		19:43	62	18:57 (T19)	20:15	30	19:53 (T17)	20:46			21:07
21	07:52			07:19		07:34		17:55 (T19)	06:44		19:21 (T17)	06:08			05:58
	17:33			18:12		19:44	61	18:56 (T19)	20:16	33	19:54 (T17)	20:47			21:08
22	07:52			07:18		07:33		17:56 (T19)	06:42		19:20 (T17)	06:07			05:58
	17:35			18:13		19:45	60	18:56 (T19)	20:17	35	19:55 (T17)	20:48			21:08
23	07:51			07:16		07:31		17:56 (T19)	06:41		19:18 (T17)	06:07			05:59
	17:36			18:14		19:46	59	18:55 (T19)	20:18	37	19:55 (T17)	20:49			21:08
24	07:50			07:15		07:29		17:56 (T19)	06:40		19:18 (T17)	06:06			05:59
	17:37			18:16		19:47	58	18:54 (T19)	20:19	38	19:56 (T17)	20:50			21:08
25	07:50			07:13		07:28		17:57 (T19)	06:38		19:18 (T17)	06:05			05:59
	17:38			18:17		19:48	57	18:54 (T19)	20:21	38	19:56 (T17)	20:51			21:08
26	07:49			07:12		07:26		17:57 (T19)	06:37		19:17 (T17)	06:04			06:00
	17:40			18:18		19:49	56	18:53 (T19)	20:22	39	19:56 (T17)	20:52			21:09
27	07:48			07:10	17:22 (T19)	07:24		17:57 (T19)	06:35		19:16 (T17)	06:04			06:00
	17:41			18:19	19 17:41 (T19)	19:50	54	18:51 (T19)	20:23	41	19:57 (T17)	20:53			21:09
28	07:47			07:09	17:17 (T19)	07:23		17:59 (T19)	06:34		19:15 (T17)	06:03			06:00
	17:42			18:20	27 17:44 (T19)	19:52	52	18:51 (T19)	20:24	41	19:56 (T17)	20:54			21:09
29	07:46					07:21		17:59 (T19)	06:33		19:15 (T17)	06:03			06:01
	17:43					19:53	50	18:49 (T19)	20:25	41	19:56 (T17)	20:55			21:09
30	07:45					07:19		18:00 (T19)	06:31		19:16 (T17)	06:02			06:01
	17:45					19:54	47	18:47 (T19)	20:26	40	19:56 (T17)	20:55			21:09
31	07:44					07:18		18:01 (T19)				06:01			
	17:46					19:55	46	18:47 (T19)				20:56			
Potential sun hours	297			297		370			399			449			453
Total, worst case		396			46		1678			690			564		
Sun reduction		0.31			0.40		0.44			0.52			0.57		
Oper. time red.		1.00			1.00		1.00			1.00			1.00		
Wind dir. red.		0.73			0.67		0.67			0.60			0.57		
Total reduction		0.23			0.27		0.30			0.32			0.33		
Total, real		92			13		506			220			188		

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 855 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6876)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		19:30 (T17)	06:57			07:27		17:37 (T19)	07:02			07:37		14:37 (T20)
	21:09			20:50	31	20:01 (T17)	20:07			19:15	60	18:37 (T19)	17:28			17:03	22	14:59 (T20)
2	06:02			06:27		19:30 (T17)	06:58			07:28		17:37 (T19)	07:03			07:38		14:36 (T20)
	21:09			20:49	32	20:02 (T17)	20:05			19:13	59	18:36 (T19)	17:26			17:03	25	15:01 (T20)
3	06:03			06:28		19:29 (T17)	06:59			07:29		17:37 (T19)	07:04			07:39		14:34 (T20)
	21:08			20:48	34	20:03 (T17)	20:04			19:11	58	18:35 (T19)	17:25			17:03	28	15:02 (T20)
4	06:03			06:29		19:28 (T17)	07:00			07:31		17:38 (T19)	07:06			07:40		14:33 (T20)
	21:08			20:47	35	20:03 (T17)	20:02			19:10	56	18:34 (T19)	17:24			17:03	31	15:04 (T20)
5	06:04			06:30		19:27 (T17)	07:01			07:32		17:38 (T19)	07:07			07:41		14:33 (T20)
	21:08			20:46	37	20:04 (T17)	20:01			19:08	55	18:33 (T19)	17:23			17:02	32	15:05 (T20)
6	06:04			06:31		19:27 (T17)	07:02		18:09 (T19)	07:33		17:40 (T19)	07:08			07:42		14:32 (T20)
	21:08			20:45	37	20:04 (T17)	19:57	17	18:26 (T19)	19:06	52	18:32 (T19)	17:22			17:02	35	15:07 (T20)
7	06:05			06:32		19:26 (T17)	07:03		18:05 (T19)	07:34		17:40 (T19)	07:09			07:43		14:32 (T20)
	21:08			20:43	39	20:05 (T17)	19:56	25	18:30 (T19)	19:05	51	18:31 (T19)	17:21			17:02	36	15:08 (T20)
8	06:06			06:33		19:25 (T17)	07:04		18:02 (T19)	07:35		17:41 (T19)	07:10			07:44		14:31 (T20)
	21:07			20:42	39	20:04 (T17)	19:54	30	18:32 (T19)	19:03	48	18:29 (T19)	17:20			17:02	38	15:09 (T20)
9	06:06			06:34		19:24 (T17)	07:05		17:59 (T19)	07:36		17:42 (T19)	07:12			07:45		14:30 (T20)
	21:07			20:41	40	20:04 (T17)	19:52	35	18:34 (T19)	19:01	46	18:28 (T19)	17:18			17:02	39	15:09 (T20)
10	06:07			06:35		19:24 (T17)	07:06		17:57 (T19)	07:37		17:43 (T19)	07:13			07:46		14:30 (T20)
	21:07			20:40	40	20:04 (T17)	19:50	38	18:35 (T19)	19:00	43	18:26 (T19)	17:17			17:02	40	15:10 (T20)
11	06:08			06:36		19:24 (T17)	07:07		17:55 (T19)	07:38		17:44 (T19)	07:14			07:47		14:30 (T20)
	21:06			20:38	40	20:04 (T17)	19:49	42	18:37 (T19)	18:58	40	18:24 (T19)	17:16			17:02	41	15:11 (T20)
12	06:08			06:37		19:23 (T17)	07:08		17:53 (T19)	07:39		17:46 (T19)	07:15			07:47		14:30 (T20)
	21:06			20:37	41	20:04 (T17)	19:47	45	18:38 (T19)	18:56	35	18:21 (T19)	17:15			17:02	42	15:12 (T20)
13	06:09			06:38		19:23 (T17)	07:09		17:51 (T19)	07:40		17:48 (T19)	07:16			07:48		14:31 (T20)
	21:05			20:36	41	20:04 (T17)	19:45	48	18:39 (T19)	18:55	30	18:18 (T19)	17:14			17:02	42	15:13 (T20)
14	06:10			06:39		19:23 (T17)	07:10		17:49 (T19)	07:41		17:51 (T19)	07:18			07:49		14:31 (T20)
	21:05			20:34	41	20:04 (T17)	19:44	50	18:39 (T19)	18:53	24	18:15 (T19)	17:14			17:03	43	15:14 (T20)
15	06:11			06:40		19:23 (T17)	07:11		17:48 (T19)	07:42		17:56 (T19)	07:19			07:50		14:30 (T20)
	21:04			20:33	41	20:04 (T17)	19:42	52	18:40 (T19)	18:52	15	18:11 (T19)	17:13			17:03	44	15:14 (T20)
16	06:11			06:41		19:23 (T17)	07:12		17:47 (T19)	07:43			07:20			07:50		14:31 (T20)
	21:04			20:31	40	20:03 (T17)	19:40	53	18:40 (T19)	18:50			17:12			17:03	44	15:15 (T20)
17	06:12			06:42		19:23 (T17)	07:13		17:45 (T19)	07:45			07:21			07:51		14:31 (T20)
	21:03			20:30	40	20:03 (T17)	19:38	56	18:41 (T19)	18:49			17:11			17:03	45	15:16 (T20)
18	06:13			06:43		19:24 (T17)	07:14		17:44 (T19)	07:46			07:22			07:52		14:31 (T20)
	21:02			20:29	38	20:02 (T17)	19:37	57	18:41 (T19)	18:47			17:10			17:04	45	15:16 (T20)
19	06:14			06:44		19:24 (T17)	07:15		17:43 (T19)	07:47			07:24			07:52		14:32 (T20)
	21:02			20:27	37	20:01 (T17)	19:35	58	18:41 (T19)	18:46			17:09			17:04	45	15:17 (T20)
20	06:15			06:45		19:24 (T17)	07:16		17:42 (T19)	07:48			07:25			07:53		14:32 (T20)
	21:01			20:26	36	20:00 (T17)	19:33	59	18:41 (T19)	18:44			17:09			17:05	45	15:17 (T20)
21	06:16			06:46		19:25 (T17)	07:17		17:41 (T19)	07:49			07:26			07:54		14:32 (T20)
	21:00			20:24	34	19:59 (T17)	19:32	60	18:41 (T19)	18:43			17:08			17:05	46	15:18 (T20)
22	06:17			06:47		19:26 (T17)	07:18		17:41 (T19)	07:50			07:27			07:54		14:32 (T20)
	20:59			20:23	32	19:58 (T17)	19:30	60	18:41 (T19)	18:41			17:07			17:06	46	15:18 (T20)
23	06:17			06:48		19:27 (T17)	07:19		17:40 (T19)	07:51			07:28			07:55		14:34 (T20)
	20:59			20:21	30	19:57 (T17)	19:28	61	18:41 (T19)	18:40			17:07			17:06	45	15:19 (T20)
24	06:18			06:49		19:28 (T17)	07:20		17:39 (T19)	07:53			07:29			07:55		14:34 (T20)
	20:58			20:20	27	19:55 (T17)	19:26	62	18:41 (T19)	18:38			17:06			17:07	45	15:19 (T20)
25	06:19		19:43 (T17)	06:50		19:29 (T17)	07:21		17:39 (T19)	07:54			07:31			07:55		14:35 (T20)
	20:57	5	19:48 (T17)	20:18	24	19:53 (T17)	19:25	61	18:40 (T19)	18:37			17:06			17:07	45	15:20 (T20)
26	06:20		19:39 (T17)	06:51		19:31 (T17)	07:22		17:38 (T19)	07:55			07:32			07:56		14:35 (T20)
	20:56	13	19:52 (T17)	20:17	20	19:51 (T17)	19:23	62	18:40 (T19)	18:36			17:05			17:08	45	15:20 (T20)
27	06:21		19:37 (T17)	06:52		19:34 (T17)	07:23		17:38 (T19)	07:56			07:33			07:56		14:36 (T20)
	20:55	17	19:54 (T17)	20:15	13	19:47 (T17)	19:21	62	18:40 (T19)	18:34			17:05			17:08	44	15:20 (T20)
28	06:22		19:35 (T17)	06:53			07:24		17:38 (T19)	07:57			07:34			07:56		14:36 (T20)
	20:54	21	19:56 (T17)	20:14			19:20	61	18:39 (T19)	18:33			17:04			17:09	44	15:20 (T20)
29	06:23		19:34 (T17)	06:54			07:25		17:37 (T19)	07:58			07:35		14:42 (T20)	07:57		14:38 (T20)
	20:53	23	19:57 (T17)	20:12			19:18	61	18:38 (T19)	18:31			17:04	9	14:51 (T20)	17:10	43	15:21 (T20)
30	06:24		19:32 (T17)	06:55			07:26		17:37 (T19)	08:00			07:36		14:38 (T20)	07:57		14:38 (T20)
	20:52	27	19:59 (T17)	20:10			19:16	61	18:38 (T19)	18:30			17:04	17	14:55 (T20)	17:11	43	15:21 (T20)
31	06:25		19:31 (T17)	06:56						08:01						07:57		14:39 (T20)
	20:51	29	20:00 (T17)	20:09						18:29						17:11	42	15:21 (T20)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		135			939			1276			672			26			1250	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.57			0.57			0.67			0.67			0.73			0.73	
Total reduction		0.39			0.36			0.40			0.33			0.22			0.16	
Total, real		52			335			516			221			6			206	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 857 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6877)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February			March			April			May			June	
1	07:58		15:50 (T26)	07:44			07:07		17:27 (T25)	07:16		18:39 (T75)	06:30		18:22 (T75)	06:01
	17:13	45	16:35 (T26)	17:47			18:22	25	17:52 (T25)	19:56	40	19:19 (T75)	20:27	63	19:25 (T75)	20:57
2	07:58		15:50 (T26)	07:43			07:06		17:28 (T25)	07:15		18:38 (T75)	06:29		18:23 (T75)	06:01
	17:14	45	16:35 (T26)	17:49			18:23	22	17:50 (T25)	19:57	43	19:21 (T75)	20:28	61	19:24 (T75)	20:58
3	07:58		15:51 (T26)	07:42			07:04		17:30 (T25)	07:13		18:35 (T75)	06:28		18:22 (T75)	06:00
	17:15	45	16:36 (T26)	17:50			18:24	19	17:49 (T25)	19:58	47	19:22 (T75)	20:29	61	19:23 (T75)	20:59
4	07:58		15:51 (T26)	07:41			07:03		17:31 (T25)	07:11		18:33 (T75)	06:26		18:23 (T75)	06:00
	17:16	45	16:36 (T26)	17:51			18:25	16	17:47 (T25)	19:59	50	19:23 (T75)	20:30	59	19:22 (T75)	20:59
5	07:58		15:52 (T26)	07:40			07:01		17:33 (T25)	07:10		18:32 (T75)	06:25		18:24 (T75)	06:00
	17:16	45	16:37 (T26)	17:52			18:26	10	17:43 (T25)	20:00	64	19:39 (T24)	20:31	58	19:22 (T75)	21:00
6	07:58		15:52 (T26)	07:38			06:59			07:08		18:30 (T75)	06:24		18:25 (T75)	05:59
	17:17	45	16:37 (T26)	17:54			18:28			20:00	70	19:40 (T24)	20:32	56	19:21 (T75)	21:01
7	07:58		15:53 (T26)	07:37			06:58			07:06		18:28 (T75)	06:23		18:26 (T75)	05:59
	17:18	45	16:38 (T26)	17:55			18:29			20:01	72	19:40 (T24)	20:34	54	19:20 (T75)	21:01
8	07:57		15:54 (T26)	07:36			07:56			07:05		18:27 (T75)	06:22		18:27 (T75)	05:59
	17:19	45	16:39 (T26)	17:56			19:30			20:03	75	19:42 (T24)	20:35	53	19:20 (T75)	21:02
9	07:57		15:53 (T26)	07:35			07:55			07:03		18:26 (T75)	06:20		18:28 (T75)	05:59
	17:20	45	16:38 (T26)	17:57			19:31			20:04	77	19:43 (T24)	20:36	51	19:19 (T75)	21:03
10	07:57		15:54 (T26)	07:34			07:53			07:01		18:25 (T75)	06:19		18:28 (T75)	05:58
	17:21	45	16:39 (T26)	17:59			19:32			20:05	78	19:43 (T24)	20:37	49	19:17 (T75)	21:03
11	07:57		15:55 (T26)	07:33			07:51			07:00		18:24 (T75)	06:18		18:29 (T75)	05:58
	17:22	44	16:39 (T26)	18:00			19:33			20:06	81	19:45 (T24)	20:38	47	19:16 (T75)	21:04
12	07:57		15:55 (T26)	07:31			07:50			06:58		18:23 (T75)	06:17		18:30 (T75)	05:58
	17:24	44	16:39 (T26)	18:01			19:34			20:07	83	19:46 (T24)	20:39	45	19:15 (T75)	21:04
13	07:56		15:56 (T26)	07:30			07:48			06:57		18:23 (T75)	06:16		18:32 (T75)	05:58
	17:25	44	16:40 (T26)	18:02			19:35			20:08	84	19:47 (T24)	20:40	41	19:13 (T75)	21:05
14	07:56		15:57 (T26)	07:29			07:46			06:55		18:22 (T75)	06:15		18:33 (T75)	05:58
	17:26	43	16:40 (T26)	18:04			19:37			20:09	84	19:46 (T24)	20:41	39	19:12 (T75)	21:05
15	07:56		15:57 (T26)	07:28		17:38 (T25)	07:45			06:53		18:22 (T75)	06:14		18:34 (T75)	05:58
	17:27	43	16:40 (T26)	18:05	4	17:42 (T25)	19:38			20:10	85	19:47 (T24)	20:42	37	19:11 (T75)	21:06
16	07:55		15:58 (T26)	07:26		17:34 (T25)	07:43			06:52		18:21 (T75)	06:13		18:37 (T75)	05:58
	17:28	43	16:41 (T26)	18:06	9	17:43 (T25)	19:39			20:11	85	19:46 (T24)	20:43	33	19:10 (T75)	21:06
17	07:55		15:58 (T26)	07:25		17:32 (T25)	07:41			06:50		18:20 (T75)	06:12		18:38 (T75)	05:58
	17:29	42	16:40 (T26)	18:07	13	17:45 (T25)	19:40			20:12	85	19:45 (T24)	20:44	30	19:08 (T75)	21:07
18	07:54		15:58 (T26)	07:23		17:30 (T25)	07:40			06:49		18:20 (T75)	06:11		18:40 (T75)	05:58
	17:30	42	16:40 (T26)	18:09	16	17:46 (T25)	19:41			20:13	85	19:45 (T24)	20:45	26	19:06 (T75)	21:07
19	07:54		16:00 (T26)	07:22		17:29 (T25)	07:38			06:47		18:19 (T75)	06:10		18:43 (T75)	05:58
	17:31	40	16:40 (T26)	18:10	19	17:48 (T25)	19:42			20:14	85	19:44 (T24)	20:46	21	19:04 (T75)	21:07
20	07:53		16:00 (T26)	07:21		17:28 (T25)	07:36			06:46		18:20 (T75)	06:09		18:45 (T75)	05:58
	17:33	40	16:40 (T26)	18:11	20	17:48 (T25)	19:43			20:15	84	19:44 (T24)	20:47	16	19:01 (T75)	21:08
21	07:52		16:02 (T26)	07:19		17:27 (T25)	07:35			06:44		18:20 (T75)	06:08		18:50 (T75)	05:59
	17:34	38	16:40 (T26)	18:12	23	17:50 (T25)	19:44			20:16	84	19:44 (T24)	20:48	6	18:56 (T75)	21:08
22	07:52		16:02 (T26)	07:18		17:26 (T25)	07:33			06:43		18:19 (T75)	06:08			05:59
	17:35	38	16:40 (T26)	18:13	25	17:51 (T25)	19:45			20:18	83	19:42 (T24)	20:49			21:08
23	07:51		16:03 (T26)	07:16		17:26 (T25)	07:31			06:41		18:20 (T75)	06:07			05:59
	17:36	36	16:39 (T26)	18:15	27	17:53 (T25)	19:46			20:19	81	19:41 (T24)	20:49			21:08
24	07:50		16:04 (T26)	07:15		17:26 (T25)	07:30			06:40		18:19 (T75)	06:06			05:59
	17:37	34	16:38 (T26)	18:16	27	17:53 (T25)	19:47			20:20	80	19:39 (T24)	20:50			21:08
25	07:50		16:06 (T26)	07:13		17:26 (T25)	07:28			06:38		18:20 (T75)	06:05			06:00
	17:39	33	16:39 (T26)	18:17	28	17:54 (T25)	19:49			20:21	78	19:38 (T24)	20:51			21:09
26	07:49		16:07 (T26)	07:12		17:26 (T25)	07:26			06:37		18:19 (T75)	06:05			06:00
	17:40	31	16:38 (T26)	18:18	27	17:53 (T25)	19:50			20:22	76	19:35 (T24)	20:52			21:09
27	07:48		16:08 (T26)	07:10		17:26 (T25)	07:25			06:36		18:20 (T75)	06:04			06:00
	17:41	28	16:36 (T26)	18:19	27	17:53 (T25)	19:51			20:23	72	19:32 (T24)	20:53			21:09
28	07:47		16:10 (T26)	07:09		17:26 (T25)	07:23			06:34		18:21 (T75)	06:03			06:01
	17:42	25	16:35 (T26)	18:21	26	17:52 (T25)	19:52			20:24	66	19:27 (T75)	20:54			21:09
29	07:46		16:12 (T26)				07:21		18:50 (T75)	06:33		18:20 (T75)	06:03			06:01
	17:44	22	16:34 (T26)				19:53	19	19:09 (T75)	20:25	65	19:25 (T75)	20:55			21:09
30	07:46		16:15 (T26)				07:20		18:46 (T75)	06:32		18:21 (T75)	06:02			06:02
	17:45	16	16:31 (T26)				19:54	28	19:14 (T75)	20:26	64	19:25 (T75)	20:56			21:09
31	07:45		16:18 (T26)				07:18		18:42 (T75)				06:02			
	17:46	10	16:28 (T26)				19:55	35	19:17 (T75)				20:56			
Potential sun hours	297			297			370			399			449			453
Total, worst case		1186			291			174			2206			906		
Sun reduction		0.31			0.40			0.44			0.52			0.57		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.74			0.69			0.66			0.61			0.61		
Total reduction		0.24			0.28			0.30			0.33			0.36		
Total, real		280			83			52			718			326		

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 857 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6877)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December		
1	06:02		06:26	18:41 (T75)	06:57	18:23 (T75)	07:28		07:02		07:37	15:37 (T26)	
	21:09		20:50	45 19:26 (T75)	20:07	81 19:44 (T24)	19:15		17:28		17:04	44 16:21 (T26)	
2	06:03		06:27	18:39 (T75)	06:58	18:24 (T75)	07:29		07:03		07:38	15:37 (T26)	
	21:09		20:49	48 19:27 (T75)	20:06	78 19:42 (T24)	19:13		17:27		17:03	45 16:22 (T26)	
3	06:03		06:28	18:38 (T75)	06:59	18:24 (T75)	07:30		07:05		07:39	15:37 (T26)	
	21:09		20:48	50 19:28 (T75)	20:04	77 19:41 (T24)	19:11		17:26		17:03	45 16:22 (T26)	
4	06:04		06:29	18:37 (T75)	07:00	18:24 (T75)	07:31		07:06		07:40	15:38 (T26)	
	21:08		20:47	52 19:29 (T75)	20:02	75 19:39 (T24)	19:10		17:24		17:03	45 16:23 (T26)	
5	06:04		06:30	18:36 (T75)	07:01	18:25 (T75)	07:32		07:07		07:41	15:38 (T26)	
	21:08		20:46	54 19:30 (T75)	20:01	73 19:38 (T24)	19:08		17:23		17:03	45 16:23 (T26)	
6	06:05		06:31	18:35 (T75)	07:02	18:26 (T75)	07:33		07:08		07:42	15:38 (T26)	
	21:08		20:45	55 19:30 (T75)	19:57	70 19:36 (T24)	19:06		17:22		17:03	45 16:23 (T26)	
7	06:05		06:32	18:34 (T75)	07:03	18:27 (T75)	07:34		07:09		07:43	15:39 (T26)	
	21:08		20:43	57 19:31 (T75)	19:56	64 19:34 (T24)	19:05		17:21		17:03	45 16:24 (T26)	
8	06:06		06:33	18:33 (T75)	07:04	18:28 (T75)	07:35	18:12 (T25)	07:11		07:44	15:39 (T26)	
	21:07		20:42	59 19:32 (T75)	19:54	50 19:18 (T75)	19:03	4 18:16 (T25)	17:20		17:02	45 16:24 (T26)	
9	06:07		06:34	18:33 (T75)	07:05	18:29 (T75)	07:36	18:07 (T25)	07:12		07:45	15:40 (T26)	
	21:07		20:41	59 19:32 (T75)	19:52	48 19:17 (T75)	19:02	13 18:20 (T25)	17:19		17:02	45 16:25 (T26)	
10	06:07		06:35	18:32 (T75)	07:06	18:30 (T75)	07:37	18:04 (T25)	07:13		07:46	15:39 (T26)	
	21:07		20:40	61 19:33 (T75)	19:51	44 19:14 (T75)	19:00	18 18:22 (T25)	17:18		17:03	45 16:24 (T26)	
11	06:08		06:36	18:31 (T75)	07:07	18:32 (T75)	07:38	18:02 (T25)	07:14	15:49 (T26)	07:47	15:40 (T26)	
	21:06		20:38	62 19:33 (T75)	19:49	40 19:12 (T75)	18:58	21 18:23 (T25)	17:17	10 15:59 (T26)	17:03	45 16:25 (T26)	
12	06:09		06:37	18:30 (T75)	07:08	18:33 (T75)	07:39	18:01 (T25)	07:15	15:46 (T26)	07:48	15:41 (T26)	
	21:06		20:37	64 19:34 (T75)	19:47	35 19:08 (T75)	18:57	23 18:24 (T25)	17:16	18 16:04 (T26)	17:03	45 16:26 (T26)	
13	06:10		06:38	18:30 (T75)	07:09	18:36 (T75)	07:40	18:01 (T25)	07:17	15:44 (T26)	07:48	15:41 (T26)	
	21:05		20:36	64 19:34 (T75)	19:46	29 19:05 (T75)	18:55	25 18:26 (T25)	17:15	22 16:06 (T26)	17:03	45 16:26 (T26)	
14	06:10		06:39	18:29 (T75)	07:10	18:40 (T75)	07:42	17:59 (T25)	07:18	15:42 (T26)	07:49	15:42 (T26)	
	21:05		20:34	65 19:34 (T75)	19:44	20 19:00 (T75)	18:54	27 18:26 (T25)	17:14	25 16:07 (T26)	17:03	45 16:27 (T26)	
15	06:11		06:40	18:28 (T75)	07:11	18:49 (T75)	07:43	17:59 (T25)	07:19	15:40 (T26)	07:50	15:42 (T26)	
	21:04		20:33	66 19:34 (T75)	19:42	1 18:50 (T75)	18:52	27 18:26 (T25)	17:13	28 16:08 (T26)	17:03	45 16:27 (T26)	
16	06:12		06:41	18:28 (T75)	07:12		07:44	17:58 (T25)	07:20	15:40 (T26)	07:51	15:43 (T26)	
	21:04		20:32	73 19:41 (T24)	19:40		18:50	28 18:26 (T25)	17:12	31 16:11 (T26)	17:04	44 16:27 (T26)	
17	06:13		06:42	18:26 (T75)	07:13		07:45	17:58 (T25)	07:21	15:39 (T26)	07:51	15:43 (T26)	
	21:03		20:30	76 19:42 (T24)	19:39		18:49	28 18:26 (T25)	17:11	32 16:11 (T26)	17:04	45 16:28 (T26)	
18	06:13		06:43	18:26 (T75)	07:14		07:46	17:57 (T25)	07:23	15:38 (T26)	07:52	15:43 (T26)	
	21:02		20:29	78 19:44 (T24)	19:37		18:47	27 18:24 (T25)	17:11	34 16:12 (T26)	17:04	45 16:28 (T26)	
19	06:14		06:44	18:25 (T75)	07:15		07:47	17:57 (T25)	07:24	15:38 (T26)	07:53	15:44 (T26)	
	21:02		20:27	80 19:45 (T24)	19:35		18:46	26 18:23 (T25)	17:10	36 16:14 (T26)	17:05	45 16:29 (T26)	
20	06:15		06:45	18:25 (T75)	07:16		07:48	17:58 (T25)	07:25	15:37 (T26)	07:53	15:44 (T26)	
	21:01		20:26	81 19:46 (T24)	19:34		18:44	24 18:22 (T25)	17:09	38 16:15 (T26)	17:05	45 16:29 (T26)	
21	06:16		06:46	18:24 (T75)	07:17		07:49	17:58 (T25)	07:26	15:37 (T26)	07:54	15:45 (T26)	
	21:00		20:24	83 19:47 (T24)	19:32		18:43	22 18:20 (T25)	17:08	38 16:15 (T26)	17:05	45 16:30 (T26)	
22	06:17		06:47	18:24 (T75)	07:18		07:50	17:59 (T25)	07:27	15:36 (T26)	07:54	15:45 (T26)	
	21:00		20:23	84 19:48 (T24)	19:30		18:41	19 18:18 (T25)	17:08	40 16:16 (T26)	17:06	45 16:30 (T26)	
23	06:18	18:58 (T75)	06:48	18:23 (T75)	07:19		07:52	17:59 (T25)	07:28	15:36 (T26)	07:55	15:46 (T26)	
	20:59	11 19:09 (T75)	20:21	85 19:48 (T24)	19:28		18:40	18 18:17 (T25)	17:07	40 16:16 (T26)	17:06	45 16:31 (T26)	
24	06:19	18:54 (T75)	06:49	18:23 (T75)	07:20		07:53	18:01 (T25)	07:30	15:36 (T26)	07:55	15:46 (T26)	
	20:58	19 19:13 (T75)	20:20	85 19:48 (T24)	19:27		18:39	15 18:16 (T25)	17:07	42 16:18 (T26)	17:07	45 16:31 (T26)	
25	06:20	18:52 (T75)	06:50	18:23 (T75)	07:21		07:54	18:03 (T25)	07:31	15:36 (T26)	07:56	15:47 (T26)	
	20:57	24 19:16 (T75)	20:18	85 19:48 (T24)	19:25		18:37	11 18:14 (T25)	17:06	42 16:18 (T26)	17:08	45 16:32 (T26)	
26	06:21	18:50 (T75)	06:51	18:23 (T75)	07:22		07:55	18:05 (T25)	07:32	15:36 (T26)	07:56	15:47 (T26)	
	20:56	28 19:18 (T75)	20:17	85 19:48 (T24)	19:23		18:36	8 18:13 (T25)	17:06	43 16:19 (T26)	17:08	45 16:32 (T26)	
27	06:21	18:48 (T75)	06:52	18:23 (T75)	07:23		07:56		07:33	15:36 (T26)	07:56	15:48 (T26)	
	20:55	32 19:20 (T75)	20:15	85 19:48 (T24)	19:22		18:34		17:05	43 16:19 (T26)	17:09	44 16:32 (T26)	
28	06:22	18:46 (T75)	06:53	18:23 (T75)	07:25		07:57		07:34	15:36 (T26)	07:57	15:48 (T26)	
	20:54	34 19:20 (T75)	20:14	85 19:48 (T24)	19:20		18:33		17:05	43 16:19 (T26)	17:10	44 16:32 (T26)	
29	06:23	18:44 (T75)	06:54	18:23 (T75)	07:26		07:59		07:35	15:36 (T26)	07:57	15:49 (T26)	
	20:53	38 19:22 (T75)	20:12	84 19:47 (T24)	19:18		18:32		17:04	44 16:20 (T26)	17:10	45 16:34 (T26)	
30	06:24	18:43 (T75)	06:55	18:23 (T75)	07:27		08:00		07:36	15:37 (T26)	07:57	15:49 (T26)	
	20:52	40 19:23 (T75)	20:11	84 19:47 (T24)	19:17		18:31		17:04	44 16:21 (T26)	17:11	45 16:34 (T26)	
31	06:25	18:42 (T75)	06:56	18:23 (T75)			08:01				07:57	15:50 (T26)	
	20:51	43 19:25 (T75)	20:09	82 19:45 (T24)			18:29				17:12	44 16:34 (T26)	
Potential sun hours	460		429		375		345		297		287		
Total, worst case		269		2176		785		384		693		1390	
Sun reduction		0.66		0.61		0.59		0.48		0.30		0.22	
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.61		0.61		0.61		0.69		0.74		0.74	
Total reduction		0.42		0.38		0.37		0.34		0.23		0.17	
Total, real		112		833		291		131		158		233	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 860 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6878)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April	May	June
1	07:57	15:18 (T23)	07:43		15:19 (T23)	07:07	15:49 (T23)	07:16	06:30	06:01
	17:13	63 16:21 (T23)	17:47	82	16:41 (T23)	18:22	30 16:19 (T23)	19:56	20:27	20:57
2	07:57	15:19 (T23)	07:43		15:19 (T23)	07:06	15:53 (T23)	07:14	06:29	06:01
	17:14	63 16:22 (T23)	17:48	83	16:42 (T23)	18:23	22 16:15 (T23)	19:57	20:28	20:58
3	07:58	15:19 (T23)	07:41		15:20 (T23)	07:04	16:01 (T23)	07:13	06:27	06:00
	17:14	63 16:22 (T23)	17:50	82	16:42 (T23)	18:24	5 16:06 (T23)	19:58	20:29	20:58
4	07:58	15:19 (T23)	07:40		15:20 (T23)	07:02		07:11	06:26	06:00
	17:15	64 16:23 (T23)	17:51	82	16:42 (T23)	18:25		19:59	20:30	20:59
5	07:58	15:19 (T23)	07:39		15:21 (T23)	07:01		07:09	06:25	06:00
	17:16	65 16:24 (T23)	17:52	81	16:42 (T23)	18:26		20:00	20:31	21:00
6	07:58	15:19 (T23)	07:38		15:20 (T23)	06:59		07:08	06:24	05:59
	17:17	66 16:25 (T23)	17:54	82	16:42 (T23)	18:27		20:00	20:32	21:01
7	07:57	15:19 (T23)	07:37		15:21 (T23)	06:58		07:06	06:22	05:59
	17:18	67 16:26 (T23)	17:55	81	16:42 (T23)	18:29		20:01	20:33	21:01
8	07:57	15:18 (T23)	07:36		15:21 (T23)	07:56		07:04	06:21	05:59
	17:19	68 16:26 (T23)	17:56	81	16:42 (T23)	19:30		20:02	20:34	21:02
9	07:57	15:19 (T23)	07:35		15:22 (T23)	07:54		07:03	06:20	05:58
	17:20	68 16:27 (T23)	17:57	80	16:42 (T23)	19:31		20:03	20:35	21:03
10	07:57	15:19 (T23)	07:34		15:23 (T23)	07:53		07:01	06:19	05:58
	17:21	69 16:28 (T23)	17:59	79	16:42 (T23)	19:32		20:05	20:37	21:03
11	07:57	15:19 (T23)	07:32		15:22 (T23)	07:51		07:00	06:18	05:58
	17:22	70 16:29 (T23)	18:00	79	16:41 (T23)	19:33		20:06	20:38	21:04
12	07:56	15:19 (T23)	07:31		15:23 (T23)	07:50		06:58	06:17	05:58
	17:23	71 16:30 (T23)	18:01	78	16:41 (T23)	19:34		20:07	20:39	21:04
13	07:56	15:19 (T23)	07:30		15:24 (T23)	07:48		06:56	06:16	05:58
	17:24	72 16:31 (T23)	18:02	77	16:41 (T23)	19:35		20:08	20:40	21:05
14	07:56	15:18 (T23)	07:29		15:25 (T23)	07:46		06:55	06:15	05:58
	17:26	73 16:31 (T23)	18:04	76	16:41 (T23)	19:36		20:09	20:41	21:05
15	07:55	15:19 (T23)	07:27		15:25 (T23)	07:45		06:53	06:14	05:58
	17:27	73 16:32 (T23)	18:05	74	16:39 (T23)	19:37		20:10	20:42	21:06
16	07:55	15:18 (T23)	07:26		15:27 (T23)	07:43		06:52	06:13	05:58
	17:28	74 16:32 (T23)	18:06	72	16:39 (T23)	19:39		20:11	20:43	21:06
17	07:55	15:19 (T23)	07:25		15:27 (T23)	07:41		06:50	06:12	05:58
	17:29	75 16:34 (T23)	18:07	71	16:38 (T23)	19:40		20:12	20:44	21:06
18	07:54	15:18 (T23)	07:23		15:28 (T23)	07:40		06:49	06:11	05:58
	17:30	76 16:34 (T23)	18:08	69	16:37 (T23)	19:41		20:13	20:45	21:07
19	07:53	15:19 (T23)	07:22		15:30 (T23)	07:38		06:47	06:10	05:58
	17:31	76 16:35 (T23)	18:10	67	16:37 (T23)	19:42		20:14	20:46	21:07
20	07:53	15:18 (T23)	07:20		15:30 (T23)	07:36		06:46	06:09	05:58
	17:32	78 16:36 (T23)	18:11	65	16:35 (T23)	19:43		20:15	20:46	21:07
21	07:52	15:18 (T23)	07:19		15:32 (T23)	07:35		06:44	06:08	05:58
	17:34	78 16:36 (T23)	18:12	63	16:35 (T23)	19:44		20:16	20:47	21:08
22	07:52	15:19 (T23)	07:18		15:33 (T23)	07:33		06:43	06:07	05:59
	17:35	78 16:37 (T23)	18:13	60	16:33 (T23)	19:45		20:17	20:48	21:08
23	07:51	15:18 (T23)	07:16		15:35 (T23)	07:31		06:41	06:07	05:59
	17:36	80 16:38 (T23)	18:14	57	16:32 (T23)	19:46		20:18	20:49	21:08
24	07:50	15:18 (T23)	07:15		15:36 (T23)	07:29		06:40	06:06	05:59
	17:37	80 16:38 (T23)	18:16	54	16:30 (T23)	19:47		20:20	20:50	21:08
25	07:50	15:18 (T23)	07:13		15:39 (T23)	07:28		06:38	06:05	05:59
	17:39	80 16:38 (T23)	18:17	50	16:29 (T23)	19:48		20:21	20:51	21:08
26	07:49	15:19 (T23)	07:12		15:40 (T23)	07:26		06:37	06:05	06:00
	17:40	81 16:40 (T23)	18:18	47	16:27 (T23)	19:49		20:22	20:52	21:09
27	07:48	15:19 (T23)	07:10		15:43 (T23)	07:24		06:35	06:04	06:00
	17:41	81 16:40 (T23)	18:19	42	16:25 (T23)	19:51		20:23	20:53	21:09
28	07:47	15:19 (T23)	07:09		15:45 (T23)	07:23		06:34	06:03	06:00
	17:42	81 16:40 (T23)	18:20	37	16:22 (T23)	19:52		20:24	20:54	21:09
29	07:46	15:19 (T23)				07:21		06:33	06:03	06:01
	17:43	82 16:41 (T23)				19:53		20:25	20:55	21:09
30	07:45	15:19 (T23)				07:19		06:31	06:02	06:01
	17:45	82 16:41 (T23)				19:54		20:26	20:55	21:09
31	07:44	15:19 (T23)				07:18			06:02	
	17:46	82 16:41 (T23)				19:55			20:56	
Potential sun hours	297		297		370		399	449	453	
Total, worst case		2279		1951		57				
Sun reduction		0.31		0.40		0.44				
Oper. time red.		1.00		1.00		1.00				
Wind dir. red.		0.74		0.74		0.74				
Total reduction		0.23		0.30		0.33				
Total, real		524		578		19				

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 860 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6878)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October			November			December		
1	06:02	06:26	06:57	07:27			07:02		14:51 (T23)	07:37		15:01 (T23)
	21:09	20:50	20:07	19:15			17:28	80	16:11 (T23)	17:03	71	16:12 (T23)
2	06:02	06:27	06:58	07:28			07:03		14:52 (T23)	07:38		15:02 (T23)
	21:09	20:49	20:06	19:13			17:27	80	16:12 (T23)	17:03	69	16:11 (T23)
3	06:03	06:28	06:59	07:30			07:04		14:51 (T23)	07:39		15:03 (T23)
	21:08	20:48	20:04	19:11			17:25	81	16:12 (T23)	17:03	68	16:11 (T23)
4	06:03	06:29	07:00	07:31			07:06		14:50 (T23)	07:40		15:04 (T23)
	21:08	20:47	20:02	19:10			17:24	81	16:11 (T23)	17:03	67	16:11 (T23)
5	06:04	06:30	07:01	07:32			07:07		14:50 (T23)	07:41		15:04 (T23)
	21:08	20:46	20:01	19:08			17:23	81	16:11 (T23)	17:03	67	16:11 (T23)
6	06:05	06:31	07:02	07:33			07:08		14:50 (T23)	07:42		15:05 (T23)
	21:08	20:45	19:57	19:06			17:22	82	16:12 (T23)	17:02	66	16:11 (T23)
7	06:05	06:32	07:03	07:34			07:09		14:50 (T23)	07:43		15:06 (T23)
	21:08	20:43	19:56	19:05			17:21	82	16:12 (T23)	17:02	65	16:11 (T23)
8	06:06	06:33	07:04	07:35			07:10		14:50 (T23)	07:44		15:07 (T23)
	21:07	20:42	19:54	19:03			17:20	82	16:12 (T23)	17:02	64	16:11 (T23)
9	06:06	06:34	07:05	07:36			07:12		14:50 (T23)	07:45		15:07 (T23)
	21:07	20:41	19:52	19:01			17:19	83	16:13 (T23)	17:02	64	16:11 (T23)
10	06:07	06:35	07:06	07:37			07:13		14:50 (T23)	07:46		15:08 (T23)
	21:07	20:40	19:51	19:00			17:18	82	16:12 (T23)	17:02	63	16:11 (T23)
11	06:08	06:36	07:07	07:38		16:30 (T23)	07:14		14:50 (T23)	07:47		15:08 (T23)
	21:06	20:38	19:49	18:58	15	16:45 (T23)	17:17	82	16:12 (T23)	17:02	63	16:11 (T23)
12	06:09	06:37	07:08	07:39		16:24 (T23)	07:15		14:50 (T23)	07:47		15:09 (T23)
	21:06	20:37	19:47	18:57	26	16:50 (T23)	17:16	82	16:12 (T23)	17:03	62	16:11 (T23)
13	06:09	06:38	07:09	07:40		16:20 (T23)	07:16		14:51 (T23)	07:48		15:10 (T23)
	21:05	20:36	19:45	18:55	33	16:53 (T23)	17:15	82	16:13 (T23)	17:03	62	16:12 (T23)
14	06:10	06:39	07:10	07:41		16:18 (T23)	07:18		14:51 (T23)	07:49		15:11 (T23)
	21:05	20:34	19:44	18:53	38	16:56 (T23)	17:14	81	16:12 (T23)	17:03	61	16:12 (T23)
15	06:11	06:40	07:11	07:42		16:15 (T23)	07:19		14:51 (T23)	07:50		15:11 (T23)
	21:04	20:33	19:42	18:52	43	16:58 (T23)	17:13	81	16:12 (T23)	17:03	61	16:12 (T23)
16	06:12	06:41	07:12	07:44		16:12 (T23)	07:20		14:52 (T23)	07:50		15:12 (T23)
	21:04	20:32	19:40	18:50	48	17:00 (T23)	17:12	81	16:13 (T23)	17:03	60	16:12 (T23)
17	06:12	06:42	07:13	07:45		16:09 (T23)	07:21		14:52 (T23)	07:51		15:13 (T23)
	21:03	20:30	19:39	18:49	52	17:01 (T23)	17:11	80	16:12 (T23)	17:04	60	16:13 (T23)
18	06:13	06:43	07:14	07:46		16:07 (T23)	07:22		14:52 (T23)	07:52		15:13 (T23)
	21:02	20:29	19:37	18:47	55	17:02 (T23)	17:10	80	16:12 (T23)	17:04	60	16:13 (T23)
19	06:14	06:44	07:15	07:47		16:05 (T23)	07:24		14:52 (T23)	07:52		15:14 (T23)
	21:02	20:27	19:35	18:46	58	17:03 (T23)	17:10	80	16:12 (T23)	17:04	59	16:13 (T23)
20	06:15	06:45	07:16	07:48		16:04 (T23)	07:25		14:54 (T23)	07:53		15:14 (T23)
	21:01	20:26	19:33	18:44	61	17:05 (T23)	17:09	78	16:12 (T23)	17:05	59	16:13 (T23)
21	06:16	06:46	07:17	07:49		16:02 (T23)	07:26		14:54 (T23)	07:54		15:15 (T23)
	21:00	20:24	19:32	18:43	64	17:06 (T23)	17:08	78	16:12 (T23)	17:05	59	16:14 (T23)
22	06:17	06:47	07:18	07:50		16:01 (T23)	07:27		14:54 (T23)	07:54		15:15 (T23)
	20:59	20:23	19:30	18:41	65	17:06 (T23)	17:08	78	16:12 (T23)	17:06	59	16:14 (T23)
23	06:18	06:48	07:19	07:51		15:59 (T23)	07:28		14:55 (T23)	07:55		15:16 (T23)
	20:59	20:21	19:28	18:40	68	17:07 (T23)	17:07	76	16:11 (T23)	17:06	59	16:15 (T23)
24	06:19	06:49	07:20	07:53		15:58 (T23)	07:29		14:56 (T23)	07:55		15:16 (T23)
	20:58	20:20	19:27	18:38	69	17:07 (T23)	17:06	76	16:12 (T23)	17:07	59	16:15 (T23)
25	06:19	06:50	07:21	07:54		15:57 (T23)	07:31		14:57 (T23)	07:55		15:16 (T23)
	20:57	20:18	19:25	18:37	72	17:09 (T23)	17:06	75	16:12 (T23)	17:07	59	16:15 (T23)
26	06:20	06:51	07:22	07:55		15:56 (T23)	07:32		14:57 (T23)	07:56		15:17 (T23)
	20:56	20:17	19:23	18:36	73	17:09 (T23)	17:05	75	16:12 (T23)	17:08	60	16:17 (T23)
27	06:21	06:52	07:23	07:56		15:55 (T23)	07:33		14:58 (T23)	07:56		15:17 (T23)
	20:55	20:15	19:21	18:34	74	17:09 (T23)	17:05	73	16:11 (T23)	17:09	60	16:17 (T23)
28	06:22	06:53	07:24	07:57		15:54 (T23)	07:34		14:58 (T23)	07:56		15:17 (T23)
	20:54	20:14	19:20	18:33	75	17:09 (T23)	17:04	73	16:11 (T23)	17:09	60	16:17 (T23)
29	06:23	06:54	07:25	07:58		15:54 (T23)	07:35		14:59 (T23)	07:57		15:18 (T23)
	20:53	20:12	19:18	18:32	76	17:10 (T23)	17:04	72	16:11 (T23)	17:10	61	16:19 (T23)
30	06:24	06:55	07:26	08:00		15:53 (T23)	07:36		15:00 (T23)	07:57		15:18 (T23)
	20:52	20:10	19:16	18:30	78	17:11 (T23)	17:04	71	16:11 (T23)	17:11	61	16:19 (T23)
31	06:25	06:56		08:01		15:52 (T23)				07:57		15:18 (T23)
	20:51	20:09		18:29	79	17:11 (T23)				17:12	62	16:20 (T23)
Potential sun hours	460	429	375	345			297			287		
Total, worst case					1222			2368			1930	
Sun reduction					0.48			0.30			0.22	
Oper. time red.					1.00			1.00			1.00	
Wind dir. red.					0.74			0.74			0.74	
Total reduction					0.36			0.22			0.16	
Total, real					435			527			315	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 861 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6879)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		08:04 (T44)		07:07		07:16		07:42 (T77)		06:30		06:51 (T42)		06:02		06:44 (T42)
	17:13		17:48	25	08:29 (T44)		18:22		19:56	35	08:17 (T77)		20:27	16	07:07 (T42)		20:57	30	07:14 (T42)
2	07:57		07:43		08:03 (T44)		07:06		07:15		07:42 (T77)		06:29		06:49 (T42)		06:01		06:45 (T42)
	17:14		17:49	26	08:29 (T44)		18:23		19:57	34	08:16 (T77)		20:28	20	07:09 (T42)		20:58	29	07:14 (T42)
3	07:57		07:41		08:02 (T44)		07:04		07:13		07:42 (T77)		06:28		06:47 (T42)		06:01		06:45 (T42)
	17:15		17:50	28	08:30 (T44)		18:24		19:58	34	08:16 (T77)		20:29	23	07:10 (T42)		20:58	28	07:13 (T42)
4	07:58		07:40		08:01 (T44)		07:03		07:11		07:42 (T77)		06:26		06:46 (T42)		06:00		06:46 (T42)
	17:16		17:51	29	08:30 (T44)		18:25		19:59	32	08:14 (T77)		20:30	26	07:12 (T42)		20:59	27	07:13 (T42)
5	07:57		07:39		08:01 (T44)		07:01		07:10		07:43 (T77)		06:25		06:45 (T42)		06:00		06:47 (T42)
	17:17		17:53	29	08:30 (T44)		18:26		20:00	31	08:14 (T77)		20:31	28	07:13 (T42)		21:00	26	07:13 (T42)
6	07:57		07:38		08:01 (T44)		06:59		07:08		07:44 (T77)		06:24		06:44 (T42)		06:00		06:46 (T42)
	17:18		17:54	29	08:30 (T44)		18:28		20:00	28	08:12 (T77)		20:32	30	07:14 (T42)		21:01	26	07:12 (T42)
7	07:57		07:37		08:01 (T44)		06:58		07:06		07:44 (T77)		06:23		06:43 (T42)		05:59		06:47 (T42)
	17:19		17:55	29	08:30 (T44)		18:29		20:01	26	08:10 (T77)		20:33	32	07:15 (T42)		21:01	25	07:12 (T42)
8	07:57		07:36		08:02 (T44)		07:56		07:05		07:46 (T77)		06:22		06:42 (T42)		05:59		06:48 (T42)
	17:20		17:56	28	08:30 (T44)		19:30		20:02	23	08:09 (T77)		20:34	34	07:16 (T42)		21:02	24	07:12 (T42)
9	07:57		07:35		08:03 (T44)		07:55		07:03		07:47 (T77)		06:20		06:41 (T42)		05:59		06:49 (T42)
	17:21		17:58	26	08:29 (T44)		19:31		20:04	19	08:06 (T77)		20:35	35	07:16 (T42)		21:02	23	07:12 (T42)
10	07:57		07:34		08:03 (T44)		07:53		07:01		07:49 (T77)		06:19		06:41 (T42)		05:59		06:50 (T42)
	17:22		17:59	26	08:29 (T44)		19:32		20:05	14	08:03 (T77)		20:36	36	07:17 (T42)		21:03	22	07:12 (T42)
11	07:57		07:32		08:04 (T44)		07:51		07:00		07:55 (T77)		06:18		06:39 (T42)		05:58		06:51 (T42)
	17:23		18:00	24	08:28 (T44)		19:33		20:06	2	07:57 (T77)		20:38	37	07:16 (T42)		21:04	21	07:12 (T42)
12	07:56		07:31		08:05 (T44)		07:50		06:58				06:17		06:39 (T42)		05:58		06:51 (T42)
	17:24		18:01	22	08:27 (T44)		19:34		20:07				20:39	37	07:16 (T42)		21:04	21	07:12 (T42)
13	07:56		07:30		08:07 (T44)		07:48		06:57				06:16		06:38 (T42)		05:58		06:51 (T42)
	17:25		18:03	19	08:26 (T44)		19:35		20:08				20:40	38	07:16 (T42)		21:05	19	07:10 (T42)
14	07:56		07:29		08:09 (T44)		07:46		06:55				06:15		06:39 (T42)		05:58		06:52 (T42)
	17:26		18:04	15	08:24 (T44)		19:37		20:09				20:41	39	07:18 (T42)		21:05	18	07:10 (T42)
15	07:55		07:27		08:11 (T44)		07:45		06:53				06:14		06:39 (T42)		05:58		06:52 (T42)
	17:27		18:05	10	08:21 (T44)		19:38		20:10				20:42	39	07:18 (T42)		21:06	18	07:10 (T42)
16	07:55		07:26				07:43		06:52				06:13		06:39 (T42)		05:58		06:54 (T42)
	17:28		18:06				19:39		20:11				20:43	39	07:18 (T42)		21:06	17	07:11 (T42)
17	07:54		07:25				07:41		06:50				06:12		06:39 (T42)		05:58		06:54 (T42)
	17:29		18:07				19:40		20:12				20:44	38	07:17 (T42)		21:06	17	07:11 (T42)
18	07:54		07:23				07:40		06:49				06:11		06:39 (T42)		05:58		06:54 (T42)
	17:30		18:09				19:41		20:13				20:45	38	07:17 (T42)		21:07	17	07:11 (T42)
19	07:53		07:22				07:38		06:47				06:10		06:39 (T42)		05:58		06:55 (T42)
	17:32		18:10				19:42		20:14				20:45	38	07:17 (T42)		21:07	15	07:10 (T42)
20	07:53		07:21				07:36		07:57 (T77)		06:46				06:09		05:59		06:55 (T42)
	17:33		18:11				19:43	12	08:09 (T77)		20:15				20:46	38	07:17 (T42)		21:07	15	07:10 (T42)
21	07:52		07:19				07:35		07:54 (T77)		06:44				06:09		06:40 (T42)		05:59		06:55 (T42)
	17:34		18:12				19:44	19	08:13 (T77)		20:16				20:47	37	07:17 (T42)		21:08	15	07:10 (T42)
22	07:52		07:18				07:33		07:52 (T77)		06:43				06:08		06:39 (T42)		05:59		06:55 (T42)
	17:35		18:14				19:45	22	08:14 (T77)		20:17				20:48	38	07:17 (T42)		21:08	15	07:10 (T42)
23	07:51		07:16				07:31		07:50 (T77)		06:41				06:07		06:39 (T42)		05:59		06:56 (T42)
	17:36		18:15				19:46	25	08:15 (T77)		20:18				20:49	38	07:17 (T42)		21:08	15	07:11 (T42)
24	07:50	08:11 (T44)	07:15				07:30		07:49 (T77)		06:40				06:06		06:39 (T42)		05:59		06:56 (T42)
	17:38	7 08:18 (T44)	18:16				19:47	28	08:17 (T77)		20:20				20:50	37	07:16 (T42)		21:08	16	07:12 (T42)
25	07:50	08:10 (T44)	07:13				07:28		07:47 (T77)		06:39				06:06		06:41 (T42)		06:00		06:55 (T42)
	17:39	11 08:21 (T44)	18:17				19:49	30	08:17 (T77)		20:21				20:51	36	07:17 (T42)		21:08	17	07:12 (T42)
26	07:49	08:09 (T44)	07:12				07:26		07:45 (T77)		06:37				06:05		06:41 (T42)		06:00		06:56 (T42)
	17:40	13 08:22 (T44)	18:18				19:50	32	08:17 (T77)		20:22				20:52	35	07:16 (T42)		21:08	17	07:13 (T42)
27	07:48	08:09 (T44)	07:10				07:25		07:45 (T77)		06:36				06:04		06:42 (T42)		06:00		06:55 (T42)
	17:41	15 08:24 (T44)	18:19				19:51	33	08:18 (T77)		20:23				20:53	34	07:16 (T42)		21:09	18	07:13 (T42)
28	07:47	08:08 (T44)	07:09				07:23		07:44 (T77)		06:34				06:04		06:42 (T42)		06:01		06:55 (T42)
	17:43	18 08:26 (T44)	18:21				19:52	34	08:18 (T77)		20:24				20:54	34	07:16 (T42)		21:09	18	07:13 (T42)
29	07:46	08:07 (T44)					07:21		07:43 (T77)		06:33				06:03		06:43 (T42)		06:01		06:55 (T42)
	17:44	20 08:27 (T44)					19:53	35	08:18 (T77)		20:25				20:54	33	07:16 (T42)		21:09	19	07:14 (T42)
30	07:45	08:06 (T44)					07:20		07:42 (T77)		06:32		06:55 (T42)		06:03		06:43 (T42)		06:02		06:55 (T42)
	17:45	21 08:27 (T44)					19:54	35	08:17 (T77)		20:26	8	07:03 (T42)		20:55	32	07:15 (T42)		21:09	19	07:14 (T42)
31	07:44	08:05 (T44)					07:18		07:42 (T77)						06:02		06:44 (T42)				
	17:46	23 08:28 (T44)					19:55	36	08:18 (T77)						20:56	31	07:15 (T42)				
Potential sun hours	297		297				370				399				448				453		
Total, worst case		128		365				341				286				1046				607	
Sun reduction		0.31		0.40				0.44				0.52				0.57				0.64	
Oper. time red.		1.00		1.00				1.00				1.00				1.00				1.00	
Wind dir. red.		0.54		0.54				0.62				0.63				0.70				0.70	
Total reduction		0.16		0.21				0.27				0.32				0.39				0.44	
Total, real		21		77				92				92				409				267	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 861 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6879)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December
1	06:02		06:55 (T42)	06:26		06:50 (T42)	06:57		07:54 (T77)	07:28			07:02		07:32 (T44)	07:37
	21:09	21	07:16 (T42)	20:50	37	07:27 (T42)	20:07	3	07:57 (T77)	19:15			17:28	26	07:58 (T44)	17:04
2	06:03		06:54 (T42)	06:27		06:50 (T42)	06:58		07:48 (T77)	07:29			07:03		07:32 (T44)	07:38
	21:08	22	07:16 (T42)	20:49	36	07:26 (T42)	20:06	14	08:02 (T77)	19:13			17:27	27	07:59 (T44)	17:03
3	06:03		06:54 (T42)	06:28		06:50 (T42)	06:59		07:45 (T77)	07:30			07:04		07:32 (T44)	07:39
	21:08	23	07:17 (T42)	20:48	36	07:26 (T42)	20:04	19	08:04 (T77)	19:11			17:26	27	07:59 (T44)	17:03
4	06:04		06:54 (T42)	06:29		06:51 (T42)	07:00		07:43 (T77)	07:31			07:06		07:31 (T44)	07:40
	21:08	23	07:17 (T42)	20:47	35	07:26 (T42)	20:02	23	08:06 (T77)	19:10			17:24	29	08:00 (T44)	17:03
5	06:04		06:54 (T42)	06:30		06:52 (T42)	07:01		07:41 (T77)	07:32			07:07		07:31 (T44)	07:41
	21:08	24	07:18 (T42)	20:46	33	07:25 (T42)	20:01	26	08:07 (T77)	19:08			17:23	28	07:59 (T44)	17:03
6	06:05		06:53 (T42)	06:31		06:53 (T42)	07:02		07:40 (T77)	07:33			07:08		07:31 (T44)	07:42
	21:08	25	07:18 (T42)	20:44	31	07:24 (T42)	19:57	28	08:08 (T77)	19:06			17:22	29	08:00 (T44)	17:03
7	06:06		06:53 (T42)	06:32		06:54 (T42)	07:03		07:38 (T77)	07:34			07:09		07:31 (T44)	07:43
	21:07	26	07:19 (T42)	20:43	29	07:23 (T42)	19:56	31	08:09 (T77)	19:05			17:21	29	08:00 (T44)	17:03
8	06:06		06:53 (T42)	06:33		06:55 (T42)	07:04		07:37 (T77)	07:35			07:10		07:32 (T44)	07:44
	21:07	27	07:20 (T42)	20:42	27	07:22 (T42)	19:54	32	08:09 (T77)	19:03			17:20	28	08:00 (T44)	17:03
9	06:07		06:52 (T42)	06:34		06:56 (T42)	07:05		07:36 (T77)	07:36			07:12		07:34 (T44)	07:45
	21:07	28	07:20 (T42)	20:41	25	07:21 (T42)	19:52	34	08:10 (T77)	19:02			17:19	26	08:00 (T44)	17:03
10	06:08		06:52 (T42)	06:35		06:57 (T42)	07:06		07:36 (T77)	07:37			07:13		07:35 (T44)	07:46
	21:06	29	07:21 (T42)	20:40	22	07:19 (T42)	19:51	34	08:10 (T77)	19:00			17:18	25	08:00 (T44)	17:03
11	06:08		06:52 (T42)	06:36		06:58 (T42)	07:07		07:35 (T77)	07:38			07:14		07:36 (T44)	07:47
	21:06	30	07:22 (T42)	20:38	19	07:17 (T42)	19:49	35	08:10 (T77)	18:58			17:17	23	07:59 (T44)	17:03
12	06:09		06:51 (T42)	06:37		07:01 (T42)	07:08		07:34 (T77)	07:39			07:15		07:37 (T44)	07:47
	21:06	31	07:22 (T42)	20:37	14	07:15 (T42)	19:47	35	08:09 (T77)	18:57			17:16	21	07:58 (T44)	17:03
13	06:10		06:51 (T42)	06:38		07:06 (T42)	07:09		07:33 (T77)	07:40			07:16		07:39 (T44)	07:48
	21:05	32	07:23 (T42)	20:36	3	07:09 (T42)	19:46	35	08:08 (T77)	18:55			17:15	20	07:59 (T44)	17:03
14	06:10		06:51 (T42)	06:39			07:10		07:33 (T77)	07:41			07:18		07:40 (T44)	07:49
	21:05	33	07:24 (T42)	20:34			19:44	35	08:08 (T77)	18:54			17:14	18	07:58 (T44)	17:03
15	06:11		06:51 (T42)	06:40			07:11		07:33 (T77)	07:43			07:19		07:41 (T44)	07:50
	21:04	34	07:25 (T42)	20:33			19:42	34	08:07 (T77)	18:52			17:13	15	07:56 (T44)	17:03
16	06:12		06:50 (T42)	06:41			07:12		07:33 (T77)	07:44			07:20		07:43 (T44)	07:50
	21:03	34	07:24 (T42)	20:32			19:40	34	08:07 (T77)	18:50			17:12	13	07:56 (T44)	17:04
17	06:13		06:50 (T42)	06:42			07:13		07:33 (T77)	07:45			07:21		07:44 (T44)	07:51
	21:03	35	07:25 (T42)	20:30			19:39	33	08:06 (T77)	18:49			17:12	10	07:54 (T44)	17:04
18	06:14		06:50 (T42)	06:43			07:14		07:34 (T77)	07:46			07:22		07:45 (T44)	07:52
	21:02	36	07:26 (T42)	20:29			19:37	31	08:05 (T77)	18:47			17:11	7	07:52 (T44)	17:04
19	06:14		06:50 (T42)	06:44			07:15		07:35 (T77)	07:47			07:24			07:52
	21:02	36	07:26 (T42)	20:27			19:35	28	08:03 (T77)	18:46			17:10			17:05
20	06:15		06:50 (T42)	06:45			07:16		07:36 (T77)	07:48			07:25			07:53
	21:01	37	07:27 (T42)	20:26			19:34	26	08:02 (T77)	18:44			17:09			17:05
21	06:16		06:49 (T42)	06:46			07:17		07:37 (T77)	07:49			07:26			07:53
	21:00	37	07:26 (T42)	20:24			19:32	23	08:00 (T77)	18:43			17:09			17:06
22	06:17		06:49 (T42)	06:47			07:18		07:38 (T77)	07:50			07:27			07:54
	20:59	38	07:27 (T42)	20:23			19:30	20	07:58 (T77)	18:42			17:08			17:06
23	06:18		06:49 (T42)	06:48			07:19		07:40 (T77)	07:52			07:28			07:54
	20:59	38	07:27 (T42)	20:21			19:28	15	07:55 (T77)	18:40			17:07			17:07
24	06:19		06:49 (T42)	06:49			07:20		07:45 (T77)	07:53			07:29			07:55
	20:58	38	07:27 (T42)	20:20			19:27	4	07:49 (T77)	18:39			17:07			17:07
25	06:20		06:49 (T42)	06:50			07:21			07:54			07:30			07:55
	20:57	39	07:28 (T42)	20:18			19:25			18:37			17:06			17:08
26	06:21		06:49 (T42)	06:51			07:22			07:55			07:32			07:56
	20:56	39	07:28 (T42)	20:17			19:23			18:36			17:06			17:08
27	06:22		06:49 (T42)	06:52			07:23			07:56	08:40 (T44)		07:33			07:56
	20:55	39	07:28 (T42)	20:15			19:22			18:35	11	08:51 (T44)	17:05			17:09
28	06:23		06:50 (T42)	06:53			07:24			07:57		08:37 (T44)	07:34			07:56
	20:54	38	07:28 (T42)	20:14			19:20			18:33	16	08:53 (T44)	17:05			17:10
29	06:23		06:49 (T42)	06:54			07:25			07:58		08:36 (T44)	07:35			07:57
	20:53	38	07:27 (T42)	20:12			19:18			18:32	20	08:56 (T44)	17:04			17:10
30	06:24		06:49 (T42)	06:55			07:27			08:00		08:34 (T44)	07:36			07:57
	20:52	38	07:27 (T42)	20:10			19:16			18:31	23	08:57 (T44)	17:04			17:11
31	06:25		06:49 (T42)	06:56						08:01		08:33 (T44)				07:57
	20:51	38	07:27 (T42)	20:09						18:29	24	08:57 (T44)				17:12
Potential sun hours	460			429			375			345			297			287
Total, worst case		1006			347			632			94			401		
Sun reduction		0.66			0.61			0.59			0.48			0.30		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.70			0.70			0.62			0.54			0.54		
Total reduction		0.45			0.42			0.36			0.25			0.16		
Total, real		456			145			229			24			64		

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 869 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6886)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:20 (T76)	07:43		08:30 (T76)	07:07		07:16		18:52 (T41)	06:30		19:47 (T40)	06:01		19:55 (T40)
	17:13	31	16:43 (T42)	17:47	47	17:04 (T42)	18:22		19:56	26	19:18 (T41)	20:27	18	20:05 (T40)	20:57	5	20:00 (T40)
2	07:57		08:20 (T76)	07:42		16:22 (T42)	07:06		07:14		18:53 (T41)	06:29		19:45 (T40)	06:01		
	17:14	33	16:44 (T42)	17:49	42	17:04 (T42)	18:23		19:57	23	19:16 (T41)	20:28	21	20:06 (T40)	20:58		
3	07:57		08:20 (T76)	07:41		16:23 (T42)	07:04		07:13		18:55 (T41)	06:28		19:43 (T40)	06:01		
	17:15	35	16:45 (T42)	17:50	41	17:04 (T42)	18:24		19:58	20	19:15 (T41)	20:29	23	20:06 (T40)	20:58		
4	07:57		08:20 (T76)	07:40		16:23 (T42)	07:02		07:11		18:56 (T41)	06:26		19:42 (T40)	06:00		
	17:16	37	16:46 (T42)	17:51	40	17:03 (T42)	18:25		19:59	16	19:12 (T41)	20:30	26	20:08 (T40)	20:59		
5	07:57		08:20 (T76)	07:39		16:24 (T42)	07:01		07:09		18:59 (T41)	06:25		19:42 (T40)	06:00		
	17:16	40	16:48 (T42)	17:52	39	17:03 (T42)	18:26		20:00	9	19:08 (T41)	20:31	27	20:09 (T40)	21:00		
6	07:57		08:20 (T76)	07:38		16:24 (T42)	06:59		07:08			06:24		19:41 (T40)	05:59		
	17:17	42	16:49 (T42)	17:54	38	17:02 (T42)	18:27		20:00			20:32	29	20:10 (T40)	21:00		
7	07:57		08:19 (T76)	07:37		16:26 (T42)	06:58		07:06			06:23		19:41 (T40)	05:59		
	17:18	45	16:49 (T42)	17:55	35	17:01 (T42)	18:29		20:01			20:33	30	20:11 (T40)	21:01		
8	07:57		08:19 (T76)	07:36		16:27 (T42)	07:56		07:05			06:22		19:41 (T40)	05:59		
	17:19	47	16:50 (T42)	17:56	33	17:00 (T42)	19:30		20:02			20:34	31	20:12 (T40)	21:02		
9	07:57		08:19 (T76)	07:35		16:29 (T42)	07:54		07:03			06:20		19:40 (T40)	05:59		
	17:20	48	16:51 (T42)	17:57	30	16:59 (T42)	19:31		20:03			20:35	33	20:13 (T40)	21:02		
10	07:57		08:19 (T76)	07:34		16:31 (T42)	07:53		07:01			06:19		19:39 (T40)	05:59		
	17:21	51	16:53 (T42)	17:59	27	16:58 (T42)	19:32		20:05			20:36	33	20:12 (T40)	21:03		
11	07:57		08:18 (T76)	07:32		16:32 (T42)	07:51		07:00			06:18		19:39 (T40)	05:58		
	17:23	53	16:53 (T42)	18:00	24	16:56 (T42)	19:33		20:06			20:37	33	20:12 (T40)	21:04		
12	07:56		08:18 (T76)	07:31		16:34 (T42)	07:50		06:58			06:17		19:39 (T40)	05:58		
	17:24	55	16:54 (T42)	18:01	19	16:53 (T42)	19:34		20:07			20:38	33	20:12 (T40)	21:04		
13	07:56		08:18 (T76)	07:30		16:38 (T42)	07:48		06:57			06:16		19:39 (T40)	05:58		
	17:25	59	16:56 (T42)	18:02	12	16:50 (T42)	19:35		20:08			20:39	33	20:12 (T40)	21:05		
14	07:56		08:17 (T76)	07:29			07:46		06:55			06:15		19:39 (T40)	05:58		
	17:26	61	16:56 (T42)	18:04			19:36		20:09			20:41	33	20:12 (T40)	21:05		
15	07:55		08:17 (T76)	07:27			07:45		06:53			06:14		19:39 (T40)	05:58		
	17:27	62	16:57 (T42)	18:05			19:38		20:10			20:42	33	20:12 (T40)	21:05		
16	07:55		08:16 (T76)	07:26			07:43		19:03 (T41)		06:52	06:13		19:40 (T40)	05:58		
	17:28	65	16:58 (T42)	18:06			19:39	14	19:17 (T41)		20:11	20:43	32	20:12 (T40)	21:06		
17	07:54		08:16 (T76)	07:25			07:41		19:00 (T41)		06:50	06:12		19:40 (T40)	05:58		
	17:29	66	16:59 (T42)	18:07			19:40	18	19:18 (T41)		20:12	20:43	32	20:12 (T40)	21:06		
18	07:54		08:15 (T76)	07:23			07:40		18:58 (T41)		06:49	06:11		19:41 (T40)	05:58		
	17:30	68	16:59 (T42)	18:09			19:41	22	19:20 (T41)		20:13	20:44	31	20:12 (T40)	21:07		
19	07:53		08:16 (T76)	07:22			07:38		18:56 (T41)		06:47	06:10		19:41 (T40)	05:58		
	17:32	68	17:00 (T42)	18:10			19:42	25	19:21 (T41)		20:14	20:45	30	20:11 (T40)	21:07		
20	07:53		08:16 (T76)	07:20			07:36		18:54 (T41)		06:46	06:09		19:41 (T40)	05:58		
	17:33	70	17:01 (T42)	18:11			19:43	27	19:21 (T41)		20:15	20:46	29	20:10 (T40)	21:07		
21	07:52		08:16 (T76)	07:19			07:35		18:54 (T41)		06:44	06:09		19:41 (T40)	05:59		
	17:34	69	17:01 (T42)	18:12			19:44	29	19:23 (T41)		20:16	20:47	29	20:10 (T40)	21:08		
22	07:52		08:17 (T76)	07:18			07:33		18:53 (T41)		06:43	06:08		19:43 (T40)	05:59		
	17:35	69	17:02 (T42)	18:13			19:45	31	19:24 (T41)		20:17	20:48	27	20:10 (T40)	21:08		
23	07:51		08:17 (T76)	07:16			07:31		18:52 (T41)		06:41	06:07		19:43 (T40)	05:59		
	17:36	69	17:02 (T42)	18:15			19:46	32	19:24 (T41)		20:18	20:49	26	20:09 (T40)	21:08		
24	07:50		08:17 (T76)	07:15			07:30		18:52 (T41)		06:40	06:06		19:44 (T40)	05:59		
	17:38	70	17:03 (T42)	18:16			19:47	33	19:25 (T41)		20:19	20:50	24	20:08 (T40)	21:08		
25	07:49		08:18 (T76)	07:13			07:28		18:51 (T41)		06:38	06:06		19:45 (T40)	06:00		
	17:39	68	17:03 (T42)	18:17			19:48	33	19:24 (T41)		20:21	20:51	23	20:08 (T40)	21:08		
26	07:49		08:18 (T76)	07:12			07:26		18:50 (T41)		06:37	06:05		19:45 (T40)	06:00		
	17:40	68	17:03 (T42)	18:18			19:50	33	19:23 (T41)		20:22	20:52	22	20:07 (T40)	21:08		
27	07:48		08:20 (T76)	07:10			07:24		18:50 (T41)		06:36	06:04		19:47 (T40)	06:00		
	17:41	66	17:04 (T42)	18:19			19:51	33	19:23 (T41)		20:23	20:53	20	20:07 (T40)	21:08		
28	07:47		08:21 (T76)	07:09			07:23		18:50 (T41)		06:34	06:04		19:48 (T40)	06:01		
	17:42	65	17:04 (T42)	18:21			19:52	33	19:23 (T41)		20:24	20:54	18	20:06 (T40)	21:09		
29	07:46		08:22 (T76)				07:21		18:50 (T41)		06:33	19:51 (T40)	06:03		19:48 (T40)	06:01		
	17:44	63	17:04 (T42)				19:53	32	19:22 (T41)		20:25	11	20:02 (T40)	20:54	16	20:04 (T40)	21:09	
30	07:45		08:24 (T76)				07:19		18:50 (T41)		06:32		19:48 (T40)	06:02		19:50 (T40)	06:02	
	17:45	59	17:04 (T42)				19:54	31	19:21 (T41)		20:26	16	20:04 (T40)	20:55	14	20:04 (T40)	21:09	
31	07:44		08:26 (T76)				07:18		18:51 (T41)					06:02		19:52 (T40)		
	17:46	55	17:04 (T42)				19:55	29	19:20 (T41)					20:56	10	20:02 (T40)		
Potential sun hours	297			297			370			399			449			453		
Total, worst case		1757			427			455			121			819			5	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.65			0.73			0.64			0.62			0.56			0.56	
Total reduction		0.21			0.30			0.29			0.33			0.33			0.37	
Total, real		363			127			131			40			268			2	

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 869 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6886)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		19:50 (T40)	06:57			07:27			07:02		15:59 (T42)	07:37		08:00 (T76)
	21:08			20:50	33	20:23 (T40)	20:07			19:15			17:28	28	16:27 (T42)	17:04	53	16:35 (T42)
2	06:03			06:27		19:50 (T40)	06:58			07:29			07:03		15:58 (T42)	07:38		08:01 (T76)
	21:08			20:49	33	20:23 (T40)	20:06			19:13			17:27	31	16:29 (T42)	17:03	51	16:35 (T42)
3	06:03			06:28		19:50 (T40)	06:59			07:30			07:04		15:57 (T42)	07:39		08:03 (T76)
	21:08			20:48	32	20:22 (T40)	20:04			19:11			17:26	33	16:30 (T42)	17:03	49	16:36 (T42)
4	06:04			06:29		19:50 (T40)	07:00			07:31			07:06		15:55 (T42)	07:40		08:04 (T76)
	21:08			20:47	32	20:22 (T40)	20:02			19:10			17:24	36	16:31 (T42)	17:03	47	16:35 (T42)
5	06:04			06:30		19:50 (T40)	07:01			07:32			07:07		15:54 (T42)	07:41		08:05 (T76)
	21:08			20:46	31	20:21 (T40)	20:01			19:08			17:23	37	16:31 (T42)	17:03	45	16:35 (T42)
6	06:05			06:31		19:51 (T40)	07:02			07:33			07:08		15:54 (T42)	07:42		08:06 (T76)
	21:08			20:44	29	20:20 (T40)	19:57			19:06			17:22	39	16:33 (T42)	17:03	42	16:35 (T42)
7	06:05			06:32		19:51 (T40)	07:03		18:56 (T41)	07:34			07:09		15:53 (T42)	07:43		08:06 (T76)
	21:07			20:43	28	20:19 (T40)	19:56	8	19:04 (T41)	19:05			17:21	40	16:33 (T42)	17:03	40	16:34 (T42)
8	06:06			06:33		19:52 (T40)	07:04		18:52 (T41)	07:35			07:10		15:52 (T42)	07:44		08:07 (T76)
	21:07			20:42	26	20:18 (T40)	19:54	15	19:07 (T41)	19:03			17:20	42	16:34 (T42)	17:03	38	16:34 (T42)
9	06:07			06:34		19:52 (T40)	07:05		18:49 (T41)	07:36			07:12		15:53 (T42)	07:45		08:08 (T76)
	21:07			20:41	25	20:17 (T40)	19:52	20	19:09 (T41)	19:01			17:19	42	16:35 (T42)	17:03	35	16:33 (T42)
10	06:07			06:35		19:53 (T40)	07:06		18:46 (T41)	07:37			07:13		08:00 (T76)	07:46		08:09 (T76)
	21:06			20:40	23	20:16 (T40)	19:51	23	19:09 (T41)	19:00			17:18	48	16:35 (T42)	17:03	33	16:33 (T42)
11	06:08			06:36		19:54 (T40)	07:07		18:44 (T41)	07:38			07:14		07:57 (T76)	07:46		08:10 (T76)
	21:06			20:38	20	20:14 (T40)	19:49	26	19:10 (T41)	18:58			17:17	55	16:35 (T42)	17:03	31	16:33 (T42)
12	06:09		20:01 (T40)	06:37		19:56 (T40)	07:08		18:43 (T41)	07:39			07:15		07:55 (T76)	07:47		08:11 (T76)
	21:06	8	20:09 (T40)	20:37	17	20:13 (T40)	19:47	28	19:11 (T41)	18:57			17:16	59	16:35 (T42)	17:03	28	16:33 (T42)
13	06:10		19:59 (T40)	06:38		19:58 (T40)	07:09		18:42 (T41)	07:40			07:16		07:54 (T76)	07:48		08:12 (T76)
	21:05	12	20:11 (T40)	20:36	14	20:12 (T40)	19:45	30	19:12 (T41)	18:55			17:15	63	16:36 (T42)	17:03	26	16:33 (T42)
14	06:10		19:58 (T40)	06:39		20:01 (T40)	07:10		18:41 (T41)	07:41			07:18		07:53 (T76)	07:49		08:12 (T76)
	21:05	15	20:13 (T40)	20:34	9	20:10 (T40)	19:44	31	19:12 (T41)	18:54			17:14	65	16:36 (T42)	17:03	25	16:33 (T42)
15	06:11		19:58 (T40)	06:40			07:11		18:40 (T41)	07:42			07:19		07:52 (T76)	07:50		08:13 (T76)
	21:04	17	20:15 (T40)	20:33			19:42	32	19:12 (T41)	18:52			17:13	66	16:36 (T42)	17:03	23	16:33 (T42)
16	06:12		19:56 (T40)	06:41			07:12		18:39 (T41)	07:44			07:20		07:51 (T76)	07:50		08:14 (T76)
	21:03	19	20:15 (T40)	20:31			19:40	33	19:12 (T41)	18:50			17:12	68	16:36 (T42)	17:04	20	16:33 (T42)
17	06:13		19:55 (T40)	06:42			07:13		18:39 (T41)	07:45			07:21		07:52 (T76)	07:51		08:14 (T76)
	21:03	21	20:16 (T40)	20:30			19:39	33	19:12 (T41)	18:49			17:11	68	16:37 (T42)	17:04	18	16:32 (T42)
18	06:14		19:55 (T40)	06:43			07:14		18:38 (T41)	07:46			07:22		07:51 (T76)	07:52		08:15 (T76)
	21:02	22	20:17 (T40)	20:29			19:37	33	19:11 (T41)	18:47			17:11	70	16:37 (T42)	17:04	17	16:33 (T42)
19	06:14		19:54 (T40)	06:44			07:15		18:38 (T41)	07:47			07:23		07:51 (T76)	07:52		08:16 (T76)
	21:02	24	20:18 (T40)	20:27			19:35	33	19:11 (T41)	18:46			17:10	69	16:36 (T42)	17:05	15	16:33 (T42)
20	06:15		19:54 (T40)	06:45			07:16		18:38 (T41)	07:48			07:25		07:52 (T76)	07:53		16:19 (T42)
	21:01	25	20:19 (T40)	20:26			19:33	32	19:10 (T41)	18:44			17:09	69	16:37 (T42)	17:05	14	16:33 (T42)
21	06:16		19:52 (T40)	06:46			07:17		18:38 (T41)	07:49			07:26		07:52 (T76)	07:53		16:21 (T42)
	21:00	27	20:19 (T40)	20:24			19:32	31	19:09 (T41)	18:43			17:08	70	16:37 (T42)	17:05	13	16:34 (T42)
22	06:17		19:52 (T40)	06:47			07:18		18:38 (T41)	07:50			07:27		07:52 (T76)	07:54		16:21 (T42)
	20:59	28	20:20 (T40)	20:23			19:30	30	19:08 (T41)	18:41			17:08	70	16:37 (T42)	17:06	13	16:34 (T42)
23	06:18		19:52 (T40)	06:48			07:19		18:38 (T41)	07:51			07:28		07:52 (T76)	07:54		16:22 (T42)
	20:59	29	20:21 (T40)	20:21			19:28	28	19:06 (T41)	18:40			17:07	68	16:36 (T42)	17:07	13	16:35 (T42)
24	06:19		19:51 (T40)	06:49			07:20		18:39 (T41)	07:53			07:29		07:52 (T76)	07:55		08:18 (T76)
	20:58	30	20:21 (T40)	20:20			19:27	25	19:04 (T41)	18:39			17:07	68	16:36 (T42)	17:07	15	16:35 (T42)
25	06:20		19:51 (T40)	06:50			07:21		18:40 (T41)	07:54			07:30		07:54 (T76)	07:55		08:18 (T76)
	20:57	31	20:22 (T40)	20:18			19:25	23	19:03 (T41)	18:37			17:06	66	16:37 (T42)	17:08	17	16:36 (T42)
26	06:21		19:51 (T40)	06:51			07:22		18:41 (T41)	07:55			07:32		07:55 (T76)	07:56		08:19 (T76)
	20:56	31	20:22 (T40)	20:17			19:23	20	19:01 (T41)	18:36			17:06	65	16:37 (T42)	17:08	18	16:37 (T42)
27	06:22		19:51 (T40)	06:52			07:23		18:43 (T41)	07:56			07:33		07:56 (T76)	07:56		08:19 (T76)
	20:55	32	20:23 (T40)	20:15			19:22	16	18:59 (T41)	18:34			17:05	62	16:36 (T42)	17:09	20	16:38 (T42)
28	06:22		19:50 (T40)	06:53			07:24		18:47 (T41)	07:57			07:34		07:57 (T76)	07:56		08:19 (T76)
	20:54	32	20:22 (T40)	20:14			19:20	8	18:55 (T41)	18:33			17:05	60	16:36 (T42)	17:10	22	16:38 (T42)
29	06:23		19:50 (T40)	06:54			07:25			07:58		17:06 (T42)	07:35		07:58 (T76)	07:57		08:19 (T76)
	20:53	32	20:22 (T40)	20:12			19:18			18:32	14	17:20 (T42)	17:04	59	16:36 (T42)	17:10	24	16:39 (T42)
30	06:24		19:49 (T40)	06:55			07:26			08:00		17:04 (T42)	07:36		07:59 (T76)	07:57		08:20 (T76)
	20:52	33	20:22 (T40)	20:10			19:16			18:30	20	17:24 (T42)	17:04	56	16:35 (T42)	17:11	25	16:41 (T42)
31	06:25		19:49 (T40)	06:56						08:01		17:01 (T42)				07:57		08:20 (T76)
	20:51	34	20:23 (T40)	20:09						18:29	25	17:26 (T42)				17:12	27	16:42 (T42)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		502			352			558			59			1672			857	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.56			0.56			0.64			0.73			0.67			0.67	
Total reduction		0.38			0.35			0.39			0.36			0.20			0.15	
Total, real		190			123			216			21			342			129	

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 870 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6887)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April			May		June		
1	07:57	07:44		07:07		16:46 (T32)	07:16			06:30		06:52 (T27)	06:01		18:56 (T29)
	17:13	17:47		18:22	44	17:30 (T32)	19:56			20:27	82	19:52 (T29)	20:57	60	19:56 (T29)
2	07:58	07:43		07:06		16:46 (T32)	07:15			06:29		06:53 (T27)	06:01		18:57 (T29)
	17:14	17:49		18:23	43	17:29 (T32)	19:57			20:28	83	19:53 (T29)	20:58	59	19:56 (T29)
3	07:58	07:42		07:04		16:48 (T32)	07:13			06:28		06:52 (T27)	06:00		18:57 (T29)
	17:15	17:50	13	17:14 (T32)	40	17:28 (T32)	19:58			20:29	83	19:53 (T29)	20:59	58	19:55 (T29)
4	07:58	07:41		16:58 (T32)		16:49 (T32)	07:11			06:26		06:53 (T27)	06:00		18:57 (T29)
	17:16	17:51	20	17:18 (T32)	37	17:26 (T32)	19:59			20:30	84	19:54 (T29)	20:59	59	19:56 (T29)
5	07:58	07:39		16:56 (T32)		16:50 (T32)	07:10			06:25		06:54 (T27)	06:00		18:58 (T29)
	17:16	17:52	25	17:21 (T32)	34	17:24 (T32)	20:00			20:31	82	19:54 (T29)	21:00	58	19:56 (T29)
6	07:58	07:38		16:54 (T32)		16:52 (T32)	07:08			06:24		06:55 (T27)	05:59		18:58 (T29)
	17:17	17:54	29	17:23 (T32)	31	17:23 (T32)	20:00			20:32	81	19:55 (T29)	21:01	57	19:55 (T29)
7	07:58	07:37		16:52 (T32)		16:53 (T32)	07:06			06:23		06:56 (T27)	05:59		18:59 (T29)
	17:18	17:55	32	17:24 (T32)	27	17:20 (T32)	20:01			20:33	80	19:55 (T29)	21:01	56	19:55 (T29)
8	07:57	07:36		16:50 (T32)		17:56 (T32)	07:05			06:22		06:57 (T27)	05:59		18:59 (T29)
	17:19	17:56	36	17:26 (T32)	21	18:17 (T32)	20:03			20:35	79	19:56 (T29)	21:02	57	19:56 (T29)
9	07:57	07:35		16:49 (T32)		18:00 (T32)	07:03			06:20		06:59 (T27)	05:59		19:00 (T29)
	17:20	17:57	38	17:27 (T32)	13	18:13 (T32)	20:04			20:36	75	19:56 (T29)	21:03	56	19:56 (T29)
10	07:57	07:34		16:49 (T32)			07:01			06:19		07:02 (T27)	05:58		19:00 (T29)
	17:21	17:59	40	17:29 (T32)			20:05			20:37	67	19:55 (T29)	21:03	56	19:56 (T29)
11	07:57	07:33		16:48 (T32)			07:00			06:18		18:52 (T29)	05:58		19:00 (T29)
	17:22	18:00	42	17:30 (T32)			20:06			20:38	64	19:56 (T29)	21:04	55	19:55 (T29)
12	07:57	07:31		16:46 (T32)			06:58			06:17		18:51 (T29)	05:58		19:00 (T29)
	17:24	18:01	44	17:30 (T32)			20:07			20:39	65	19:56 (T29)	21:04	55	19:55 (T29)
13	07:56	07:30		16:46 (T32)			06:57			06:16		18:51 (T29)	05:58		19:01 (T29)
	17:25	18:02	45	17:31 (T32)			20:08			20:40	65	19:56 (T29)	21:05	54	19:55 (T29)
14	07:56	07:29		16:46 (T32)			06:55			06:15		18:51 (T29)	05:58		19:01 (T29)
	17:26	18:04	46	17:32 (T32)			20:09			20:41	65	19:56 (T29)	21:05	54	19:55 (T29)
15	07:56	07:27		16:44 (T32)			06:53			06:14		18:51 (T29)	05:58		19:01 (T29)
	17:27	18:05	48	17:32 (T32)			20:10			20:42	65	19:56 (T29)	21:06	54	19:55 (T29)
16	07:55	07:26		16:44 (T32)			06:52			06:13		18:52 (T29)	05:58		19:02 (T29)
	17:28	18:06	49	17:33 (T32)			20:11			20:43	65	19:57 (T29)	21:06	54	19:56 (T29)
17	07:55	07:25		16:44 (T32)			06:50			06:12		18:52 (T29)	05:58		19:02 (T29)
	17:29	18:07	50	17:34 (T32)			20:12			20:44	65	19:57 (T29)	21:07	54	19:56 (T29)
18	07:54	07:23		16:43 (T32)			06:49			06:11		18:52 (T29)	05:58		19:03 (T29)
	17:30	18:09	50	17:33 (T32)			20:13			20:45	65	19:57 (T29)	21:07	54	19:57 (T29)
19	07:54	07:22		16:44 (T32)			06:47		07:06 (T27)	06:10		18:52 (T29)	05:58		19:03 (T29)
	17:31	18:10	50	17:34 (T32)			20:14	4	07:10 (T27)	20:46	65	19:57 (T29)	21:07	54	19:57 (T29)
20	07:53	07:21		16:43 (T32)			06:46		07:05 (T27)	06:09		18:52 (T29)	05:58		19:03 (T29)
	17:33	18:11	50	17:33 (T32)			20:15	20	19:32 (T29)	20:47	64	19:56 (T29)	21:08	54	19:57 (T29)
21	07:52	07:19		16:43 (T32)			06:44		07:04 (T27)	06:09		18:52 (T29)	05:59		19:03 (T29)
	17:34	18:12	51	17:34 (T32)			20:16	34	19:38 (T29)	20:48	64	19:56 (T29)	21:08	54	19:57 (T29)
22	07:52	07:18		16:43 (T32)			06:43		07:02 (T27)	06:08		18:53 (T29)	05:59		19:03 (T29)
	17:35	18:13	50	17:33 (T32)			20:18	43	19:40 (T29)	20:48	64	19:57 (T29)	21:08	54	19:57 (T29)
23	07:51	07:16		16:43 (T32)			06:41		07:01 (T27)	06:07		18:53 (T29)	05:59		19:04 (T29)
	17:36	18:15	50	17:33 (T32)			20:19	51	19:43 (T29)	20:49	63	19:56 (T29)	21:08	54	19:58 (T29)
24	07:50	07:15		16:43 (T32)			06:40		06:59 (T27)	06:06		18:53 (T29)	05:59		19:04 (T29)
	17:37	18:16	50	17:33 (T32)			20:20	57	19:44 (T29)	20:50	63	19:56 (T29)	21:08	54	19:58 (T29)
25	07:50	07:13		16:44 (T32)			06:38		06:58 (T27)	06:05		18:54 (T29)	06:00		19:04 (T29)
	17:39	18:17	49	17:33 (T32)			20:21	62	19:46 (T29)	20:51	63	19:57 (T29)	21:09	54	19:58 (T29)
26	07:49	07:12		16:44 (T32)			06:37		06:56 (T27)	06:05		18:54 (T29)	06:00		19:05 (T29)
	17:40	18:18	48	17:32 (T32)			20:22	67	19:47 (T29)	20:52	62	19:56 (T29)	21:09	54	19:59 (T29)
27	07:48	07:10		16:45 (T32)			06:36		06:55 (T27)	06:04		18:54 (T29)	06:00		19:05 (T29)
	17:41	18:19	47	17:32 (T32)			20:23	71	19:48 (T29)	20:53	62	19:56 (T29)	21:09	53	19:58 (T29)
28	07:47	07:09		16:45 (T32)			06:34		06:54 (T27)	06:04		18:55 (T29)	06:01		19:04 (T29)
	17:42	18:21	45	17:30 (T32)			20:24	76	19:50 (T29)	20:54	61	19:56 (T29)	21:09	54	19:58 (T29)
29	07:46						06:33		06:52 (T27)	06:03		18:54 (T29)	06:01		19:05 (T29)
	17:44						20:25	79	19:50 (T29)	20:55	62	19:56 (T29)	21:09	54	19:59 (T29)
30	07:45						06:32		06:52 (T27)	06:02		18:55 (T29)	06:02		19:04 (T29)
	17:45						20:26	80	19:51 (T29)	20:55	61	19:56 (T29)	21:09	55	19:59 (T29)
31	07:45									06:02		18:55 (T29)			
	17:46									20:56	60	19:55 (T29)			
Potential sun hours	297	297		370			399			449			453		
Total, worst case			1097		290			644			2129			1658	
Sun reduction			0.40		0.44			0.52			0.57			0.64	
Oper. time red.			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.			0.71		0.71			0.61			0.58			0.57	
Total reduction			0.29		0.32			0.32			0.34			0.37	
Total, real			317		92			207			715			614	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 870 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6887)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September	October		November		December
1	06:02		19:05 (T29)	06:26		19:02 (T29)	06:57	07:28		07:02		16:18 (T32)	07:37
	21:09	55	20:00 (T29)	20:50	64	20:06 (T29)	20:07	19:15		17:28	39	16:57 (T32)	17:04
2	06:03		19:04 (T29)	06:27		19:02 (T29)	06:58	07:29		07:03		16:19 (T32)	07:38
	21:09	56	20:00 (T29)	20:49	64	20:06 (T29)	20:06	19:13		17:27	38	16:57 (T32)	17:03
3	06:03		19:05 (T29)	06:28		07:11 (T27)	06:59	07:30		07:05		16:20 (T32)	07:39
	21:08	56	20:01 (T29)	20:48	72	20:06 (T29)	20:04	19:11		17:26	35	16:55 (T32)	17:03
4	06:04		19:04 (T29)	06:29		07:08 (T27)	07:00	07:31	17:42 (T32)	07:06		16:22 (T32)	07:40
	21:08	57	20:01 (T29)	20:47	76	20:06 (T29)	20:02	19:10	5 17:47 (T32)	17:24	32	16:54 (T32)	17:03
5	06:04		19:05 (T29)	06:30		07:06 (T27)	07:01	07:32	17:35 (T32)	07:07		16:24 (T32)	07:41
	21:08	56	20:01 (T29)	20:46	79	20:05 (T29)	20:01	19:08	18 17:53 (T32)	17:23	29	16:53 (T32)	17:03
6	06:05		19:04 (T29)	06:31		07:05 (T27)	07:02	07:33	17:31 (T32)	07:08		16:26 (T32)	07:42
	21:08	57	20:01 (T29)	20:45	81	20:05 (T29)	19:57	19:06	25 17:56 (T32)	17:22	24	16:50 (T32)	17:03
7	06:05		19:04 (T29)	06:32		07:04 (T27)	07:03	07:34	17:29 (T32)	07:09		16:28 (T32)	07:43
	21:08	58	20:02 (T29)	20:43	82	20:04 (T29)	19:56	19:05	28 17:57 (T32)	17:21	20	16:48 (T32)	17:03
8	06:06		19:05 (T29)	06:33		07:03 (T27)	07:04	07:35	17:26 (T32)	07:11		16:32 (T32)	07:44
	21:07	58	20:03 (T29)	20:42	83	20:04 (T29)	19:54	19:03	33 17:59 (T32)	17:20	12	16:44 (T32)	17:03
9	06:07		19:04 (T29)	06:34		07:02 (T27)	07:05	07:36	17:24 (T32)	07:12			07:45
	21:07	59	20:03 (T29)	20:41	84	20:03 (T29)	19:52	19:02	36 18:00 (T32)	17:19			17:03
10	06:07		19:04 (T29)	06:35		07:02 (T27)	07:06	07:37	17:22 (T32)	07:13			07:46
	21:07	59	20:03 (T29)	20:40	82	20:02 (T29)	19:51	19:00	39 18:01 (T32)	17:18			17:03
11	06:08		19:04 (T29)	06:36		07:01 (T27)	07:07	07:38	17:21 (T32)	07:14			07:47
	21:06	60	20:04 (T29)	20:38	83	20:02 (T29)	19:49	18:58	41 18:02 (T32)	17:17			17:03
12	06:09		19:04 (T29)	06:37		07:01 (T27)	07:08	07:39	17:19 (T32)	07:15			07:47
	21:06	60	20:04 (T29)	20:37	81	20:01 (T29)	19:47	18:57	43 18:02 (T32)	17:16			17:03
13	06:10		19:04 (T29)	06:38		07:00 (T27)	07:09	07:40	17:18 (T32)	07:17			07:48
	21:05	60	20:04 (T29)	20:36	81	20:00 (T29)	19:46	18:55	45 18:03 (T32)	17:15			17:03
14	06:10		19:04 (T29)	06:39		07:01 (T27)	07:10	07:41	17:18 (T32)	07:18			07:49
	21:05	61	20:05 (T29)	20:34	78	19:59 (T29)	19:44	18:54	46 18:04 (T32)	17:14			17:03
15	06:11		19:04 (T29)	06:40		07:02 (T27)	07:11	07:43	17:17 (T32)	07:19			07:50
	21:04	61	20:05 (T29)	20:33	74	19:57 (T29)	19:42	18:52	47 18:04 (T32)	17:13			17:03
16	06:12		19:03 (T29)	06:41		07:03 (T27)	07:12	07:44	17:16 (T32)	07:20			07:50
	21:04	62	20:05 (T29)	20:32	71	19:56 (T29)	19:40	18:50	48 18:04 (T32)	17:12			17:04
17	06:13		19:03 (T29)	06:42		07:03 (T27)	07:13	07:45	17:15 (T32)	07:21			07:51
	21:03	62	20:05 (T29)	20:30	65	19:53 (T29)	19:39	18:49	49 18:04 (T32)	17:11			17:04
18	06:14		19:03 (T29)	06:43		07:04 (T27)	07:14	07:46	17:14 (T32)	07:23			07:52
	21:02	63	20:06 (T29)	20:29	62	19:52 (T29)	19:37	18:47	50 18:04 (T32)	17:11			17:04
19	06:14		19:03 (T29)	06:44		07:05 (T27)	07:15	07:47	17:14 (T32)	07:24			07:52
	21:02	63	20:06 (T29)	20:27	56	19:50 (T29)	19:35	18:46	50 18:04 (T32)	17:10			17:05
20	06:15		19:03 (T29)	06:45		07:06 (T27)	07:16	07:48	17:14 (T32)	07:25			07:53
	21:01	64	20:07 (T29)	20:26	50	19:47 (T29)	19:34	18:44	51 18:05 (T32)	17:09			17:05
21	06:16		19:02 (T29)	06:46		07:07 (T27)	07:17	07:49	17:14 (T32)	07:26			07:54
	21:00	64	20:06 (T29)	20:24	43	19:45 (T29)	19:32	18:43	50 18:04 (T32)	17:08			17:05
22	06:17		19:02 (T29)	06:47		07:08 (T27)	07:18	07:50	17:13 (T32)	07:27			07:54
	21:00	64	20:06 (T29)	20:23	33	19:41 (T29)	19:30	18:41	51 18:04 (T32)	17:08			17:06
23	06:18		19:02 (T29)	06:48		07:09 (T27)	07:19	07:52	17:13 (T32)	07:28			07:55
	20:59	65	20:07 (T29)	20:21	18	19:35 (T29)	19:28	18:40	50 18:03 (T32)	17:07			17:06
24	06:19		19:02 (T29)	06:49		07:10 (T27)	07:20	07:53	17:13 (T32)	07:29			07:55
	20:58	65	20:07 (T29)	20:20	3	07:13 (T27)	19:27	18:39	50 18:03 (T32)	17:07			17:07
25	06:20		19:03 (T29)	06:50			07:21	07:54	17:14 (T32)	07:31			07:55
	20:57	64	20:07 (T29)	20:18			19:25	18:37	49 18:03 (T32)	17:06			17:08
26	06:21		19:03 (T29)	06:51			07:22	07:55	17:14 (T32)	07:32			07:56
	20:56	64	20:07 (T29)	20:17			19:23	18:36	49 18:03 (T32)	17:06			17:08
27	06:21		19:03 (T29)	06:52			07:23	07:56	17:14 (T32)	07:33			07:56
	20:55	64	20:07 (T29)	20:15			19:22	18:34	48 18:02 (T32)	17:05			17:09
28	06:22		19:02 (T29)	06:53			07:24	07:57	17:14 (T32)	07:34			07:56
	20:54	65	20:07 (T29)	20:14			19:20	18:33	47 18:01 (T32)	17:05			17:10
29	06:23		19:02 (T29)	06:54			07:26	07:59	17:16 (T32)	07:35			07:57
	20:53	65	20:07 (T29)	20:12			19:18	18:32	45 18:01 (T32)	17:04			17:10
30	06:24		19:02 (T29)	06:55			07:27	08:00	17:16 (T32)	07:36			07:57
	20:52	64	20:06 (T29)	20:11			19:16	18:31	44 18:00 (T32)	17:04			17:11
31	06:25		19:02 (T29)	06:56				08:01	17:17 (T32)				07:57
	20:51	64	20:06 (T29)	20:09				18:29	42 17:59 (T32)				17:12
Potential sun hours	460			429			375	345		297			287
Total, worst case		1895			1565				1179		229		
Sun reduction		0.66			0.61				0.48		0.30		
Oper. time red.		1.00			1.00				1.00		1.00		
Wind dir. red.		0.57			0.60				0.71		0.71		
Total reduction		0.38			0.37				0.35		0.22		
Total, real		724			581				409		50		

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 879 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6895)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March	April		May		June
1	07:57		08:29 (T42)	07:44	08:18 (T41)	07:07	07:16		06:30	07:18 (T40)	06:01
	17:13	31	09:00 (T42)	17:48 54	09:12 (T41)	18:22	19:56		20:27 61	08:19 (T40)	20:57
2	07:57		08:29 (T42)	07:43	08:18 (T41)	07:06	07:15		06:29	07:18 (T40)	06:01
	17:14	31	09:00 (T42)	17:49 55	09:13 (T41)	18:23	19:57		20:28 61	08:19 (T40)	20:58
3	07:57		08:30 (T42)	07:42	08:18 (T41)	07:04	07:13		06:28	07:18 (T40)	06:01
	17:15	30	09:00 (T42)	17:50 55	09:13 (T41)	18:24	19:58		20:29 60	08:18 (T40)	20:58
4	07:58		08:30 (T42)	07:40	08:18 (T41)	07:03	07:11	07:47 (T40)	06:26	07:18 (T40)	06:00
	17:16	31	09:01 (T42)	17:51 55	09:13 (T41)	18:25	19:59	18 08:05 (T40)	20:30 59	08:17 (T40)	20:59
5	07:58		08:31 (T42)	07:39	08:19 (T41)	07:01	07:10	07:43 (T40)	06:25	07:19 (T40)	06:00
	17:17	30	09:01 (T42)	17:53 54	09:13 (T41)	18:26	20:00	26 08:09 (T40)	20:31 58	08:17 (T40)	21:00
6	07:57		08:32 (T42)	07:38	08:18 (T41)	06:59	07:08	07:39 (T40)	06:24	07:19 (T40)	06:00
	17:18	29	09:01 (T42)	17:54 55	09:13 (T41)	18:28	20:00	33 08:12 (T40)	20:32 57	08:16 (T40)	21:01
7	07:57		08:31 (T41)	07:37	08:18 (T41)	06:58	07:06	07:36 (T40)	06:23	07:20 (T40)	05:59
	17:18	30	09:01 (T42)	17:55 55	09:13 (T41)	18:29	20:01	37 08:13 (T40)	20:33 56	08:16 (T40)	21:01
8	07:57		08:29 (T41)	07:36	08:19 (T41)	07:56	07:05	07:35 (T40)	06:22	07:21 (T40)	05:59
	17:19	32	09:01 (T42)	17:56 54	09:13 (T41)	19:30	20:02	41 08:16 (T40)	20:34 54	08:15 (T40)	21:02
9	07:57		08:28 (T41)	07:35	08:19 (T41)	07:55	07:03	07:32 (T40)	06:20	07:21 (T40)	05:59
	17:20	33	09:01 (T42)	17:58 54	09:13 (T41)	19:31	20:04	45 08:17 (T40)	20:35 53	08:14 (T40)	21:02
10	07:57		08:27 (T41)	07:34	08:20 (T41)	07:53	07:01	07:30 (T40)	06:19	07:22 (T40)	05:59
	17:22	34	09:01 (T42)	17:59 53	09:13 (T41)	19:32	20:05	47 08:17 (T40)	20:37 52	08:14 (T40)	21:03
11	07:57		08:26 (T41)	07:32	08:20 (T41)	07:51	07:00	07:29 (T40)	06:18	07:22 (T40)	05:58
	17:23	35	09:01 (T42)	18:00 51	09:11 (T41)	19:33	20:06	50 08:19 (T40)	20:38 50	08:12 (T40)	21:04
12	07:56		08:25 (T41)	07:31	08:20 (T41)	07:50	06:58	07:27 (T40)	06:17	07:22 (T40)	05:58
	17:24	36	09:01 (T42)	18:01 51	09:11 (T41)	19:34	20:07	52 08:19 (T40)	20:39 49	08:11 (T40)	21:04
13	07:56		08:25 (T41)	07:30	08:21 (T41)	07:48	06:57	07:26 (T40)	06:16	07:23 (T40)	05:58
	17:25	36	09:01 (T42)	18:03 50	09:11 (T41)	19:35	20:08	55 08:21 (T40)	20:40 47	08:10 (T40)	21:05
14	07:56		08:24 (T41)	07:29	08:22 (T41)	07:46	06:55	07:25 (T40)	06:15	07:24 (T40)	05:58
	17:26	36	09:00 (T42)	18:04 48	09:10 (T41)	19:37	20:09	56 08:21 (T40)	20:41 45	08:09 (T40)	21:05
15	07:55		08:24 (T41)	07:27	08:22 (T41)	07:45	06:53	07:24 (T40)	06:14	07:26 (T40)	05:58
	17:27	36	09:00 (T42)	18:05 47	09:09 (T41)	19:38	20:10	58 08:22 (T40)	20:42 43	08:09 (T40)	21:06
16	07:55		08:23 (T41)	07:26	08:24 (T41)	07:43	06:52	07:23 (T40)	06:13	07:27 (T40)	05:58
	17:28	36	08:59 (T42)	18:06 44	09:08 (T41)	19:39	20:11	59 08:22 (T40)	20:43 41	08:08 (T40)	21:06
17	07:55		08:23 (T41)	07:25	08:24 (T41)	07:41	06:50	07:23 (T40)	06:12	07:28 (T40)	05:58
	17:29	38	09:01 (T41)	18:07 42	09:06 (T41)	19:40	20:12	59 08:22 (T40)	20:44 38	08:06 (T40)	21:06
18	07:54		08:22 (T41)	07:23	08:25 (T41)	07:40	06:49	07:21 (T40)	06:11	07:29 (T40)	05:58
	17:30	40	09:02 (T41)	18:09 40	09:05 (T41)	19:41	20:13	61 08:22 (T40)	20:45 36	08:05 (T40)	21:07
19	07:53		08:22 (T41)	07:22	08:27 (T41)	07:38	06:47	07:21 (T40)	06:10	07:30 (T40)	05:58
	17:32	41	09:03 (T41)	18:10 37	09:04 (T41)	19:42	20:14	62 08:23 (T40)	20:46 34	08:04 (T40)	21:07
20	07:53		08:21 (T41)	07:21	08:28 (T41)	07:36	06:46	07:20 (T40)	06:09	07:31 (T40)	05:59
	17:33	43	09:04 (T41)	18:11 34	09:02 (T41)	19:43	20:15	62 08:22 (T40)	20:46 31	08:02 (T40)	21:07
21	07:52		08:20 (T41)	07:19	08:30 (T41)	07:35	06:44	07:20 (T40)	06:09	07:34 (T40)	05:59
	17:34	45	09:05 (T41)	18:12 30	09:00 (T41)	19:44	20:16	63 08:23 (T40)	20:47 27	08:01 (T40)	21:08
22	07:52		08:20 (T41)	07:18	08:32 (T41)	07:33	06:43	07:19 (T40)	06:08	07:35 (T40)	05:59
	17:35	46	09:06 (T41)	18:13 25	08:57 (T41)	19:45	20:17	63 08:22 (T40)	20:48 24	07:59 (T40)	21:08
23	07:51		08:20 (T41)	07:16	08:36 (T41)	07:31	06:41	07:19 (T40)	06:07	07:37 (T40)	05:59
	17:36	47	09:07 (T41)	18:15 18	08:54 (T41)	19:46	20:18	63 08:22 (T40)	20:49 20	07:57 (T40)	21:08
24	07:50		08:19 (T41)	07:15	08:41 (T41)	07:30	06:40	07:18 (T40)	06:06	07:40 (T40)	05:59
	17:38	49	09:08 (T41)	18:16 6	08:47 (T41)	19:47	20:20	64 08:22 (T40)	20:50 14	07:54 (T40)	21:08
25	07:50		08:19 (T41)	07:13		07:28	06:39	07:18 (T40)	06:06	07:45 (T40)	06:00
	17:39	49	09:08 (T41)	18:17		19:49	20:21	64 08:22 (T40)	20:51 4	07:49 (T40)	21:08
26	07:49		08:19 (T41)	07:12		07:26	06:37	07:18 (T40)	06:05		06:00
	17:40	51	09:10 (T41)	18:18		19:50	20:22	64 08:22 (T40)	20:52		21:08
27	07:48		08:19 (T41)	07:10		07:25	06:36	07:18 (T40)	06:04		06:00
	17:41	51	09:10 (T41)	18:19		19:51	20:23	63 08:21 (T40)	20:53		21:09
28	07:47		08:19 (T41)	07:09		07:23	06:34	07:18 (T40)	06:04		06:01
	17:43	52	09:11 (T41)	18:21		19:52	20:24	63 08:21 (T40)	20:54		21:09
29	07:46		08:18 (T41)			07:21	06:33	07:18 (T40)	06:03		06:01
	17:44	53	09:11 (T41)			19:53	20:25	63 08:21 (T40)	20:55		21:09
30	07:45		08:18 (T41)			07:20	06:32	07:18 (T40)	06:02		06:02
	17:45	54	09:12 (T41)			19:54	20:26	62 08:20 (T40)	20:55		21:09
31	07:44		08:18 (T41)			07:18			06:02		
	17:46	54	09:12 (T41)			19:55			20:56		
Potential sun hours	297		297		370	399		449		453	
Total, worst case		1239		1067			1453		1074		
Sun reduction		0.31		0.40			0.52		0.57		
Oper. time red.		1.00		1.00			1.00		1.00		
Wind dir. red.		0.52		0.52			0.65		0.65		
Total reduction		0.16		0.20			0.33		0.36		
Total, real		193		213			478		388		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 879 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6895)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		07:33 (T40)	06:57		07:28 (T40)	07:28			07:02		07:49 (T41)	07:37		08:08 (T41)
	21:09			20:50	49	08:22 (T40)	20:07	50	08:18 (T40)	19:15			17:28	52	08:41 (T41)	17:04	35	08:43 (T42)
2	06:03			06:27		07:32 (T40)	06:58		07:29 (T40)	07:29			07:03		07:49 (T41)	07:38		08:10 (T41)
	21:08			20:49	51	08:23 (T40)	20:06	47	08:16 (T40)	19:13			17:27	54	08:43 (T41)	17:03	34	08:44 (T42)
3	06:03			06:28		07:31 (T40)	06:59		07:30 (T40)	07:30			07:04		07:49 (T41)	07:39		08:12 (T41)
	21:08			20:48	53	08:24 (T40)	20:04	45	08:15 (T40)	19:11			17:26	54	08:43 (T41)	17:03	33	08:45 (T42)
4	06:04			06:29		07:31 (T40)	07:00		07:32 (T40)	07:31			07:06		07:48 (T41)	07:40		08:14 (T41)
	21:08			20:47	53	08:24 (T40)	20:02	41	08:13 (T40)	19:10			17:24	55	08:43 (T41)	17:03	32	08:46 (T42)
5	06:04			06:30		07:30 (T40)	07:01		07:33 (T40)	07:32			07:07		07:48 (T41)	07:41		08:16 (T41)
	21:08			20:46	55	08:25 (T40)	20:01	37	08:10 (T40)	19:08			17:23	54	08:42 (T41)	17:03	31	08:47 (T42)
6	06:05			06:31		07:29 (T40)	07:02		07:35 (T40)	07:33			07:08		07:49 (T41)	07:42		08:18 (T42)
	21:08			20:45	57	08:26 (T40)	19:57	33	08:08 (T40)	19:06			17:22	54	08:43 (T41)	17:03	29	08:47 (T42)
7	06:06			06:32		07:29 (T40)	07:03		07:38 (T40)	07:34			07:09		07:48 (T41)	07:43		08:18 (T42)
	21:07			20:43	57	08:26 (T40)	19:56	27	08:05 (T40)	19:05			17:21	55	08:43 (T41)	17:03	30	08:48 (T42)
8	06:06			06:33		07:28 (T40)	07:04		07:41 (T40)	07:35			07:10		07:48 (T41)	07:44		08:17 (T42)
	21:07			20:42	59	08:27 (T40)	19:54	19	08:00 (T40)	19:03			17:20	55	08:43 (T41)	17:03	31	08:48 (T42)
9	06:07			06:34		07:28 (T40)	07:05			07:36			07:12		07:49 (T41)	07:45		08:18 (T42)
	21:07			20:41	59	08:27 (T40)	19:52			19:02			17:19	55	08:44 (T41)	17:03	30	08:48 (T42)
10	06:08			06:35		07:27 (T40)	07:06			07:37			07:13		07:49 (T41)	07:46		08:18 (T42)
	21:06			20:40	61	08:28 (T40)	19:51			19:00			17:18	54	08:43 (T41)	17:03	31	08:49 (T42)
11	06:08			06:36		07:27 (T40)	07:07			07:38			07:14		07:49 (T41)	07:47		08:19 (T42)
	21:06			20:38	61	08:28 (T40)	19:49			18:58			17:17	54	08:43 (T41)	17:03	31	08:50 (T42)
12	06:09			06:37		07:27 (T40)	07:08			07:39			07:15		07:49 (T41)	07:47		08:19 (T42)
	21:06			20:37	61	08:28 (T40)	19:47			18:57			17:16	54	08:43 (T41)	17:03	31	08:50 (T42)
13	06:10			06:38		07:26 (T40)	07:09			07:40			07:16		07:50 (T41)	07:48		08:20 (T42)
	21:05			20:36	62	08:28 (T40)	19:46			18:55			17:15	53	08:43 (T41)	17:03	31	08:51 (T42)
14	06:10			06:39		07:26 (T40)	07:10			07:41			07:18		07:51 (T41)	07:49		08:19 (T42)
	21:05			20:34	63	08:29 (T40)	19:44			18:54			17:14	52	08:43 (T41)	17:03	32	08:51 (T42)
15	06:11			06:40		07:26 (T40)	07:11			07:43			07:19		07:51 (T41)	07:50		08:20 (T42)
	21:04			20:33	63	08:29 (T40)	19:42			18:52			17:13	51	08:42 (T41)	17:03	32	08:52 (T42)
16	06:12			06:41		07:25 (T40)	07:12			07:44			07:20		07:52 (T41)	07:50		08:21 (T42)
	21:04			20:32	64	08:29 (T40)	19:40			18:50			17:12	51	08:43 (T41)	17:04	32	08:53 (T42)
17	06:13			06:42		07:25 (T40)	07:13			07:45			07:21		07:53 (T41)	07:51		08:21 (T42)
	21:03			20:30	64	08:29 (T40)	19:39			18:49			17:11	49	08:42 (T41)	17:04	31	08:52 (T42)
18	06:14			06:43		07:24 (T40)	07:14			07:46		09:10 (T41)	07:22		07:53 (T41)	07:52		08:21 (T42)
	21:02			20:29	64	08:28 (T40)	19:37			18:47	12	09:22 (T41)	17:11	49	08:42 (T41)	17:04	32	08:53 (T42)
19	06:14		07:52 (T40)	06:44		07:24 (T40)	07:15			07:47		09:05 (T41)	07:24		07:54 (T41)	07:52		08:22 (T42)
	21:02	10	08:02 (T40)	20:27	63	08:27 (T40)	19:35			18:46	21	09:26 (T41)	17:10	47	08:41 (T41)	17:05	32	08:54 (T42)
20	06:15		07:49 (T40)	06:45		07:24 (T40)	07:16			07:48		09:03 (T41)	07:25		07:55 (T41)	07:53		08:22 (T42)
	21:01	17	08:06 (T40)	20:26	63	08:27 (T40)	19:34			18:44	26	09:29 (T41)	17:09	46	08:41 (T41)	17:05	32	08:54 (T42)
21	06:16		07:46 (T40)	06:46		07:24 (T40)	07:17			07:49		09:00 (T41)	07:26		07:56 (T41)	07:53		08:23 (T42)
	21:00	21	08:07 (T40)	20:24	63	08:27 (T40)	19:32			18:43	31	09:31 (T41)	17:09	45	08:41 (T41)	17:06	32	08:55 (T42)
22	06:17		07:44 (T40)	06:47		07:24 (T40)	07:18			07:50		08:58 (T41)	07:27		07:57 (T41)	07:54		08:23 (T42)
	20:59	26	08:10 (T40)	20:23	63	08:27 (T40)	19:30			18:42	35	09:33 (T41)	17:08	43	08:40 (T41)	17:06	32	08:55 (T42)
23	06:18		07:43 (T40)	06:48		07:24 (T40)	07:19			07:52		08:56 (T41)	07:28		07:58 (T41)	07:54		08:24 (T42)
	20:59	28	08:11 (T40)	20:21	62	08:26 (T40)	19:28			18:40	38	09:34 (T41)	17:07	41	08:39 (T41)	17:07	32	08:56 (T42)
24	06:19		07:41 (T40)	06:49		07:24 (T40)	07:20			07:53		08:55 (T41)	07:29		07:59 (T41)	07:55		08:24 (T42)
	20:58	32	08:13 (T40)	20:20	62	08:26 (T40)	19:27			18:39	40	09:35 (T41)	17:07	40	08:39 (T41)	17:07	32	08:56 (T42)
25	06:20		07:40 (T40)	06:50		07:24 (T40)	07:21			07:54		08:54 (T41)	07:31		08:01 (T41)	07:55		08:24 (T42)
	20:57	35	08:15 (T40)	20:18	61	08:25 (T40)	19:25			18:37	43	09:37 (T41)	17:06	38	08:39 (T41)	17:08	32	08:56 (T42)
26	06:21		07:39 (T40)	06:51		07:24 (T40)	07:22			07:55		08:53 (T41)	07:32		08:02 (T41)	07:56		08:26 (T42)
	20:56	37	08:16 (T40)	20:17	60	08:24 (T40)	19:23			18:36	45	09:38 (T41)	17:06	36	08:38 (T42)	17:08	31	08:57 (T42)
27	06:22		07:38 (T40)	06:52		07:25 (T40)	07:23			07:56		08:52 (T41)	07:33		08:03 (T41)	07:56		08:26 (T42)
	20:55	40	08:18 (T40)	20:15	58	08:23 (T40)	19:22			18:35	47	09:39 (T41)	17:05	36	08:39 (T42)	17:09	32	08:58 (T42)
28	06:23		07:37 (T40)	06:53		07:25 (T40)	07:24			07:57		08:51 (T41)	07:34		08:04 (T41)	07:56		08:26 (T42)
	20:54	42	08:19 (T40)	20:14	58	08:23 (T40)	19:20			18:33	48	09:39 (T41)	17:05	36	08:40 (T42)	17:10	32	08:58 (T42)
29	06:23		07:35 (T40)	06:54		07:26 (T40)	07:25			07:59		08:51 (T41)	07:35		08:05 (T41)	07:57		08:26 (T42)
	20:53	44	08:19 (T40)	20:12	56	08:22 (T40)	19:18			18:32	50	09:41 (T41)	17:04	36	08:41 (T42)	17:10	32	08:58 (T42)
30	06:24		07:34 (T40)	06:55		07:26 (T40)	07:27			08:00		08:50 (T41)	07:36		08:06 (T41)	07:57		08:28 (T42)
	20:52	46	08:20 (T40)	20:10	54	08:20 (T40)	19:16			18:31	51	09:41 (T41)	17:04	36	08:42 (T42)	17:11	31	08:59 (T42)
31	06:25		07:34 (T40)	06:56		07:27 (T40)				08:01		08:49 (T41)				07:57		08:28 (T42)
	20:51	47	08:21 (T40)	20:09	52	08:19 (T40)				18:29	52	09:41 (T41)				17:12	31	08:59 (T42)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		425			1831			299			539			1435			981	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.65			0.65			0.65			0.52			0.52			0.52	
Total reduction		0.42			0.39			0.37			0.24			0.15			0.11	
Total, real		178			707			112			129			215			110	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 880 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6896)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		07:07		07:16		06:30		06:01	
	17:13	17:47		18:22	27	17:55 (T77)	19:56	20:27	42	19:53 (T42)	20:57	25	20:32 (T41)
2	07:57	07:42		07:06		17:26 (T77)	07:14	06:29		19:12 (T42)	06:01		20:07 (T41)
	17:14	17:49		18:23	30	17:56 (T77)	19:57	20:28	41	19:53 (T42)	20:58	26	20:33 (T41)
3	07:57	07:41		07:04		17:23 (T77)	07:13	06:28		19:11 (T42)	06:01		20:07 (T41)
	17:15	17:50		18:24	34	17:57 (T77)	19:58	20:29	41	19:52 (T42)	20:58	26	20:33 (T41)
4	07:57	07:40		07:02		17:22 (T77)	07:11	06:26		19:12 (T42)	06:00		20:07 (T41)
	17:16	17:51		18:25	37	17:59 (T77)	19:59	20:30	40	19:52 (T42)	20:59	27	20:34 (T41)
5	07:57	07:39		07:01		17:21 (T77)	07:09	06:25		19:12 (T42)	06:00		20:07 (T41)
	17:17	17:52		18:26	38	17:59 (T77)	20:00	20:31	39	19:51 (T42)	21:00	28	20:35 (T41)
6	07:57	07:38		06:59		17:20 (T77)	07:08	06:24		19:13 (T42)	05:59		20:07 (T41)
	17:17	17:54		18:27	41	18:01 (T77)	20:00	20:32	38	19:51 (T42)	21:00	28	20:35 (T41)
7	07:57	07:37		06:58		17:19 (T77)	07:06	06:23		19:14 (T42)	05:59		20:07 (T41)
	17:18	17:55		18:29	42	18:01 (T77)	20:01	20:33	37	19:51 (T42)	21:01	29	20:36 (T41)
8	07:57	07:36		07:56		18:18 (T77)	07:05	06:22		19:14 (T42)	05:59		20:08 (T41)
	17:19	17:56		19:30	43	19:01 (T77)	20:02	20:34	36	19:50 (T42)	21:02	28	20:36 (T41)
9	07:57	07:35		07:54		08:18 (T76)	07:03	06:20		19:15 (T42)	05:59		20:08 (T41)
	17:20	17:57		19:31	51	19:02 (T77)	20:03	20:35	34	19:49 (T42)	21:02	29	20:37 (T41)
10	07:57	07:34		07:53		08:13 (T76)	07:01	06:19		19:15 (T42)	05:59		20:08 (T41)
	17:21	17:59		19:32	60	19:02 (T77)	20:05	20:36	32	19:47 (T42)	21:03	29	20:37 (T41)
11	07:57	07:32		07:51		08:10 (T76)	07:00	06:18		19:16 (T42)	05:58		20:09 (T41)
	17:23	18:00		19:33	66	19:02 (T77)	20:06	20:37	30	19:46 (T42)	21:03	28	20:37 (T41)
12	07:56	07:31		07:50		08:09 (T76)	06:58	06:17		19:17 (T42)	05:58		20:08 (T41)
	17:24	18:01		19:34	69	19:02 (T77)	20:07	20:38	28	19:45 (T42)	21:04	29	20:37 (T41)
13	07:56	07:30		07:48		08:07 (T76)	06:57	06:16		19:18 (T42)	05:58		20:08 (T41)
	17:25	18:02		19:35	73	19:02 (T77)	20:08	20:39	26	19:44 (T42)	21:05	29	20:37 (T41)
14	07:56	07:29		07:46		08:05 (T76)	06:55	19:29 (T42)		06:15	19:20 (T42)	05:58		20:09 (T41)
	17:26	18:04		19:36	75	19:01 (T77)	20:09	13	19:42 (T42)	20:40	23	19:43 (T42)	21:05	28	20:37 (T41)
15	07:55	07:27		07:45		08:04 (T76)	06:53	19:25 (T42)		06:14	19:21 (T42)	05:58		20:09 (T41)
	17:27	18:05		19:38	76	19:01 (T77)	20:10	20	19:45 (T42)	20:41	20	19:41 (T42)	21:05	28	20:37 (T41)
16	07:55	07:26		07:43		08:03 (T76)	06:52	19:23 (T42)		06:13	19:24 (T42)	05:58		20:09 (T41)
	17:28	18:06		19:39	77	19:00 (T77)	20:11	24	19:47 (T42)	20:42	16	19:40 (T42)	21:06	28	20:37 (T41)
17	07:54	07:25		07:41		08:02 (T76)	06:50	19:20 (T42)		06:12	19:27 (T42)	05:58		20:10 (T41)
	17:29	18:07		19:40	77	18:59 (T77)	20:12	29	19:49 (T42)	20:43	10	19:37 (T42)	21:06	29	20:39 (T41)
18	07:54	07:23		07:40		08:02 (T76)	06:49	19:19 (T42)		06:11	20:16 (T41)	05:58		20:10 (T41)
	17:30	18:09		19:41	76	18:59 (T77)	20:13	31	19:50 (T42)	20:44	5	20:21 (T41)	21:07	29	20:39 (T41)
19	07:53	07:22		07:38		08:01 (T76)	06:47	19:17 (T42)		06:10	20:13 (T41)	05:58		20:10 (T41)
	17:32	18:10		19:42	76	18:58 (T77)	20:14	34	19:51 (T42)	20:45	9	20:22 (T41)	21:07	29	20:39 (T41)
20	07:53	07:20		07:36		08:00 (T76)	06:46	19:16 (T42)		06:09	20:11 (T41)	05:59		20:10 (T41)
	17:33	18:11		19:43	75	18:57 (T77)	20:15	36	19:52 (T42)	20:46	12	20:23 (T41)	21:07	29	20:39 (T41)
21	07:52	07:19		07:35		08:01 (T76)	06:44	19:16 (T42)		06:09	20:10 (T41)	05:59		20:10 (T41)
	17:34	18:12		19:44	72	18:56 (T77)	20:16	37	19:53 (T42)	20:47	13	20:23 (T41)	21:08	29	20:39 (T41)
22	07:52	07:18		07:33		08:00 (T76)	06:43	19:14 (T42)		06:08	20:10 (T41)	05:59		20:10 (T41)
	17:35	18:13		19:45	70	18:54 (T77)	20:17	39	19:53 (T42)	20:48	15	20:25 (T41)	21:08	29	20:39 (T41)
23	07:51	07:16		07:31		08:00 (T76)	06:41	19:14 (T42)		06:07	20:09 (T41)	05:59		20:11 (T41)
	17:36	18:15		19:46	67	18:53 (T77)	20:18	40	19:54 (T42)	20:49	16	20:25 (T41)	21:08	29	20:40 (T41)
24	07:50	07:15		07:30		08:01 (T76)	06:40	19:13 (T42)		06:06	20:08 (T41)	05:59		20:11 (T41)
	17:38	18:16		19:47	61	18:51 (T77)	20:19	40	19:53 (T42)	20:50	18	20:26 (T41)	21:08	29	20:40 (T41)
25	07:49	07:13		07:28		08:01 (T76)	06:38	19:12 (T42)		06:06	20:08 (T41)	06:00		20:11 (T41)
	17:39	18:17		19:48	57	18:49 (T77)	20:21	42	19:54 (T42)	20:51	19	20:27 (T41)	21:08	29	20:40 (T41)
26	07:49	07:12		07:26		08:02 (T76)	06:37	19:11 (T42)		06:05	20:07 (T41)	06:00		20:12 (T41)
	17:40	18:18		19:50	49	18:46 (T77)	20:22	42	19:53 (T42)	20:52	21	20:28 (T41)	21:08	28	20:40 (T41)
27	07:48	07:10	17:34 (T77)	07:24		08:02 (T76)	06:36	19:11 (T42)		06:04	20:08 (T41)	06:00		20:12 (T41)
	17:41	18:19	15 17:49 (T77)	19:51	40	18:42 (T77)	20:23	43	19:54 (T42)	20:53	21	20:29 (T41)	21:08	28	20:40 (T41)
28	07:47	07:09	17:30 (T77)	07:23		08:05 (T76)	06:34	19:12 (T42)		06:04	20:07 (T41)	06:01		20:12 (T41)
	17:42	18:21	22 17:52 (T77)	19:52	21	08:26 (T76)	20:24	42	19:54 (T42)	20:54	22	20:29 (T41)	21:09	28	20:40 (T41)
29	07:46			07:21		08:06 (T76)	06:33	19:11 (T42)		06:03	20:06 (T41)	06:01		20:12 (T41)
	17:44			19:53	17	08:23 (T76)	20:25	42	19:53 (T42)	20:54	24	20:30 (T41)	21:09	29	20:41 (T41)
30	07:45			07:19		08:09 (T76)	06:32	19:11 (T42)		06:02	20:07 (T41)	06:02		20:12 (T41)
	17:45			19:54	10	08:19 (T76)	20:26	42	19:53 (T42)	20:55	24	20:31 (T41)	21:08	29	20:41 (T41)
31	07:44			07:18						06:02		20:06 (T41)			
	17:46			19:55						20:56	25	20:31 (T41)			
Potential sun hours	297	297		370		399		448		453	
Total, worst case		37		1607		596		777		848	
Sun reduction		0.40		0.44		0.52		0.57		0.64	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.67		0.64		0.57		0.56		0.54	
Total reduction		0.27		0.28		0.30		0.32		0.35	
Total, real		10		458		179		252		297	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 880 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6896)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		20:13 (T41)	06:26	19:27 (T42)	06:57		07:27	07:47 (T76)	07:02	07:37
	21:08	29	20:42 (T41)	20:50 29	19:56 (T42)	20:07		19:15 71	18:41 (T77)	17:28	17:04
2	06:03		20:13 (T41)	06:27	19:26 (T42)	06:58		07:29	07:48 (T76)	07:03	07:38
	21:08	28	20:41 (T41)	20:49 31	19:57 (T42)	20:06		19:13 68	18:40 (T77)	17:27	17:03
3	06:03		20:13 (T41)	06:28	19:25 (T42)	06:59		07:30	07:49 (T76)	07:04	07:39
	21:08	29	20:42 (T41)	20:48 33	19:58 (T42)	20:04		19:11 64	18:40 (T77)	17:26	17:03
4	06:04		20:13 (T41)	06:29	19:24 (T42)	07:00		07:31	07:52 (T76)	07:06	07:40
	21:08	29	20:42 (T41)	20:47 35	19:59 (T42)	20:02		19:10 57	18:39 (T77)	17:24	17:03
5	06:04		20:13 (T41)	06:30	19:24 (T42)	07:01		07:32	17:55 (T77)	07:07	07:41
	21:08	29	20:42 (T41)	20:46 36	20:00 (T42)	20:01		19:08 44	18:39 (T77)	17:23	17:03
6	06:05		20:13 (T41)	06:31	19:23 (T42)	07:02		07:33	17:55 (T77)	07:08	07:42
	21:08	29	20:42 (T41)	20:44 37	20:00 (T42)	19:57		19:06 43	18:38 (T77)	17:22	17:03
7	06:05		20:14 (T41)	06:32	19:22 (T42)	07:03		07:34	17:56 (T77)	07:09	07:43
	21:07	28	20:42 (T41)	20:43 39	20:01 (T42)	19:56		19:05 41	18:37 (T77)	17:21	17:03
8	06:06		20:14 (T41)	06:33	19:22 (T42)	07:04		07:35	17:56 (T77)	07:10	07:44
	21:07	28	20:42 (T41)	20:42 39	20:01 (T42)	19:54		19:03 40	18:36 (T77)	17:20	17:03
9	06:07		20:14 (T41)	06:34	19:21 (T42)	07:05		07:36	17:57 (T77)	07:12	07:45
	21:07	27	20:41 (T41)	20:41 41	20:02 (T42)	19:52		19:01 37	18:34 (T77)	17:19	17:03
10	06:07		20:14 (T41)	06:35	19:21 (T42)	07:06		07:37	17:57 (T77)	07:13	07:46
	21:06	27	20:41 (T41)	20:39 41	20:02 (T42)	19:51		19:00 36	18:33 (T77)	17:18	17:03
11	06:08		20:15 (T41)	06:36	19:20 (T42)	07:07		07:38	17:58 (T77)	07:14	07:46
	21:06	26	20:41 (T41)	20:38 42	20:02 (T42)	19:49		18:58 33	18:31 (T77)	17:17	17:03
12	06:09		20:14 (T41)	06:37	19:20 (T42)	07:08		07:39	18:00 (T77)	07:15	07:47
	21:06	26	20:40 (T41)	20:37 42	20:02 (T42)	19:47		18:57 29	18:29 (T77)	17:16	17:03
13	06:10		20:15 (T41)	06:38	19:20 (T42)	07:09	08:01 (T76)	07:40	18:01 (T77)	07:16	07:48
	21:05	25	20:40 (T41)	20:36 42	20:02 (T42)	19:45 8	08:09 (T76)	18:55 25	18:26 (T77)	17:15	17:03
14	06:10		20:16 (T41)	06:39	19:19 (T42)	07:10	07:57 (T76)	07:41	18:04 (T77)	07:18	07:49
	21:05	23	20:39 (T41)	20:34 43	20:02 (T42)	19:44 16	08:13 (T76)	18:54 19	18:23 (T77)	17:14	17:03
15	06:11		20:16 (T41)	06:40	19:19 (T42)	07:11	07:54 (T76)	07:42	18:09 (T77)	07:19	07:50
	21:04	23	20:39 (T41)	20:33 43	20:02 (T42)	19:42 21	08:15 (T76)	18:52 11	18:20 (T77)	17:13	17:03
16	06:12		20:16 (T41)	06:41	19:18 (T42)	07:12	07:52 (T76)	07:44		07:20	07:50
	21:03	22	20:38 (T41)	20:31 43	20:01 (T42)	19:40 36	18:30 (T77)	18:50		17:12	17:04
17	06:13		20:17 (T41)	06:42	19:18 (T42)	07:13	07:50 (T76)	07:45		07:21	07:51
	21:03	20	20:37 (T41)	20:30 42	20:00 (T42)	19:39 47	18:33 (T77)	18:49		17:11	17:04
18	06:14		20:17 (T41)	06:43	19:18 (T42)	07:14	07:49 (T76)	07:46		07:22	07:52
	21:02	20	20:37 (T41)	20:29 42	20:00 (T42)	19:37 55	18:36 (T77)	18:47		17:11	17:04
19	06:14		20:18 (T41)	06:44	19:18 (T42)	07:15	07:48 (T76)	07:47		07:23	07:52
	21:01	19	20:37 (T41)	20:27 41	19:59 (T42)	19:35 59	18:37 (T77)	18:46		17:10	17:05
20	06:15		20:19 (T41)	06:45	19:19 (T42)	07:16	07:47 (T76)	07:48		07:25	07:53
	21:01	17	20:36 (T41)	20:26 39	19:58 (T42)	19:33 65	18:39 (T77)	18:44		17:09	17:05
21	06:16		20:19 (T41)	06:46	19:19 (T42)	07:17	07:46 (T76)	07:49		07:26	07:53
	21:00	16	20:35 (T41)	20:24 39	19:58 (T42)	19:32 69	18:40 (T77)	18:43		17:08	17:06
22	06:17		20:20 (T41)	06:47	19:20 (T42)	07:18	07:45 (T76)	07:50		07:27	07:54
	20:59	14	20:34 (T41)	20:23 37	19:57 (T42)	19:30 72	18:40 (T77)	18:41		17:08	17:06
23	06:18		20:21 (T41)	06:48	19:20 (T42)	07:19	07:45 (T76)	07:51		07:28	07:54
	20:58	12	20:33 (T41)	20:21 36	19:56 (T42)	19:28 74	18:41 (T77)	18:40		17:07	17:07
24	06:19		20:23 (T41)	06:49	19:21 (T42)	07:20	07:44 (T76)	07:53		07:29	07:55
	20:58	10	20:33 (T41)	20:20 33	19:54 (T42)	19:27 75	18:41 (T77)	18:39		17:07	17:07
25	06:20		20:25 (T41)	06:50	19:22 (T42)	07:21	07:44 (T76)	07:54		07:30	07:55
	20:57	7	20:32 (T41)	20:18 31	19:53 (T42)	19:25 77	18:42 (T77)	18:37		17:06	17:08
26	06:21		19:42 (T42)	06:51	19:23 (T42)	07:22	07:44 (T76)	07:55		07:32	07:56
	20:56	4	20:31 (T41)	20:17 28	19:51 (T42)	19:23 77	18:42 (T77)	18:36		17:06	17:08
27	06:22		19:36 (T42)	06:52	19:25 (T42)	07:23	07:44 (T76)	07:56		07:33	07:56
	20:55	13	19:49 (T42)	20:15 24	19:49 (T42)	19:21 78	18:42 (T77)	18:34		17:05	17:09
28	06:22		19:34 (T42)	06:53	19:27 (T42)	07:24	07:44 (T76)	07:57		07:34	07:56
	20:54	17	19:51 (T42)	20:14 20	19:47 (T42)	19:20 78	18:42 (T77)	18:33		17:05	17:10
29	06:23		19:31 (T42)	06:54	19:30 (T42)	07:25	07:45 (T76)	07:58		07:35	07:57
	20:53	21	19:52 (T42)	20:12 13	19:43 (T42)	19:18 76	18:41 (T77)	18:32		17:04	17:10
30	06:24		19:30 (T42)	06:55		07:26	07:46 (T76)	08:00		07:36	07:57
	20:52	24	19:54 (T42)	20:10		19:16 73	18:41 (T77)	18:30		17:04	17:11
31	06:25		19:28 (T42)	06:56				08:01			07:57
	20:51	27	19:55 (T42)	20:09				18:29			17:12
Potential sun hours	460		429		375		345		297	287	
Total, worst case		669		1041		1056		618			
Sun reduction		0.66		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.55		0.57		0.63		0.66			
Total reduction		0.36		0.35		0.38		0.32			
Total, real		244		367		398		197			

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 923 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6930)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58		08:38 (T38)	07:44		08:45 (T38)	07:07		07:27 (T37)	07:16			06:30			06:02		06:27 (T87)
	17:13	55	09:33 (T38)	17:48	61	09:46 (T38)	18:22	23	07:50 (T37)	19:56			20:27			20:57	56	07:23 (T34)
2	07:58		08:38 (T38)	07:43		08:46 (T38)	07:06		07:25 (T37)	07:15			06:29			06:01		06:27 (T87)
	17:14	56	09:34 (T38)	17:49	59	09:45 (T38)	18:23	25	07:50 (T37)	19:57			20:28			20:58	57	07:24 (T34)
3	07:58		08:39 (T38)	07:42		08:46 (T38)	07:04		07:24 (T37)	07:13			06:28			06:01		06:27 (T87)
	17:15	55	09:34 (T38)	17:50	59	09:45 (T38)	18:24	27	07:51 (T37)	19:58			20:29			20:59	57	07:24 (T34)
4	07:58		08:39 (T38)	07:41		08:47 (T38)	07:03		07:22 (T37)	07:11			06:27			06:00		06:27 (T87)
	17:16	56	09:35 (T38)	17:51	58	09:45 (T38)	18:25	29	07:51 (T37)	19:59			20:30			20:59	58	07:25 (T34)
5	07:58		08:39 (T38)	07:40		08:48 (T38)	07:01		07:22 (T37)	07:10			06:25			06:00		06:28 (T87)
	17:17	57	09:36 (T38)	17:53	56	09:44 (T38)	18:27	30	07:52 (T37)	20:01			20:32			21:00	58	07:26 (T34)
6	07:58		08:39 (T38)	07:39		08:49 (T38)	07:00		07:21 (T37)	07:08			06:24			06:00		06:28 (T87)
	17:18	58	09:37 (T38)	17:54	55	09:44 (T38)	18:28	31	07:52 (T37)	20:01			20:33			21:01	58	07:26 (T34)
7	07:58		08:40 (T38)	07:37		08:50 (T38)	06:58		07:20 (T37)	07:06			06:23			05:59		06:28 (T87)
	17:19	58	09:38 (T38)	17:55	53	09:43 (T38)	18:29	31	07:51 (T37)	20:02			20:34			21:02	58	07:26 (T34)
8	07:58		08:40 (T38)	07:36		08:50 (T38)	07:56		08:20 (T37)	07:05			06:22			05:59		06:28 (T87)
	17:20	58	09:38 (T38)	17:56	51	09:41 (T38)	19:30	32	08:52 (T37)	20:03			20:35			21:02	58	07:26 (T34)
9	07:57		08:39 (T38)	07:35		08:51 (T38)	07:55		08:20 (T37)	07:03			06:21			05:59		06:29 (T87)
	17:21	59	09:38 (T38)	17:58	50	09:41 (T38)	19:31	31	08:51 (T37)	20:04			20:36			21:03	58	07:27 (T34)
10	07:57		08:40 (T38)	07:34		08:52 (T38)	07:53		08:20 (T37)	07:02			06:19			05:59		06:29 (T87)
	17:22	59	09:39 (T38)	17:59	48	09:40 (T38)	19:32	30	08:50 (T37)	20:05			20:37			21:03	58	07:27 (T34)
11	07:57		08:40 (T38)	07:33		08:54 (T38)	07:52		08:21 (T37)	07:00			06:18			05:59		06:30 (T87)
	17:23	60	09:40 (T38)	18:00	45	09:39 (T38)	19:33	29	08:50 (T37)	20:06			20:38			21:04	58	07:28 (T34)
12	07:57		08:40 (T38)	07:31		08:54 (T38)	07:50		08:21 (T37)	06:58			06:17		06:38 (T87)	05:58		06:30 (T87)
	17:24	60	09:40 (T38)	18:01	42	09:36 (T38)	19:35	27	08:48 (T37)	20:07			20:39	10	06:48 (T87)	21:04	58	07:28 (T34)
13	07:56		08:40 (T38)	07:30		08:56 (T38)	07:48		08:21 (T37)	06:57			06:16		06:37 (T87)	05:58		06:30 (T87)
	17:25	61	09:41 (T38)	18:03	39	09:35 (T38)	19:36	26	08:47 (T37)	20:08			20:40	14	06:51 (T87)	21:05	58	07:28 (T34)
14	07:56		08:41 (T38)	07:29		08:58 (T38)	07:47		08:23 (T37)	06:55			06:15		06:36 (T87)	05:58		06:31 (T87)
	17:26	61	09:42 (T38)	18:04	35	09:33 (T38)	19:37	23	08:46 (T37)	20:09			20:41	26	07:02 (T34)	21:05	58	07:29 (T34)
15	07:56		08:40 (T38)	07:28		08:59 (T38)	07:45		08:24 (T37)	06:54			06:14		06:35 (T87)	05:58		06:31 (T87)
	17:27	62	09:42 (T38)	18:05	31	09:30 (T38)	19:38	20	08:44 (T37)	20:10			20:42	31	07:06 (T34)	21:06	58	07:29 (T34)
16	07:55		08:41 (T38)	07:26		09:02 (T38)	07:43		08:25 (T37)	06:52			06:13		06:34 (T87)	05:58		06:31 (T87)
	17:28	62	09:43 (T38)	18:06	26	09:28 (T38)	19:39	16	08:41 (T37)	20:11			20:43	35	07:09 (T34)	21:06	58	07:29 (T34)
17	07:55		08:41 (T38)	07:25		09:06 (T38)	07:42		08:30 (T37)	06:51			06:12		06:33 (T87)	05:58		06:31 (T87)
	17:29	62	09:43 (T38)	18:08	18	09:24 (T38)	19:40	7	08:37 (T37)	20:12			20:44	37	07:10 (T34)	21:07	58	07:29 (T34)
18	07:54		08:42 (T38)	07:24			07:40			06:49			06:11		06:32 (T87)	05:58		06:32 (T87)
	17:31	62	09:44 (T38)	18:09			19:41			20:13			20:45	40	07:12 (T34)	21:07	58	07:30 (T34)
19	07:54		08:41 (T38)	07:22			07:38			06:47			06:10		06:31 (T87)	05:59		06:32 (T87)
	17:32	63	09:44 (T38)	18:10			19:42			20:14			20:46	42	07:13 (T34)	21:07	58	07:30 (T34)
20	07:53		08:41 (T38)	07:21			07:37			06:46			06:10		06:30 (T87)	05:59		06:32 (T87)
	17:33	63	09:44 (T38)	18:11			19:43			20:16			20:47	44	07:14 (T34)	21:08	58	07:30 (T34)
21	07:53		08:42 (T38)	07:19			07:35			06:44			06:09		06:30 (T87)	05:59		06:32 (T87)
	17:34	63	09:45 (T38)	18:12			19:44			20:17			20:48	46	07:16 (T34)	21:08	58	07:30 (T34)
22	07:52		08:42 (T38)	07:18			07:33			06:43			06:08		06:29 (T87)	05:59		06:33 (T87)
	17:35	63	09:45 (T38)	18:14			19:45			20:18			20:49	48	07:17 (T34)	21:08	58	07:31 (T34)
23	07:51		08:42 (T38)	07:16			07:31			06:42			06:07		06:28 (T87)	05:59		06:33 (T87)
	17:36	63	09:45 (T38)	18:15			19:47			20:19			20:50	50	07:18 (T34)	21:08	58	07:31 (T34)
24	07:51		08:42 (T38)	07:15			07:30			06:40			06:06		06:28 (T87)	06:00		06:33 (T87)
	17:38	64	09:46 (T38)	18:16			19:48			20:20			20:50	51	07:19 (T34)	21:09	58	07:31 (T34)
25	07:50		08:43 (T38)	07:14			07:28			06:39			06:06		06:27 (T87)	06:00		06:32 (T87)
	17:39	64	09:47 (T38)	18:17			19:49			20:21			20:51	53	07:20 (T34)	21:09	58	07:30 (T34)
26	07:49		08:43 (T38)	07:12		07:32 (T37)	07:26			06:37			06:05		06:26 (T87)	06:00		06:33 (T87)
	17:40	63	09:46 (T38)	18:18	13	07:45 (T37)	19:50			20:22			20:52	54	07:20 (T34)	21:09	58	07:31 (T34)
27	07:48		08:43 (T38)	07:11		07:30 (T37)	07:25			06:36			06:04		06:27 (T87)	06:01		06:33 (T87)
	17:41	63	09:46 (T38)	18:20	17	07:47 (T37)	19:51			20:23			20:53	54	07:21 (T34)	21:09	58	07:31 (T34)
28	07:47		08:43 (T38)	07:09		07:28 (T37)	07:23			06:34			06:04		06:26 (T87)	06:01		06:33 (T87)
	17:43	63	09:46 (T38)	18:21	20	07:48 (T37)	19:52			20:24			20:54	55	07:21 (T34)	21:09	58	07:31 (T34)
29	07:47		08:44 (T38)				07:21			06:33			06:03		06:27 (T87)	06:01		06:34 (T87)
	17:44	62	09:46 (T38)				19:53			20:25			20:55	56	07:23 (T34)	21:09	58	07:32 (T34)
30	07:46		08:44 (T38)				07:20			06:32			06:03		06:26 (T87)	06:02		06:33 (T87)
	17:45	62	09:46 (T38)				19:54			20:26			20:56	57	07:23 (T34)	21:09	58	07:31 (T34)
31	07:45		08:45 (T38)				07:18						06:02		06:27 (T87)			
	17:46	61	09:46 (T38)				19:55						20:56	57	07:24 (T34)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		1878			836			437						860			1736	
Sun reduction		0.31			0.40			0.44						0.57			0.64	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.53			0.53			0.57						0.71			0.71	
Total reduction		0.16			0.20			0.24						0.39			0.43	
Total, real		291			168			105						332			753	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 923 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6930)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		06:34 (T87)	06:26		06:48 (T87)	06:58			07:28		08:01 (T37)	07:02		08:22 (T38)	07:37		08:22 (T38)
	21:09	58	07:32 (T34)	20:50	9	06:57 (T87)	20:07			19:15	27	08:28 (T37)	17:28	48	09:10 (T38)	17:04	60	09:22 (T38)
2	06:03		06:33 (T87)	06:27			06:59			07:29		08:00 (T37)	07:04		08:20 (T38)	07:38		08:23 (T38)
	21:09	58	07:31 (T34)	20:49			20:06			19:13	28	08:28 (T37)	17:27	51	09:11 (T38)	17:04	59	09:22 (T38)
3	06:03		06:34 (T87)	06:28			07:00			07:30		07:59 (T37)	07:05		08:19 (T38)	07:39		08:23 (T38)
	21:09	58	07:32 (T34)	20:48			20:04			19:12	29	08:28 (T37)	17:26	52	09:11 (T38)	17:03	59	09:22 (T38)
4	06:04		06:34 (T87)	06:29			07:01			07:31		07:58 (T37)	07:06		08:18 (T38)	07:40		08:24 (T38)
	21:08	58	07:32 (T34)	20:47			20:03			19:10	30	08:28 (T37)	17:25	54	09:12 (T38)	17:03	58	09:22 (T38)
5	06:04		06:34 (T87)	06:30			07:02			07:32		07:57 (T37)	07:07		08:18 (T38)	07:41		08:25 (T38)
	21:08	58	07:32 (T34)	20:46			20:01			19:08	31	08:28 (T37)	17:23	56	09:14 (T38)	17:03	58	09:23 (T38)
6	06:05		06:35 (T87)	06:31			07:03			07:33		07:57 (T37)	07:08		08:17 (T38)	07:42		08:25 (T38)
	21:08	57	07:32 (T34)	20:45			19:58			19:07	31	08:28 (T37)	17:22	57	09:14 (T38)	17:03	58	09:23 (T38)
7	06:06		06:34 (T87)	06:32			07:04			07:34		07:56 (T37)	07:10		08:17 (T38)	07:43		08:26 (T38)
	21:08	58	07:32 (T34)	20:44			19:56			19:05	32	08:28 (T37)	17:21	58	09:15 (T38)	17:03	57	09:23 (T38)
8	06:06		06:35 (T87)	06:33			07:05			07:35		07:56 (T37)	07:11		08:17 (T38)	07:44		08:27 (T38)
	21:07	57	07:32 (T34)	20:42			19:54			19:03	31	08:27 (T37)	17:20	59	09:16 (T38)	17:03	56	09:23 (T38)
9	06:07		06:34 (T87)	06:34			07:06			07:36		07:56 (T37)	07:12		08:16 (T38)	07:45		08:28 (T38)
	21:07	57	07:31 (T34)	20:41			19:53			19:02	30	08:26 (T37)	17:19	60	09:16 (T38)	17:03	55	09:23 (T38)
10	06:08		06:34 (T87)	06:35			07:07			07:37		07:57 (T37)	07:13		08:16 (T38)	07:46		08:28 (T38)
	21:07	58	07:32 (T34)	20:40			19:51			19:00	29	08:26 (T37)	17:18	61	09:17 (T38)	17:03	56	09:24 (T38)
11	06:08		06:35 (T87)	06:36			07:08			07:38		07:58 (T37)	07:14		08:15 (T38)	07:47		08:28 (T38)
	21:06	57	07:32 (T34)	20:39			19:49			18:59	26	08:24 (T37)	17:17	62	09:17 (T38)	17:03	55	09:23 (T38)
12	06:09		06:34 (T87)	06:37			07:09			07:39		08:00 (T37)	07:16		08:16 (T38)	07:48		08:29 (T38)
	21:06	57	07:31 (T34)	20:37			19:47			18:57	24	08:24 (T37)	17:16	62	09:18 (T38)	17:03	55	09:24 (T38)
13	06:10		06:35 (T87)	06:38			07:10			07:41		08:01 (T37)	07:17		08:16 (T38)	07:48		08:30 (T38)
	21:05	56	07:31 (T34)	20:36			19:46			18:55	22	08:23 (T37)	17:15	62	09:18 (T38)	17:03	54	09:24 (T38)
14	06:11		06:35 (T87)	06:39			07:11			07:42		08:02 (T37)	07:18		08:15 (T38)	07:49		08:31 (T38)
	21:05	56	07:31 (T34)	20:35			19:44			18:54	19	08:21 (T37)	17:14	63	09:18 (T38)	17:03	54	09:25 (T38)
15	06:11		06:36 (T87)	06:40			07:12			07:43		08:03 (T37)	07:19		08:16 (T38)	07:50		08:31 (T38)
	21:04	55	07:31 (T34)	20:33			19:42			18:52	15	08:18 (T37)	17:13	63	09:19 (T38)	17:04	53	09:24 (T38)
16	06:12		06:35 (T87)	06:41			07:13			07:44		08:05 (T37)	07:20		08:16 (T38)	07:51		08:32 (T38)
	21:04	55	07:30 (T34)	20:32			19:41			18:51	10	08:15 (T37)	17:12	63	09:19 (T38)	17:04	53	09:25 (T38)
17	06:13		06:35 (T87)	06:42			07:14			07:45			07:21		08:16 (T38)	07:51		08:32 (T38)
	21:03	55	07:30 (T34)	20:30			19:39			18:49			17:12	63	09:19 (T38)	17:04	53	09:25 (T38)
18	06:14		06:36 (T87)	06:43			07:15			07:46			07:23		08:16 (T38)	07:52		08:32 (T38)
	21:03	53	07:29 (T34)	20:29			19:37			18:48			17:11	64	09:20 (T38)	17:04	53	09:25 (T38)
19	06:15		06:37 (T87)	06:44			07:16			07:47			07:24		08:17 (T38)	07:53		08:33 (T38)
	21:02	52	07:29 (T34)	20:28			19:35			18:46			17:10	63	09:20 (T38)	17:05	53	09:26 (T38)
20	06:15		06:38 (T87)	06:45			07:17			07:48			07:25		08:17 (T38)	07:53		08:34 (T38)
	21:01	51	07:29 (T34)	20:26			19:34			18:45			17:09	63	09:20 (T38)	17:05	53	09:27 (T38)
21	06:16		06:39 (T87)	06:46			07:18			07:49			07:26		08:17 (T38)	07:54		08:34 (T38)
	21:00	49	07:28 (T34)	20:25			19:32			18:43			17:09	63	09:20 (T38)	17:06	53	09:27 (T38)
22	06:17		06:39 (T87)	06:47			07:19			07:51			07:27		08:17 (T38)	07:54		08:35 (T38)
	21:00	47	07:26 (T34)	20:23			19:30			18:42			17:08	63	09:20 (T38)	17:06	53	09:28 (T38)
23	06:18		06:40 (T87)	06:48			07:20			07:52			07:29		08:18 (T38)	07:55		08:35 (T38)
	20:59	45	07:25 (T34)	20:22			19:29			18:40			17:07	63	09:21 (T38)	17:07	53	09:28 (T38)
24	06:19		06:41 (T87)	06:49			07:21			07:53		09:40 (T38)	07:30		08:19 (T38)	07:55		08:35 (T38)
	20:58	43	07:24 (T34)	20:20			19:27			18:39	10	09:50 (T38)	17:07	62	09:21 (T38)	17:07	53	09:28 (T38)
25	06:20		06:42 (T87)	06:50			07:22			07:54		09:35 (T38)	07:31		08:19 (T38)	07:56		08:36 (T38)
	20:57	41	07:23 (T34)	20:19			19:25			18:37	20	09:55 (T38)	17:06	62	09:21 (T38)	17:08	53	09:29 (T38)
26	06:21		06:43 (T87)	06:51			07:23			07:55		09:31 (T38)	07:32		08:19 (T38)	07:56		08:36 (T38)
	20:56	39	07:22 (T34)	20:17			19:23			18:36	27	09:58 (T38)	17:06	62	09:21 (T38)	17:08	53	09:29 (T38)
27	06:22		06:44 (T87)	06:52			07:24		08:08 (T37)	07:56		09:29 (T38)	07:33		08:20 (T38)	07:56		08:37 (T38)
	20:55	36	07:20 (T34)	20:15			19:22	13	08:21 (T37)	18:35	32	10:01 (T38)	17:05	61	09:21 (T38)	17:09	53	09:30 (T38)
28	06:23		06:45 (T87)	06:53			07:25		08:06 (T37)	07:58		09:27 (T38)	07:34		08:20 (T38)	07:57		08:38 (T38)
	20:54	33	07:18 (T34)	20:14			19:20	18	08:24 (T37)	18:33	37	10:04 (T38)	17:05	61	09:21 (T38)	17:10	53	09:31 (T38)
29	06:24		06:46 (T87)	06:55			07:26		08:04 (T37)	07:59		09:25 (T38)	07:35		08:21 (T38)	07:57		08:38 (T38)
	20:54	29	07:15 (T34)	20:12			19:18	22	08:26 (T37)	18:32	40	10:05 (T38)	17:05	61	09:22 (T38)	17:11	53	09:31 (T38)
30	06:25		06:47 (T87)	06:56			07:27		08:02 (T37)	08:00		09:24 (T38)	07:36		08:22 (T38)	07:57		08:38 (T38)
	20:53	16	07:08 (T34)	20:11			19:17	25	08:27 (T37)	18:31	43	10:07 (T38)	17:04	60	09:22 (T38)	17:11	54	09:32 (T38)
31	06:25		06:47 (T87)	06:57						08:01		09:22 (T38)				07:57		08:38 (T38)
	20:51	13	07:00 (T87)	20:09						18:29	46	10:08 (T38)				17:12	54	09:32 (T38)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		1515			9			78			669			1802			1697	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.71			0.71			0.57			0.55			0.53			0.53	
Total reduction		0.45			0.41			0.32			0.25			0.15			0.11	
Total, real		678			4			25			169			270			187	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 932 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6939)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		16:21 (T77)	07:07	07:37 (T76)	07:16	18:30 (T42)	06:30	19:38 (T41)	06:01
	17:13		17:47	48	17:09 (T77)	18:22 27	08:04 (T76)	19:56 42	19:12 (T42)	20:27 27	20:05 (T41)	20:57
2	07:57		07:42		16:21 (T77)	07:06	07:37 (T76)	07:14	18:30 (T42)	06:29	19:38 (T41)	06:01
	17:14		17:49	48	17:09 (T77)	18:23 26	08:03 (T76)	19:57 41	19:11 (T42)	20:28 28	20:06 (T41)	20:58
3	07:57		07:41		16:22 (T77)	07:04	07:38 (T76)	07:13	18:31 (T42)	06:28	19:36 (T41)	06:01
	17:15		17:50	48	17:10 (T77)	18:24 23	08:01 (T76)	19:58 39	19:10 (T42)	20:29 30	20:06 (T41)	20:58
4	07:57		07:40		16:22 (T77)	07:02	07:40 (T76)	07:11	18:32 (T42)	06:26	19:36 (T41)	06:00
	17:16		17:51	48	17:10 (T77)	18:25 20	08:00 (T76)	19:59 37	19:09 (T42)	20:30 32	20:08 (T41)	20:59
5	07:57		07:39		16:23 (T77)	07:01	07:41 (T76)	07:09	18:32 (T42)	06:25	19:36 (T41)	06:00
	17:17		17:52	47	17:10 (T77)	18:26 16	07:57 (T76)	20:00 35	19:07 (T42)	20:31 32	20:08 (T41)	21:00
6	07:57		07:38		16:22 (T77)	06:59	07:45 (T76)	07:08	18:34 (T42)	06:24	19:36 (T41)	05:59
	17:17		17:54	47	17:09 (T77)	18:27 10	07:55 (T76)	20:00 32	19:06 (T42)	20:32 32	20:08 (T41)	21:00
7	07:57	16:33 (T77)	07:37		16:23 (T77)	06:58		07:06	18:35 (T42)	06:23	19:36 (T41)	05:59
	17:18 8	16:41 (T77)	17:55	46	17:09 (T77)	18:29		20:01 28	19:03 (T42)	20:33 32	20:08 (T41)	21:01
8	07:57	16:31 (T77)	07:36		16:23 (T77)	07:56		07:05	18:38 (T42)	06:22	19:36 (T41)	05:59
	17:19 13	16:44 (T77)	17:56	46	17:09 (T77)	19:30		20:02 23	19:01 (T42)	20:34 32	20:08 (T41)	21:02
9	07:57	16:30 (T77)	07:35		16:24 (T77)	07:54		07:03	18:40 (T42)	06:20	19:37 (T41)	05:59
	17:20 17	16:47 (T77)	17:57	44	17:08 (T77)	19:31		20:03 18	18:58 (T42)	20:35 31	20:08 (T41)	21:02
10	07:57	16:29 (T77)	07:34		16:25 (T77)	07:53		07:01	18:44 (T42)	06:19	19:36 (T41)	05:59
	17:21 20	16:49 (T77)	17:59	43	17:08 (T77)	19:32		20:05 8	18:52 (T42)	20:36 31	20:07 (T41)	21:03
11	07:57	16:27 (T77)	07:32		16:25 (T77)	07:51	18:54 (T42)	07:00		06:18	19:36 (T41)	05:58
	17:23 23	16:50 (T77)	18:00	42	17:07 (T77)	19:33 5	18:59 (T42)	20:06		20:37 30	20:06 (T41)	21:04
12	07:56	16:27 (T77)	07:31		16:26 (T77)	07:50	18:48 (T42)	06:58		06:17	19:37 (T41)	05:58
	17:24 25	16:52 (T77)	18:01	40	17:06 (T77)	19:34 18	19:06 (T42)	20:07		20:38 29	20:06 (T41)	21:04
13	07:56	16:26 (T77)	07:30		16:28 (T77)	07:48	18:44 (T42)	06:57		06:16	19:37 (T41)	05:58
	17:25 28	16:54 (T77)	18:02	38	17:06 (T77)	19:35 24	19:08 (T42)	20:08		20:39 28	20:05 (T41)	21:05
14	07:56	16:25 (T77)	07:29		16:28 (T77)	07:46	18:41 (T42)	06:55		06:15	19:38 (T41)	05:58
	17:26 29	16:54 (T77)	18:04	36	17:04 (T77)	19:36 29	19:10 (T42)	20:09		20:40 27	20:05 (T41)	21:05
15	07:55	16:25 (T77)	07:27		07:47 (T76)	07:45	18:40 (T42)	06:53		06:14	19:38 (T41)	05:58
	17:27 31	16:56 (T77)	18:05	44	17:03 (T77)	19:38 32	19:12 (T42)	20:10		20:42 26	20:04 (T41)	21:05
16	07:55	16:24 (T77)	07:26		07:46 (T76)	07:43	18:38 (T42)	06:52		06:13	19:40 (T41)	05:58
	17:28 33	16:57 (T77)	18:06	45	17:02 (T77)	19:39 35	19:13 (T42)	20:11		20:42 24	20:04 (T41)	21:06
17	07:54	16:24 (T77)	07:25		07:44 (T76)	07:41	18:36 (T42)	06:50		06:12	19:41 (T41)	05:58
	17:29 35	16:59 (T77)	18:07	44	16:59 (T77)	19:40 38	19:14 (T42)	20:12		20:43 22	20:03 (T41)	21:06
18	07:54	16:23 (T77)	07:23		07:43 (T76)	07:40	18:35 (T42)	06:49		06:11	19:41 (T41)	05:58
	17:30 36	16:59 (T77)	18:09	41	16:57 (T77)	19:41 40	19:15 (T42)	20:13		20:44 21	20:02 (T41)	21:07
19	07:53	16:23 (T77)	07:22		07:42 (T76)	07:38	18:34 (T42)	06:47		06:10	19:42 (T41)	05:58
	17:32 38	17:01 (T77)	18:10	37	16:54 (T77)	19:42 42	19:16 (T42)	20:14		20:45 19	20:01 (T41)	21:07
20	07:53	16:23 (T77)	07:20		07:40 (T76)	07:36	18:32 (T42)	06:46		06:09	19:44 (T41)	05:59
	17:33 39	17:02 (T77)	18:11	25	08:05 (T76)	19:43 44	19:16 (T42)	20:15		20:46 15	19:59 (T41)	21:07
21	07:52	16:22 (T77)	07:19		07:39 (T76)	07:35	18:32 (T42)	06:44		06:09	19:45 (T41)	05:59
	17:34 40	17:02 (T77)	18:12	27	08:06 (T76)	19:44 45	19:17 (T42)	20:16		20:47 13	19:58 (T41)	21:08
22	07:52	16:22 (T77)	07:18		07:37 (T76)	07:33	18:31 (T42)	06:43		06:08	19:49 (T41)	05:59
	17:35 42	17:04 (T77)	18:13	29	08:06 (T76)	19:45 46	19:17 (T42)	20:17		20:48 7	19:56 (T41)	21:08
23	07:51	16:22 (T77)	07:16		07:37 (T76)	07:31	18:30 (T42)	06:41		06:07		05:59
	17:36 42	17:04 (T77)	18:15	30	08:07 (T76)	19:46 46	19:16 (T42)	20:18		20:49		21:08
24	07:50	16:21 (T77)	07:15		07:36 (T76)	07:30	18:30 (T42)	06:40	19:51 (T41)	06:06		05:59
	17:38 44	17:05 (T77)	18:16	30	08:06 (T76)	19:47 47	19:17 (T42)	20:19 5	19:56 (T41)	20:50		21:08
25	07:49	16:21 (T77)	07:13		07:36 (T76)	07:28	18:30 (T42)	06:38	19:47 (T41)	06:06		06:00
	17:39 44	17:05 (T77)	18:17	31	08:07 (T76)	19:48 47	19:17 (T42)	20:21 12	19:59 (T41)	20:51		21:08
26	07:49	16:21 (T77)	07:12		07:36 (T76)	07:26	18:29 (T42)	06:37	19:44 (T41)	06:05		06:00
	17:40 45	17:06 (T77)	18:18	30	08:06 (T76)	19:50 47	19:16 (T42)	20:22 15	19:59 (T41)	20:52		21:08
27	07:48	16:21 (T77)	07:10		07:36 (T76)	07:24	18:28 (T42)	06:36	19:42 (T41)	06:04		06:00
	17:41 46	17:07 (T77)	18:19	30	08:06 (T76)	19:51 47	19:15 (T42)	20:23 19	20:01 (T41)	20:53		21:08
28	07:47	16:21 (T77)	07:09		07:36 (T76)	07:23	18:29 (T42)	06:34	19:41 (T41)	06:04		06:01
	17:42 47	17:08 (T77)	18:21	29	08:05 (T76)	19:52 46	19:15 (T42)	20:24 21	20:02 (T41)	20:54		21:09
29	07:46	16:21 (T77)				07:21	18:29 (T42)	06:33	19:39 (T41)	06:03		06:01
	17:44 47	17:08 (T77)				19:53 46	19:15 (T42)	20:25 23	20:02 (T41)	20:54		21:09
30	07:45	16:21 (T77)				07:19	18:29 (T42)	06:32	19:38 (T41)	06:02		06:02
	17:45 48	17:09 (T77)				19:54 45	19:14 (T42)	20:26 26	20:04 (T41)	20:55		21:08
31	07:44	16:21 (T77)				07:18	18:30 (T42)			06:02		
	17:46 48	17:09 (T77)				19:55 43	19:13 (T42)			20:56		
Potential sun hours	297		297			370		399		448		453
Total, worst case		868		1093		934		424		568		
Sun reduction		0.31		0.40		0.44		0.52		0.57		
Oper. time red.		1.00		1.00		1.00		1.00		1.00		
Wind dir. red.		0.73		0.68		0.64		0.63		0.57		
Total reduction		0.23		0.28		0.29		0.33		0.33		
Total, real		200		301		268		141		187		

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 932 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6939)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		06:26	19:47 (T41)	06:57		07:27	18:25 (T42)	07:02	15:54 (T77)	07:37	16:09 (T77)
	21:08		20:50 30	20:17 (T41)	20:07		19:15 21	18:46 (T42)	17:28 43	16:37 (T77)	17:04 23	16:32 (T77)
2	06:03		06:27	19:47 (T41)	06:58	18:43 (T42)	07:29	18:29 (T42)	07:03	15:54 (T77)	07:38	16:11 (T77)
	21:08		20:49 30	20:17 (T41)	20:06 8	18:51 (T42)	19:13 12	18:41 (T42)	17:27 44	16:38 (T77)	17:03 20	16:31 (T77)
3	06:03		06:28	19:46 (T41)	06:59	18:38 (T42)	07:30		07:04	15:53 (T77)	07:39	16:14 (T77)
	21:08		20:48 31	20:17 (T41)	20:04 18	18:56 (T42)	19:11		17:26 45	16:38 (T77)	17:03 17	16:31 (T77)
4	06:04		06:29	19:46 (T41)	07:00	18:35 (T42)	07:31		07:06	15:52 (T77)	07:40	16:16 (T77)
	21:08		20:47 32	20:18 (T41)	20:02 23	18:58 (T42)	19:10		17:24 47	16:39 (T77)	17:03 13	16:29 (T77)
5	06:04		06:30	19:46 (T41)	07:01	18:32 (T42)	07:32		07:07	15:52 (T77)	07:41	16:18 (T77)
	21:08		20:46 32	20:18 (T41)	20:01 28	19:00 (T42)	19:08		17:23 47	16:39 (T77)	17:03 9	16:27 (T77)
6	06:05		06:31	19:46 (T41)	07:02	18:30 (T42)	07:33		07:08	15:52 (T77)	07:42	
	21:08		20:44 32	20:18 (T41)	19:57 32	19:02 (T42)	19:06		17:22 48	16:40 (T77)	17:03	
7	06:05		06:32	19:46 (T41)	07:03	18:28 (T42)	07:34	08:24 (T76)	07:09	15:52 (T77)	07:43	
	21:07		20:43 32	20:18 (T41)	19:56 35	19:03 (T42)	19:05 2	08:26 (T76)	17:21 48	16:40 (T77)	17:03	
8	06:06		06:33	19:46 (T41)	07:04	18:27 (T42)	07:35	08:18 (T76)	07:10	15:52 (T77)	07:44	
	21:07		20:42 31	20:17 (T41)	19:54 37	19:04 (T42)	19:03 14	08:32 (T76)	17:20 47	16:39 (T77)	17:03	
9	06:07		06:34	19:46 (T41)	07:05	18:25 (T42)	07:36	08:16 (T76)	07:12	15:52 (T77)	07:45	
	21:07		20:41 31	20:17 (T41)	19:52 39	19:04 (T42)	19:01 18	08:34 (T76)	17:19 48	16:40 (T77)	17:03	
10	06:07		06:35	19:46 (T41)	07:06	18:23 (T42)	07:37	08:13 (T76)	07:13	15:52 (T77)	07:46	
	21:06		20:39 30	20:16 (T41)	19:51 41	19:04 (T42)	19:00 22	08:35 (T76)	17:18 48	16:40 (T77)	17:03	
11	06:08		06:36	19:46 (T41)	07:07	18:22 (T42)	07:38	08:12 (T76)	07:14	15:52 (T77)	07:46	
	21:06		20:38 28	20:14 (T41)	19:49 42	19:04 (T42)	18:58 24	08:36 (T76)	17:17 48	16:40 (T77)	17:03	
12	06:09		06:37	19:47 (T41)	07:08	18:21 (T42)	07:39	08:10 (T76)	07:15	15:52 (T77)	07:47	
	21:06		20:37 26	20:13 (T41)	19:47 44	19:05 (T42)	18:57 27	08:37 (T76)	17:16 47	16:39 (T77)	17:03	
13	06:10		06:38	19:47 (T41)	07:09	18:20 (T42)	07:40	08:09 (T76)	07:16	15:53 (T77)	07:48	
	21:05		20:36 25	20:12 (T41)	19:45 45	19:05 (T42)	18:55 28	08:37 (T76)	17:15 47	16:40 (T77)	17:03	
14	06:10		06:39	19:48 (T41)	07:10	18:19 (T42)	07:41	08:08 (T76)	07:18	15:53 (T77)	07:49	
	21:05		20:34 23	20:11 (T41)	19:44 46	19:05 (T42)	18:54 29	08:37 (T76)	17:14 47	16:40 (T77)	17:03	
15	06:11		06:40	19:49 (T41)	07:11	18:18 (T42)	07:42	08:09 (T76)	07:19	15:53 (T77)	07:50	
	21:04		20:33 20	20:09 (T41)	19:42 47	19:05 (T42)	18:52 29	08:38 (T76)	17:13 46	16:39 (T77)	17:03	
16	06:12		06:41	19:49 (T41)	07:12	18:18 (T42)	07:44	08:08 (T76)	07:20	15:54 (T77)	07:50	
	21:03		20:31 18	20:07 (T41)	19:40 47	19:05 (T42)	18:50 30	08:38 (T76)	17:12 45	16:39 (T77)	17:04	
17	06:13		06:42	19:51 (T41)	07:13	18:17 (T42)	07:45	08:08 (T76)	07:21	15:55 (T77)	07:51	
	21:03		20:30 15	20:06 (T41)	19:39 47	19:04 (T42)	18:49 30	08:38 (T76)	17:11 44	16:39 (T77)	17:04	
18	06:14		06:43	19:53 (T41)	07:14	18:17 (T42)	07:46	08:07 (T76)	07:22	15:55 (T77)	07:52	
	21:02		20:29 11	20:04 (T41)	19:37 47	19:04 (T42)	18:47 31	08:38 (T76)	17:11 44	16:39 (T77)	17:04	
19	06:14		06:44		07:15	18:17 (T42)	07:47	08:07 (T76)	07:23	15:56 (T77)	07:52	
	21:02		20:27		19:35 46	19:03 (T42)	18:46 30	08:37 (T76)	17:10 42	16:38 (T77)	17:05	
20	06:15		06:45		07:16	18:16 (T42)	07:48	08:08 (T76)	07:25	15:57 (T77)	07:53	
	21:01		20:26		19:33 47	19:03 (T42)	18:44 28	08:36 (T76)	17:09 42	16:39 (T77)	17:05	
21	06:16		06:46		07:17	18:16 (T42)	07:49	08:10 (T76)	07:26	15:58 (T77)	07:53	
	21:00		20:24		19:32 46	19:02 (T42)	18:43 26	08:36 (T76)	17:08 40	16:38 (T77)	17:05	
22	06:17	19:57 (T41)	06:47		07:18	18:16 (T42)	07:50	08:11 (T76)	07:27	15:59 (T77)	07:54	
	20:59 10	20:07 (T41)	20:23		19:30 45	19:01 (T42)	18:41 26	17:18 (T77)	17:08 39	16:38 (T77)	17:06	
23	06:18	19:55 (T41)	06:48		07:19	18:17 (T42)	07:51	08:12 (T76)	07:28	15:59 (T77)	07:54	
	20:59 14	20:09 (T41)	20:21		19:28 43	19:00 (T42)	18:40 38	17:25 (T77)	17:07 38	16:37 (T77)	17:07	
24	06:19	19:54 (T41)	06:49		07:20	18:17 (T42)	07:53	08:13 (T76)	07:29	16:00 (T77)	07:55	
	20:58 17	20:11 (T41)	20:20		19:27 42	18:59 (T42)	18:39 43	17:28 (T77)	17:07 36	16:36 (T77)	17:07	
25	06:20	19:53 (T41)	06:50		07:21	18:17 (T42)	07:54	08:15 (T76)	07:30	16:02 (T77)	07:55	
	20:57 19	20:12 (T41)	20:18		19:25 41	18:58 (T42)	18:37 44	17:30 (T77)	17:06 35	16:37 (T77)	17:08	
26	06:21	19:52 (T41)	06:51		07:22	18:18 (T42)	07:55	08:16 (T76)	07:32	16:03 (T77)	07:56	
	20:56 21	20:13 (T41)	20:17		19:23 39	18:57 (T42)	18:36 45	17:32 (T77)	17:06 33	16:36 (T77)	17:08	
27	06:22	19:51 (T41)	06:52		07:23	18:19 (T42)	07:56	08:17 (T76)	07:33	16:04 (T77)	07:56	
	20:55 23	20:14 (T41)	20:15		19:22 36	18:55 (T42)	18:34 43	17:33 (T77)	17:05 31	16:35 (T77)	17:09	
28	06:22	19:50 (T41)	06:53		07:24	18:20 (T42)	07:57	16:58 (T77)	07:34	16:05 (T77)	07:56	
	20:54 25	20:15 (T41)	20:14		19:20 33	18:53 (T42)	18:33 36	17:34 (T77)	17:05 29	16:34 (T77)	17:10	
29	06:23	19:48 (T41)	06:54		07:25	18:21 (T42)	07:58	16:56 (T77)	07:35	16:06 (T77)	07:57	
	20:53 27	20:15 (T41)	20:12		19:18 30	18:51 (T42)	18:32 39	17:35 (T77)	17:04 28	16:34 (T77)	17:10	
30	06:24	19:48 (T41)	06:55		07:26	18:23 (T42)	08:00	16:56 (T77)	07:36	16:08 (T77)	07:57	
	20:52 28	20:16 (T41)	20:10		19:16 26	18:49 (T42)	18:30 40	17:36 (T77)	17:04 25	16:33 (T77)	17:11	
31	06:25	19:47 (T41)	06:56				08:01	16:55 (T77)			07:57	
	20:51 29	20:16 (T41)	20:09				18:29 42	17:37 (T77)			17:12	
Potential sun hours	460		429		375		345		297		287	
Total, worst case	213		477		1100		797		1251		82	
Sun reduction	0.66		0.61		0.59		0.48		0.30		0.22	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.57		0.57		0.65		0.63		0.73		0.73	
Total reduction	0.38		0.35		0.39		0.31		0.22		0.16	
Total, real	81		168		431		244		278		13	

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 938 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6944)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57		15:34 (T77)	07:43		08:04 (T76)	07:07		16:45 (T42)	07:16		19:24 (T41)	06:30			06:01		20:08 (T40)
	17:13	6	15:40 (T77)	17:47	49	17:17 (T42)	18:22	35	17:20 (T42)	19:56	6	19:30 (T41)	20:27			20:57	24	20:32 (T40)
2	07:57			07:42		08:03 (T76)	07:06		16:47 (T42)	07:14		19:18 (T41)	06:29			06:01		20:09 (T40)
	17:14			17:49	55	17:19 (T42)	18:23	30	17:17 (T42)	19:57	16	19:34 (T41)	20:28			20:58	24	20:33 (T40)
3	07:57			07:41		08:02 (T76)	07:04		16:48 (T42)	07:13		19:16 (T41)	06:28			06:01		20:08 (T40)
	17:15			17:50	58	17:20 (T42)	18:24	27	17:15 (T42)	19:58	21	19:37 (T41)	20:29			20:58	26	20:34 (T40)
4	07:57			07:40		08:01 (T76)	07:02		16:52 (T42)	07:11		19:14 (T41)	06:26			06:00		20:08 (T40)
	17:16			17:51	63	17:22 (T42)	18:25	20	17:12 (T42)	19:59	23	19:37 (T41)	20:30			20:59	27	20:35 (T40)
5	07:57			07:39		08:00 (T76)	07:01		16:55 (T42)	07:09		19:12 (T41)	06:25			06:00		20:08 (T40)
	17:17			17:52	66	17:23 (T42)	18:26	13	17:08 (T42)	20:00	26	19:38 (T41)	20:31			21:00	27	20:35 (T40)
6	07:57			07:38		07:58 (T76)	06:59			07:08		19:11 (T41)	06:24			05:59		20:07 (T40)
	17:17			17:54	69	17:23 (T42)	18:27			20:00	29	19:40 (T41)	20:32			21:00	28	20:35 (T40)
7	07:57			07:37		07:58 (T76)	06:58			07:06		19:09 (T41)	06:23			05:59		20:07 (T40)
	17:18			17:55	71	17:24 (T42)	18:29			20:01	31	19:40 (T41)	20:33			21:01	29	20:36 (T40)
8	07:57			07:36		07:58 (T76)	07:56			07:05		19:09 (T41)	06:22			05:59		20:08 (T40)
	17:19			17:56	72	17:25 (T42)	19:30			20:02	33	19:42 (T41)	20:34			21:02	29	20:37 (T40)
9	07:57			07:35		07:59 (T76)	07:54			07:03		19:08 (T41)	06:20			05:59		20:08 (T40)
	17:20			17:57	73	17:26 (T42)	19:31			20:03	34	19:42 (T41)	20:35			21:02	30	20:38 (T40)
10	07:57			07:34		08:00 (T76)	07:53			07:01		19:07 (T41)	06:19			05:59		20:08 (T40)
	17:21			17:59	73	17:27 (T42)	19:32			20:05	34	19:41 (T41)	20:36			21:03	30	20:38 (T40)
11	07:57			07:32		08:00 (T76)	07:51			07:00		19:07 (T41)	06:18			05:58		20:08 (T40)
	17:23			18:00	72	17:27 (T42)	19:33			20:06	35	19:42 (T41)	20:37			21:04	31	20:39 (T40)
12	07:56			07:31		08:01 (T76)	07:50			06:58		19:06 (T41)	06:17			05:58		20:07 (T40)
	17:24			18:01	71	17:27 (T42)	19:34			20:07	35	19:41 (T41)	20:38			21:04	32	20:39 (T40)
13	07:56			07:30		08:02 (T76)	07:48			06:57		19:06 (T41)	06:16			05:58		20:07 (T40)
	17:25			18:02	70	17:28 (T42)	19:35			20:08	36	19:42 (T41)	20:39			21:05	32	20:39 (T40)
14	07:56			07:29		08:03 (T76)	07:46			06:55		19:06 (T41)	06:15			05:58		20:08 (T40)
	17:26			18:04	68	17:28 (T42)	19:36			20:09	35	19:41 (T41)	20:41			21:05	31	20:39 (T40)
15	07:55			07:27		08:05 (T76)	07:45			06:53		19:05 (T41)	06:14			05:58		20:08 (T40)
	17:27			18:05	65	17:28 (T42)	19:38			20:10	35	19:40 (T41)	20:42			21:05	32	20:40 (T40)
16	07:55			07:26		08:09 (T76)	07:43			06:52		19:06 (T41)	06:13			05:58		20:08 (T40)
	17:28			18:06	58	17:29 (T42)	19:39			20:11	34	19:40 (T41)	20:43			21:06	32	20:40 (T40)
17	07:54			07:25		16:37 (T42)	07:41			06:50		19:05 (T41)	06:12			05:58		20:09 (T40)
	17:29			18:07	51	17:28 (T42)	19:40			20:12	34	19:39 (T41)	20:43			21:06	32	20:41 (T40)
18	07:54			07:23		16:38 (T42)	07:40			06:49		19:06 (T41)	06:11			05:58		20:09 (T40)
	17:30			18:09	50	17:28 (T42)	19:41			20:13	32	19:38 (T41)	20:44			21:07	33	20:42 (T40)
19	07:53			07:22		16:38 (T42)	07:38			06:47		19:06 (T41)	06:10			05:58		20:09 (T40)
	17:32			18:10	50	17:28 (T42)	19:42			20:14	31	19:37 (T41)	20:45			21:07	33	20:42 (T40)
20	07:53			07:20		16:38 (T42)	07:36			06:46		19:08 (T41)	06:09			05:59		20:09 (T40)
	17:33			18:11	50	17:28 (T42)	19:43			20:15	28	19:36 (T41)	20:46			21:07	33	20:42 (T40)
21	07:52			07:19		16:39 (T42)	07:35			06:44		19:09 (T41)	06:09			05:59		20:09 (T40)
	17:34			18:12	49	17:28 (T42)	19:44			20:16	26	19:35 (T41)	20:47			21:08	33	20:42 (T40)
22	07:52			07:18		16:38 (T42)	07:33			06:43		19:10 (T41)	06:08			05:59		20:09 (T40)
	17:35			18:13	49	17:27 (T42)	19:45			20:17	23	19:33 (T41)	20:48			21:08	33	20:42 (T40)
23	07:51			07:16		16:39 (T42)	07:31			06:41		19:12 (T41)	06:07		20:20 (T40)	05:59		20:10 (T40)
	17:36			18:15	47	17:26 (T42)	19:46			20:18	20	19:32 (T41)	20:49	2	20:22 (T40)	21:08	33	20:43 (T40)
24	07:50			07:15		16:40 (T42)	07:30			06:40		19:13 (T41)	06:06		20:15 (T40)	05:59		20:10 (T40)
	17:38			18:16	45	17:25 (T42)	19:47			20:19	15	19:28 (T41)	20:50	11	20:26 (T40)	21:08	33	20:43 (T40)
25	07:49			07:13		16:41 (T42)	07:28			06:38		19:17 (T41)	06:06		20:14 (T40)	06:00		20:10 (T40)
	17:39			18:17	44	17:25 (T42)	19:48			20:21	8	19:25 (T41)	20:51	13	20:27 (T40)	21:08	33	20:43 (T40)
26	07:49			07:12		16:41 (T42)	07:26			06:37			06:05		20:12 (T40)	06:00		20:11 (T40)
	17:40			18:18	42	17:23 (T42)	19:50			20:22			20:52	16	20:28 (T40)	21:08	32	20:43 (T40)
27	07:48		08:09 (T76)	07:10		16:43 (T42)	07:24			06:36			06:04		20:12 (T40)	06:00		20:11 (T40)
	17:41	6	08:15 (T76)	18:19	40	17:23 (T42)	19:51			20:23			20:53	17	20:29 (T40)	21:08	32	20:43 (T40)
28	07:47		08:08 (T76)	07:09		16:43 (T42)	07:23			06:34			06:04		20:11 (T40)	06:01		20:11 (T40)
	17:42	19	17:06 (T42)	18:21	38	17:21 (T42)	19:52			20:24			20:54	19	20:30 (T40)	21:09	32	20:43 (T40)
29	07:46		08:07 (T76)				07:21			06:33			06:03		20:09 (T40)	06:01		20:11 (T40)
	17:44	29	17:10 (T42)				19:53			20:25			20:54	21	20:30 (T40)	21:09	32	20:43 (T40)
30	07:45		08:06 (T76)				07:19			06:32			06:02		20:09 (T40)	06:02		20:11 (T40)
	17:45	38	17:13 (T42)				19:54			20:26			20:55	22	20:31 (T40)	21:09	32	20:43 (T40)
31	07:44		08:05 (T76)				07:18						06:02		20:08 (T40)			
	17:46	44	17:15 (T42)				19:55						20:56	23	20:31 (T40)			
Potential sun hours	297			297			370			399			448			453		
Total, worst case		142			1608			125			680			144			920	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.64			0.68			0.72			0.60			0.54			0.54	
Total reduction		0.20			0.28			0.32			0.32			0.31			0.35	
Total, real		29			447			40			218			45			323	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 938 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6944)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September		October			November		December		
1	06:02		20:12 (T40)	06:26		06:57		19:06 (T41)	07:27		07:02		07:28 (T76)	07:37	
	21:08	31	20:43 (T40)	20:50		20:07	35	19:41 (T41)	19:15		17:28	74	16:56 (T42)	17:04	
2	06:03		20:12 (T40)	06:27		06:58		19:06 (T41)	07:29		07:03		07:29 (T76)	07:38	
	21:08	31	20:43 (T40)	20:49		20:06	34	19:40 (T41)	19:13		17:27	73	16:56 (T42)	17:03	
3	06:03		20:13 (T40)	06:28		06:59		19:06 (T41)	07:30		07:04		07:28 (T76)	07:39	
	21:08	30	20:43 (T40)	20:48		20:04	34	19:40 (T41)	19:11		17:26	72	16:55 (T42)	17:03	
4	06:04		20:13 (T40)	06:29		07:00		19:06 (T41)	07:31		07:06		07:28 (T76)	07:40	
	21:08	29	20:42 (T40)	20:47		20:02	33	19:39 (T41)	19:10		17:24	71	16:54 (T42)	17:03	
5	06:04		20:13 (T40)	06:30		07:01		19:06 (T41)	07:32		07:07		07:28 (T76)	07:41	
	21:08	30	20:43 (T40)	20:46		20:01	31	19:37 (T41)	19:08		17:23	68	16:53 (T42)	17:03	
6	06:05		20:13 (T40)	06:31		07:02		19:07 (T41)	07:33		07:08		07:30 (T76)	07:42	
	21:08	29	20:42 (T40)	20:44		19:57	29	19:36 (T41)	19:06		17:22	66	16:53 (T42)	17:03	
7	06:05		20:14 (T40)	06:32		07:03		19:08 (T41)	07:34		07:09		07:31 (T76)	07:43	
	21:07	28	20:42 (T40)	20:43		19:56	26	19:34 (T41)	19:05		17:21	62	16:51 (T42)	17:03	
8	06:06		20:15 (T40)	06:33		07:04		19:09 (T41)	07:35		07:10		07:32 (T76)	07:44	
	21:07	27	20:42 (T40)	20:42		19:54	24	19:33 (T41)	19:03		17:20	58	16:50 (T42)	17:03	
9	06:07		20:15 (T40)	06:34		07:05		19:10 (T41)	07:36		07:12		07:34 (T76)	07:45	
	21:07	26	20:41 (T40)	20:41		19:52	21	19:31 (T41)	19:02	17	17:45 (T42)	53	16:49 (T42)	17:03	
10	06:07		20:16 (T40)	06:35		07:06		19:11 (T41)	07:37		17:24 (T42)		07:13	07:35 (T76)	07:46	
	21:06	25	20:41 (T40)	20:40		19:51	17	19:28 (T41)	19:00	24	17:48 (T42)	49	17:18	16:48 (T42)	17:03	
11	06:08		20:16 (T40)	06:36		07:07		19:15 (T41)	07:38		17:22 (T42)		07:14	07:36 (T76)	07:46	15:25 (T77)
	21:06	25	20:41 (T40)	20:38		19:49	8	19:23 (T41)	18:58	28	17:50 (T42)	44	17:17	16:46 (T42)	17:03	4	15:29 (T77)
12	06:09		20:16 (T40)	06:37		07:08			07:39		17:19 (T42)		07:15	07:37 (T76)	07:47		15:23 (T77)
	21:06	24	20:40 (T40)	20:37		19:47			18:57	33	17:52 (T42)	37	17:16	16:44 (T42)	17:03	9	15:32 (T77)
13	06:10		20:17 (T40)	06:38		07:09			07:40		17:17 (T42)		07:16	07:39 (T76)	07:48		15:22 (T77)
	21:05	23	20:40 (T40)	20:36		19:45			18:55	36	17:53 (T42)	29	17:15	16:42 (T42)	17:03	12	15:34 (T77)
14	06:10		20:18 (T40)	06:39		07:10			07:41		17:15 (T42)		07:18	07:40 (T76)	07:49		15:21 (T77)
	21:05	21	20:39 (T40)	20:34		19:44			18:54	39	17:54 (T42)	19	17:14	16:38 (T42)	17:03	14	15:35 (T77)
15	06:11		20:20 (T40)	06:40		07:11			07:42		17:15 (T42)		07:19	07:41 (T76)	07:50		15:21 (T77)
	21:04	19	20:39 (T40)	20:33		19:42			18:52	40	17:55 (T42)	6	17:13	07:47 (T76)	17:03	15	15:36 (T77)
16	06:12		20:20 (T40)	06:41		07:12			07:44		17:13 (T42)		07:20		07:50		15:21 (T77)
	21:03	18	20:38 (T40)	20:31		19:40			18:50	43	17:56 (T42)		17:12		17:04	17	15:38 (T77)
17	06:13		20:21 (T40)	06:42		07:13			07:45		17:12 (T42)		07:21		07:51		15:20 (T77)
	21:03	16	20:37 (T40)	20:30		19:39			18:49	45	17:57 (T42)		17:11		17:04	18	15:38 (T77)
18	06:14		20:23 (T40)	06:43	19:22 (T41)	07:14			07:46		17:11 (T42)		07:22		07:52		15:21 (T77)
	21:02	14	20:37 (T40)	20:29	10 19:32 (T41)	19:37			18:47	46	17:57 (T42)		17:11		17:04	18	15:39 (T77)
19	06:14		20:25 (T40)	06:44	19:18 (T41)	07:15			07:47		17:10 (T42)		07:23		07:52		15:22 (T77)
	21:02	12	20:37 (T40)	20:27	17 19:35 (T41)	19:35			18:46	47	17:57 (T42)		17:10		17:05	18	15:40 (T77)
20	06:15		20:27 (T40)	06:45	19:16 (T41)	07:16			07:48		17:09 (T42)		07:25		07:53		15:21 (T77)
	21:01	8	20:35 (T40)	20:26	21 19:37 (T41)	19:33			18:44	48	17:57 (T42)		17:09		17:05	19	15:40 (T77)
21	06:16			06:46	19:14 (T41)	07:17			07:49		17:09 (T42)		07:26		07:53		15:22 (T77)
	21:00			20:24	24 19:38 (T41)	19:32			18:43	49	17:58 (T42)		17:08		17:05	19	15:41 (T77)
22	06:17			06:47	19:13 (T41)	07:18			07:50		17:08 (T42)		07:27		07:54		15:22 (T77)
	20:59			20:23	26 19:39 (T41)	19:30			18:41	50	17:58 (T42)		17:08		17:06	19	15:41 (T77)
23	06:18			06:48	19:11 (T41)	07:19			07:51		17:08 (T42)		07:28		07:54		15:23 (T77)
	20:59			20:21	29 19:40 (T41)	19:28			18:40	50	17:58 (T42)		17:07		17:07	19	15:42 (T77)
24	06:19			06:49	19:10 (T41)	07:20			07:53		17:07 (T42)		07:29		07:55		15:23 (T77)
	20:58			20:20	31 19:41 (T41)	19:27			18:39	51	17:58 (T42)		17:07		17:07	19	15:42 (T77)
25	06:20			06:50	19:09 (T41)	07:21			07:54		17:08 (T42)		07:30		07:55		15:24 (T77)
	20:57			20:18	32 19:41 (T41)	19:25			18:37	51	17:59 (T42)		17:06		17:08	18	15:42 (T77)
26	06:21			06:51	19:08 (T41)	07:22			07:55		08:37 (T76)		07:32		07:56		15:25 (T77)
	20:56			20:17	34 19:42 (T41)	19:23			18:36	60	17:58 (T42)		17:06		17:08	18	15:43 (T77)
27	06:22			06:52	19:08 (T41)	07:23			07:56		08:34 (T76)		07:33		07:56		15:26 (T77)
	20:55			20:15	34 19:42 (T41)	19:22			18:34	66	17:58 (T42)		17:05		17:09	17	15:43 (T77)
28	06:22			06:53	19:07 (T41)	07:24			07:57		08:32 (T76)		07:34		07:56		15:27 (T77)
	20:54			20:14	35 19:42 (T41)	19:20			18:33	68	17:57 (T42)		17:05		17:10	15	15:42 (T77)
29	06:23			06:54	19:06 (T41)	07:25			07:58		08:31 (T76)		07:35		07:57		15:28 (T77)
	20:53			20:12	36 19:42 (T41)	19:18			18:32	70	17:57 (T42)		17:04		17:10	14	15:42 (T77)
30	06:24			06:55	19:06 (T41)	07:26			08:00		08:30 (T76)		07:36		07:57		15:30 (T77)
	20:52			20:10	36 19:42 (T41)	19:16			18:30	72	17:57 (T42)		17:04		17:11	13	15:43 (T77)
31	06:25			06:56	19:06 (T41)				08:01		08:29 (T76)				07:57		15:31 (T77)
	20:51			20:09	35 19:41 (T41)				18:29	72	17:56 (T42)				17:12	11	15:42 (T77)
Potential sun hours	460			429		375			345			297			287		
Total, worst case		466			400		292			1105			781			326	
Sun reduction		0.66			0.61		0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.		0.54			0.60		0.60			0.70			0.65			0.74	
Total reduction		0.36			0.38		0.36			0.34			0.20			0.17	
Total, real		169			150		106			380			156			55	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 940 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6945)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57		15:17 (T53)	07:44			07:07		16:45 (T52)	07:16		17:56 (T52)	06:31			06:02		06:26 (T51)
	17:13	48	16:05 (T53)	17:48			18:22	60	17:45 (T52)	19:56	25	18:21 (T52)	20:27			20:57	24	06:50 (T51)
2	07:57		15:17 (T53)	07:43			07:06		16:44 (T52)	07:15		18:00 (T52)	06:29			06:01		06:27 (T51)
	17:14	48	16:05 (T53)	17:49			18:23	61	17:45 (T52)	19:57	18	18:18 (T52)	20:28			20:58	23	06:50 (T51)
3	07:57		15:18 (T53)	07:42			07:04		16:44 (T52)	07:13			06:28			06:01		06:28 (T51)
	17:15	48	16:06 (T53)	17:50			18:24	62	17:46 (T52)	19:58			20:29			20:58	23	06:51 (T51)
4	07:57		15:19 (T53)	07:40			07:03		16:42 (T52)	07:11			06:27			06:01		06:28 (T51)
	17:16	47	16:06 (T53)	17:52			18:25	64	17:46 (T52)	19:59			20:30			20:59	22	06:50 (T51)
5	07:57		15:19 (T53)	07:39			07:01		16:41 (T52)	07:10			06:25			06:00		06:28 (T51)
	17:17	47	16:06 (T53)	17:53			18:27	65	17:46 (T52)	20:00			20:31			21:00	22	06:50 (T51)
6	07:57		15:20 (T53)	07:38			06:59		16:41 (T52)	07:08			06:24			06:00		06:29 (T51)
	17:18	46	16:06 (T53)	17:54			18:28	66	17:47 (T52)	20:00			20:32			21:01	21	06:50 (T51)
7	07:57		15:20 (T53)	07:37			06:58		16:40 (T52)	07:06			06:23			06:00		06:30 (T51)
	17:19	45	16:05 (T53)	17:55			18:29	67	17:47 (T52)	20:01			20:33			21:01	20	06:50 (T51)
8	07:57		15:21 (T53)	07:36			07:56		17:41 (T52)	07:05			06:22			05:59		06:30 (T51)
	17:20	45	16:06 (T53)	17:57			19:30	67	18:48 (T52)	20:03			20:34			21:02	19	06:49 (T51)
9	07:57		15:23 (T53)	07:35			07:55		17:40 (T52)	07:03			06:21			05:59		06:30 (T51)
	17:21	43	16:06 (T53)	17:58			19:31	68	18:48 (T52)	20:04			20:35			21:02	19	06:49 (T51)
10	07:57		15:24 (T53)	07:34			07:53		17:39 (T52)	07:02			06:20			05:59		06:31 (T51)
	17:22	42	16:06 (T53)	17:59			19:32	68	18:47 (T52)	20:05			20:37			21:03	18	06:49 (T51)
11	07:57		15:24 (T53)	07:33			07:51		17:39 (T52)	07:00			06:19		06:39 (T51)	05:59		06:32 (T51)
	17:23	41	16:05 (T53)	18:00			19:33	69	18:48 (T52)	20:06			20:38	2	06:41 (T51)	21:04	17	06:49 (T51)
12	07:56		15:25 (T53)	07:31			07:50		17:39 (T52)	06:58			06:17		06:38 (T51)	05:59		06:32 (T51)
	17:24	40	16:05 (T53)	18:02			19:34	68	18:47 (T52)	20:07			20:39	6	06:44 (T51)	21:04	17	06:49 (T51)
13	07:56		15:27 (T53)	07:30			07:48		17:38 (T52)	06:57			06:16		06:37 (T51)	05:59		06:33 (T51)
	17:25	38	16:05 (T53)	18:03			19:36	68	18:46 (T52)	20:08			20:40	8	06:45 (T51)	21:05	16	06:49 (T51)
14	07:56		15:28 (T53)	07:29			07:46		17:39 (T52)	06:55			06:15		06:36 (T51)	05:59		06:33 (T51)
	17:26	37	16:05 (T53)	18:04			19:37	68	18:47 (T52)	20:09			20:41	10	06:46 (T51)	21:05	16	06:49 (T51)
15	07:55		15:29 (T53)	07:27			07:45		17:39 (T52)	06:54			06:14		06:35 (T51)	05:59		06:34 (T51)
	17:27	36	16:05 (T53)	18:05			19:38	67	18:46 (T52)	20:10			20:42	12	06:47 (T51)	21:06	15	06:49 (T51)
16	07:55		15:30 (T53)	07:26			07:43		17:39 (T52)	06:52			06:13		06:34 (T51)	05:59		06:34 (T51)
	17:28	33	16:03 (T53)	18:06			19:39	66	18:45 (T52)	20:11			20:43	14	06:48 (T51)	21:06	15	06:49 (T51)
17	07:54		15:32 (T53)	07:25			07:42		17:39 (T52)	06:51			06:12		06:33 (T51)	05:59		06:35 (T51)
	17:30	31	16:03 (T53)	18:08			19:40	66	18:45 (T52)	20:12			20:44	16	06:49 (T51)	21:06	14	06:49 (T51)
18	07:54		15:34 (T53)	07:23		17:09 (T52)	07:40		17:39 (T52)	06:49			06:12		06:32 (T51)	05:59		06:35 (T51)
	17:31	28	16:02 (T53)	18:09	14	17:23 (T52)	19:41	65	18:44 (T52)	20:13			20:45	17	06:49 (T51)	21:07	14	06:49 (T51)
19	07:53		15:36 (T53)	07:22		17:04 (T52)	07:38		17:39 (T52)	06:48			06:11		06:31 (T51)	05:59		06:35 (T51)
	17:32	25	16:01 (T53)	18:10	24	17:28 (T52)	19:42	64	18:43 (T52)	20:14			20:46	18	06:49 (T51)	21:07	14	06:49 (T51)
20	07:53		15:38 (T53)	07:21		17:00 (T52)	07:36		17:41 (T52)	06:46			06:10		06:31 (T51)	05:59		06:35 (T51)
	17:33	21	15:59 (T53)	18:11	31	17:31 (T52)	19:43	62	18:43 (T52)	20:15			20:46	19	06:50 (T51)	21:07	14	06:49 (T51)
21	07:52		15:41 (T53)	07:19		16:58 (T52)	07:35		17:41 (T52)	06:45			06:09		06:30 (T51)	05:59		06:36 (T51)
	17:34	16	15:57 (T53)	18:13	36	17:34 (T52)	19:44	61	18:42 (T52)	20:16			20:47	20	06:50 (T51)	21:08	14	06:50 (T51)
22	07:52		15:46 (T53)	07:18		16:55 (T52)	07:33		17:41 (T52)	06:43			06:08		06:29 (T51)	05:59		06:36 (T51)
	17:35	7	15:53 (T53)	18:14	41	17:36 (T52)	19:45	59	18:40 (T52)	20:17			20:48	21	06:50 (T51)	21:08	14	06:50 (T51)
23	07:51			07:16		16:54 (T52)	07:31		17:41 (T52)	06:42			06:07		06:28 (T51)	06:00		06:36 (T51)
	17:37			18:15	44	17:38 (T52)	19:47	58	18:39 (T52)	20:19			20:49	22	06:50 (T51)	21:08	14	06:50 (T51)
24	07:50			07:15		16:51 (T52)	07:30		17:43 (T52)	06:40			06:07		06:28 (T51)	06:00		06:36 (T51)
	17:38			18:16	48	17:39 (T52)	19:48	55	18:38 (T52)	20:20			20:50	23	06:51 (T51)	21:08	14	06:50 (T51)
25	07:50			07:13		16:50 (T52)	07:28		17:44 (T52)	06:39			06:06		06:27 (T51)	06:00		06:37 (T51)
	17:39			18:17	51	17:41 (T52)	19:49	53	18:37 (T52)	20:21			20:51	24	06:51 (T51)	21:08	14	06:51 (T51)
26	07:49			07:12		16:48 (T52)	07:26		17:44 (T52)	06:37			06:05		06:26 (T51)	06:00		06:36 (T51)
	17:40			18:18	54	17:42 (T52)	19:50	51	18:35 (T52)	20:22			20:52	24	06:50 (T51)	21:08	15	06:51 (T51)
27	07:48			07:10		16:48 (T52)	07:25		17:46 (T52)	06:36			06:05		06:26 (T51)	06:01		06:36 (T51)
	17:42			18:20	55	17:43 (T52)	19:51	48	18:34 (T52)	20:23			20:53	25	06:51 (T51)	21:09	15	06:51 (T51)
28	07:47			07:09		16:46 (T52)	07:23		17:47 (T52)	06:35			06:04		06:25 (T51)	06:01		06:37 (T51)
	17:43			18:21	58	17:44 (T52)	19:52	45	18:32 (T52)	20:24			20:54	26	06:51 (T51)	21:09	15	06:52 (T51)
29	07:46						07:21		17:49 (T52)	06:33			06:03		06:26 (T51)	06:02		06:36 (T51)
	17:44						19:53	41	18:30 (T52)	20:25			20:54	25	06:51 (T51)	21:09	16	06:52 (T51)
30	07:45						07:20		17:51 (T52)	06:32			06:03		06:26 (T51)	06:02		06:37 (T51)
	17:45						19:54	37	18:28 (T52)	20:26			20:55	24	06:50 (T51)	21:09	16	06:53 (T51)
31	07:44						07:18		17:53 (T52)				06:02		06:26 (T51)			
	17:47						19:55	32	18:25 (T52)				20:56	25	06:51 (T51)			
Potential sun hours	297			297			370			399			448			452		
Total, worst case		812			456			1851			43			381			510	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.75			0.69			0.69			0.69			0.71			0.71	
Total reduction		0.23			0.28			0.31			0.36			0.41			0.46	
Total, real		189			127			567			16			156			234	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 940 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6945)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:03		06:36 (T51)	06:27		06:49 (T51)	06:58		07:28		17:19 (T52)	07:02			07:37		15:06 (T53)
	21:08	17	06:53 (T51)	20:50	4	06:53 (T51)	20:07		19:15	68	18:27 (T52)	17:28			17:04	41	15:47 (T53)
2	06:03		06:36 (T51)	06:28			06:59		07:29		17:18 (T52)	07:03			07:38		15:06 (T53)
	21:08	18	06:54 (T51)	20:49			20:06		19:13	68	18:26 (T52)	17:27			17:04	42	15:48 (T53)
3	06:04		06:36 (T51)	06:29			07:00		07:30		17:18 (T52)	07:04			07:39		15:07 (T53)
	21:08	18	06:54 (T51)	20:48			20:04		19:12	68	18:26 (T52)	17:26			17:04	43	15:50 (T53)
4	06:04		06:36 (T51)	06:30			07:01		07:31		17:17 (T52)	07:06			07:40		15:06 (T53)
	21:08	19	06:55 (T51)	20:47			20:02		19:10	68	18:25 (T52)	17:25			17:03	45	15:51 (T53)
5	06:05		06:35 (T51)	06:31			07:02		07:32		17:17 (T52)	07:07			07:41		15:06 (T53)
	21:08	20	06:55 (T51)	20:46			20:01		19:08	68	18:25 (T52)	17:24			17:03	45	15:51 (T53)
6	06:05		06:36 (T51)	06:32			07:03		07:33		17:17 (T52)	07:08			07:42		15:06 (T53)
	21:08	20	06:56 (T51)	20:45			19:57		19:07	67	18:24 (T52)	17:22			17:03	46	15:52 (T53)
7	06:06		06:35 (T51)	06:33			07:04		07:34		17:17 (T52)	07:09			07:43		15:06 (T53)
	21:07	21	06:56 (T51)	20:43			19:56		19:05	66	18:23 (T52)	17:21			17:03	46	15:52 (T53)
8	06:07		06:35 (T51)	06:34			07:05		07:35		17:17 (T52)	07:10			07:44		15:06 (T53)
	21:07	22	06:57 (T51)	20:42			19:54		19:03	65	18:22 (T52)	17:20			17:03	47	15:53 (T53)
9	06:07		06:35 (T51)	06:35			07:06		07:36		17:17 (T52)	07:12			07:45		15:06 (T53)
	21:07	23	06:58 (T51)	20:41			19:52		19:02	64	18:21 (T52)	17:19			17:03	48	15:54 (T53)
10	06:08		06:34 (T51)	06:36			07:07	17:54 (T52)	07:37		17:17 (T52)	07:13			07:46		15:06 (T53)
	21:06	23	06:57 (T51)	20:40			19:51	16 18:10 (T52)	19:00	63	18:20 (T52)	17:18			17:03	48	15:54 (T53)
11	06:09		06:35 (T51)	06:37			07:08	17:49 (T52)	07:38		17:17 (T52)	07:14			07:46		15:07 (T53)
	21:06	23	06:58 (T51)	20:38			19:49	25 18:14 (T52)	18:59	62	18:19 (T52)	17:17			17:03	48	15:55 (T53)
12	06:09		06:35 (T51)	06:38			07:09	17:46 (T52)	07:39		17:18 (T52)	07:15			07:47		15:07 (T53)
	21:06	24	06:59 (T51)	20:37			19:47	31 18:17 (T52)	18:57	60	18:18 (T52)	17:16			17:03	49	15:56 (T53)
13	06:10		06:34 (T51)	06:39			07:10	17:43 (T52)	07:40		17:19 (T52)	07:16			07:48		15:08 (T53)
	21:05	25	06:59 (T51)	20:36			19:46	36 18:19 (T52)	18:55	59	18:18 (T52)	17:15			17:03	49	15:57 (T53)
14	06:11		06:34 (T51)	06:40			07:11	17:40 (T52)	07:42		17:20 (T52)	07:18			07:49		15:07 (T53)
	21:05	25	06:59 (T51)	20:34			19:44	40 18:20 (T52)	18:54	57	18:17 (T52)	17:14			17:04	50	15:57 (T53)
15	06:12		06:34 (T51)	06:41			07:12	17:38 (T52)	07:43		17:20 (T52)	07:19			07:50		15:08 (T53)
	21:04	26	07:00 (T51)	20:33			19:42	44 18:22 (T52)	18:52	55	18:15 (T52)	17:13			17:04	49	15:57 (T53)
16	06:12		06:35 (T51)	06:42			07:13	17:36 (T52)	07:44		17:21 (T52)	07:20			07:50		15:08 (T53)
	21:03	25	07:00 (T51)	20:32			19:41	47 18:23 (T52)	18:51	53	18:14 (T52)	17:13			17:04	50	15:58 (T53)
17	06:13		06:35 (T51)	06:43			07:14	17:33 (T52)	07:45		17:22 (T52)	07:21			07:51		15:08 (T53)
	21:03	25	07:00 (T51)	20:30			19:39	50 18:23 (T52)	18:49	50	18:12 (T52)	17:12			17:04	50	15:58 (T53)
18	06:14		06:36 (T51)	06:44			07:15	17:31 (T52)	07:46		17:23 (T52)	07:22			07:52		15:09 (T53)
	21:02	24	07:00 (T51)	20:29			19:37	53 18:24 (T52)	18:48	47	18:10 (T52)	17:11			17:05	50	15:59 (T53)
19	06:15		06:37 (T51)	06:45			07:16	17:30 (T52)	07:47		17:25 (T52)	07:24			07:52		15:10 (T53)
	21:02	23	07:00 (T51)	20:27			19:35	55 18:25 (T52)	18:46	43	18:08 (T52)	17:10			17:05	50	16:00 (T53)
20	06:16		06:38 (T51)	06:46			07:17	17:28 (T52)	07:48		17:27 (T52)	07:25	15:21 (T53)		07:53		15:10 (T53)
	21:01	23	07:01 (T51)	20:26			19:34	57 18:25 (T52)	18:45	40	18:07 (T52)	17:10	7 15:28 (T53)		17:05	50	16:00 (T53)
21	06:17		06:39 (T51)	06:47			07:18	17:27 (T52)	07:49		17:29 (T52)	07:26	15:17 (T53)		07:53		15:10 (T53)
	21:00	22	07:01 (T51)	20:24			19:32	59 18:26 (T52)	18:43	35	18:04 (T52)	17:09	16 15:33 (T53)		17:06	51	16:01 (T53)
22	06:17		06:40 (T51)	06:48			07:19	17:25 (T52)	07:50		17:32 (T52)	07:27	15:14 (T53)		07:54		15:10 (T53)
	20:59	21	07:01 (T51)	20:23			19:30	61 18:26 (T52)	18:42	29	18:01 (T52)	17:08	21 15:35 (T53)		17:06	51	16:01 (T53)
23	06:18		06:40 (T51)	06:49			07:20	17:24 (T52)	07:52		17:35 (T52)	07:28	15:12 (T53)		07:54		15:11 (T53)
	20:59	20	07:00 (T51)	20:21			19:29	62 18:26 (T52)	18:40	22	17:57 (T52)	17:08	25 15:37 (T53)		17:07	51	16:02 (T53)
24	06:19		06:41 (T51)	06:50			07:21	17:23 (T52)	07:53		17:41 (T52)	07:29	15:11 (T53)		07:55		15:12 (T53)
	20:58	19	07:00 (T51)	20:20			19:27	63 18:26 (T52)	18:39	9	17:50 (T52)	17:07	28 15:39 (T53)		17:07	50	16:02 (T53)
25	06:20		06:42 (T51)	06:51			07:22	17:22 (T52)	07:54			07:30	15:11 (T53)		07:55		15:12 (T53)
	20:57	18	07:00 (T51)	20:18			19:25	65 18:27 (T52)	18:38			17:07	30 15:41 (T53)		17:08	50	16:02 (T53)
26	06:21		06:43 (T51)	06:52			07:23	17:21 (T52)	07:55			07:32	15:09 (T53)		07:56		15:13 (T53)
	20:56	16	06:59 (T51)	20:17			19:23	66 18:27 (T52)	18:36			17:06	33 15:42 (T53)		17:09	50	16:03 (T53)
27	06:22		06:44 (T51)	06:53			07:24	17:20 (T52)	07:56			07:33	15:08 (T53)		07:56		15:13 (T53)
	20:55	15	06:59 (T51)	20:15			19:22	67 18:27 (T52)	18:35			17:06	36 15:44 (T53)		17:09	50	16:03 (T53)
28	06:23		06:45 (T51)	06:54			07:25	17:19 (T52)	07:57			07:34	15:08 (T53)		07:56		15:14 (T53)
	20:54	13	06:58 (T51)	20:14			19:20	67 18:26 (T52)	18:33			17:05	37 15:45 (T53)		17:10	49	16:03 (T53)
29	06:24		06:46 (T51)	06:55			07:26	17:19 (T52)	07:59			07:35	15:07 (T53)		07:57		15:14 (T53)
	20:53	12	06:58 (T51)	20:12			19:18	67 18:26 (T52)	18:32			17:05	38 15:45 (T53)		17:11	49	16:03 (T53)
30	06:25		06:47 (T51)	06:56			07:27	17:18 (T52)	08:00			07:36	15:07 (T53)		07:57		15:15 (T53)
	20:52	10	06:57 (T51)	20:11			19:17	68 18:26 (T52)	18:31			17:04	39 15:46 (T53)		17:12	50	16:05 (T53)
31	06:26		06:48 (T51)	06:57					08:01						07:57		15:16 (T53)
	20:51	7	06:55 (T51)	20:09					18:30						17:12	49	16:05 (T53)
Potential sun hours	459			428			375		345			297			287		
Total, worst case		617			4			1099		1286			310			1496	
Sun reduction		0.66			0.61			0.59		0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00		1.00			1.00			1.00	
Wind dir. red.		0.71			0.71			0.69		0.69			0.75			0.75	
Total reduction		0.47			0.44			0.41		0.33			0.23			0.17	
Total, real		292			2			451		430			70			247	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 941 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6946)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57		15:24 (T53)	07:44			07:07		16:49 (T52)	07:16			06:31			06:02		06:25 (T51)
	17:13	47	16:11 (T53)	17:48			18:22	58	17:47 (T52)	19:56			20:27			20:57	26	06:51 (T51)
2	07:57		15:24 (T53)	07:43			07:06		16:48 (T52)	07:15			06:29			06:01		06:26 (T51)
	17:14	48	16:12 (T53)	17:49			18:23	59	17:47 (T52)	19:57			20:28			20:58	25	06:51 (T51)
3	07:57		15:25 (T53)	07:42			07:04		16:48 (T52)	07:13			06:28			06:01		06:27 (T51)
	17:15	47	16:12 (T53)	17:50			18:24	60	17:48 (T52)	19:58			20:29			20:58	24	06:51 (T51)
4	07:57		15:26 (T53)	07:40			07:03		16:47 (T52)	07:11			06:27			06:01		06:27 (T51)
	17:16	46	16:12 (T53)	17:52			18:25	61	17:48 (T52)	19:59			20:30			20:59	24	06:51 (T51)
5	07:57		15:26 (T53)	07:39			07:01		16:46 (T52)	07:10			06:25			06:00		06:27 (T51)
	17:17	46	16:12 (T53)	17:53			18:27	62	17:48 (T52)	20:00			20:31			21:00	24	06:51 (T51)
6	07:57		15:27 (T53)	07:38			06:59		16:46 (T52)	07:08			06:24			06:00		06:28 (T51)
	17:18	46	16:13 (T53)	17:54			18:28	62	17:48 (T52)	20:00			20:32			21:01	23	06:51 (T51)
7	07:57		15:27 (T53)	07:37			06:58		16:45 (T52)	07:06			06:23			06:00		06:29 (T51)
	17:19	45	16:12 (T53)	17:55			18:29	63	17:48 (T52)	20:01			20:33			21:01	22	06:51 (T51)
8	07:57		15:28 (T53)	07:36			07:56		17:45 (T52)	07:05			06:22			05:59		06:29 (T51)
	17:20	44	16:12 (T53)	17:57			19:30	64	18:49 (T52)	20:03			20:34			21:02	21	06:50 (T51)
9	07:57		15:29 (T53)	07:35			07:55		17:45 (T52)	07:03			06:21			05:59		06:29 (T51)
	17:21	44	16:13 (T53)	17:58			19:31	63	18:48 (T52)	20:04			20:35			21:02	21	06:50 (T51)
10	07:57		15:30 (T53)	07:34			07:53		17:44 (T52)	07:02			06:20			05:59		06:30 (T51)
	17:22	43	16:13 (T53)	17:59			19:32	64	18:48 (T52)	20:05			20:37			21:03	20	06:50 (T51)
11	07:57		15:31 (T53)	07:33			07:51		17:45 (T52)	07:00			06:19			05:59		06:30 (T51)
	17:23	41	16:12 (T53)	18:00			19:33	63	18:48 (T52)	20:06			20:38			21:04	20	06:50 (T51)
12	07:56		15:32 (T53)	07:31			07:50		17:44 (T52)	06:58			06:17		06:38 (T51)	05:59		06:31 (T51)
	17:24	40	16:12 (T53)	18:02			19:34	63	18:47 (T52)	20:07			20:39	5	06:43 (T51)	21:04	19	06:50 (T51)
13	07:56		15:33 (T53)	07:30			07:48		17:44 (T52)	06:57			06:16		06:37 (T51)	05:59		06:31 (T51)
	17:25	39	16:12 (T53)	18:03			19:36	63	18:47 (T52)	20:08			20:40	8	06:45 (T51)	21:05	19	06:50 (T51)
14	07:56		15:34 (T53)	07:29			07:46		17:45 (T52)	06:55			06:15		06:36 (T51)	05:59		06:32 (T51)
	17:26	38	16:12 (T53)	18:04			19:37	62	18:47 (T52)	20:09			20:41	10	06:46 (T51)	21:05	18	06:50 (T51)
15	07:55		15:36 (T53)	07:27			07:45		17:45 (T52)	06:54			06:14		06:35 (T51)	05:59		06:32 (T51)
	17:27	36	16:12 (T53)	18:05			19:38	61	18:46 (T52)	20:10			20:42	12	06:47 (T51)	21:06	18	06:50 (T51)
16	07:55		15:36 (T53)	07:26			07:43		17:45 (T52)	06:52			06:13		06:34 (T51)	05:59		06:33 (T51)
	17:28	35	16:11 (T53)	18:06			19:39	60	18:45 (T52)	20:11			20:43	14	06:48 (T51)	21:06	17	06:50 (T51)
17	07:54		15:38 (T53)	07:25			07:42		17:46 (T52)	06:51			06:12		06:33 (T51)	05:59		06:33 (T51)
	17:30	33	16:11 (T53)	18:08			19:40	59	18:45 (T52)	20:12			20:44	15	06:48 (T51)	21:06	17	06:50 (T51)
18	07:54		15:39 (T53)	07:23		17:10 (T52)	07:40		17:46 (T52)	06:49			06:12		06:32 (T51)	05:59		06:33 (T51)
	17:31	30	16:09 (T53)	18:09	18	17:28 (T52)	19:41	58	18:44 (T52)	20:13			20:45	17	06:49 (T51)	21:07	17	06:50 (T51)
19	07:53		15:42 (T53)	07:22		17:06 (T52)	07:38		17:46 (T52)	06:48			06:11		06:31 (T51)	05:59		06:33 (T51)
	17:32	27	16:09 (T53)	18:10	26	17:32 (T52)	19:42	56	18:42 (T52)	20:14			20:45	18	06:49 (T51)	21:07	17	06:50 (T51)
20	07:53		15:43 (T53)	07:21		17:03 (T52)	07:36		17:47 (T52)	06:46			06:10		06:31 (T51)	05:59		06:33 (T51)
	17:33	24	16:07 (T53)	18:11	31	17:34 (T52)	19:43	55	18:42 (T52)	20:15			20:46	19	06:50 (T51)	21:07	17	06:50 (T51)
21	07:52		15:45 (T53)	07:19		17:01 (T52)	07:35		17:48 (T52)	06:45			06:09		06:30 (T51)	05:59		06:34 (T51)
	17:34	21	16:06 (T53)	18:13	36	17:37 (T52)	19:44	52	18:40 (T52)	20:16			20:47	20	06:50 (T51)	21:08	17	06:51 (T51)
22	07:52		15:49 (T53)	07:18		16:58 (T52)	07:33		17:48 (T52)	06:43			06:08		06:29 (T51)	05:59		06:34 (T51)
	17:35	15	16:04 (T53)	18:14	40	17:38 (T52)	19:45	51	18:39 (T52)	20:17			20:48	21	06:50 (T51)	21:08	17	06:51 (T51)
23	07:51		15:54 (T53)	07:16		16:57 (T52)	07:31		17:49 (T52)	06:42			06:07		06:28 (T51)	06:00		06:34 (T51)
	17:37	5	15:59 (T53)	18:15	43	17:40 (T52)	19:47	48	18:37 (T52)	20:19			20:49	22	06:50 (T51)	21:08	17	06:51 (T51)
24	07:50			07:15		16:55 (T52)	07:30		17:51 (T52)	06:40			06:07		06:28 (T51)	06:00		06:34 (T51)
	17:38			18:16	46	17:41 (T52)	19:48	45	18:36 (T52)	20:20			20:50	23	06:51 (T51)	21:08	17	06:51 (T51)
25	07:50			07:13		16:54 (T52)	07:28		17:52 (T52)	06:39			06:06		06:27 (T51)	06:00		06:35 (T51)
	17:39			18:17	49	17:43 (T52)	19:49	42	18:34 (T52)	20:21			20:51	24	06:51 (T51)	21:08	17	06:52 (T51)
26	07:49			07:12		16:52 (T52)	07:26		17:53 (T52)	06:37			06:05		06:26 (T51)	06:00		06:35 (T51)
	17:40			18:18	52	17:44 (T52)	19:50	39	18:32 (T52)	20:22			20:52	25	06:51 (T51)	21:08	17	06:52 (T51)
27	07:48			07:10		16:51 (T52)	07:25		17:56 (T52)	06:36			06:05		06:26 (T51)	06:01		06:34 (T51)
	17:42			18:20	54	17:45 (T52)	19:51	34	18:30 (T52)	20:23			20:53	25	06:51 (T51)	21:09	18	06:52 (T51)
28	07:47			07:09		16:50 (T52)	07:23		17:58 (T52)	06:35			06:04		06:25 (T51)	06:01		06:35 (T51)
	17:43			18:21	55	17:45 (T52)	19:52	29	18:27 (T52)	20:24			20:54	26	06:51 (T51)	21:09	18	06:53 (T51)
29	07:46						07:21		18:00 (T52)	06:33			06:03		06:25 (T51)	06:02		06:35 (T51)
	17:44						19:53	23	18:23 (T52)	20:25			20:54	27	06:52 (T51)	21:09	18	06:53 (T51)
30	07:45						07:20		18:06 (T52)	06:32			06:03		06:25 (T51)	06:02		06:35 (T51)
	17:45						19:54	13	18:19 (T52)	20:26			20:55	26	06:51 (T51)	21:09	19	06:54 (T51)
31	07:44						07:18						06:02		06:26 (T51)			
	17:47						19:55						20:56	25	06:51 (T51)			
Potential sun hours	297			297			370			399			448			452		
Total, worst case		840			450			1592						382			584	
Sun reduction		0.31			0.40			0.44						0.57			0.64	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.75			0.69			0.69						0.71			0.71	
Total reduction		0.23			0.28			0.31						0.41			0.46	
Total, real		196			125			488						156			268	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 941 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6946)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December		
1	06:03		06:35 (T51)	06:27		06:49 (T51)	06:58				07:28		17:24 (T52)	07:02			07:37		15:13 (T53)
	21:08	19	06:54 (T51)	20:50	3	06:52 (T51)	20:07				19:15	63	18:27 (T52)	17:28			17:04	41	15:54 (T53)
2	06:03		06:35 (T51)	06:28			06:59				07:29		17:23 (T52)	07:03			07:38		15:12 (T53)
	21:08	20	06:55 (T51)	20:49			20:06				19:13	64	18:27 (T52)	17:27			17:04	43	15:55 (T53)
3	06:04		06:34 (T51)	06:29			07:00				07:30		17:23 (T52)	07:04			07:39		15:13 (T53)
	21:08	21	06:55 (T51)	20:48			20:04				19:12	63	18:26 (T52)	17:26			17:04	44	15:57 (T53)
4	06:04		06:35 (T51)	06:30			07:01				07:31		17:22 (T52)	07:06			07:40		15:13 (T53)
	21:08	21	06:56 (T51)	20:47			20:02				19:10	64	18:26 (T52)	17:25			17:03	44	15:57 (T53)
5	06:05		06:34 (T51)	06:31			07:02				07:32		17:22 (T52)	07:07			07:41		15:13 (T53)
	21:08	22	06:56 (T51)	20:46			20:01				19:08	63	18:25 (T52)	17:24			17:03	45	15:58 (T53)
6	06:05		06:34 (T51)	06:32			07:03				07:33		17:22 (T52)	07:08			07:42		15:13 (T53)
	21:08	23	06:57 (T51)	20:45			19:57				19:07	63	18:25 (T52)	17:22			17:03	46	15:59 (T53)
7	06:06		06:34 (T51)	06:33			07:04				07:34		17:21 (T52)	07:09			07:43		15:12 (T53)
	21:07	23	06:57 (T51)	20:43			19:56				19:05	63	18:24 (T52)	17:21			17:03	46	15:58 (T53)
8	06:07		06:34 (T51)	06:34			07:05				07:35		17:21 (T52)	07:10			07:44		15:13 (T53)
	21:07	24	06:58 (T51)	20:42			19:54				19:03	63	18:24 (T52)	17:20			17:03	46	15:59 (T53)
9	06:07		06:34 (T51)	06:35			07:06				07:36		17:21 (T52)	07:12			07:45		15:13 (T53)
	21:07	25	06:59 (T51)	20:41			19:52				19:02	62	18:23 (T52)	17:19			17:03	47	16:00 (T53)
10	06:08		06:34 (T51)	06:36			07:07				07:37		17:21 (T52)	07:13			07:46		15:13 (T53)
	21:06	24	06:58 (T51)	20:40			19:51				19:00	61	18:22 (T52)	17:18			17:03	48	16:01 (T53)
11	06:09		06:34 (T51)	06:37			07:08				07:38		17:22 (T52)	07:14			07:46		15:14 (T53)
	21:06	25	06:59 (T51)	20:38			19:49				18:59	59	18:21 (T52)	17:17			17:03	47	16:01 (T53)
12	06:09		06:34 (T51)	06:38			07:09				07:39		17:22 (T52)	07:15			07:47		15:14 (T53)
	21:06	26	07:00 (T51)	20:37			19:47				18:57	58	18:20 (T52)	17:16			17:03	48	16:02 (T53)
13	06:10		06:33 (T51)	06:39			07:10		17:58 (T52)		07:40		17:23 (T52)	07:16			07:48		15:15 (T53)
	21:05	26	06:59 (T51)	20:36			19:46	11	18:09 (T52)		18:55	57	18:20 (T52)	17:15			17:03	48	16:03 (T53)
14	06:11		06:34 (T51)	06:40			07:11		17:52 (T52)		07:42		17:24 (T52)	07:18			07:49		15:14 (T53)
	21:05	26	07:00 (T51)	20:34			19:44	22	18:14 (T52)		18:54	55	18:19 (T52)	17:14			17:04	49	16:03 (T53)
15	06:12		06:34 (T51)	06:41			07:12		17:48 (T52)		07:43		17:24 (T52)	07:19			07:50		15:15 (T53)
	21:04	26	07:00 (T51)	20:33			19:42	29	18:17 (T52)		18:52	53	18:17 (T52)	17:13			17:04	49	16:04 (T53)
16	06:12		06:35 (T51)	06:42			07:13		17:45 (T52)		07:44		17:25 (T52)	07:20			07:50		15:16 (T53)
	21:03	26	07:01 (T51)	20:32			19:41	34	18:19 (T52)		18:51	51	18:16 (T52)	17:13			17:04	48	16:04 (T53)
17	06:13		06:35 (T51)	06:43			07:13		17:42 (T52)		07:45		17:26 (T52)	07:21			07:51		15:15 (T53)
	21:03	25	07:00 (T51)	20:30			19:39	38	18:20 (T52)		18:49	48	18:14 (T52)	17:12			17:04	49	16:04 (T53)
18	06:14		06:36 (T51)	06:44			07:14		17:40 (T52)		07:46		17:27 (T52)	07:22			07:52		15:16 (T53)
	21:02	24	07:00 (T51)	20:29			19:37	41	18:21 (T52)		18:48	45	18:12 (T52)	17:11			17:05	49	16:05 (T53)
19	06:15		06:37 (T51)	06:45			07:15		17:38 (T52)		07:47		17:28 (T52)	07:24		15:28 (T53)	07:52		15:17 (T53)
	21:02	24	07:01 (T51)	20:27			19:35	44	18:22 (T52)		18:46	42	18:10 (T52)	17:10	5	15:33 (T53)	17:05	49	16:06 (T53)
20	06:16		06:38 (T51)	06:46			07:17		17:36 (T52)		07:48		17:30 (T52)	07:25		15:24 (T53)	07:53		15:17 (T53)
	21:01	23	07:01 (T51)	20:26			19:34	47	18:23 (T52)		18:45	39	18:09 (T52)	17:10	15	15:39 (T53)	17:05	49	16:06 (T53)
21	06:16		06:39 (T51)	06:47			07:18		17:34 (T52)		07:49		17:32 (T52)	07:26		15:21 (T53)	07:53		15:18 (T53)
	21:00	22	07:01 (T51)	20:24			19:32	50	18:24 (T52)		18:43	35	18:07 (T52)	17:09	20	15:41 (T53)	17:06	49	16:07 (T53)
22	06:17		06:40 (T51)	06:48			07:19		17:32 (T52)		07:50		17:34 (T52)	07:27		15:19 (T53)	07:54		15:18 (T53)
	20:59	21	07:01 (T51)	20:23			19:30	53	18:25 (T52)		18:42	30	18:04 (T52)	17:08	24	15:43 (T53)	17:06	49	16:07 (T53)
23	06:18		06:40 (T51)	06:49			07:20		17:31 (T52)		07:52		17:37 (T52)	07:28		15:18 (T53)	07:54		15:19 (T53)
	20:59	20	07:00 (T51)	20:21			19:29	54	18:25 (T52)		18:40	24	18:01 (T52)	17:08	27	15:45 (T53)	17:07	49	16:08 (T53)
24	06:19		06:41 (T51)	06:50			07:21		17:30 (T52)		07:53		17:41 (T52)	07:29		15:16 (T53)	07:55		15:19 (T53)
	20:58	19	07:00 (T51)	20:20			19:27	56	18:26 (T52)		18:39	15	17:56 (T52)	17:07	30	15:46 (T53)	17:07	49	16:08 (T53)
25	06:20		06:42 (T51)	06:51			07:22		17:28 (T52)		07:54			07:30		15:16 (T53)	07:55		15:19 (T53)
	20:57	18	07:00 (T51)	20:18			19:25	58	18:26 (T52)		18:38			17:07	33	15:49 (T53)	17:08	49	16:08 (T53)
26	06:21		06:43 (T51)	06:52			07:23		17:27 (T52)		07:55			07:32		15:15 (T53)	07:56		15:20 (T53)
	20:56	16	06:59 (T51)	20:17			19:23	59	18:26 (T52)		18:36			17:06	35	15:50 (T53)	17:09	49	16:09 (T53)
27	06:22		06:44 (T51)	06:53			07:24		17:26 (T52)		07:56			07:33		15:15 (T53)	07:56		15:20 (T53)
	20:55	15	06:59 (T51)	20:15			19:22	60	18:26 (T52)		18:35			17:06	36	15:51 (T53)	17:09	49	16:09 (T53)
28	06:23		06:45 (T51)	06:54			07:25		17:25 (T52)		07:57			07:34		15:14 (T53)	07:56		15:21 (T53)
	20:54	13	06:58 (T51)	20:14			19:20	61	18:26 (T52)		18:33			17:05	38	15:52 (T53)	17:10	49	16:10 (T53)
29	06:24		06:46 (T51)	06:55			07:26		17:24 (T52)		07:59			07:35		15:13 (T53)	07:57		15:21 (T53)
	20:53	11	06:57 (T51)	20:12			19:18	62	18:26 (T52)		18:32			17:05	39	15:52 (T53)	17:11	49	16:10 (T53)
30	06:25		06:47 (T51)	06:56			07:27		17:24 (T52)		08:00			07:36		15:13 (T53)	07:57		15:23 (T53)
	20:52	9	06:56 (T51)	20:11			19:17	62	18:26 (T52)		18:31			17:04	40	15:53 (T53)	17:12	48	16:11 (T53)
31	06:26		06:48 (T51)	06:57							08:01						07:57		15:23 (T53)
	20:51	6	06:54 (T51)	20:09							18:30						17:12	48	16:11 (T53)
Potential sun hours	459			428			375				345			297			287		
Total, worst case		643			3			841				1240			342			1472	
Sun reduction		0.66			0.61			0.59				0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.71			0.71			0.69				0.69			0.75			0.75	
Total reduction		0.47			0.44			0.41				0.33			0.23			0.17	
Total, real		305			1			346				414			77			243	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 948 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6952)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February	March	April			May			June		
1	07:57		08:50 (T63)	07:43	07:07	07:16			06:31		07:13 (T61)	06:02		07:21 (T61)
	17:13	34	09:24 (T63)	17:48	18:22	19:56			20:27	75	08:28 (T61)	20:57	56	08:17 (T61)
2	07:57		08:51 (T63)	07:42	07:06	07:15			06:29		07:13 (T61)	06:01		07:22 (T61)
	17:14	33	09:24 (T63)	17:49	18:23	19:57			20:28	75	08:28 (T61)	20:58	55	08:17 (T61)
3	07:57		08:51 (T63)	07:41	07:04	07:13			06:28		07:13 (T61)	06:01		07:23 (T61)
	17:15	33	09:24 (T63)	17:50	18:24	19:58			20:29	75	08:28 (T61)	20:58	54	08:17 (T61)
4	07:57		08:52 (T63)	07:40	07:03	07:11			06:27		07:13 (T61)	06:01		07:23 (T61)
	17:16	32	09:24 (T63)	17:52	18:25	19:59			20:30	75	08:28 (T61)	20:59	53	08:16 (T61)
5	07:57		08:53 (T63)	07:39	07:01	07:10			06:25		07:12 (T61)	06:00		07:24 (T61)
	17:17	31	09:24 (T63)	17:53	18:27	20:00			20:31	75	08:27 (T61)	21:00	52	08:16 (T61)
6	07:57		08:53 (T63)	07:38	06:59	07:08			06:24		07:12 (T61)	06:00		07:25 (T61)
	17:18	31	09:24 (T63)	17:54	18:28	20:00			20:32	75	08:27 (T61)	21:00	51	08:16 (T61)
7	07:57		08:54 (T63)	07:37	06:58	07:06			06:23		07:13 (T61)	06:00		07:26 (T61)
	17:19	30	09:24 (T63)	17:55	18:29	20:01			20:33	74	08:27 (T61)	21:01	50	08:16 (T61)
8	07:57		08:55 (T63)	07:36	07:56	07:05		07:52 (T61)	06:22		07:13 (T61)	05:59		07:25 (T61)
	17:20	29	09:24 (T63)	17:57	19:30	20:02	10	08:02 (T61)	20:34	74	08:27 (T61)	21:02	50	08:15 (T61)
9	07:57		08:57 (T63)	07:35	07:55	07:03		07:45 (T61)	06:21		07:13 (T61)	05:59		07:26 (T61)
	17:21	26	09:23 (T63)	17:58	19:31	20:04	23	08:08 (T61)	20:35	74	08:27 (T61)	21:02	49	08:15 (T61)
10	07:57		08:58 (T63)	07:34	07:53	07:02		07:41 (T61)	06:20		07:13 (T61)	05:59		07:27 (T61)
	17:22	25	09:23 (T63)	17:59	19:32	20:05	31	08:12 (T61)	20:36	74	08:27 (T61)	21:03	48	08:15 (T61)
11	07:57		08:59 (T63)	07:32	07:51	07:00		07:37 (T61)	06:19		07:13 (T61)	05:59		07:27 (T61)
	17:23	23	09:22 (T63)	18:00	19:33	20:06	37	08:14 (T61)	20:37	73	08:26 (T61)	21:03	48	08:15 (T61)
12	07:56		09:00 (T63)	07:31	07:50	06:58		07:34 (T61)	06:17		07:13 (T61)	05:59		07:28 (T61)
	17:24	22	09:22 (T63)	18:02	19:34	20:07	42	08:16 (T61)	20:38	73	08:26 (T61)	21:04	47	08:15 (T61)
13	07:56		09:02 (T63)	07:30	07:48	06:57		07:32 (T61)	06:16		07:13 (T61)	05:59		07:28 (T61)
	17:25	19	09:21 (T63)	18:03	19:36	20:08	47	08:19 (T61)	20:39	73	08:26 (T61)	21:04	47	08:15 (T61)
14	07:56		09:04 (T63)	07:29	07:46	06:55		07:30 (T61)	06:15		07:13 (T61)	05:59		07:29 (T61)
	17:26	15	09:19 (T63)	18:04	19:37	20:09	50	08:20 (T61)	20:40	72	08:25 (T61)	21:05	46	08:15 (T61)
15	07:55		09:07 (T63)	07:27	07:45	06:54		07:29 (T61)	06:14		07:14 (T61)	05:59		07:29 (T61)
	17:27	11	09:18 (T63)	18:05	19:38	20:10	52	08:21 (T61)	20:41	71	08:25 (T61)	21:05	46	08:15 (T61)
16	07:55			07:26	07:43	06:52		07:26 (T61)	06:13		07:14 (T61)	05:59		07:30 (T61)
	17:28			18:06	19:39	20:11	56	08:22 (T61)	20:42	70	08:24 (T61)	21:06	45	08:15 (T61)
17	07:54			07:25	07:41	06:51		07:25 (T61)	06:12		07:14 (T61)	05:59		07:30 (T61)
	17:30			18:08	19:40	20:12	59	08:24 (T61)	20:43	70	08:24 (T61)	21:06	45	08:15 (T61)
18	07:54			07:23	07:40	06:49		07:23 (T61)	06:12		07:14 (T61)	05:59		07:30 (T61)
	17:31			18:09	19:41	20:13	61	08:24 (T61)	20:44	69	08:23 (T61)	21:07	45	08:15 (T61)
19	07:53			07:22	07:38	06:48		07:23 (T61)	06:11		07:14 (T61)	05:59		07:30 (T61)
	17:32			18:10	19:42	20:14	62	08:25 (T61)	20:45	69	08:23 (T61)	21:07	45	08:15 (T61)
20	07:53			07:21	07:36	06:46		07:21 (T61)	06:10		07:16 (T61)	05:59		07:31 (T61)
	17:33			18:11	19:43	20:15	64	08:25 (T61)	20:46	67	08:23 (T61)	21:07	44	08:15 (T61)
21	07:52			07:19	07:35	06:45		07:20 (T61)	06:09		07:16 (T61)	05:59		07:32 (T61)
	17:34			18:13	19:44	20:16	66	08:26 (T61)	20:47	66	08:22 (T61)	21:07	44	08:16 (T61)
22	07:52			07:18	07:33	06:43		07:19 (T61)	06:08		07:16 (T61)	05:59		07:32 (T61)
	17:35			18:14	19:45	20:17	67	08:26 (T61)	20:48	66	08:22 (T61)	21:08	44	08:16 (T61)
23	07:51			07:16	07:31	06:42		07:18 (T61)	06:07		07:16 (T61)	06:00		07:32 (T61)
	17:37			18:15	19:46	20:18	69	08:27 (T61)	20:49	65	08:21 (T61)	21:08	44	08:16 (T61)
24	07:50			07:15	07:30	06:40		07:18 (T61)	06:07		07:17 (T61)	06:00		07:31 (T61)
	17:38			18:16	19:48	20:20	70	08:28 (T61)	20:50	64	08:21 (T61)	21:08	45	08:16 (T61)
25	07:49			07:13	07:28	06:39		07:17 (T61)	06:06		07:17 (T61)	06:00		07:32 (T61)
	17:39			18:17	19:49	20:21	70	08:27 (T61)	20:51	63	08:20 (T61)	21:08	45	08:17 (T61)
26	07:49			07:12	07:26	06:37		07:16 (T61)	06:05		07:19 (T61)	06:01		07:32 (T61)
	17:40			18:18	19:50	20:22	72	08:28 (T61)	20:52	62	08:21 (T61)	21:08	45	08:17 (T61)
27	07:48			07:10	07:25	06:36		07:15 (T61)	06:05		07:19 (T61)	06:01		07:32 (T61)
	17:42			18:20	19:51	20:23	73	08:28 (T61)	20:53	61	08:20 (T61)	21:08	45	08:17 (T61)
28	07:47			07:09	07:23	06:35		07:15 (T61)	06:04		07:19 (T61)	06:01		07:32 (T61)
	17:43			18:21	19:52	20:24	73	08:28 (T61)	20:54	60	08:19 (T61)	21:08	46	08:18 (T61)
29	07:46				07:21	06:33		07:15 (T61)	06:03		07:20 (T61)	06:02		07:32 (T61)
	17:44				19:53	20:25	73	08:28 (T61)	20:54	59	08:19 (T61)	21:08	46	08:18 (T61)
30	07:45				07:20	06:32		07:14 (T61)	06:03		07:20 (T61)	06:02		07:32 (T61)
	17:45				19:54	20:26	74	08:28 (T61)	20:55	58	08:18 (T61)	21:08	47	08:19 (T61)
31	07:44				07:18				06:02		07:21 (T61)			
	17:47				19:55				20:56	57	08:18 (T61)			
Potential sun hours	297			297	370	399			448			452		
Total, worst case		394					1301			2134			1427	
Sun reduction		0.31					0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00	
Wind dir. red.		0.53					0.66			0.66			0.66	
Total reduction		0.16					0.34			0.37			0.42	
Total, real		64					439			790			593	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 948 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6952)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:03		07:32 (T61)	06:27		07:24 (T61)	06:58		07:36 (T61)	07:28		07:02			07:37		08:41 (T63)
	21:08	47	08:19 (T61)	20:50	73	08:37 (T61)	20:07	37	08:13 (T61)	19:15		17:28			17:04	23	09:04 (T63)
2	06:03		07:32 (T61)	06:28		07:23 (T61)	06:59		07:39 (T61)	07:29		07:03			07:38		08:40 (T63)
	21:08	48	08:20 (T61)	20:49	73	08:36 (T61)	20:06	31	08:10 (T61)	19:13		17:27			17:04	25	09:05 (T63)
3	06:04		07:31 (T61)	06:29		07:22 (T61)	07:00		07:43 (T61)	07:30		07:04			07:39		08:40 (T63)
	21:08	49	08:20 (T61)	20:48	74	08:36 (T61)	20:04	23	08:06 (T61)	19:12		17:26			17:04	26	09:06 (T63)
4	06:04		07:32 (T61)	06:30		07:22 (T61)	07:01		07:49 (T61)	07:31		07:06			07:40		08:39 (T63)
	21:08	49	08:21 (T61)	20:47	75	08:37 (T61)	20:02	10	07:59 (T61)	19:10		17:25			17:03	29	09:08 (T63)
5	06:05		07:31 (T61)	06:31		07:22 (T61)	07:02			07:32		07:07			07:41		08:39 (T63)
	21:08	50	08:21 (T61)	20:46	75	08:37 (T61)	20:01			19:08		17:24			17:03	30	09:09 (T63)
6	06:05		07:31 (T61)	06:32		07:22 (T61)	07:03			07:33		07:08			07:42		08:39 (T63)
	21:08	51	08:22 (T61)	20:44	75	08:37 (T61)	19:57			19:07		17:22			17:03	31	09:10 (T63)
7	06:06		07:30 (T61)	06:33		07:22 (T61)	07:04			07:34		07:09			07:43		08:39 (T63)
	21:07	52	08:22 (T61)	20:43	75	08:37 (T61)	19:56			19:05		17:21			17:03	31	09:10 (T63)
8	06:07		07:30 (T61)	06:34		07:22 (T61)	07:05			07:35		07:10			07:44		08:39 (T63)
	21:07	53	08:23 (T61)	20:42	75	08:37 (T61)	19:54			19:03		17:20			17:03	32	09:11 (T63)
9	06:07		07:30 (T61)	06:35		07:22 (T61)	07:06			07:36		07:12			07:45		08:39 (T63)
	21:07	54	08:24 (T61)	20:41	75	08:37 (T61)	19:52			19:02		17:19			17:03	33	09:12 (T63)
10	06:08		07:29 (T61)	06:36		07:22 (T61)	07:07			07:37		07:13			07:46		08:40 (T63)
	21:06	55	08:24 (T61)	20:39	75	08:37 (T61)	19:51			19:00		17:18			17:03	33	09:13 (T63)
11	06:09		07:30 (T61)	06:37		07:22 (T61)	07:08			07:38		07:14			07:46		08:40 (T63)
	21:06	55	08:25 (T61)	20:38	75	08:37 (T61)	19:49			18:59		17:17			17:03	34	09:14 (T63)
12	06:09		07:29 (T61)	06:38		07:22 (T61)	07:08			07:39		07:15			07:47		08:40 (T63)
	21:05	57	08:26 (T61)	20:37	75	08:37 (T61)	19:47			18:57		17:16			17:03	35	09:15 (T63)
13	06:10		07:28 (T61)	06:39		07:22 (T61)	07:09			07:40		07:16			07:48		08:40 (T63)
	21:05	58	08:26 (T61)	20:36	74	08:36 (T61)	19:46			18:55		17:15			17:03	35	09:15 (T63)
14	06:11		07:28 (T61)	06:40		07:22 (T61)	07:10			07:41		07:18			07:49		08:40 (T63)
	21:04	59	08:27 (T61)	20:34	74	08:36 (T61)	19:44			18:54		17:14			17:04	36	09:16 (T63)
15	06:12		07:28 (T61)	06:41		07:23 (T61)	07:11			07:43		07:19			07:49		08:41 (T63)
	21:04	60	08:28 (T61)	20:33	73	08:36 (T61)	19:42			18:52		17:13			17:04	36	09:17 (T63)
16	06:12		07:28 (T61)	06:42		07:23 (T61)	07:12			07:44		07:20			07:50		08:42 (T63)
	21:03	61	08:29 (T61)	20:31	72	08:35 (T61)	19:40			18:51		17:13			17:04	35	09:17 (T63)
17	06:13		07:27 (T61)	06:43		07:23 (T61)	07:13			07:45		07:21			07:51		08:41 (T63)
	21:03	62	08:29 (T61)	20:30	72	08:35 (T61)	19:39			18:49		17:12			17:04	36	09:17 (T63)
18	06:14		07:27 (T61)	06:44		07:23 (T61)	07:14			07:46		07:22			07:52		08:42 (T63)
	21:02	63	08:30 (T61)	20:29	71	08:34 (T61)	19:37			18:48		17:11			17:05	36	09:18 (T63)
19	06:15		07:27 (T61)	06:45		07:24 (T61)	07:15			07:47		07:23			07:52		08:42 (T63)
	21:01	63	08:30 (T61)	20:27	69	08:33 (T61)	19:35			18:46		17:10			17:05	36	09:18 (T63)
20	06:16		07:27 (T61)	06:46		07:24 (T61)	07:16			07:48		07:25			07:53		08:43 (T63)
	21:01	64	08:31 (T61)	20:26	69	08:33 (T61)	19:34			18:45		17:10			17:06	36	09:19 (T63)
21	06:17		07:27 (T61)	06:47		07:25 (T61)	07:17			07:49		07:26			07:53		08:44 (T63)
	21:00	65	08:32 (T61)	20:24	67	08:32 (T61)	19:32			18:43		17:09			17:06	36	09:20 (T63)
22	06:17		07:26 (T61)	06:48		07:25 (T61)	07:18			07:50		07:27			07:54		08:44 (T63)
	20:59	67	08:33 (T61)	20:23	66	08:31 (T61)	19:30			18:42		17:08			17:06	36	09:20 (T63)
23	06:18		07:25 (T61)	06:49		07:26 (T61)	07:19			07:52		07:28			07:54		08:44 (T63)
	20:58	67	08:32 (T61)	20:21	64	08:30 (T61)	19:29			18:40		17:08			17:07	36	09:20 (T63)
24	06:19		07:25 (T61)	06:50		07:26 (T61)	07:20			07:53		07:29			07:55		08:45 (T63)
	20:58	68	08:33 (T61)	20:20	62	08:28 (T61)	19:27			18:39		17:07			17:08	36	09:21 (T63)
25	06:20		07:25 (T61)	06:51		07:26 (T61)	07:22			07:54		07:30			07:55		08:45 (T63)
	20:57	68	08:33 (T61)	20:18	61	08:27 (T61)	19:25			18:38		17:07			17:08	36	09:21 (T63)
26	06:21		07:25 (T61)	06:52		07:27 (T61)	07:23			07:55		07:31			07:56		08:45 (T63)
	20:56	69	08:34 (T61)	20:17	58	08:25 (T61)	19:23			18:36		17:06			17:09	36	09:21 (T63)
27	06:22		07:25 (T61)	06:53		07:28 (T61)	07:24			07:56		07:33		08:46 (T63)	07:56		08:46 (T63)
	20:55	70	08:35 (T61)	20:15	56	08:24 (T61)	19:22			18:35		17:06	11	08:57 (T63)	17:09	36	09:22 (T63)
28	06:23		07:24 (T61)	06:54		07:30 (T61)	07:25			07:57		07:34		08:44 (T63)	07:56		08:47 (T63)
	20:54	71	08:35 (T61)	20:14	52	08:22 (T61)	19:20			18:33		17:05	15	08:59 (T63)	17:10	36	09:23 (T63)
29	06:24		07:24 (T61)	06:55		07:31 (T61)	07:26			07:58		07:35		08:43 (T63)	07:56		08:47 (T63)
	20:53	72	08:36 (T61)	20:12	49	08:20 (T61)	19:18			18:32		17:05	18	09:01 (T63)	17:11	36	09:23 (T63)
30	06:25		07:24 (T61)	06:56		07:32 (T61)	07:27			08:00		07:36		08:42 (T63)	07:57		08:48 (T63)
	20:52	72	08:36 (T61)	20:10	46	08:18 (T61)	19:17			18:31		17:04	21	09:03 (T63)	17:12	35	09:23 (T63)
31	06:26		07:24 (T61)	06:57		07:34 (T61)				08:01					07:57		08:49 (T63)
	20:51	72	08:36 (T61)	20:09	42	08:16 (T61)				18:30					17:12	35	09:24 (T63)
Potential sun hours	459			428			375			345			298			288		
Total, worst case		1871			2092			101				65				1042		
Sun reduction		0.66			0.61			0.59				0.30				0.22		
Oper. time red.		1.00			1.00			1.00				1.00				1.00		
Wind dir. red.		0.66			0.66			0.66				0.53				0.53		
Total reduction		0.43			0.40			0.38				0.16				0.11		
Total, real		802			828			39				10				119		

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 956 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6959)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		16:04 (T30)	07:44		08:04 (T31)	07:07			07:16		08:12 (T28)	06:30		06:01	
	17:13	38	16:42 (T30)	17:47	59	16:56 (T30)	18:22			19:56	48	19:14 (T27)	20:27		20:57	
2	07:57		16:04 (T30)	07:43		08:03 (T31)	07:06			07:14		08:14 (T28)	06:29		06:01	
	17:14	38	16:42 (T30)	17:49	59	16:55 (T30)	18:23			19:57	39	19:12 (T27)	20:28		20:58	
3	07:58		16:04 (T30)	07:42		08:02 (T31)	07:04			07:13		08:19 (T28)	06:28		06:00	
	17:15	39	16:43 (T30)	17:50	61	16:55 (T30)	18:24			19:58	25	19:10 (T27)	20:29		20:58	
4	07:58		16:04 (T30)	07:40		08:01 (T31)	07:02			07:11		18:55 (T27)	06:26		06:00	
	17:15	40	16:44 (T30)	17:51	61	16:54 (T30)	18:25			19:59	11	19:06 (T27)	20:30		20:59	
5	07:58		16:04 (T30)	07:39		08:00 (T31)	07:01			07:09			06:25		06:00	
	17:16	41	16:45 (T30)	17:52	62	16:54 (T30)	18:26			20:00			20:31		21:00	
6	07:58		16:05 (T30)	07:38		07:58 (T31)	06:59		07:25 (T28)	07:08			06:24		05:59	
	17:17	41	16:46 (T30)	17:54	61	16:52 (T30)	18:27	13	07:38 (T28)	20:00			20:32		21:01	
7	07:57		16:05 (T30)	07:37		07:57 (T31)	06:58		07:21 (T28)	07:06			06:23		05:59	
	17:18	42	16:47 (T30)	17:55	61	16:51 (T30)	18:29	20	07:41 (T28)	20:01			20:33		21:01	
8	07:57		16:04 (T30)	07:36		07:56 (T31)	07:56		08:18 (T28)	07:05			06:21		05:59	
	17:19	43	16:47 (T30)	17:56	60	16:50 (T30)	19:30	25	08:43 (T28)	20:02			20:34		21:02	
9	07:57		16:04 (T30)	07:35		07:55 (T31)	07:54		08:16 (T28)	07:03			06:20		05:59	
	17:20	44	16:48 (T30)	17:57	57	16:48 (T30)	19:31	30	08:46 (T28)	20:03			20:35		21:03	
10	07:57		16:05 (T30)	07:34		07:54 (T31)	07:53		08:14 (T28)	07:01			06:19		05:58	
	17:21	44	16:49 (T30)	17:59	56	16:47 (T30)	19:32	33	08:47 (T28)	20:05			20:37		21:03	
11	07:57		16:05 (T30)	07:32		07:53 (T31)	07:51		08:12 (T28)	07:00			06:18		05:58	
	17:22	45	16:50 (T30)	18:00	49	16:43 (T30)	19:33	36	08:48 (T28)	20:06			20:38		21:04	
12	07:56		16:05 (T30)	07:31		07:54 (T31)	07:50		08:11 (T28)	06:58			06:17		05:58	
	17:23	45	16:50 (T30)	18:01	39	16:39 (T30)	19:34	38	08:49 (T28)	20:07			20:39		21:04	
13	07:56		16:05 (T30)	07:30		07:54 (T31)	07:48		08:10 (T28)	06:56			06:16		05:58	
	17:25	46	16:51 (T30)	18:02	32	08:26 (T31)	19:35	45	19:10 (T27)	20:08			20:40		21:05	
14	07:56		16:05 (T30)	07:29		07:55 (T31)	07:46		08:08 (T28)	06:55			06:15		05:58	
	17:26	46	16:51 (T30)	18:04	31	08:26 (T31)	19:36	58	19:14 (T27)	20:09			20:41		21:05	
15	07:55		16:05 (T30)	07:27		07:54 (T31)	07:45		08:08 (T28)	06:53			06:14		05:58	
	17:27	47	16:52 (T30)	18:05	31	08:25 (T31)	19:38	63	19:16 (T27)	20:10			20:42		21:06	
16	07:55		16:05 (T30)	07:26		07:55 (T31)	07:43		08:07 (T28)	06:52			06:13		05:58	
	17:28	47	16:52 (T30)	18:06	29	08:24 (T31)	19:39	66	19:17 (T27)	20:11			20:43		21:06	
17	07:55		16:06 (T30)	07:25		07:55 (T31)	07:41		08:06 (T28)	06:50			06:12		05:58	
	17:29	47	16:53 (T30)	18:07	28	08:23 (T31)	19:40	70	19:18 (T27)	20:12			20:44		21:06	
18	07:54		16:05 (T30)	07:23		07:56 (T31)	07:40		08:06 (T28)	06:49			06:11		05:58	
	17:30	48	16:53 (T30)	18:09	26	08:22 (T31)	19:41	74	19:20 (T27)	20:13			20:45		21:07	
19	07:53		16:06 (T30)	07:22		07:58 (T31)	07:38		08:05 (T28)	06:47			06:10		05:58	
	17:31	48	16:54 (T30)	18:10	23	08:21 (T31)	19:42	77	19:21 (T27)	20:14			20:46		21:07	
20	07:53		16:06 (T30)	07:21		07:59 (T31)	07:36		08:05 (T28)	06:46			06:09		05:58	
	17:33	48	16:54 (T30)	18:11	20	08:19 (T31)	19:43	78	19:21 (T27)	20:15			20:46		21:07	
21	07:52		16:06 (T30)	07:19		08:01 (T31)	07:35		08:05 (T28)	06:44			06:08		05:59	
	17:34	48	16:54 (T30)	18:12	17	08:18 (T31)	19:44	79	19:22 (T27)	20:16			20:47		21:08	
22	07:52		16:07 (T30)	07:18		08:04 (T31)	07:33		08:05 (T28)	06:43			06:08		05:59	
	17:35	48	16:55 (T30)	18:13	10	08:14 (T31)	19:45	79	19:22 (T27)	20:17			20:48		21:08	
23	07:51		16:07 (T30)	07:16			07:31		08:04 (T28)	06:41			06:07		05:59	
	17:36	48	16:55 (T30)	18:15			19:46	79	19:21 (T27)	20:18			20:49		21:08	
24	07:50		16:07 (T30)	07:15			07:30		08:05 (T28)	06:40			06:06		05:59	
	17:37	48	16:55 (T30)	18:16			19:47	79	19:22 (T27)	20:20			20:50		21:08	
25	07:50		16:07 (T30)	07:13			07:28		08:05 (T28)	06:38			06:05		06:00	
	17:39	49	16:56 (T30)	18:17			19:48	77	19:21 (T27)	20:21			20:51		21:08	
26	07:49		16:08 (T30)	07:12			07:26		08:05 (T28)	06:37			06:05		06:00	
	17:40	48	16:56 (T30)	18:18			19:50	75	19:20 (T27)	20:22			20:52		21:09	
27	07:48		16:08 (T30)	07:10			07:24		08:05 (T28)	06:36			06:04		06:00	
	17:41	48	16:56 (T30)	18:19			19:51	73	19:19 (T27)	20:23			20:53		21:09	
28	07:47		16:09 (T30)	07:09			07:23		08:07 (T28)	06:34			06:03		06:01	
	17:42	47	16:56 (T30)	18:20			19:52	69	19:19 (T27)	20:24			20:54		21:09	
29	07:46		16:09 (T30)				07:21		08:07 (T28)	06:33			06:03		06:01	
	17:44	47	16:56 (T30)				19:53	66	19:18 (T27)	20:25			20:55		21:09	
30	07:45		08:06 (T31)				07:19		08:08 (T28)	06:31			06:02		06:01	
	17:45	52	16:56 (T30)				19:54	62	19:17 (T27)	20:26			20:55		21:09	
31	07:44		08:05 (T31)				07:18		08:10 (T28)				06:02			
	17:46	56	16:56 (T30)				19:55	56	19:16 (T27)				20:56			
Potential sun hours	297			297			370			399			449		453	
Total, worst case		1416			932			1520			123					
Sun reduction		0.31			0.40			0.44			0.52					
Oper. time red.		1.00			1.00			1.00			1.00					
Wind dir. red.		0.73			0.62			0.61			0.62					
Total reduction		0.23			0.26			0.27			0.33					
Total, real		328			238			416			41					

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 956 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6959)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September			October			November			December		
1	06:02		06:26		06:57			07:27		07:49 (T28)	07:02		07:23 (T31)	07:37		15:47 (T30)
	21:09		20:50		20:07			19:15	39	08:28 (T28)	17:28	55	16:16 (T30)	17:04	45	16:32 (T30)
2	06:02		06:27		06:58			07:29		07:50 (T28)	07:03		07:25 (T31)	07:38		15:48 (T30)
	21:08		20:49		20:06			19:13	37	08:27 (T28)	17:27	59	16:19 (T30)	17:03	44	16:32 (T30)
3	06:03		06:28		06:59			07:30		07:51 (T28)	07:04		07:26 (T31)	07:39		15:48 (T30)
	21:08		20:48		20:04			19:11	34	08:25 (T28)	17:25	60	16:20 (T30)	17:03	44	16:32 (T30)
4	06:03		06:29		07:00			07:31		07:52 (T28)	07:06		07:27 (T31)	07:40		15:49 (T30)
	21:08		20:47		20:02			19:10	31	08:23 (T28)	17:24	61	16:21 (T30)	17:03	43	16:32 (T30)
5	06:04		06:30		07:01			07:32		07:54 (T28)	07:07		07:28 (T31)	07:41		15:50 (T30)
	21:08		20:46		20:01			19:08	28	08:22 (T28)	17:23	62	16:22 (T30)	17:03	42	16:32 (T30)
6	06:05		06:31		07:02			07:33		07:56 (T28)	07:08		07:30 (T31)	07:42		15:51 (T30)
	21:08		20:45		19:57			19:06	23	08:19 (T28)	17:22	62	16:24 (T30)	17:03	41	16:32 (T30)
7	06:05		06:32		07:03			07:34		07:59 (T28)	07:09		07:31 (T31)	07:43		15:51 (T30)
	21:07		20:43		19:56			19:05	17	08:16 (T28)	17:21	61	16:24 (T30)	17:02	41	16:32 (T30)
8	06:06		06:33		07:04		18:51 (T27)	07:35		08:04 (T28)	07:10		07:32 (T31)	07:44		15:52 (T30)
	21:07		20:42		19:54	9	19:00 (T27)	19:03	6	08:10 (T28)	17:20	61	16:25 (T30)	17:02	40	16:32 (T30)
9	06:07		06:34		07:05		08:13 (T28)	07:36			07:12		07:34 (T31)	07:45		15:52 (T30)
	21:07		20:41		19:52	23	19:03 (T27)	19:01			17:19	59	16:26 (T30)	17:02	39	16:31 (T30)
10	06:07		06:35		07:06		08:07 (T28)	07:37			07:13		07:35 (T31)	07:46		15:53 (T30)
	21:06		20:40		19:51	38	19:04 (T27)	19:00			17:18	57	16:26 (T30)	17:02	38	16:31 (T30)
11	06:08		06:36		07:07		08:04 (T28)	07:38			07:14		07:36 (T31)	07:47		15:54 (T30)
	21:06		20:38		19:49	48	19:06 (T27)	18:58			17:17	56	16:27 (T30)	17:02	38	16:32 (T30)
12	06:09		06:37		07:08		08:02 (T28)	07:39			07:15		07:37 (T31)	07:47		15:55 (T30)
	21:06		20:37		19:47	55	19:07 (T27)	18:57			17:16	51	16:27 (T30)	17:03	37	16:32 (T30)
13	06:09		06:38		07:09		07:59 (T28)	07:40			07:16		15:41 (T30)	07:48		15:56 (T30)
	21:05		20:36		19:45	61	19:08 (T27)	18:55			17:15	47	16:28 (T30)	17:03	36	16:32 (T30)
14	06:10		06:39		07:10		07:58 (T28)	07:41			07:18		15:41 (T30)	07:49		15:56 (T30)
	21:05		20:34		19:44	64	19:08 (T27)	18:53			17:14	47	16:28 (T30)	17:03	36	16:32 (T30)
15	06:11		06:40		07:11		07:56 (T28)	07:42			07:19		15:40 (T30)	07:50		15:57 (T30)
	21:04		20:33		19:42	69	19:08 (T27)	18:52			17:13	48	16:28 (T30)	17:03	35	16:32 (T30)
16	06:12		06:41		07:12		07:55 (T28)	07:44			07:20		15:41 (T30)	07:50		15:57 (T30)
	21:04		20:32		19:40	72	19:09 (T27)	18:50			17:12	48	16:29 (T30)	17:03	36	16:33 (T30)
17	06:13		06:42		07:13		07:54 (T28)	07:45			07:21		15:41 (T30)	07:51		15:58 (T30)
	21:03		20:30		19:39	74	19:09 (T27)	18:49			17:11	48	16:29 (T30)	17:04	36	16:34 (T30)
18	06:13		06:43		07:14		07:53 (T28)	07:46			07:22		15:41 (T30)	07:52		15:58 (T30)
	21:02		20:29		19:37	76	19:08 (T27)	18:47			17:10	48	16:29 (T30)	17:04	35	16:33 (T30)
19	06:14		06:44		07:15		07:52 (T28)	07:47			07:24		15:41 (T30)	07:52		15:59 (T30)
	21:02		20:27		19:35	77	19:08 (T27)	18:46			17:10	48	16:29 (T30)	17:04	35	16:34 (T30)
20	06:15		06:45		07:16		07:51 (T28)	07:48		08:34 (T31)	07:25		15:42 (T30)	07:53		15:59 (T30)
	21:01		20:26		19:33	79	19:08 (T27)	18:44	13	08:47 (T31)	17:09	48	16:30 (T30)	17:05	35	16:34 (T30)
21	06:16		06:46		07:17		07:50 (T28)	07:49		08:31 (T31)	07:26		15:42 (T30)	07:53		16:00 (T30)
	21:00		20:24		19:32	79	19:07 (T27)	18:43	18	08:49 (T31)	17:08	48	16:30 (T30)	17:05	35	16:35 (T30)
22	06:17		06:47		07:18		07:50 (T28)	07:50		08:29 (T31)	07:27		15:42 (T30)	07:54		16:00 (T30)
	20:59		20:23		19:30	79	19:07 (T27)	18:41	21	08:50 (T31)	17:08	48	16:30 (T30)	17:06	35	16:35 (T30)
23	06:18		06:48		07:19		07:49 (T28)	07:51		08:27 (T31)	07:28		15:42 (T30)	07:54		16:01 (T30)
	20:59		20:21		19:28	79	19:06 (T27)	18:40	24	08:51 (T31)	17:07	48	16:30 (T30)	17:06	35	16:36 (T30)
24	06:19		06:49		07:20		07:49 (T28)	07:53		08:26 (T31)	07:29		15:43 (T30)	07:55		16:01 (T30)
	20:58		20:20		19:27	77	19:04 (T27)	18:39	26	08:52 (T31)	17:07	48	16:31 (T30)	17:07	35	16:36 (T30)
25	06:20		06:50		07:21		07:48 (T28)	07:54		08:26 (T31)	07:31		15:44 (T30)	07:55		16:01 (T30)
	20:57		20:18		19:25	75	19:03 (T27)	18:37	28	08:54 (T31)	17:06	47	16:31 (T30)	17:07	35	16:36 (T30)
26	06:20		06:51		07:22		07:48 (T28)	07:55		08:25 (T31)	07:32		15:44 (T30)	07:56		16:02 (T30)
	20:56		20:17		19:23	72	19:01 (T27)	18:36	29	08:54 (T31)	17:05	47	16:31 (T30)	17:08	36	16:38 (T30)
27	06:21		06:52		07:23		07:48 (T28)	07:56		08:24 (T31)	07:33		15:44 (T30)	07:56		16:02 (T30)
	20:55		20:15		19:21	68	18:59 (T27)	18:34	30	08:54 (T31)	17:05	47	16:31 (T30)	17:09	36	16:38 (T30)
28	06:22		06:53		07:24		07:48 (T28)	07:57		08:23 (T31)	07:34		15:45 (T30)	07:56		16:03 (T30)
	20:54		20:14		19:20	64	18:57 (T27)	18:33	31	08:54 (T31)	17:05	46	16:31 (T30)	17:09	35	16:38 (T30)
29	06:23		06:54		07:25		07:48 (T28)	07:58		08:24 (T31)	07:35		15:45 (T30)	07:57		16:04 (T30)
	20:53		20:12		19:18	60	18:56 (T27)	18:32	31	08:55 (T31)	17:04	46	16:31 (T30)	17:10	36	16:40 (T30)
30	06:24		06:55		07:26		07:49 (T28)	08:00		08:23 (T31)	07:36		15:46 (T30)	07:57		16:04 (T30)
	20:52		20:10		19:16	51	18:52 (T27)	18:30	43	17:10 (T30)	17:04	45	16:31 (T30)	17:11	36	16:40 (T30)
31	06:25		06:56					08:01		08:23 (T31)				07:57		16:04 (T30)
	20:51		20:09					18:29	51	17:14 (T30)				17:12	37	16:41 (T30)
Potential sun hours	460		429		375			345			297			287		
Total, worst case						1449			560			1556			1167	
Sun reduction						0.59			0.48			0.30			0.22	
Oper. time red.						1.00			1.00			1.00			1.00	
Wind dir. red.						0.61			0.57			0.70			0.73	
Total reduction						0.37			0.28			0.22			0.16	
Total, real						536			157			336			193	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 986 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6986)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:43	07:07	07:16	06:30	06:49 (T5) 06:01	06:26 (T4) 06:01	06:31 (T4) 06:26	06:57 (T5) 06:57	07:27	07:02	07:37
	17:12	17:47	18:21	19:56	20:27 27	07:16 (T5) 20:57 43	07:09 (T4) 21:09 46	07:17 (T4) 20:50 29	07:26 (T5) 20:07	19:14	17:27	17:03
2	07:57	07:42	07:05	07:14	06:28	06:48 (T5) 06:00	06:26 (T4) 06:02	06:31 (T4) 06:27	06:56 (T5) 06:58	07:28	07:03	07:38
	17:13	17:48	18:22	19:57	20:28 28	07:16 (T5) 20:58 44	07:10 (T4) 21:08 46	07:17 (T4) 20:49 30	07:26 (T5) 20:05	19:13	17:26	17:03
3	07:57	07:41	07:04	07:12	06:27	06:47 (T5) 06:00	06:27 (T4) 06:02	06:32 (T4) 06:28	06:56 (T5) 06:59	07:29	07:04	07:39
	17:14	17:49	18:24	19:58	20:29 30	07:17 (T5) 20:58 44	07:11 (T4) 21:08 45	07:17 (T4) 20:48 31	07:27 (T5) 20:04	19:11	17:25	17:02
4	07:58	07:40	07:02	07:11	06:26	06:46 (T5) 05:59	06:26 (T4) 06:03	06:32 (T4) 06:29	06:55 (T5) 07:00	07:30	07:05	07:40
	17:15	17:51	18:25	19:59	20:30 31	07:17 (T5) 20:59 44	07:10 (T4) 21:08 46	07:18 (T4) 20:47 31	07:26 (T5) 20:02	19:09	17:24	17:02
5	07:58	07:39	07:01	07:09	06:25	06:45 (T5) 05:59	06:26 (T4) 06:04	06:32 (T4) 06:30	06:55 (T5) 07:01	07:31	07:07	07:41
	17:16	17:52	18:26	20:00	20:31 31	07:16 (T5) 21:00 45	07:11 (T4) 21:08 45	07:17 (T4) 20:46 31	07:26 (T5) 20:00	19:08	17:23	17:02
6	07:57	07:38	06:59	07:07	06:23	06:45 (T5) 05:59	06:27 (T4) 06:04	06:33 (T4) 06:31	06:54 (T5) 07:02	07:32	07:08	07:42
	17:17	17:53	18:27	20:00	20:32 31	07:16 (T5) 21:01 45	07:12 (T4) 21:08 45	07:18 (T4) 20:44 32	07:26 (T5) 19:57	19:06	17:21	17:02
7	07:57	07:37	06:57	07:06	06:22	06:45 (T5) 05:58	06:26 (T4) 06:05	06:33 (T4) 06:32	06:54 (T5) 07:03	07:34	07:09	07:43
	17:18	17:54	18:28	20:01	20:33 31	07:16 (T5) 21:01 45	07:11 (T4) 21:07 44	07:17 (T4) 20:43 32	07:26 (T5) 19:55	19:04	17:20	17:02
8	07:57	07:36	07:56	07:04	06:21	06:45 (T5) 05:58	06:26 (T4) 06:05	06:33 (T4) 06:33	06:54 (T5) 07:04	07:35	07:10	07:44
	17:19	17:56	19:29	20:02	20:34 31	07:16 (T5) 21:02 46	07:12 (T4) 21:07 45	07:18 (T4) 20:42 32	07:26 (T5) 19:54	19:03	17:19	17:02
9	07:57	07:35	07:54	07:03	06:20	06:45 (T5) 05:58	06:27 (T4) 06:06	06:34 (T4) 06:34	06:55 (T5) 07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03	20:35 31	07:16 (T5) 21:02 45	07:12 (T4) 21:07 44	07:18 (T4) 20:41 31	07:26 (T5) 19:52	19:01	17:18	17:02
10	07:57	07:34	07:53	07:01	06:19	06:45 (T5) 05:58	06:27 (T4) 06:07	06:34 (T4) 06:35	06:56 (T5) 07:06	07:37	07:13	07:46
	17:21	17:58	19:32	20:04	20:36 31	07:16 (T5) 21:03 45	07:12 (T4) 21:06 43	07:17 (T4) 20:39 29	07:25 (T5) 19:50	18:59	17:17	17:02
11	07:57	07:32	07:51	06:59	06:18	06:46 (T5) 05:58	06:27 (T4) 06:07	06:34 (T4) 06:36	06:57 (T5) 07:07	07:38	07:14	07:47
	17:22	17:59	19:33	20:05	20:37 29	07:15 (T5) 21:04 46	07:13 (T4) 21:06 44	07:18 (T4) 20:38 28	07:25 (T5) 19:49	18:58	17:16	17:02
12	07:56	07:31	07:49	06:58	06:16	06:46 (T5) 05:58	06:27 (T4) 06:08	06:35 (T4) 06:37	06:58 (T5) 07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:06	20:38 29	07:15 (T5) 21:04 46	07:13 (T4) 21:06 43	07:18 (T4) 20:37 26	07:24 (T5) 19:47	18:56	17:15	17:02
13	07:56	07:30	07:48	06:56	06:15	06:47 (T5) 05:57	06:28 (T4) 06:09	06:35 (T4) 06:38	06:59 (T5) 07:09	07:40	07:16	07:48
	17:24	18:02	19:35	20:08	20:39 27	07:14 (T5) 21:05 45	07:13 (T4) 21:05 42	07:17 (T4) 20:36 25	07:24 (T5) 19:45	18:55	17:14	17:02
14	07:56	07:28	07:46	06:55	06:14	06:44 (T4) 05:57	06:28 (T4) 06:10	06:35 (T4) 06:39	07:00 (T5) 07:10	07:41	07:18	07:49
	17:25	18:03	19:36	20:09	20:41 30	07:14 (T5) 21:05 46	07:14 (T4) 21:05 42	07:17 (T4) 20:34 23	07:23 (T5) 19:44	18:53	17:13	17:02
15	07:55	07:27	07:44	06:53	06:13	06:40 (T4) 05:57	06:28 (T4) 06:10	06:36 (T4) 06:40	07:01 (T5) 07:11	07:42	07:19	07:50
	17:26	18:04	19:37	20:10	20:42 33	07:13 (T5) 21:06 46	07:14 (T4) 21:04 41	07:17 (T4) 20:33 21	07:22 (T5) 19:42	18:52	17:12	17:03
16	07:55	07:26	07:43	06:51	06:12	06:37 (T4) 05:57	06:28 (T4) 06:11	06:37 (T4) 06:41	07:02 (T5) 07:12	07:43	07:20	07:50
	17:27	18:06	19:38	20:11	20:43 35	07:12 (T5) 21:06 46	07:14 (T4) 21:03 40	07:17 (T4) 20:31 18	07:20 (T5) 19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50	06:11	06:35 (T4) 05:57	06:28 (T4) 06:12	06:36 (T4) 06:42	07:03 (T5) 07:13	07:44	07:21	07:51
	17:29	18:07	19:39	20:12	20:44 36	07:11 (T5) 21:06 46	07:14 (T4) 21:03 40	07:16 (T4) 20:30 16	07:19 (T5) 19:38	18:48	17:11	17:03
18	07:54	07:23	07:39	06:48	06:10	06:34 (T4) 05:58	06:28 (T4) 06:13	06:37 (T4) 06:43	07:04 (T5) 07:14	07:46	07:22	07:52
	17:30	18:08	19:41	20:13	20:44 36	07:10 (T5) 21:07 46	07:14 (T4) 21:02 39	07:16 (T4) 20:29 12	07:16 (T5) 19:37	18:47	17:10	17:04
19	07:53	07:22	07:38	06:47	06:10	06:32 (T4) 05:58	06:28 (T4) 06:14	06:38 (T4) 06:44	07:05 (T5) 07:15	07:47	07:23	07:52
	17:31	18:09	19:42	20:14	20:45 36	07:08 (T5) 21:07 46	07:14 (T4) 21:02 38	07:16 (T4) 20:27 8	07:13 (T5) 19:35	18:45	17:09	17:04
20	07:53	07:20	07:36	06:45	06:09	06:32 (T4) 05:58	06:28 (T4) 06:15	06:39 (T4) 06:45	07:16	07:48	07:25	07:53
	17:32	18:11	19:43	20:15	20:46 35	07:07 (T5) 21:07 46	07:14 (T4) 21:01 36	07:15 (T4) 20:26	19:33	18:44	17:09	17:04
21	07:52	07:19	07:34	06:44	06:08	06:31 (T4) 05:58	06:28 (T4) 06:15	06:40 (T4) 06:46	07:17	07:49	07:26	07:53
	17:33	18:12	19:44	20:16	20:47 33	07:04 (T5) 21:08 47	07:15 (T4) 21:00 35	07:15 (T4) 20:24	19:31	18:42	17:08	17:05
22	07:52	07:17	07:33	06:42	06:07	06:30 (T4) 05:58	06:29 (T4) 06:16	06:41 (T4) 06:47	07:18	07:50	07:27	07:54
	17:34	18:13	19:45	20:17	20:48 34	07:04 (T4) 21:08 46	07:15 (T4) 20:59 33	07:14 (T4) 20:23	19:30	18:41	17:07	17:05
23	07:51	07:16	07:31	06:41	06:06	06:29 (T4) 05:58	06:29 (T4) 06:17	06:41 (T4) 06:48	07:19	07:51	07:28	07:54
	17:36	18:14	19:46	20:18	20:49 36	07:05 (T4) 21:08 46	07:15 (T4) 20:59 34	07:15 (T5) 20:21	19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:39 06:59 (T5)	06:06	06:29 (T4) 05:59	06:29 (T4) 06:18	06:42 (T4) 06:49	07:20	07:52	07:29	07:55
	17:37	18:15	19:47	20:19 9 07:08 (T5)	20:50 37	07:06 (T4) 21:08 46	07:15 (T4) 20:58 36	07:18 (T5) 20:20	19:26	18:38	17:06	17:06
25	07:49	07:13	07:28	06:38 06:57 (T5)	06:05	06:28 (T4) 05:59	06:30 (T4) 06:19	06:43 (T4) 06:50	07:21	07:54	07:30	07:55
	17:38	18:17	19:48	20:20 13 07:10 (T5)	20:51 38	07:06 (T4) 21:08 46	07:16 (T4) 20:57 36	07:19 (T5) 20:18	19:25	18:37	17:05	17:07
26	07:49	07:12	07:26	06:36 06:56 (T5)	06:04	06:27 (T4) 05:59	06:30 (T4) 06:20	06:45 (T4) 06:51	07:22	07:55	07:32	07:56
	17:39	18:18	19:49	20:22 16 07:12 (T5)	20:52 40	07:07 (T4) 21:09 46	07:16 (T4) 20:56 36	07:21 (T5) 20:17	19:23	18:35	17:05	17:08
27	07:48	07:10	07:24	06:35 06:55 (T5)	06:04	06:28 (T4) 06:00	06:30 (T4) 06:21	06:47 (T4) 06:52	07:23	07:56	07:33	07:56
	17:41	18:19	19:50	20:23 19 07:14 (T5)	20:53 40	07:08 (T4) 21:09 46	07:16 (T4) 20:55 35	07:22 (T5) 20:15	19:21	18:34	17:05	17:08
28	07:47	07:08	07:22	06:34 06:53 (T5)	06:03	06:27 (T4) 06:00	06:31 (T4) 06:22	06:49 (T4) 06:53	07:24	07:57	07:34	07:56
	17:42	18:20	19:51	20:24 21 07:14 (T5)	20:54 41	07:08 (T4) 21:09 46	07:17 (T4) 20:54 34	07:23 (T5) 20:13	19:19	18:33	17:04	17:09
29	07:46		07:21	06:32 06:52 (T5)	06:02	06:27 (T4) 06:00	06:31 (T4) 06:23	06:52 (T4) 06:54	07:25	07:58	07:35	07:57
	17:43		19:52	20:25 23 07:15 (T5)	20:55 42	07:09 (T4) 21:09 46	07:17 (T4) 20:53 32	07:24 (T5) 20:12	19:18	18:31	17:04	17:10
30	07:45		07:19	06:31 06:51 (T5)	06:02	06:26 (T4) 06:01	06:31 (T4) 06:24	06:58 (T5) 06:55	07:26	08:00	07:36	07:57
	17:44		19:54	20:26 25 07:16 (T5)	20:55 43	07:09 (T4) 21:09 46	07:17 (T4) 20:52 27	07:25 (T5) 20:10	19:16	18:30	17:03	17:10
31	07:44		07:17		06:01	06:27 (T4)	06:25	06:57 (T5) 06:56		08:01		07:57
	17:46		19:55		20:56 43	07:10 (T4)	20:51 28	07:25 (T5) 20:09		18:29		17:11
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				126	1055	1366	1220	485				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.69	0.70	0.71	0.71	0.69				
Total reduction				0.36	0.40	0.46	0.47	0.42				
Total, real				45	422	624	572	203				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 998 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6994)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April		May		June		July		August		September	October	November	December
1	07:58	07:44	07:07	07:16		06:30		18:34 (T26)	06:01	18:29 (T26)	06:02	18:36 (T26)	06:26	18:38 (T26)	06:57	07:28	07:02	07:37
	17:13	17:47	18:22	19:56		20:27	88	20:02 (T25)	20:57	84	19:53 (T26)	21:09	83	19:59 (T26)	20:50	91	20:09 (T25)	20:07	19:15	17:28	17:04
2	07:58	07:43	07:06	07:15		06:29		18:33 (T26)	06:01	18:29 (T26)	06:03	18:36 (T26)	06:27	18:38 (T26)	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57		20:28	89	20:02 (T25)	20:58	85	19:54 (T26)	21:09	83	19:59 (T26)	20:49	91	20:09 (T25)	20:06	19:13	17:27	17:03
3	07:58	07:42	07:04	07:13		06:28		18:32 (T26)	06:00	18:29 (T26)	06:03	18:37 (T26)	06:28	18:38 (T26)	06:59	07:30	07:05	07:39
	17:15	17:50	18:24	19:58		20:29	90	20:02 (T25)	20:59	84	19:53 (T26)	21:09	83	20:00 (T26)	20:48	92	20:10 (T25)	20:04	19:11	17:26	17:03
4	07:58	07:41	07:03	07:11		06:26		18:31 (T26)	06:00	18:30 (T26)	06:04	18:36 (T26)	06:29	18:39 (T26)	07:00	07:31	07:06	07:40
	17:16	17:51	18:25	19:59		20:30	91	20:02 (T25)	20:59	84	19:54 (T26)	21:08	83	19:59 (T26)	20:47	91	20:10 (T25)	20:02	19:10	17:24	17:03
5	07:58	07:40	07:01	07:10		06:25		18:31 (T26)	06:00	18:30 (T26)	06:04	18:37 (T26)	06:30	18:39 (T26)	07:01	07:32	07:07	07:41
	17:16	17:52	18:26	20:00		20:31	91	20:02 (T25)	21:00	84	19:54 (T26)	21:08	83	20:00 (T26)	20:46	92	20:11 (T25)	20:01	19:08	17:23	17:03
6	07:58	07:38	06:59	07:08		06:24		18:30 (T26)	05:59	18:30 (T26)	06:05	18:36 (T26)	06:31	18:40 (T26)	07:02	07:33	07:08	07:42
	17:17	17:54	18:28	20:00		20:32	91	20:01 (T25)	21:01	83	19:53 (T26)	21:08	84	20:00 (T26)	20:45	91	20:11 (T25)	19:57	19:06	17:22	17:03
7	07:58	07:37	06:58	07:06		06:23		18:30 (T26)	05:59	18:30 (T26)	06:05	18:36 (T26)	06:32	18:40 (T26)	07:03	07:34	07:09	07:43
	17:18	17:55	18:29	20:01		20:34	91	20:01 (T25)	21:01	84	19:54 (T26)	21:08	84	20:00 (T26)	20:43	91	20:11 (T25)	19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05		06:22		18:29 (T26)	05:59	18:31 (T26)	06:06	18:37 (T26)	06:33	18:41 (T26)	07:04	07:35	07:11	07:44
	17:19	17:56	19:30	20:03		20:35	92	20:01 (T25)	21:02	83	19:54 (T26)	21:07	84	20:01 (T26)	20:42	90	20:11 (T25)	19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03		06:20		18:29 (T26)	05:59	18:31 (T26)	06:07	18:36 (T26)	06:34	18:41 (T26)	07:05	07:36	07:12	07:45
	17:20	17:58	19:31	20:04		20:36	92	20:01 (T25)	21:03	83	19:54 (T26)	21:07	84	20:00 (T26)	20:41	90	20:11 (T25)	19:52	19:02	17:19	17:03
10	07:57	07:34	07:53	07:01		06:19		18:28 (T26)	05:58	18:32 (T26)	06:07	18:37 (T26)	06:35	18:42 (T26)	07:06	07:37	07:13	07:46
	17:21	17:59	19:32	20:05		20:37	91	19:59 (T25)	21:03	83	19:55 (T26)	21:07	84	20:01 (T26)	20:40	89	20:11 (T25)	19:51	19:00	17:18	17:03
11	07:57	07:33	07:51	07:00		06:18		18:27 (T26)	05:58	18:31 (T26)	06:08	18:37 (T26)	06:36	18:42 (T26)	07:07	07:38	07:14	07:47
	17:22	18:00	19:33	20:06		20:38	91	19:58 (T25)	21:04	83	19:54 (T26)	21:06	84	20:01 (T26)	20:38	89	20:11 (T25)	19:49	18:58	17:17	17:03
12	07:57	07:31	07:50	06:58		06:17		18:27 (T26)	05:58	18:32 (T26)	06:09	18:36 (T26)	06:37	18:43 (T26)	07:08	07:39	07:15	07:48
	17:24	18:01	19:34	20:07		20:39	91	19:58 (T25)	21:04	82	19:54 (T26)	21:06	85	20:01 (T26)	20:37	88	20:11 (T25)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57		06:16		18:27 (T26)	05:58	18:32 (T26)	06:10	18:37 (T26)	06:38	18:44 (T26)	07:09	07:40	07:17	07:48
	17:25	18:03	19:35	20:08		20:40	90	19:57 (T25)	21:05	82	19:54 (T26)	21:05	84	20:01 (T26)	20:36	87	20:11 (T25)	19:46	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55		06:15		18:27 (T26)	05:58	18:32 (T26)	06:10	18:37 (T26)	06:39	18:45 (T26)	07:10	07:42	07:18	07:49
	17:26	18:04	19:37	20:09		20:41	89	19:56 (T25)	21:05	83	19:55 (T26)	21:05	85	20:02 (T26)	20:34	85	20:10 (T25)	19:44	18:54	17:14	17:03
15	07:56	07:28	07:45	06:53		06:14		18:27 (T26)	05:58	18:32 (T26)	06:11	18:37 (T26)	06:40	18:46 (T26)	07:11	07:43	07:19	07:50
	17:27	18:05	19:38	20:10		20:42	89	19:56 (T25)	21:06	83	19:55 (T26)	21:04	85	20:02 (T26)	20:33	83	20:09 (T25)	19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52		06:13		18:27 (T26)	05:58	18:33 (T26)	06:12	18:36 (T26)	06:41	18:47 (T26)	07:12	07:44	07:20	07:51
	17:28	18:06	19:39	20:11		20:43	87	19:54 (T25)	21:06	82	19:55 (T26)	21:04	86	20:02 (T26)	20:32	81	20:08 (T25)	19:40	18:50	17:12	17:04
17	07:55	07:25	07:41	06:50		06:12		18:27 (T26)	05:58	18:33 (T26)	06:13	18:37 (T26)	06:42	18:48 (T26)	07:13	07:45	07:21	07:51
	17:29	18:07	19:40	20:12		20:44	86	19:53 (T25)	21:07	82	19:55 (T26)	21:03	85	20:02 (T26)	20:30	79	20:07 (T25)	19:39	18:49	17:11	17:04
18	07:54	07:23	07:40	06:49	19:08 (T26)	06:11		18:27 (T26)	05:58	18:34 (T26)	06:14	18:37 (T26)	06:43	18:49 (T26)	07:14	07:46	07:23	07:52
	17:30	18:09	19:41	20:13	6 19:14 (T26)	20:45	84	19:51 (T26)	21:07	82	19:56 (T26)	21:02	85	20:02 (T26)	20:29	76	20:05 (T25)	19:37	18:47	17:11	17:04
19	07:54	07:22	07:38	06:47	19:00 (T26)	06:10		18:27 (T26)	05:58	18:34 (T26)	06:14	18:37 (T26)	06:44	18:50 (T26)	07:15	07:47	07:24	07:53
	17:31	18:10	19:42	20:14	23 19:23 (T26)	20:46	85	19:52 (T26)	21:07	82	19:56 (T26)	21:02	85	20:02 (T26)	20:27	73	20:03 (T25)	19:35	18:46	17:10	17:05
20	07:53	07:21	07:36	06:46	18:55 (T26)	06:09		18:26 (T26)	05:58	18:34 (T26)	06:15	18:37 (T26)	06:45	18:52 (T26)	07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	45 19:53 (T25)	20:47	85	19:51 (T26)	21:08	82	19:56 (T26)	21:01	86	20:03 (T26)	20:26	70	20:02 (T25)	19:34	18:44	17:09	17:05
21	07:52	07:19	07:35	06:44	18:52 (T26)	06:09		18:26 (T26)	05:59	18:34 (T26)	06:16	18:37 (T26)	06:46	18:54 (T26)	07:17	07:49	07:26	07:54
	17:34	18:12	19:44	20:16	56 19:55 (T25)	20:48	85	19:51 (T26)	21:08	82	19:56 (T26)	21:00	85	20:02 (T26)	20:24	63	20:00 (T25)	19:32	18:43	17:08	17:05
22	07:52	07:18	07:33	06:43	18:49 (T26)	06:08		18:27 (T26)	05:59	18:34 (T26)	06:17	18:37 (T26)	06:47	18:56 (T26)	07:18	07:50	07:27	07:54
	17:35	18:13	19:45	20:18	65 19:56 (T25)	20:49	85	19:52 (T26)	21:08	82	19:56 (T26)	21:00	85	20:02 (T26)	20:23	56	19:59 (T25)	19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:41	18:47 (T26)	06:07		18:27 (T26)	05:59	18:35 (T26)	06:18	18:37 (T26)	06:48	18:59 (T26)	07:19	07:52	07:28	07:55
	17:36	18:15	19:46	20:19	70 19:57 (T25)	20:49	85	19:52 (T26)	21:08	82	19:57 (T26)	20:59	85	20:02 (T26)	20:21	43	19:56 (T25)	19:28	18:40	17:07	17:06
24	07:50	07:15	07:30	06:40	18:44 (T26)	06:06		18:27 (T26)	05:59	18:35 (T26)	06:19	18:37 (T26)	06:49	19:04 (T26)	07:20	07:53	07:30	07:55
	17:37	18:16	19:47	20:20	74 19:58 (T25)	20:50	85	19:52 (T26)	21:08	82	19:57 (T26)	20:58	85	20:02 (T26)	20:20	21	19:25 (T26)	19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:38	18:42 (T26)	06:05		18:28 (T26)	06:00	18:35 (T26)	06:20	18:37 (T26)	06:50		07:21	07:54	07:31	07:56
	17:39	18:17	19:49	20:21	77 19:59 (T25)	20:51	85	19:53 (T26)	21:09	82	19:57 (T26)	20:57	85	20:02 (T26)	20:18			19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	18:41 (T26)	06:05		18:27 (T26)	06:00	18:36 (T26)	06:21	18:37 (T26)	06:51		07:22	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	79 20:00 (T25)	20:52	85	19:52 (T26)	21:09	82	19:58 (T26)	20:56	85	20:02 (T26)	20:17			19:23	18:36	17:06	17:08
27	07:48	07:10	07:25	06:36	18:39 (T26)	06:04		18:27 (T26)	06:00	18:36 (T26)	06:21	18:38 (T26)	06:52		07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23	82 20:01 (T25)	20:53	85	19:52 (T26)	21:09	82	19:58 (T26)	20:55	86	20:04 (T25)	20:15			19:22	18:34	17:05	17:09
28	07:47	07:09	07:23	06:34	18:38 (T26)	06:04		18:28 (T26)	06:01	18:35 (T26)	06:22	18:38 (T26)	06:53		07:25	07:57	07:34	07:57
	17:42	18:21	19:52	20:24	84 20:02 (T25)	20:54	85	19:53 (T26)	21:09	83	19:58 (T26)	20:54	88	20:06 (T25)	20:14			19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	18:37 (T26)	06:03		18:28 (T26)	06:01	18:36 (T26)	06:23	18:37 (T26)	06:54		07:26	07:59	07:35	07:57
	17:44		19:53	20:25	85 20:02 (T25)	20:55	85	19:53 (T26)	21:09	83	19:59 (T26)	20:53	89	20:06 (T25)	20:12			19:18	18:32	17:04	17:10
30	07:46		07:20	06:32	18:35 (T26)	06:02		18:28 (T26)	06:02	18:36 (T26)	06:24	18:37 (T26)	06:55		07:27	08:00	07:36	07:57
	17:45		19:54	20:26	87 20:02 (T25)	20:56	85	19:53 (T26)	21:09	82	19:58 (T26)	20:52	90	20:07 (T25)	20:11			19:17	18:31	17:04	17:11
31	07:45		07:18			06:02		18:28 (T26)				06:25		18:38 (T26)	06:56				08:01		07:57
	17:46		19:55			20:56	85	19:53 (T26)				20:51	90	20:08 (T25)	20:09				18:29		17:12
Potential sun hours	297	297	370	399		449		453		460		429		375	345	297	287				
Total, worst case				833		2718		2482		2638		1902									
Sun reduction				0.52		0.57		0.64		0.66		0.61									
Oper. time red.				1.00		1.00		1.00		1.00		1.00									
Wind dir. red.				0.57		0.57		0.57		0.57		0.57									
Total reduction				0.30		0.33		0.37		0.38		0.35									
Total, real				248		886		909		996		663									

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1022 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7016)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		08:04 (T44)		07:07		07:16		07:37 (T77)	06:30		06:02		06:36 (T42)
	17:13		17:48	17	08:21 (T44)		18:22		19:56	34	08:11 (T77)	20:27		20:57	35	07:11 (T42)
2	07:57		07:43		08:03 (T44)		07:06		07:15		07:36 (T77)	06:29		06:01		06:37 (T42)
	17:14		17:49	19	08:22 (T44)		18:23		19:57	35	08:11 (T77)	20:28		20:58	35	07:12 (T42)
3	07:57		07:41		08:02 (T44)		07:04		07:13		07:36 (T77)	06:28		06:01		06:36 (T42)
	17:15		17:50	21	08:23 (T44)		18:24		19:58	35	08:11 (T77)	20:29		20:58	35	07:11 (T42)
4	07:58		07:40		08:01 (T44)		07:03		07:11		07:35 (T77)	06:26		06:00		06:37 (T42)
	17:16		17:51	23	08:24 (T44)		18:25		19:59	35	08:10 (T77)	20:30		20:59	34	07:11 (T42)
5	07:57		07:39		08:00 (T44)		07:01		07:10		07:36 (T77)	06:25	06:46 (T42)	06:00		06:38 (T42)
	17:17		17:53	25	08:25 (T44)		18:26		20:00	34	08:10 (T77)	20:31	13 06:59 (T42)	21:00	33	07:11 (T42)
6	07:57		07:38		07:58 (T44)		06:59		07:08		07:36 (T77)	06:24	06:44 (T42)	06:00		06:37 (T42)
	17:18		17:54	26	08:24 (T44)		18:28		20:00	33	08:09 (T77)	20:32	18 07:02 (T42)	21:01	34	07:11 (T42)
7	07:57		07:37		07:57 (T44)		06:58		07:06		07:35 (T77)	06:23	06:43 (T42)	05:59		06:38 (T42)
	17:19		17:55	28	08:25 (T44)		18:29		20:01	33	08:08 (T77)	20:33	21 07:04 (T42)	21:01	33	07:11 (T42)
8	07:57		07:36		07:56 (T44)		07:56		07:05		07:36 (T77)	06:22	06:42 (T42)	05:59		06:39 (T42)
	17:20		17:56	29	08:25 (T44)		19:30		20:02	32	08:08 (T77)	20:34	24 07:06 (T42)	21:02	32	07:11 (T42)
9	07:57		07:35		07:57 (T44)		07:55		07:03		07:36 (T77)	06:20	06:41 (T42)	05:59		06:39 (T42)
	17:21		17:58	29	08:26 (T44)		19:31		20:04	30	08:06 (T77)	20:35	26 07:07 (T42)	21:02	32	07:11 (T42)
10	07:57		07:34		07:57 (T44)		07:53		07:01		07:37 (T77)	06:19	06:40 (T42)	05:59		06:40 (T42)
	17:22		17:59	29	08:26 (T44)		19:32		20:05	28	08:05 (T77)	20:36	28 07:08 (T42)	21:03	31	07:11 (T42)
11	07:57		07:32		07:57 (T44)		07:51		07:00		07:38 (T77)	06:18	06:38 (T42)	05:58		06:40 (T42)
	17:23		18:00	28	08:25 (T44)		19:33		20:06	26	08:04 (T77)	20:38	30 07:08 (T42)	21:04	31	07:11 (T42)
12	07:56		07:31		07:57 (T44)		07:50		06:58		07:39 (T77)	06:17	06:37 (T42)	05:58		06:41 (T42)
	17:24		18:01	28	08:25 (T44)		19:34		20:07	23	08:02 (T77)	20:39	31 07:08 (T42)	21:04	30	07:11 (T42)
13	07:56		07:30		07:58 (T44)		07:48		06:57		07:41 (T77)	06:16	06:36 (T42)	05:58		06:40 (T42)
	17:25		18:03	27	08:25 (T44)		19:35		20:08	19	08:00 (T77)	20:40	33 07:09 (T42)	21:05	30	07:10 (T42)
14	07:56		07:29		07:59 (T44)		07:46		06:55		07:43 (T77)	06:15	06:36 (T42)	05:58		06:41 (T42)
	17:26		18:04	25	08:24 (T44)		19:37		20:09	13	07:56 (T77)	20:41	34 07:10 (T42)	21:05	29	07:10 (T42)
15	07:55		07:27		07:59 (T44)		07:45		06:53			06:14	06:35 (T42)	05:58		06:41 (T42)
	17:27		18:05	24	08:23 (T44)		19:38		20:10			20:42	36 07:11 (T42)	21:06	29	07:10 (T42)
16	07:55		07:26		08:01 (T44)		07:43		06:52			06:13	06:35 (T42)	05:58		06:42 (T42)
	17:28		18:06	21	08:22 (T44)		19:39		20:11			20:43	36 07:11 (T42)	21:06	29	07:11 (T42)
17	07:54		07:25		08:02 (T44)		07:41		06:50			06:12	06:34 (T42)	05:58		06:43 (T42)
	17:29		18:07	17	08:19 (T44)		19:40		20:12			20:44	37 07:11 (T42)	21:06	28	07:11 (T42)
18	07:54		07:23		08:04 (T44)		07:40		06:49			06:11	06:34 (T42)	05:58		06:43 (T42)
	17:30		18:09	13	08:17 (T44)		19:41		20:13			20:45	37 07:11 (T42)	21:07	28	07:11 (T42)
19	07:53		07:22		08:10 (T44)		07:38		06:47			06:10	06:34 (T42)	05:58		06:43 (T42)
	17:32		18:10	3	08:13 (T44)		19:42		20:14			20:45	37 07:11 (T42)	21:07	28	07:11 (T42)
20	07:53		07:21				07:36		06:46			06:09	06:33 (T42)	05:59		06:43 (T42)
	17:33		18:11				19:43		20:15			20:46	38 07:11 (T42)	21:07	28	07:11 (T42)
21	07:52		07:19				07:35		06:44			06:09	06:34 (T42)	05:59		06:43 (T42)
	17:34		18:12				19:44		20:16			20:47	38 07:12 (T42)	21:08	28	07:11 (T42)
22	07:52		07:18				07:33		06:43			06:08	06:34 (T42)	05:59		06:43 (T42)
	17:35		18:14				19:45		20:17			20:48	38 07:12 (T42)	21:08	28	07:11 (T42)
23	07:51		07:16				07:31		06:41			06:07	06:34 (T42)	05:59		06:44 (T42)
	17:36		18:15				19:46		20:18			20:49	38 07:12 (T42)	21:08	28	07:12 (T42)
24	07:50		07:15				07:30	07:50 (T77)	06:40			06:06	06:33 (T42)	05:59		06:44 (T42)
	17:38		18:16				19:47	14 08:04 (T77)	20:20			20:50	38 07:11 (T42)	21:08	28	07:12 (T42)
25	07:50		07:13				07:28	07:47 (T77)	06:39			06:06	06:34 (T42)	06:00		06:44 (T42)
	17:39		18:17				19:49	19 08:06 (T77)	20:21			20:51	38 07:12 (T42)	21:08	28	07:12 (T42)
26	07:49		07:12				07:26	07:45 (T77)	06:37			06:05	06:34 (T42)	06:00		06:45 (T42)
	17:40		18:18				19:50	22 08:07 (T77)	20:22			20:52	38 07:12 (T42)	21:08	28	07:13 (T42)
27	07:48		07:10				07:25	07:44 (T77)	06:36			06:04	06:35 (T42)	06:00		06:44 (T42)
	17:41		18:19				19:51	25 08:09 (T77)	20:23			20:53	37 07:12 (T42)	21:09	29	07:13 (T42)
28	07:47	08:08 (T44)	07:09				07:23	07:42 (T77)	06:34			06:04	06:35 (T42)	06:01		06:44 (T42)
	17:43	4 08:12 (T44)	18:21				19:52	28 08:10 (T77)	20:24			20:54	37 07:12 (T42)	21:09	29	07:13 (T42)
29	07:46	08:07 (T44)					07:21	07:40 (T77)	06:33			06:03	06:35 (T42)	06:01		06:45 (T42)
	17:44	9 08:16 (T44)					19:53	30 08:10 (T77)	20:25			20:54	37 07:12 (T42)	21:09	29	07:14 (T42)
30	07:45	08:06 (T44)					07:20	07:39 (T77)	06:32			06:03	06:35 (T42)	06:02		06:44 (T42)
	17:45	12 08:18 (T44)					19:54	32 08:11 (T77)	20:26			20:55	37 07:12 (T42)	21:09	30	07:14 (T42)
31	07:44	08:05 (T44)					07:18	07:38 (T77)				06:02	06:36 (T42)			
	17:46	15 08:20 (T44)					19:55	33 08:11 (T77)				20:56	36 07:12 (T42)			
Potential sun hours	297		297		370		399		448			453				
Total, worst case		40		432		203		410		891			909			
Sun reduction		0.31		0.40		0.44		0.52		0.57			0.64			
Oper. time red.		1.00		1.00		1.00		1.00		1.00			1.00			
Wind dir. red.		0.54		0.54		0.63		0.63		0.70			0.70			
Total reduction		0.17		0.21		0.27		0.32		0.40			0.44			
Total, real		7		93		56		133		352			404			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1022 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7016)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		06:45 (T42)	06:26		06:48 (T42)	06:57		07:37 (T77)	07:28		07:26 (T44)	07:37
	21:09	30	07:15 (T42)	20:50	31	07:19 (T42)	20:07	26	08:03 (T77)	19:15		17:28	29	07:55 (T44)	17:04
2	06:03		06:44 (T42)	06:27		06:49 (T42)	06:58		07:36 (T77)	07:29		07:03		07:26 (T44)	07:38
	21:08	31	07:15 (T42)	20:49	29	07:18 (T42)	20:06	28	08:04 (T77)	19:13		17:27	29	07:55 (T44)	17:03
3	06:03		06:45 (T42)	06:28		06:50 (T42)	06:59		07:34 (T77)	07:30		07:04		07:26 (T44)	07:39
	21:08	31	07:16 (T42)	20:48	27	07:17 (T42)	20:04	30	08:04 (T77)	19:11		17:26	29	07:55 (T44)	17:03
4	06:04		06:44 (T42)	06:29		06:51 (T42)	07:00		07:33 (T77)	07:31		07:06		07:27 (T44)	07:40
	21:08	32	07:16 (T42)	20:47	25	07:16 (T42)	20:02	32	08:05 (T77)	19:10		17:24	28	07:55 (T44)	17:03
5	06:04		06:44 (T42)	06:30		06:52 (T42)	07:01		07:32 (T77)	07:32		07:07		07:28 (T44)	07:41
	21:08	33	07:17 (T42)	20:46	23	07:15 (T42)	20:01	33	08:05 (T77)	19:08		17:23	26	07:54 (T44)	17:03
6	06:05		06:44 (T42)	06:31		06:53 (T42)	07:02		07:32 (T77)	07:33		07:08		07:30 (T44)	07:42
	21:08	33	07:17 (T42)	20:44	20	07:13 (T42)	19:57	33	08:05 (T77)	19:06		17:22	25	07:55 (T44)	17:03
7	06:06		06:44 (T42)	06:32		06:54 (T42)	07:03		07:31 (T77)	07:34		07:09		07:31 (T44)	07:43
	21:07	34	07:18 (T42)	20:43	17	07:11 (T42)	19:56	34	08:05 (T77)	19:05		17:21	23	07:54 (T44)	17:03
8	06:06		06:44 (T42)	06:33		06:57 (T42)	07:04		07:31 (T77)	07:35		07:10		07:32 (T44)	07:44
	21:07	34	07:18 (T42)	20:42	11	07:08 (T42)	19:54	34	08:05 (T77)	19:03		17:20	21	07:53 (T44)	17:03
9	06:07		06:44 (T42)	06:34			07:05		07:30 (T77)	07:36		07:12		07:34 (T44)	07:45
	21:07	34	07:18 (T42)	20:41			19:52	35	08:05 (T77)	19:02		17:19	19	07:53 (T44)	17:03
10	06:08		06:44 (T42)	06:35			07:06		07:30 (T77)	07:37		07:13		07:35 (T44)	07:46
	21:06	35	07:19 (T42)	20:40			19:51	35	08:05 (T77)	19:00		17:18	17	07:52 (T44)	17:03
11	06:08		06:44 (T42)	06:36			07:07		07:30 (T77)	07:38		07:14		07:36 (T44)	07:47
	21:06	36	07:20 (T42)	20:38			19:49	34	08:04 (T77)	18:58		17:17	15	07:51 (T44)	17:03
12	06:09		06:43 (T42)	06:37			07:08		07:29 (T77)	07:39		07:15		07:37 (T44)	07:47
	21:06	36	07:19 (T42)	20:37			19:47	33	08:02 (T77)	18:57		17:16	12	07:49 (T44)	17:03
13	06:10		06:44 (T42)	06:38			07:09		07:29 (T77)	07:40		07:16		07:39 (T44)	07:48
	21:05	36	07:20 (T42)	20:36			19:46	33	08:02 (T77)	18:55		17:15	9	07:48 (T44)	17:03
14	06:10		06:44 (T42)	06:39			07:10		07:30 (T77)	07:41		07:18		07:40 (T44)	07:49
	21:05	36	07:20 (T42)	20:34			19:44	31	08:01 (T77)	18:54		17:14	4	07:44 (T44)	17:03
15	06:11		06:44 (T42)	06:40			07:11		07:31 (T77)	07:43		07:19			07:50
	21:04	37	07:21 (T42)	20:33			19:42	28	07:59 (T77)	18:52		17:13			17:03
16	06:12		06:43 (T42)	06:41			07:12		07:32 (T77)	07:44		07:20			07:50
	21:03	38	07:21 (T42)	20:32			19:40	26	07:58 (T77)	18:50		17:12			17:04
17	06:13		06:42 (T42)	06:42			07:13		07:33 (T77)	07:45		07:21			07:51
	21:03	38	07:21 (T42)	20:30			19:39	23	07:56 (T77)	18:49		17:12			17:04
18	06:14		06:44 (T42)	06:43			07:14		07:34 (T77)	07:46		07:22			07:52
	21:02	37	07:21 (T42)	20:29			19:37	20	07:54 (T77)	18:47		17:11			17:04
19	06:14		06:44 (T42)	06:44			07:15		07:36 (T77)	07:47		07:24			07:52
	21:02	38	07:22 (T42)	20:27			19:35	15	07:51 (T77)	18:46		17:10			17:05
20	06:15		06:44 (T42)	06:45			07:16		07:40 (T77)	07:48		07:25			07:53
	21:01	38	07:22 (T42)	20:26			19:34	6	07:46 (T77)	18:44		17:09			17:05
21	06:16		06:43 (T42)	06:46			07:17			07:49		07:26			07:53
	21:00	38	07:21 (T42)	20:24			19:32			18:43		17:09			17:06
22	06:17		06:43 (T42)	06:47			07:18			07:50		07:27			07:54
	20:59	39	07:22 (T42)	20:23			19:30			18:42		17:08			17:06
23	06:18		06:44 (T42)	06:48			07:19			07:52		08:37 (T44)	07:28		07:54
	20:59	38	07:22 (T42)	20:21			19:28			18:40	8	08:45 (T44)	17:07		17:07
24	06:19		06:44 (T42)	06:49			07:20			07:53		08:33 (T44)	07:29		07:55
	20:58	38	07:22 (T42)	20:20			19:27			18:39	15	08:48 (T44)	17:07		17:07
25	06:20		06:44 (T42)	06:50			07:21			07:54		08:32 (T44)	07:30		07:55
	20:57	38	07:22 (T42)	20:18			19:25			18:37	18	08:50 (T44)	17:06		17:08
26	06:21		06:45 (T42)	06:51			07:22			07:55		08:30 (T44)	07:32		07:56
	20:56	37	07:22 (T42)	20:17			19:23			18:36	22	08:52 (T44)	17:06		17:08
27	06:22		06:45 (T42)	06:52			07:23			07:56		08:29 (T44)	07:33		07:56
	20:55	37	07:22 (T42)	20:15			19:22			18:35	23	08:52 (T44)	17:05		17:09
28	06:23		06:45 (T42)	06:53		07:50 (T77)	07:24			07:57		08:28 (T44)	07:34		07:56
	20:54	36	07:21 (T42)	20:14	2	07:52 (T77)	19:20			18:33	25	08:53 (T44)	17:05		17:10
29	06:23		06:45 (T42)	06:54		07:44 (T77)	07:25			07:58		08:28 (T44)	07:35		07:57
	20:53	35	07:20 (T42)	20:12	14	07:58 (T77)	19:18			18:32	26	08:54 (T44)	17:04		17:10
30	06:24		06:46 (T42)	06:55		07:41 (T77)	07:27			08:00		08:27 (T44)	07:36		07:57
	20:52	34	07:20 (T42)	20:10	19	08:00 (T77)	19:16			18:31	28	08:55 (T44)	17:04		17:11
31	06:25		06:47 (T42)	06:56		07:39 (T77)				08:01		08:26 (T44)			07:57
	20:51	32	07:19 (T42)	20:09	23	08:02 (T77)				18:29	29	08:55 (T44)			17:12
Potential sun hours	460			429			375			345			297		287
Total, worst case		1099			241			569			194			286	
Sun reduction		0.66			0.61			0.59			0.48			0.30	
Oper. time red.		1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.70			0.69			0.63			0.54			0.54	
Total reduction		0.46			0.41			0.37			0.26			0.16	
Total, real		503			100			209			50			46	

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

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

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1030 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7022)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:28 (T4)	07:43		08:19 (T4)	07:07		07:16		07:53 (T3)	06:30		07:38 (T3)	06:01
	17:12	6	08:34 (T4)	17:47	44	09:03 (T4)	18:21		19:56	58	08:51 (T3)	20:27	68	08:46 (T3)	20:57
2	07:57		08:26 (T4)	07:42		08:03 (T5)	07:05		07:14		07:51 (T3)	06:28		07:39 (T3)	06:00
	17:13	10	08:36 (T4)	17:48	52	09:03 (T4)	18:22		19:57	61	08:52 (T3)	20:28	66	08:45 (T3)	20:58
3	07:58		08:25 (T4)	07:41		08:02 (T5)	07:04		07:12		07:49 (T3)	06:27		07:39 (T3)	06:00
	17:14	13	08:38 (T4)	17:49	55	09:03 (T4)	18:24		19:58	64	08:53 (T3)	20:29	66	08:45 (T3)	20:58
4	07:58		08:24 (T4)	07:40		08:01 (T5)	07:02		07:11		07:48 (T3)	06:26		07:40 (T3)	05:59
	17:15	16	08:40 (T4)	17:51	59	09:03 (T4)	18:25		19:59	66	08:54 (T3)	20:30	64	08:44 (T3)	20:59
5	07:58		08:24 (T4)	07:39		08:00 (T5)	07:01		07:09		07:46 (T3)	06:25		07:40 (T3)	05:59
	17:16	18	08:42 (T4)	17:52	60	09:03 (T4)	18:26		20:00	68	08:54 (T3)	20:31	62	08:42 (T3)	21:00
6	07:57		08:23 (T4)	07:38		07:58 (T5)	06:59		07:07		07:45 (T3)	06:23		07:41 (T3)	05:59
	17:17	20	08:43 (T4)	17:53	61	09:01 (T4)	18:27		20:00	69	08:54 (T3)	20:32	60	08:41 (T3)	21:01
7	07:57		08:23 (T4)	07:37		07:57 (T5)	06:57		07:06		07:44 (T3)	06:22		07:42 (T3)	05:58
	17:18	22	08:45 (T4)	17:54	62	09:01 (T4)	18:28		20:01	71	08:55 (T3)	20:33	58	08:40 (T3)	21:01
8	07:57		08:22 (T4)	07:36		07:56 (T5)	07:56		07:04		07:43 (T3)	06:21		07:43 (T3)	05:58
	17:19	23	08:45 (T4)	17:56	62	09:00 (T4)	19:29		20:02	72	08:55 (T3)	20:34	56	08:39 (T3)	21:02
9	07:57		08:21 (T4)	07:35		07:55 (T5)	07:54		07:03		07:43 (T3)	06:20		07:43 (T3)	05:58
	17:20	26	08:47 (T4)	17:57	63	09:00 (T4)	19:30		20:03	73	08:56 (T3)	20:35	55	08:38 (T3)	21:02
10	07:57		08:21 (T4)	07:34		07:54 (T5)	07:53		07:01		07:42 (T3)	06:19		07:44 (T3)	05:58
	17:21	28	08:49 (T4)	17:58	63	08:59 (T4)	19:32		20:04	74	08:56 (T3)	20:36	53	08:37 (T3)	21:03
11	07:57		08:21 (T4)	07:32		07:52 (T5)	07:51		06:59		07:40 (T3)	06:18		07:46 (T3)	05:58
	17:22	29	08:50 (T4)	17:59	61	08:57 (T4)	19:33		20:05	75	08:55 (T3)	20:37	50	08:36 (T3)	21:04
12	07:56		08:20 (T4)	07:31		07:51 (T5)	07:49		06:58		07:40 (T3)	06:16		07:47 (T3)	05:58
	17:23	31	08:51 (T4)	18:01	61	08:56 (T4)	19:34		20:06	76	08:56 (T3)	20:38	48	08:35 (T3)	21:04
13	07:56		08:20 (T4)	07:30		07:52 (T5)	07:48		06:56		07:39 (T3)	06:15		07:48 (T3)	05:57
	17:24	32	08:52 (T4)	18:02	55	08:54 (T4)	19:35		20:08	76	08:55 (T3)	20:40	46	08:34 (T3)	21:05
14	07:56		08:19 (T4)	07:29		07:51 (T5)	07:46		06:55		07:39 (T3)	06:14		07:49 (T3)	05:57
	17:25	34	08:53 (T4)	18:03	52	08:51 (T4)	19:36		20:09	77	08:56 (T3)	20:41	43	08:32 (T3)	21:05
15	07:55		08:19 (T4)	07:27		07:51 (T5)	07:44		06:53		07:38 (T3)	06:13		07:50 (T3)	05:57
	17:26	35	08:54 (T4)	18:04	45	08:48 (T4)	19:37		20:10	77	08:55 (T3)	20:42	41	08:31 (T3)	21:06
16	07:55		08:19 (T4)	07:26		07:52 (T5)	07:43		06:51		07:38 (T3)	06:12		07:52 (T3)	05:57
	17:27	35	08:54 (T4)	18:06	31	08:23 (T5)	19:38		20:11	78	08:56 (T3)	20:43	37	08:29 (T3)	21:06
17	07:54		08:19 (T4)	07:25		07:52 (T5)	07:41		06:50		07:38 (T3)	06:11		07:53 (T3)	05:57
	17:29	37	08:56 (T4)	18:07	30	08:22 (T5)	19:39		20:12	77	08:55 (T3)	20:44	34	08:27 (T3)	21:06
18	07:54		08:18 (T4)	07:23		07:53 (T5)	07:39		06:48		07:37 (T3)	06:10		07:55 (T3)	05:58
	17:30	38	08:56 (T4)	18:08	29	08:22 (T5)	19:41		20:13	77	08:54 (T3)	20:45	30	08:25 (T3)	21:07
19	07:53		08:19 (T4)	07:22		07:53 (T5)	07:38		06:47		07:37 (T3)	06:10		07:57 (T3)	05:58
	17:31	39	08:58 (T4)	18:09	27	08:20 (T5)	19:42		20:14	77	08:54 (T3)	20:45	26	08:23 (T3)	21:07
20	07:53		08:18 (T4)	07:20		07:54 (T5)	07:36		06:45		07:37 (T3)	06:09		08:00 (T3)	05:58
	17:32	40	08:58 (T4)	18:11	26	08:20 (T5)	19:43		20:15	77	08:54 (T3)	20:46	21	08:21 (T3)	21:07
21	07:52		08:18 (T4)	07:19		07:56 (T5)	07:34		06:44		07:37 (T3)	06:08		08:03 (T3)	05:58
	17:33	41	08:59 (T4)	18:12	23	08:19 (T5)	19:44		20:16	76	08:53 (T3)	20:47	15	08:18 (T3)	21:08
22	07:52		08:18 (T4)	07:17		07:56 (T5)	07:33		06:42		07:37 (T3)	06:07		08:08 (T3)	05:58
	17:34	42	09:00 (T4)	18:13	20	08:16 (T5)	19:45		20:17	76	08:53 (T3)	20:48	4	08:12 (T3)	21:08
23	07:51		08:18 (T4)	07:16		07:59 (T5)	07:31		06:41		07:36 (T3)	06:06			05:58
	17:36	42	09:00 (T4)	18:14	16	08:15 (T5)	19:46		20:18	76	08:52 (T3)	20:49			21:08
24	07:50		08:18 (T4)	07:15		08:02 (T5)	07:29	08:16 (T3)	06:39		07:37 (T3)	06:06			05:59
	17:37	43	09:01 (T4)	18:15	9	08:11 (T5)	19:47	16 08:32 (T3)	20:19	75	08:52 (T3)	20:50			21:08
25	07:49		08:17 (T4)	07:13			07:28	08:11 (T3)	06:38		07:36 (T3)	06:05			05:59
	17:38	44	09:01 (T4)	18:17			19:48	27 08:38 (T3)	20:20	74	08:50 (T3)	20:51			21:08
26	07:49		08:17 (T4)	07:12			07:26	08:07 (T3)	06:36		07:37 (T3)	06:04			05:59
	17:39	44	09:01 (T4)	18:18			19:49	34 08:41 (T3)	20:22	73	08:50 (T3)	20:52			21:09
27	07:48		08:18 (T4)	07:10			07:24	08:03 (T3)	06:35		07:37 (T3)	06:03			06:00
	17:41	45	09:03 (T4)	18:19			19:50	40 08:43 (T3)	20:23	73	08:50 (T3)	20:53			21:09
28	07:47		08:18 (T4)	07:09			07:22	08:00 (T3)	06:34		07:37 (T3)	06:03			06:00
	17:42	45	09:03 (T4)	18:20			19:51	45 08:45 (T3)	20:24	71	08:48 (T3)	20:54			21:09
29	07:46		08:18 (T4)				07:21	07:58 (T3)	06:32		07:38 (T3)	06:02			06:00
	17:43	45	09:03 (T4)				19:52	49 08:47 (T3)	20:25	70	08:48 (T3)	20:55			21:09
30	07:45		08:18 (T4)				07:19	07:56 (T3)	06:31		07:38 (T3)	06:02			06:01
	17:44	45	09:03 (T4)				19:54	53 08:49 (T3)	20:26	69	08:47 (T3)	20:55			21:09
31	07:44		08:19 (T4)				07:17	07:54 (T3)				06:01			
	17:46	44	09:03 (T4)				19:55	56 08:50 (T3)				20:56			
Potential sun hours	297		297			370		399			449			453	
Total, worst case		1012		1066		320			2176			1003			
Sun reduction		0.31		0.40		0.44			0.52			0.57			
Oper. time red.		1.00		1.00		1.00			1.00			1.00			
Wind dir. red.		0.52		0.53		0.63			0.63			0.63			
Total reduction		0.16		0.21		0.27			0.32			0.35			
Total, real		158		223		87			701			354			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1030 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7022)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:01			06:26		07:57 (T3)	06:57		07:39 (T3)	07:27			07:02		07:23 (T5)	07:37		08:03 (T4)
	21:09			20:50	49	08:46 (T3)	20:07	75	08:54 (T3)	19:14			17:27	62	08:28 (T4)	17:03	29	08:32 (T4)
2	06:02			06:27		07:56 (T3)	06:58		07:40 (T3)	07:28			07:03		07:25 (T5)	07:38		08:04 (T4)
	21:08			20:49	51	08:47 (T3)	20:05	74	08:54 (T3)	19:13			17:26	63	08:30 (T4)	17:03	28	08:32 (T4)
3	06:02			06:28		07:54 (T3)	06:59		07:40 (T3)	07:29			07:04		07:26 (T5)	07:39		08:05 (T4)
	21:08			20:48	53	08:47 (T3)	20:04	73	08:53 (T3)	19:11			17:25	63	08:30 (T4)	17:02	26	08:31 (T4)
4	06:03			06:29		07:53 (T3)	07:00		07:40 (T3)	07:30			07:05		07:27 (T5)	07:40		08:07 (T4)
	21:08			20:47	55	08:48 (T3)	20:02	72	08:52 (T3)	19:09			17:24	63	08:31 (T4)	17:02	24	08:31 (T4)
5	06:04			06:30		07:52 (T3)	07:01		07:40 (T3)	07:31			07:07		07:28 (T5)	07:41		08:08 (T4)
	21:08			20:46	57	08:49 (T3)	20:00	71	08:51 (T3)	19:08			17:23	60	08:31 (T4)	17:02	22	08:30 (T4)
6	06:04			06:31		07:51 (T3)	07:02		07:41 (T3)	07:32			07:08		07:30 (T5)	07:42		08:09 (T4)
	21:08			20:44	59	08:50 (T3)	19:57	69	08:50 (T3)	19:06			17:21	60	08:33 (T4)	17:02	20	08:29 (T4)
7	06:05			06:32		07:50 (T3)	07:03		07:41 (T3)	07:34			07:09		07:31 (T5)	07:43		08:11 (T4)
	21:07			20:43	61	08:51 (T3)	19:55	68	08:49 (T3)	19:04			17:20	58	08:33 (T4)	17:02	18	08:29 (T4)
8	06:05			06:33		07:49 (T3)	07:04		07:42 (T3)	07:35			07:10		07:32 (T5)	07:44		08:12 (T4)
	21:07			20:42	63	08:52 (T3)	19:54	66	08:48 (T3)	19:03			17:19	55	08:33 (T4)	17:02	16	08:28 (T4)
9	06:06			06:34		07:49 (T3)	07:05		07:43 (T3)	07:36			07:12		07:34 (T5)	07:45		08:13 (T4)
	21:07			20:41	64	08:53 (T3)	19:52	64	08:47 (T3)	19:01			17:18	52	08:34 (T4)	17:02	13	08:26 (T4)
10	06:07			06:35		07:48 (T3)	07:06		07:44 (T3)	07:37			07:13		07:50 (T4)	07:46		08:15 (T4)
	21:06			20:39	66	08:54 (T3)	19:50	61	08:45 (T3)	18:59			17:17	44	08:34 (T4)	17:02	10	08:25 (T4)
11	06:07			06:36		07:47 (T3)	07:07		07:45 (T3)	07:38			07:14		07:50 (T4)	07:47		08:18 (T4)
	21:06			20:38	67	08:54 (T3)	19:49	59	08:44 (T3)	18:58			17:16	44	08:34 (T4)	17:02	6	08:24 (T4)
12	06:08			06:37		07:46 (T3)	07:08		07:46 (T3)	07:39			07:15		07:49 (T4)	07:47		
	21:06			20:37	69	08:55 (T3)	19:47	56	08:42 (T3)	18:56			17:15	45	08:34 (T4)	17:02		
13	06:09			06:38		07:46 (T3)	07:09		07:47 (T3)	07:40			07:16		07:50 (T4)	07:48		
	21:05			20:36	69	08:55 (T3)	19:45	53	08:40 (T3)	18:55			17:14	45	08:35 (T4)	17:02		
14	06:10			06:39		07:45 (T3)	07:10		07:48 (T3)	07:41			07:18		07:50 (T4)	07:49		
	21:05			20:34	71	08:56 (T3)	19:44	50	08:38 (T3)	18:53			17:13	45	08:35 (T4)	17:02		
15	06:10			06:40		07:45 (T3)	07:11		07:50 (T3)	07:42			07:19		07:50 (T4)	07:50		
	21:04			20:33	71	08:56 (T3)	19:42	46	08:36 (T3)	18:52			17:12	45	08:35 (T4)	17:03		
16	06:11			06:41		07:44 (T3)	07:12		07:52 (T3)	07:43			07:20		07:51 (T4)	07:50		
	21:04			20:31	73	08:57 (T3)	19:40	41	08:33 (T3)	18:50			17:12	44	08:35 (T4)	17:03		
17	06:12			06:42		07:43 (T3)	07:13		07:54 (T3)	07:44			07:21		07:51 (T4)	07:51		
	21:03			20:30	74	08:57 (T3)	19:38	36	08:30 (T3)	18:48			17:11	44	08:35 (T4)	17:03		
18	06:13			06:43		07:43 (T3)	07:14		07:57 (T3)	07:46		08:32 (T5)	07:22		07:52 (T4)	07:52		
	21:02			20:29	74	08:57 (T3)	19:37	29	08:26 (T3)	18:47	12	08:44 (T5)	17:10	43	08:35 (T4)	17:04		
19	06:14			06:44		07:43 (T3)	07:15		08:02 (T3)	07:47		08:29 (T5)	07:24		07:52 (T4)	07:52		
	21:02			20:27	75	08:58 (T3)	19:35	19	08:21 (T3)	18:45	17	08:46 (T5)	17:09	42	08:34 (T4)	17:04		
20	06:15			06:45		07:42 (T3)	07:16			07:48		08:26 (T5)	07:25		07:53 (T4)	07:53		
	21:01			20:26	76	08:58 (T3)	19:33			18:44	22	08:48 (T5)	17:09	42	08:35 (T4)	17:04		
21	06:15			06:46		07:42 (T3)	07:17			07:49		08:26 (T5)	07:26		07:54 (T4)	07:53		
	21:00			20:24	76	08:58 (T3)	19:31			18:42	24	08:50 (T5)	17:08	41	08:35 (T4)	17:05		
22	06:16		08:15 (T3)	06:47		07:41 (T3)	07:18			07:50		08:24 (T5)	07:27		07:54 (T4)	07:54		
	20:59	11	08:26 (T3)	20:23	77	08:58 (T3)	19:30			18:41	26	08:50 (T5)	17:07	40	08:34 (T4)	17:05		
23	06:17		08:11 (T3)	06:48		07:41 (T3)	07:19			07:51		08:23 (T5)	07:28		07:55 (T4)	07:54		
	20:59	18	08:29 (T3)	20:21	77	08:58 (T3)	19:28			18:40	28	08:51 (T5)	17:07	39	08:34 (T4)	17:06		
24	06:18		08:08 (T3)	06:49		07:41 (T3)	07:20			07:52		08:22 (T5)	07:29		07:55 (T4)	07:55		
	20:58	24	08:32 (T3)	20:20	77	08:58 (T3)	19:26			18:38	29	08:51 (T5)	17:06	38	08:33 (T4)	17:06		
25	06:19		08:06 (T3)	06:50		07:41 (T3)	07:21			07:54		08:21 (T5)	07:30		07:57 (T4)	07:55		
	20:57	29	08:35 (T3)	20:18	77	08:58 (T3)	19:25			18:37	31	08:52 (T5)	17:05	37	08:34 (T4)	17:07		
26	06:20		08:05 (T3)	06:51		07:40 (T3)	07:22			07:55		08:22 (T5)	07:32		07:58 (T4)	07:56		
	20:56	32	08:37 (T3)	20:17	78	08:58 (T3)	19:23			18:35	31	08:53 (T5)	17:05	36	08:34 (T4)	17:08		
27	06:21		08:03 (T3)	06:52		07:40 (T3)	07:23			07:56		08:21 (T5)	07:33		07:58 (T4)	07:56		
	20:55	36	08:39 (T3)	20:15	77	08:57 (T3)	19:21			18:34	46	09:19 (T4)	17:04	35	08:33 (T4)	17:08		
28	06:22		08:02 (T3)	06:53		07:40 (T3)	07:24			07:57		08:21 (T5)	07:34		07:59 (T4)	07:56		
	20:54	38	08:40 (T3)	20:13	77	08:57 (T3)	19:19			18:33	52	09:21 (T4)	17:04	34	08:33 (T4)	17:09		
29	06:23		08:00 (T3)	06:54		07:40 (T3)	07:25			07:58		08:20 (T5)	07:35		08:00 (T4)	07:57		
	20:53	42	08:42 (T3)	20:12	77	08:57 (T3)	19:18			18:31	57	09:23 (T4)	17:04	32	08:32 (T4)	17:10		
30	06:24		07:59 (T3)	06:55		07:40 (T3)	07:26			08:00		08:21 (T5)	07:36		08:01 (T4)	07:57		
	20:52	44	08:43 (T3)	20:10	76	08:56 (T3)	19:16			18:30	61	09:26 (T4)	17:03	31	08:32 (T4)	17:10		
31	06:25		07:58 (T3)	06:56		07:39 (T3)				08:01		08:22 (T5)				07:57		
	20:51	47	08:45 (T3)	20:09	76	08:55 (T3)				18:29	62	09:27 (T4)				17:11		
Potential sun hours	460			429			375			345			297			287		
Total, worst case		321			2142			1082			498			1382			212	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.63			0.63			0.54			0.52			0.52	
Total reduction		0.41			0.38			0.37			0.25			0.15			0.11	
Total, real		131			809			395			127			211			24	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1040 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7031)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February			March			April			May			June	
1	07:57	07:43			07:07		16:44 (T5)	07:16			06:30		19:30 (T3)	06:01	
	17:12	17:47			18:21	60	17:44 (T5)	19:56			20:27	31	20:01 (T3)	20:57	
2	07:57	07:42			07:05		16:44 (T5)	07:14			06:28		19:30 (T3)	06:00	
	17:13	17:48			18:22	73	17:57 (T4)	19:57			20:28	31	20:01 (T3)	20:58	
3	07:57	07:41			07:04		16:43 (T5)	07:12			06:27		19:30 (T3)	06:00	
	17:14	17:49			18:24	76	17:59 (T4)	19:58			20:29	31	20:01 (T3)	20:58	
4	07:57	07:40			07:02		16:44 (T5)	07:11			06:26		19:31 (T3)	05:59	
	17:15	17:51			18:25	78	18:02 (T4)	19:59			20:30	30	20:01 (T3)	20:59	
5	07:57	07:39			07:01		16:43 (T5)	07:09			06:24		19:30 (T3)	05:59	
	17:16	17:52			18:26	80	18:03 (T4)	20:00			20:31	30	20:00 (T3)	21:00	
6	07:57	07:38			06:59		16:42 (T5)	07:07			06:23		19:31 (T3)	05:59	
	17:17	17:53			18:27	82	18:04 (T4)	20:00			20:32	28	19:59 (T3)	21:00	
7	07:57	07:37			06:57		16:43 (T5)	07:06			06:22		19:32 (T3)	05:58	
	17:18	17:54			18:28	83	18:06 (T4)	20:01			20:33	27	19:59 (T3)	21:01	
8	07:57	07:36			07:56		17:42 (T5)	07:04			06:21		19:33 (T3)	05:58	
	17:19	17:56			19:29	84	19:06 (T4)	20:02			20:34	25	19:58 (T3)	21:02	
9	07:57	07:35			07:54		17:42 (T5)	07:02			06:20		19:34 (T3)	05:58	
	17:20	17:57			19:30	84	19:06 (T4)	20:03			20:35	23	19:57 (T3)	21:02	
10	07:57	07:33			07:53		17:42 (T5)	07:01			06:19		19:35 (T3)	05:58	
	17:21	17:58			19:32	85	19:07 (T4)	20:04			20:36	21	19:56 (T3)	21:03	
11	07:57	07:32			07:51		17:42 (T5)	06:59			06:17		19:36 (T3)	05:58	
	17:22	17:59			19:33	85	19:07 (T4)	20:05			20:37	19	19:55 (T3)	21:04	
12	07:56	07:31			07:49		17:42 (T5)	06:58			06:16		19:38 (T3)	05:57	
	17:23	18:01			19:34	85	19:07 (T4)	20:06			20:38	15	19:53 (T3)	21:04	
13	07:56	07:30			07:48		17:43 (T5)	06:56			06:15		19:40 (T3)	05:57	
	17:24	18:02			19:35	84	19:07 (T4)	20:07			20:39	11	19:51 (T3)	21:05	
14	07:56	07:28			07:46		17:43 (T5)	06:54			06:14		19:44 (T3)	05:57	
	17:25	18:03			19:36	84	19:07 (T4)	20:09			20:40	3	19:47 (T3)	21:05	
15	07:55	07:27		17:10 (T5)	07:44		17:43 (T5)	06:53			06:13			05:57	
	17:26	18:04	11	17:21 (T5)	19:37	83	19:06 (T4)	20:10			20:41			21:06	
16	07:55	07:26		17:05 (T5)	07:43		17:44 (T5)	06:51			06:12			05:57	
	17:27	18:06	22	17:27 (T5)	19:38	82	19:06 (T4)	20:11			20:42			21:06	
17	07:54	07:24		17:01 (T5)	07:41		17:44 (T5)	06:50			06:11			05:57	
	17:28	18:07	29	17:30 (T5)	19:39	81	19:05 (T4)	20:12			20:43			21:06	
18	07:54	07:23		16:59 (T5)	07:39		17:45 (T5)	06:48			06:10			05:57	
	17:30	18:08	33	17:32 (T5)	19:40	79	19:04 (T4)	20:13			20:44			21:07	
19	07:53	07:22		16:56 (T5)	07:38		17:46 (T5)	06:47		19:44 (T3)	06:10			05:58	
	17:31	18:09	38	17:34 (T5)	19:42	78	19:04 (T4)	20:14	8	19:52 (T3)	20:45			21:07	
20	07:53	07:20		16:55 (T5)	07:36		17:47 (T5)	06:45		19:40 (T3)	06:09			05:58	
	17:32	18:10	41	17:36 (T5)	19:43	76	19:03 (T4)	20:15	13	19:53 (T3)	20:46			21:07	
21	07:52	07:19		16:54 (T5)	07:34		17:48 (T5)	06:44		19:38 (T3)	06:08			05:58	
	17:33	18:12	44	17:38 (T5)	19:44	73	19:01 (T4)	20:16	17	19:55 (T3)	20:47			21:08	
22	07:52	07:17		16:52 (T5)	07:33		17:50 (T5)	06:42		19:37 (T3)	06:07			05:58	
	17:34	18:13	47	17:39 (T5)	19:45	70	19:00 (T4)	20:17	19	19:56 (T3)	20:48			21:08	
23	07:51	07:16		16:51 (T5)	07:31		17:51 (T5)	06:41		19:35 (T3)	06:06			05:58	
	17:36	18:14	49	17:40 (T5)	19:46	65	18:58 (T4)	20:18	21	19:56 (T3)	20:49			21:08	
24	07:50	07:14		16:49 (T5)	07:29		17:53 (T5)	06:39		19:34 (T3)	06:05			05:59	
	17:37	18:15	52	17:41 (T5)	19:47	57	18:56 (T4)	20:19	24	19:58 (T3)	20:50			21:08	
25	07:49	07:13		16:49 (T5)	07:27		17:55 (T5)	06:38		19:32 (T3)	06:05			05:59	
	17:38	18:16	53	17:42 (T5)	19:48	47	18:53 (T4)	20:20	26	19:58 (T3)	20:51			21:08	
26	07:49	07:11		16:47 (T5)	07:26		17:58 (T5)	06:36		19:32 (T3)	06:04			05:59	
	17:39	18:18	56	17:43 (T5)	19:49	32	18:49 (T4)	20:21	28	20:00 (T3)	20:52			21:08	
27	07:48	07:10		16:46 (T5)	07:24		18:03 (T5)	06:35		19:32 (T3)	06:03			06:00	
	17:41	18:19	57	17:43 (T5)	19:50	13	18:16 (T5)	20:23	29	20:01 (T3)	20:53			21:09	
28	07:47	07:08		16:46 (T5)	07:22			06:34		19:31 (T3)	06:03			06:00	
	17:42	18:20	58	17:44 (T5)	19:51			20:24	30	20:01 (T3)	20:54			21:09	
29	07:46				07:21			06:32		19:31 (T3)	06:02			06:00	
	17:43				19:52			20:25	31	20:02 (T3)	20:54			21:09	
30	07:45				07:19			06:31		19:31 (T3)	06:02			06:01	
	17:44				19:53			20:26	31	20:02 (T3)	20:55			21:09	
31	07:44				07:17						06:01				
	17:46				19:55						20:56				
Potential sun hours	297	297			370			399			449			453	
Total, worst case			590			1959			277			325			
Sun reduction			0.40			0.44			0.52			0.57			
Oper. time red.			1.00			1.00			1.00			1.00			
Wind dir. red.			0.70			0.69			0.57			0.57			
Total reduction			0.28			0.30			0.30			0.33			
Total, real			165			594			83			106			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1040 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7031)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:01		06:26		19:47 (T3)	06:57		07:27	17:22 (T5)	07:02	07:37
	21:08		20:50	17	20:04 (T3)	20:07		19:14	84	18:46 (T4)	17:27	17:03
2	06:02		06:27		19:45 (T3)	06:58		07:28		17:21 (T5)	07:03	07:38
	21:08		20:49	20	20:05 (T3)	20:05		19:13	85	18:46 (T4)	17:26	17:03
3	06:02		06:28		19:44 (T3)	06:59		07:29		17:20 (T5)	07:04	07:39
	21:08		20:48	22	20:06 (T3)	20:04		19:11	85	18:45 (T4)	17:25	17:02
4	06:03		06:29		19:43 (T3)	07:00		07:30		17:19 (T5)	07:05	07:40
	21:08		20:47	24	20:07 (T3)	20:02		19:09	85	18:44 (T4)	17:24	17:02
5	06:03		06:30		19:42 (T3)	07:01		07:31		17:19 (T5)	07:07	07:41
	21:08		20:46	26	20:08 (T3)	20:00		19:08	84	18:43 (T4)	17:23	17:02
6	06:04		06:31		19:41 (T3)	07:02		07:32		17:18 (T5)	07:08	07:42
	21:08		20:44	27	20:08 (T3)	19:57		19:06	84	18:42 (T4)	17:21	17:02
7	06:05		06:32		19:41 (T3)	07:03		07:33		17:18 (T5)	07:09	07:43
	21:07		20:43	28	20:09 (T3)	19:55		19:04	82	18:40 (T4)	17:20	17:02
8	06:05		06:33		19:40 (T3)	07:04		07:35		17:18 (T5)	07:10	07:44
	21:07		20:42	29	20:09 (T3)	19:54		19:03	82	18:40 (T4)	17:19	17:02
9	06:06		06:34		19:39 (T3)	07:05		07:36		17:18 (T5)	07:11	07:45
	21:07		20:41	31	20:10 (T3)	19:52		19:01	80	18:38 (T4)	17:18	17:02
10	06:07		06:35		19:39 (T3)	07:06		07:37		17:18 (T5)	07:13	07:46
	21:06		20:39	31	20:10 (T3)	19:50		18:59	77	18:35 (T4)	17:17	17:02
11	06:07		06:36		19:39 (T3)	07:07		07:38		17:18 (T5)	07:14	07:46
	21:06		20:38	31	20:10 (T3)	19:49		18:58	74	18:32 (T4)	17:16	17:02
12	06:08		06:37		19:39 (T3)	07:08		07:39		17:18 (T5)	07:15	07:47
	21:06		20:37	31	20:10 (T3)	19:47		18:56	67	18:27 (T4)	17:15	17:02
13	06:09		06:38		19:38 (T3)	07:09		07:40		17:18 (T5)	07:16	07:48
	21:05		20:35	32	20:10 (T3)	19:45		18:55	59	18:17 (T5)	07:14	17:02
14	06:10		06:39		19:38 (T3)	07:10		07:41		17:18 (T5)	07:17	07:49
	21:05		20:34	31	20:09 (T3)	19:43		18:53	58	18:16 (T5)	07:13	17:02
15	06:10		06:40		19:38 (T3)	07:11		07:42		17:18 (T5)	07:19	07:50
	21:04		20:33	31	20:09 (T3)	19:42		18:51	57	18:15 (T5)	07:12	17:03
16	06:11		06:41		19:39 (T3)	07:12	17:53 (T5)	07:43		17:20 (T5)	07:20	07:50
	21:03		20:31	28	20:07 (T3)	19:40	11	18:04 (T5)	18:50	55	18:15 (T5)	07:12	17:03
17	06:12		06:42		19:39 (T3)	07:13		17:47 (T5)	07:44		17:20 (T5)	07:21	07:51
	21:03		20:30	27	20:06 (T3)	19:38	29	18:36 (T4)	18:48	54	18:14 (T5)	07:11	17:03
18	06:13		06:43		19:39 (T3)	07:14		17:44 (T5)	07:46		17:21 (T5)	07:22	07:52
	21:02		20:28	26	20:05 (T3)	19:37	44	18:40 (T4)	18:47	51	18:12 (T5)	07:10	17:03
19	06:14		06:44		19:40 (T3)	07:15		17:41 (T5)	07:47		17:22 (T5)	07:23	07:52
	21:02		20:27	23	20:03 (T3)	19:35	55	18:43 (T4)	18:45	49	18:11 (T5)	17:09	17:04
20	06:14		06:45		19:41 (T3)	07:16		17:38 (T5)	07:48		17:23 (T5)	07:25	07:53
	21:01		20:26	21	20:02 (T3)	19:33	62	18:44 (T4)	18:44	46	18:09 (T5)	17:08	17:04
21	06:15		06:46		19:42 (T3)	07:17		17:36 (T5)	07:49		17:24 (T5)	07:26	07:53
	21:00		20:24	19	20:01 (T3)	19:31	69	18:45 (T4)	18:42	43	18:07 (T5)	17:08	17:05
22	06:16		06:47		19:43 (T3)	07:18		17:34 (T5)	07:50		17:26 (T5)	07:27	07:54
	20:59		20:23	16	19:59 (T3)	19:30	72	18:46 (T4)	18:41	40	18:06 (T5)	17:07	17:05
23	06:17		06:48		19:45 (T3)	07:19		17:32 (T5)	07:51		17:27 (T5)	07:28	07:54
	20:58		20:21	13	19:58 (T3)	19:28	75	18:47 (T4)	18:39	37	18:04 (T5)	17:07	17:06
24	06:18		06:49		19:49 (T3)	07:20		17:30 (T5)	07:52		17:29 (T5)	07:29	07:55
	20:58		20:20	6	19:55 (T3)	19:26	77	18:47 (T4)	18:38	32	18:01 (T5)	17:06	17:06
25	06:19		06:50			07:21		17:29 (T5)	07:54		17:32 (T5)	07:30	07:55
	20:57		20:18			19:25	79	18:48 (T4)	18:37	26	17:58 (T5)	17:05	17:07
26	06:20		06:51			07:22		17:27 (T5)	07:55		17:36 (T5)	07:32	07:56
	20:56		20:16			19:23	81	18:48 (T4)	18:35	20	17:56 (T5)	17:05	17:08
27	06:21		06:52			07:23		17:26 (T5)	07:56		17:42 (T5)	07:33	07:56
	20:55		20:15			19:21	82	18:48 (T4)	18:34	7	17:49 (T5)	17:04	17:08
28	06:22		06:53			07:24		17:25 (T5)	07:57			07:34	07:56
	20:54		20:13			19:19	83	18:48 (T4)	18:33			17:04	17:09
29	06:23		06:54			07:25		17:24 (T5)	07:58			07:35	07:57
	20:53		20:12			19:18	83	18:47 (T4)	18:31			17:04	17:10
30	06:24	19:52 (T3)	06:55			07:26		17:23 (T5)	07:59			07:36	07:57
	20:52	8	20:00 (T3)	20:10		19:16	84	18:47 (T4)	18:30			17:03	17:10
31	06:25	19:49 (T3)	06:56						08:01				07:57
	20:51	13	20:02 (T3)	20:09					18:29				17:11
Potential sun hours	460		429			375			345			297	287
Total, worst case		21		590			986			1603			
Sun reduction		0.66		0.61			0.59			0.48			
Oper. time red.		1.00		1.00			1.00			1.00			
Wind dir. red.		0.57		0.57			0.68			0.69			
Total reduction		0.38		0.35			0.41			0.33			
Total, real		8		207			400			534			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1043 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7033)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:36 (T71)	07:43		07:07		07:16		17:49 (T69)	06:30	06:59 (T67)	06:02
	17:13	44	09:20 (T71)	17:48		18:22		19:56	80	19:09 (T69)	20:27	128	18:53 (T69)	20:57
2	07:57		08:36 (T71)	07:42		07:06		07:15		17:49 (T69)	06:29		07:00 (T67)	06:01
	17:14	45	09:21 (T71)	17:49		18:23		19:57	81	19:10 (T69)	20:28	124	18:52 (T69)	20:57
3	07:57		08:37 (T71)	07:41		07:04		07:13		17:49 (T69)	06:28		07:02 (T67)	06:01
	17:15	44	09:21 (T71)	17:50		18:24		19:58	81	19:10 (T69)	20:29	119	18:51 (T69)	20:58
4	07:57		08:37 (T71)	07:40		07:02		07:11		17:48 (T69)	06:27		07:04 (T67)	06:01
	17:16	45	09:22 (T71)	17:51		18:25		19:59	82	19:10 (T69)	20:30	112	18:49 (T69)	20:59
5	07:57		08:38 (T71)	07:39		07:01		07:10		17:48 (T69)	06:25		07:15 (T68)	06:00
	17:17	44	09:22 (T71)	17:53		18:26		20:00	82	19:10 (T69)	20:31	98	18:47 (T69)	20:59
6	07:57		08:39 (T71)	07:38		06:59		07:08		07:44 (T68)	06:24		07:15 (T68)	06:00
	17:18	43	09:22 (T71)	17:54		18:28		20:00	93	19:10 (T69)	20:32	95	18:46 (T69)	21:00
7	07:57		08:39 (T71)	07:37		06:58		07:06		07:38 (T68)	06:23		07:16 (T68)	06:00
	17:19	44	09:23 (T71)	17:55		18:29		20:01	104	19:09 (T69)	20:33	90	18:44 (T69)	21:01
8	07:57		08:40 (T71)	07:36		07:56		07:05		07:35 (T68)	06:22		07:16 (T68)	05:59
	17:20	43	09:23 (T71)	17:57		19:30		20:02	111	19:10 (T69)	20:34	84	18:42 (T69)	21:01
9	07:57		08:41 (T71)	07:35		07:54		07:03		07:32 (T68)	06:21		07:17 (T68)	05:59
	17:21	43	09:24 (T71)	17:58		19:31		20:03	115	19:09 (T69)	20:35	78	18:40 (T69)	21:02
10	07:57		08:41 (T71)	07:33		07:53		07:02		07:29 (T68)	06:20		07:18 (T68)	05:59
	17:22	42	09:23 (T71)	17:59		19:32		20:04	120	19:09 (T69)	20:36	70	18:37 (T69)	21:03
11	07:56		08:42 (T71)	07:32		07:51		07:00		07:28 (T68)	06:18		07:19 (T68)	05:59
	17:23	42	09:24 (T71)	18:00		19:33		20:06	123	19:09 (T69)	20:37	61	18:33 (T69)	21:03
12	07:56		08:43 (T71)	07:31		07:50		06:58		07:25 (T68)	06:17		07:19 (T68)	05:59
	17:24	41	09:24 (T71)	18:01		19:34		20:07	126	19:08 (T69)	20:38	45	08:04 (T68)	21:04
13	07:56		08:43 (T71)	07:30		07:48		06:57		07:16 (T67)	06:16		07:20 (T68)	05:59
	17:25	40	09:23 (T71)	18:03		19:35		20:08	130	19:08 (T69)	20:39	43	08:03 (T68)	21:04
14	07:55		08:44 (T71)	07:28		07:46	18:26 (T69)	06:55		07:14 (T67)	06:15		07:21 (T68)	05:59
	17:26	40	09:24 (T71)	18:04	17	19:37	18:43 (T69)	20:09	136	19:07 (T69)	20:40	41	08:02 (T68)	21:05
15	07:55		08:44 (T71)	07:27		07:45	18:20 (T69)	06:54		07:13 (T67)	06:14		07:22 (T68)	05:59
	17:27	39	09:23 (T71)	18:05	29	19:38	18:49 (T69)	20:10	139	19:07 (T69)	20:41	39	08:01 (T68)	21:05
16	07:55		08:45 (T71)	07:26		07:43	18:16 (T69)	06:52		07:11 (T67)	06:13		07:23 (T68)	05:59
	17:28	38	09:23 (T71)	18:06	36	19:39	18:52 (T69)	20:11	140	19:06 (T69)	20:42	36	07:59 (T68)	21:06
17	07:54		08:46 (T71)	07:25		07:41	18:12 (T69)	06:51		07:10 (T67)	06:12		07:24 (T68)	05:59
	17:30	37	09:23 (T71)	18:08	43	19:40	18:55 (T69)	20:12	142	19:06 (T69)	20:43	34	07:58 (T68)	21:06
18	07:54		08:47 (T71)	07:23		07:40	18:10 (T69)	06:49		07:08 (T67)	06:11		07:25 (T68)	05:59
	17:31	36	09:23 (T71)	18:09	48	19:41	18:58 (T69)	20:13	143	19:05 (T69)	20:44	32	07:57 (T68)	21:06
19	07:53		08:48 (T71)	07:22		07:38	18:07 (T69)	06:47		07:07 (T67)	06:11		07:27 (T68)	05:59
	17:32	34	09:22 (T71)	18:10	52	19:42	18:59 (T69)	20:14	143	19:05 (T69)	20:45	28	07:55 (T68)	21:07
20	07:53		08:50 (T71)	07:20		07:36	18:05 (T69)	06:46		07:05 (T67)	06:10		07:29 (T68)	05:59
	17:33	32	09:22 (T71)	18:11	55	19:43	19:00 (T69)	20:15	144	19:04 (T69)	20:46	25	07:54 (T68)	21:07
21	07:52		08:51 (T71)	07:19		07:35	18:03 (T69)	06:44		07:04 (T67)	06:09		07:31 (T68)	05:59
	17:34	30	09:21 (T71)	18:12	60	19:44	19:03 (T69)	20:16	145	19:04 (T69)	20:47	21	07:52 (T68)	21:07
22	07:51		08:52 (T71)	07:18		07:33	18:01 (T69)	06:43		07:02 (T67)	06:08		07:33 (T68)	05:59
	17:35	28	09:20 (T71)	18:14	62	19:45	19:03 (T69)	20:17	144	19:02 (T69)	20:48	16	07:49 (T68)	21:07
23	07:51		08:54 (T71)	07:16		07:31	17:59 (T69)	06:42		07:01 (T67)	06:07		07:36 (T68)	06:00
	17:37	26	09:20 (T71)	18:15	65	19:46	19:04 (T69)	20:18	145	19:02 (T69)	20:49	10	07:46 (T68)	21:08
24	07:50		08:56 (T71)	07:15		07:30	17:58 (T69)	06:40		06:59 (T67)	06:07			06:00
	17:38	22	09:18 (T71)	18:16	68	19:47	19:06 (T69)	20:19	144	19:00 (T69)	20:50			21:08
25	07:49		08:58 (T71)	07:13		07:28	17:57 (T69)	06:39		06:58 (T67)	06:06			06:00
	17:39	18	09:16 (T71)	18:17	69	19:48	19:06 (T69)	20:20	144	19:00 (T69)	20:51			21:08
26	07:48		09:00 (T71)	07:12		07:26	17:55 (T69)	06:37		06:57 (T67)	06:05			06:00
	17:40	13	09:13 (T71)	18:18	72	19:50	19:07 (T69)	20:21	142	18:59 (T69)	20:52			21:08
27	07:48			07:10		07:25	17:55 (T69)	06:36		06:56 (T67)	06:05			06:01
	17:42			18:20	73	19:51	19:08 (T69)	20:23	141	18:58 (T69)	20:52			21:08
28	07:47			07:09		07:23	17:53 (T69)	06:35		06:56 (T67)	06:04			06:01
	17:43			18:21	75	19:52	19:08 (T69)	20:24	139	18:57 (T69)	20:53			21:08
29	07:46					07:21	17:52 (T69)	06:33		06:57 (T67)	06:03			06:02
	17:44				77	19:53	19:09 (T69)	20:25	136	18:56 (T69)	20:54			21:08
30	07:45					07:20	17:52 (T69)	06:32		06:57 (T67)	06:03			06:02
	17:45				78	19:54	19:10 (T69)	20:26	132	18:54 (T69)	20:55			21:08
31	07:44					07:18	17:51 (T69)				06:02			
	17:46				79	19:55	19:10 (T69)				20:56			
Potential sun hours	297			297	370			399			448			452
Total, worst case		953				1058			3727			1429		
Sun reduction		0.31				0.44			0.52			0.57		
Oper. time red.		1.00				1.00			1.00			1.00		
Wind dir. red.		0.53				0.65			0.65			0.66		
Total reduction		0.16				0.28			0.33			0.37		
Total, real		153				297			1243			524		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1043 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7033)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November			December		
1	06:03			06:27		07:29 (T68)	06:57		07:27 (T68)	07:28	07:02			07:37		08:24 (T71)
	21:08			20:50	51	18:38 (T69)	20:07	123	19:08 (T69)	19:15	17:28			17:04	42	09:06 (T71)
2	06:03			06:28		07:28 (T68)	06:58		07:28 (T68)	07:29	07:03			07:38		08:24 (T71)
	21:08			20:49	65	18:44 (T69)	20:05	120	19:08 (T69)	19:13	17:27			17:04	42	09:06 (T71)
3	06:04			06:29		07:27 (T68)	06:59		07:30 (T68)	07:30	07:04			07:39		08:24 (T71)
	21:08			20:48	73	18:48 (T69)	20:04	115	19:07 (T69)	19:11	17:26			17:04	43	09:07 (T71)
4	06:04			06:30		07:27 (T68)	07:00		07:32 (T68)	07:31	07:05			07:40		08:24 (T71)
	21:08			20:47	79	18:50 (T69)	20:02	111	19:07 (T69)	19:10	17:25			17:03	43	09:07 (T71)
5	06:05			06:31		07:26 (T68)	07:01		07:35 (T68)	07:32	07:07			07:41		08:24 (T71)
	21:08			20:45	86	18:52 (T69)	20:01	104	19:07 (T69)	19:08	17:23			17:03	44	09:08 (T71)
6	06:05			06:31		07:25 (T68)	07:02		07:40 (T68)	07:33	07:08			07:42		08:25 (T71)
	21:07			20:44	91	18:54 (T69)	19:57	93	19:06 (T69)	19:07	17:22			17:03	43	09:08 (T71)
7	06:06			06:32		07:25 (T68)	07:03		17:43 (T69)	07:34	07:09			07:43		08:25 (T71)
	21:07			20:43	96	18:56 (T69)	19:56	82	19:05 (T69)	19:05	17:21			17:03	44	09:09 (T71)
8	06:07			06:33		07:24 (T68)	07:04		17:43 (T69)	07:35	07:10			07:44		08:25 (T71)
	21:07			20:42	99	18:57 (T69)	19:54	82	19:05 (T69)	19:03	17:20			17:03	45	09:10 (T71)
9	06:07			06:34		07:12 (T67)	07:05		17:43 (T69)	07:36	07:11			07:44		08:26 (T71)
	21:06			20:41	116	18:59 (T69)	19:52	81	19:04 (T69)	19:02	17:19			17:03	44	09:10 (T71)
10	06:08			06:35		07:10 (T67)	07:06		17:43 (T69)	07:37	07:13			07:45		08:26 (T71)
	21:06			20:39	121	19:00 (T69)	19:51	80	19:03 (T69)	19:00	17:18			17:03	45	09:11 (T71)
11	06:09			06:36		07:08 (T67)	07:07		17:43 (T69)	07:38	07:14			07:46		08:27 (T71)
	21:06			20:38	126	19:01 (T69)	19:49	80	19:03 (T69)	18:58	17:17			17:03	44	09:11 (T71)
12	06:09			06:37		07:07 (T67)	07:08		17:42 (T69)	07:39	07:15			07:47		08:26 (T71)
	21:05			20:37	130	19:02 (T69)	19:47	79	19:01 (T69)	18:57	17:16			17:03	45	09:11 (T71)
13	06:10			06:38		07:06 (T67)	07:09		17:42 (T69)	07:40	07:16			07:48		08:27 (T71)
	21:05			20:35	133	19:03 (T69)	19:45	78	19:00 (T69)	18:55	17:15			17:03	45	09:12 (T71)
14	06:11			06:39		07:05 (T67)	07:10		17:42 (T69)	07:41	07:17			07:49		08:28 (T71)
	21:04			20:34	136	19:04 (T69)	19:44	77	18:59 (T69)	18:54	17:14			17:04	45	09:13 (T71)
15	06:12			06:40		07:04 (T67)	07:11		17:42 (T69)	07:42	07:19			07:49		08:28 (T71)
	21:04			20:33	139	19:05 (T69)	19:42	76	18:58 (T69)	18:52	17:13			17:04	45	09:13 (T71)
16	06:12			06:41		07:03 (T67)	07:12		17:43 (T69)	07:44	07:20		08:33 (T71)	07:50		08:28 (T71)
	21:03			20:31	142	19:05 (T69)	19:40	74	18:57 (T69)	18:51	17:13	13	08:46 (T71)	17:04	45	09:13 (T71)
17	06:13			06:42		07:04 (T67)	07:13		17:43 (T69)	07:45	07:21		08:30 (T71)	07:51		08:29 (T71)
	21:03			20:30	143	19:06 (T69)	19:39	72	18:55 (T69)	18:49	17:12	19	08:49 (T71)	17:04	45	09:14 (T71)
18	06:14			06:43		07:05 (T67)	07:14		17:44 (T69)	07:46	07:22		08:30 (T71)	07:51		08:30 (T71)
	21:02			20:28	144	19:07 (T69)	19:37	70	18:54 (T69)	18:48	17:11	22	08:52 (T71)	17:05	45	09:15 (T71)
19	06:15			06:44		07:06 (T67)	07:15		17:45 (T69)	07:47	07:23		08:28 (T71)	07:52		08:30 (T71)
	21:01			20:27	144	19:07 (T69)	19:35	67	18:52 (T69)	18:46	17:10	26	08:54 (T71)	17:05	45	09:15 (T71)
20	06:16		07:50 (T68)	06:45		07:07 (T67)	07:16		17:45 (T69)	07:48	07:24		08:27 (T71)	07:53		08:31 (T71)
	21:01	3	07:53 (T68)	20:26	144	19:08 (T69)	19:34	66	18:51 (T69)	18:45	17:10	28	08:55 (T71)	17:05	45	09:16 (T71)
21	06:16		07:45 (T68)	06:46		07:08 (T67)	07:17		17:46 (T69)	07:49	07:26		08:26 (T71)	07:53		08:30 (T71)
	21:00	13	07:58 (T68)	20:24	144	19:08 (T69)	19:32	63	18:49 (T69)	18:43	17:09	30	08:56 (T71)	17:06	46	09:16 (T71)
22	06:17		07:42 (T68)	06:47		07:08 (T67)	07:18		17:47 (T69)	07:50	07:27		08:26 (T71)	07:54		08:31 (T71)
	20:59	19	08:01 (T68)	20:23	143	19:07 (T69)	19:30	60	18:47 (T69)	18:42	17:08	32	08:58 (T71)	17:06	46	09:17 (T71)
23	06:18		07:39 (T68)	06:48		07:09 (T67)	07:19		17:49 (T69)	07:51	07:28		08:25 (T71)	07:54		08:31 (T71)
	20:58	23	08:02 (T68)	20:21	144	19:08 (T69)	19:28	56	18:45 (T69)	18:40	17:08	34	08:59 (T71)	17:07	46	09:17 (T71)
24	06:19		07:38 (T68)	06:49		07:10 (T67)	07:20		17:50 (T69)	07:53	07:29		08:24 (T71)	07:55		08:33 (T71)
	20:57	26	08:04 (T68)	20:20	143	19:08 (T69)	19:27	53	18:43 (T69)	18:39	17:07	36	09:00 (T71)	17:07	45	09:18 (T71)
25	06:20		07:37 (T68)	06:50		07:11 (T67)	07:21		17:52 (T69)	07:54	07:30		08:24 (T71)	07:55		08:33 (T71)
	20:57	29	08:06 (T68)	20:18	142	19:08 (T69)	19:25	49	18:41 (T69)	18:37	17:06	37	09:01 (T71)	17:08	45	09:18 (T71)
26	06:21		07:35 (T68)	06:51		07:12 (T67)	07:22		17:54 (T69)	07:55	07:31		08:24 (T71)	07:55		08:33 (T71)
	20:56	33	08:08 (T68)	20:17	142	19:08 (T69)	19:23	44	18:38 (T69)	18:36	17:06	37	09:01 (T71)	17:09	45	09:18 (T71)
27	06:22		07:34 (T68)	06:52		07:13 (T67)	07:23		17:56 (T69)	07:56	07:32		08:24 (T71)	07:56		08:34 (T71)
	20:55	35	08:09 (T68)	20:15	140	19:08 (T69)	19:22	39	18:35 (T69)	18:35	17:06	39	09:03 (T71)	17:09	45	09:19 (T71)
28	06:23		07:33 (T68)	06:53		07:14 (T67)	07:24		17:59 (T69)	07:57	07:34		08:24 (T71)	07:56		08:34 (T71)
	20:54	37	08:10 (T68)	20:13	139	19:08 (T69)	19:20	32	18:31 (T69)	18:33	17:05	40	09:04 (T71)	17:10	45	09:19 (T71)
29	06:24		07:32 (T68)	06:54		07:15 (T67)	07:25		18:04 (T69)	07:58	07:35		08:24 (T71)	07:56		08:35 (T71)
	20:53	40	08:12 (T68)	20:12	135	19:08 (T69)	19:18	22	18:26 (T69)	18:32	17:05	40	09:04 (T71)	17:11	45	09:20 (T71)
30	06:25		07:31 (T68)	06:55		07:16 (T67)	07:26			07:59	07:36		08:24 (T71)	07:56		08:35 (T71)
	20:52	42	08:13 (T68)	20:10	130	19:08 (T69)	19:17			18:31	17:04	41	09:05 (T71)	17:12	45	09:20 (T71)
31	06:26		07:30 (T68)	06:56		07:25 (T68)				08:01				07:57		08:35 (T71)
	20:51	44	08:14 (T68)	20:09	125	19:08 (T69)				18:29				17:12	45	09:20 (T71)
Potential sun hours	459			428			375			345	298			288		
Total, worst case		344			3785			2148				474			1382	
Sun reduction		0.66			0.61			0.59				0.30			0.22	
Oper. time red.		1.00			1.00			1.00				1.00			1.00	
Wind dir. red.		0.66			0.65			0.65				0.53			0.53	
Total reduction		0.43			0.39			0.38				0.16			0.11	
Total, real		147			1484			808				74			158	

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1056 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7044)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58	09:02 (T12)	07:44	08:06 (T13)	07:07		07:16	18:54 (T11)	06:30	07:05 (T10)	06:01	06:43 (T10)
	17:13 64	10:06 (T12)	17:47 48	09:49 (T12)	18:22		19:56 33	19:27 (T11)	20:27 39	19:18 (T11)	20:57 56	07:39 (T10)
2	07:58	09:02 (T12)	07:43	08:06 (T13)	07:06		07:14	18:52 (T11)	06:29	07:01 (T10)	06:01	06:42 (T10)
	17:14 64	10:06 (T12)	17:49 35	08:41 (T13)	18:23		19:57 36	19:28 (T11)	20:28 43	19:16 (T11)	20:58 56	07:38 (T10)
3	07:58	09:03 (T12)	07:42	08:06 (T13)	07:04		07:13	18:50 (T11)	06:27	06:57 (T10)	06:00	06:43 (T10)
	17:14 64	10:07 (T12)	17:50 35	08:41 (T13)	18:24		19:58 40	19:30 (T11)	20:29 44	19:13 (T11)	20:59 56	07:39 (T10)
4	07:58	09:04 (T12)	07:41	08:06 (T13)	07:03		07:11	18:49 (T11)	06:26	06:55 (T10)	06:00	06:43 (T10)
	17:15 63	10:07 (T12)	17:51 36	08:42 (T13)	18:25		19:59 42	19:31 (T11)	20:30 40	19:09 (T11)	21:00 56	07:39 (T10)
5	07:58	09:04 (T12)	07:40	08:06 (T13)	07:01		07:09	18:47 (T11)	06:25	06:53 (T10)	06:00	06:43 (T10)
	17:16 63	10:07 (T12)	17:52 36	08:42 (T13)	18:26		20:00 44	19:31 (T11)	20:32 34	07:27 (T10)	21:00 56	07:39 (T10)
6	07:58	09:05 (T12)	07:39	08:07 (T13)	06:59		07:08	18:46 (T11)	06:24	06:52 (T10)	05:59	06:43 (T10)
	17:17 63	10:08 (T12)	17:54 35	08:42 (T13)	18:27		20:00 47	19:33 (T11)	20:33 37	07:29 (T10)	21:01 56	07:39 (T10)
7	07:58	09:06 (T12)	07:37	08:07 (T13)	06:58		07:06	18:45 (T11)	06:23	06:51 (T10)	05:59	06:44 (T10)
	17:18 62	10:08 (T12)	17:55 35	08:42 (T13)	18:29		20:01 48	19:33 (T11)	20:34 39	07:30 (T10)	21:02 55	07:39 (T10)
8	07:58	09:06 (T12)	07:36	08:07 (T13)	07:56		07:05	18:45 (T11)	06:21	06:49 (T10)	05:59	06:44 (T10)
	17:19 63	10:09 (T12)	17:56 34	08:41 (T13)	19:30		20:03 49	19:34 (T11)	20:35 41	07:30 (T10)	21:02 56	07:40 (T10)
9	07:57	09:06 (T12)	07:35	08:07 (T13)	07:55		07:03	18:43 (T11)	06:20	06:48 (T10)	05:58	06:45 (T10)
	17:20 62	10:08 (T12)	17:57 34	08:41 (T13)	19:31		20:04 51	19:34 (T11)	20:36 43	07:31 (T10)	21:03 55	07:40 (T10)
10	07:57	09:07 (T12)	07:34	08:08 (T13)	07:53		07:01	18:42 (T11)	06:19	06:47 (T10)	05:58	06:44 (T10)
	17:21 61	10:08 (T12)	17:59 33	08:41 (T13)	19:32		20:05 51	19:33 (T11)	20:37 45	07:32 (T10)	21:03 55	07:39 (T10)
11	07:57	09:08 (T12)	07:33	08:09 (T13)	07:51		07:00	18:42 (T11)	06:18	06:46 (T10)	05:58	06:45 (T10)
	17:22 61	10:09 (T12)	18:00 32	08:41 (T13)	19:33		20:06 52	19:34 (T11)	20:38 47	07:33 (T10)	21:04 54	07:39 (T10)
12	07:57	09:08 (T12)	07:31	08:09 (T13)	07:50		06:58	18:41 (T11)	06:17	06:45 (T10)	05:58	06:45 (T10)
	17:23 60	10:08 (T12)	18:01 30	08:39 (T13)	19:34		20:07 53	19:34 (T11)	20:39 49	07:34 (T10)	21:04 55	07:40 (T10)
13	07:56	09:09 (T12)	07:30	08:10 (T13)	07:48		06:57	18:42 (T11)	06:16	06:45 (T10)	05:58	06:45 (T10)
	17:24 60	10:09 (T12)	18:02 28	08:38 (T13)	19:35		20:08 52	19:34 (T11)	20:40 49	07:34 (T10)	21:05 55	07:40 (T10)
14	07:56	09:10 (T12)	07:29	08:12 (T13)	07:46		06:55	18:41 (T11)	06:15	06:44 (T10)	05:58	06:46 (T10)
	17:26 59	10:09 (T12)	18:04 25	08:37 (T13)	19:37		20:09 52	19:33 (T11)	20:41 51	07:35 (T10)	21:05 54	07:40 (T10)
15	07:56	09:10 (T12)	07:28	08:13 (T13)	07:45		06:53	18:40 (T11)	06:14	06:44 (T10)	05:58	06:46 (T10)
	17:27 59	10:09 (T12)	18:05 22	08:35 (T13)	19:38		20:10 53	19:33 (T11)	20:42 51	07:35 (T10)	21:06 54	07:40 (T10)
16	07:55	09:12 (T12)	07:26	08:15 (T13)	07:43		06:52	18:41 (T11)	06:13	06:43 (T10)	05:58	06:46 (T10)
	17:28 57	10:09 (T12)	18:06 19	08:34 (T13)	19:39		20:11 52	19:33 (T11)	20:43 52	07:35 (T10)	21:06 54	07:40 (T10)
17	07:55	09:12 (T12)	07:25	08:18 (T13)	07:41		06:50	18:40 (T11)	06:12	06:44 (T10)	05:58	06:46 (T10)
	17:29 56	10:08 (T12)	18:07 13	08:31 (T13)	19:40		20:12 52	19:32 (T11)	20:44 53	07:37 (T10)	21:07 54	07:40 (T10)
18	07:54	09:13 (T12)	07:24		07:40		06:49	18:41 (T11)	06:11	06:43 (T10)	05:58	06:46 (T10)
	17:30 56	10:09 (T12)	18:09		19:41		20:13 51	19:32 (T11)	20:45 54	07:37 (T10)	21:07 54	07:40 (T10)
19	07:54	09:14 (T12)	07:22		07:38		06:47	18:40 (T11)	06:10	06:43 (T10)	05:58	06:47 (T10)
	17:31 54	10:08 (T12)	18:10		19:42		20:14 51	19:31 (T11)	20:46 54	07:37 (T10)	21:07 54	07:41 (T10)
20	07:53	08:17 (T13)	07:21		07:36		06:46	18:41 (T11)	06:09	06:42 (T10)	05:58	06:47 (T10)
	17:32 60	10:07 (T12)	18:11		19:43		20:15 50	19:31 (T11)	20:47 55	07:37 (T10)	21:08 54	07:41 (T10)
21	07:53	08:15 (T13)	07:19		07:35		06:44	18:41 (T11)	06:08	06:42 (T10)	05:58	06:47 (T10)
	17:34 64	10:07 (T12)	18:12		19:44		20:17 49	19:30 (T11)	20:48 55	07:37 (T10)	21:08 54	07:41 (T10)
22	07:52	08:13 (T13)	07:18		07:33		06:43	18:42 (T11)	06:08	06:42 (T10)	05:59	06:47 (T10)
	17:35 66	10:06 (T12)	18:13		19:45		20:18 47	19:29 (T11)	20:49 56	07:38 (T10)	21:08 54	07:41 (T10)
23	07:51	08:12 (T13)	07:16		07:31		06:41	18:43 (T11)	06:07	06:42 (T10)	05:59	06:47 (T10)
	17:36 68	10:05 (T12)	18:15		19:46		20:19 46	19:29 (T11)	20:50 56	07:38 (T10)	21:08 54	07:41 (T10)
24	07:51	08:11 (T13)	07:15		07:30		06:40	18:43 (T11)	06:06	06:42 (T10)	05:59	06:48 (T10)
	17:37 68	10:04 (T12)	18:16		19:47		20:20 45	19:28 (T11)	20:51 56	07:38 (T10)	21:09 54	07:42 (T10)
25	07:50	08:11 (T13)	07:13		07:28		06:38	18:44 (T11)	06:05	06:42 (T10)	05:59	06:48 (T10)
	17:39 68	10:04 (T12)	18:17		19:49		20:21 43	19:27 (T11)	20:51 57	07:39 (T10)	21:09 54	07:42 (T10)
26	07:49	08:10 (T13)	07:12		07:26		06:37	18:44 (T11)	06:05	06:42 (T10)	06:00	06:48 (T10)
	17:40 67	10:03 (T12)	18:18		19:50		20:22 41	19:25 (T11)	20:52 56	07:38 (T10)	21:09 54	07:42 (T10)
27	07:48	08:09 (T13)	07:10		07:25		06:36	18:45 (T11)	06:04	06:42 (T10)	06:00	06:49 (T10)
	17:41 67	10:02 (T12)	18:19		19:51		20:23 39	19:24 (T11)	20:53 56	07:38 (T10)	21:09 54	07:43 (T10)
28	07:47	08:08 (T13)	07:09		07:23		06:34	18:47 (T11)	06:03	06:42 (T10)	06:00	06:49 (T10)
	17:42 65	10:00 (T12)	18:21		19:52		20:24 36	19:23 (T11)	20:54 57	07:39 (T10)	21:09 54	07:43 (T10)
29	07:47	08:07 (T13)			07:21	19:03 (T11)	06:33	18:47 (T11)	06:03	06:42 (T10)	06:01	06:49 (T10)
	17:44 63	09:58 (T12)			19:53 17	19:20 (T11)	20:25 34	19:21 (T11)	20:55 56	07:38 (T10)	21:09 55	07:44 (T10)
30	07:46	08:07 (T13)			07:19	18:59 (T11)	06:31	18:49 (T11)	06:02	06:42 (T10)	06:01	06:49 (T10)
	17:45 59	09:56 (T12)			19:54 24	19:23 (T11)	20:26 31	19:20 (T11)	20:56 57	07:39 (T10)	21:09 55	07:44 (T10)
31	07:45	08:06 (T13)			07:18	18:57 (T11)			06:02	06:42 (T10)		
	17:46 55	09:53 (T12)			19:55 29	19:26 (T11)			20:56 56	07:38 (T10)		
Potential sun hours	297		297		370		399		449		453	
Total, worst case	1921		530		70		1370		1538		1641	
Sun reduction	0.31		0.40		0.44		0.52		0.57		0.64	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.53		0.53		0.61		0.61		0.69		0.70	
Total reduction	0.16		0.20		0.26		0.31		0.38		0.43	
Total, real	303		108		18		421		585		705	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1056 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7044)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		06:26		06:57		18:41 (T11)		07:02		07:37	
	21:09	55	07:44 (T10)	48	07:44 (T10)	52	19:33 (T11)		07:28		07:38 (T13)	
			20:50		20:07		19:15		17:28	33	17:03	61
2	06:02		06:27		06:58		18:41 (T11)		07:03		07:38	
	21:09	55	07:44 (T10)	46	07:43 (T10)	51	19:32 (T11)		07:29		07:37 (T13)	
			20:49		20:06		19:13		17:27	34	17:03	61
3	06:03		06:28		06:59		18:41 (T11)		07:05		07:39	
	21:09	55	07:44 (T10)	44	07:42 (T10)	51	19:32 (T11)		07:30		07:36 (T13)	
			20:48		20:04		19:11		17:25	35	17:03	62
4	06:03		06:29		06:59		18:42 (T11)		07:06		07:40	
	21:09	55	07:45 (T10)	43	07:42 (T10)	49	19:31 (T11)		07:31		07:36 (T13)	
			20:47		20:02		19:10		17:24	35	17:03	63
5	06:04		06:30		07:00 (T10)		18:42 (T11)		07:07		07:41	
	21:08	56	07:46 (T10)	40	07:40 (T10)	48	19:30 (T11)		07:32		07:37 (T13)	
			20:46		20:01		19:08		17:23	35	17:03	62
6	06:05		06:31		07:01 (T10)		18:42 (T11)		07:08		07:42	
	21:08	55	07:45 (T10)	38	07:39 (T10)	47	19:29 (T11)		07:33		07:36 (T13)	
			20:45		19:57		19:06		17:22	36	17:02	63
7	06:05		06:32		07:03		18:43 (T11)		07:09		07:43	
	21:08	56	07:46 (T10)	36	07:38 (T10)	44	19:27 (T11)		07:34		07:36 (T13)	
			20:44		19:56		19:05		17:21	36	17:02	63
8	06:06		06:33		07:04 (T10)		18:44 (T11)		07:11		07:44	
	21:08	55	07:45 (T10)	32	07:36 (T10)	42	19:26 (T11)		07:35		07:37 (T13)	
			20:42		19:54		19:03		17:20	35	17:02	63
9	06:07		06:34		07:05 (T10)		18:44 (T11)		07:12		07:45	
	21:07	56	07:46 (T10)	42	19:20 (T11)	41	19:25 (T11)		07:36		07:37 (T13)	
			20:41		19:52		19:02		17:19	35	17:02	64
10	06:07		06:35		07:08 (T10)		18:46 (T11)		07:37		07:46	
	21:07	56	07:47 (T10)	43	19:23 (T11)	37	19:23 (T11)		07:13		07:37 (T13)	
			20:40		19:51		19:00		17:18	49	09:21 (T12)	64
11	06:08		06:36		07:11 (T10)		18:46 (T11)		07:38		07:47	
	21:06	56	07:46 (T10)	43	19:26 (T11)	34	19:20 (T11)		07:14		07:37 (T13)	
			20:39		19:49		18:58		17:17	57	09:25 (T12)	64
12	06:09		06:37		07:16 (T10)		18:48 (T11)		07:39		07:48	
	21:06	57	07:47 (T10)	36	19:28 (T11)	29	19:17 (T11)		07:15		07:39 (T13)	
			20:37		19:47		18:57		17:16	59	09:28 (T12)	64
13	06:09		06:38		18:57 (T11)		18:50 (T11)		07:40		07:48	
	21:05	56	07:47 (T10)	32	19:29 (T11)	25	19:15 (T11)		07:17		07:39 (T13)	
			20:36		19:46		18:55		17:15	64	09:30 (T12)	65
14	06:10		06:39		18:54 (T11)		18:53 (T11)		07:42		07:49	
	21:05	57	07:48 (T10)	35	19:29 (T11)	18	19:11 (T11)		07:18		07:40 (T13)	
			20:35		19:44		18:54		17:14	65	09:32 (T12)	64
15	06:11		06:40		18:53 (T11)		19:01 (T11)		07:43		07:50	
	21:04	56	07:47 (T10)	37	19:30 (T11)	1	19:02 (T11)		07:19		07:42 (T13)	
			20:33		19:42		18:52		17:13	67	09:35 (T12)	65
16	06:12		06:41		18:52 (T11)				07:44		07:51	
	21:04	56	07:47 (T10)	39	19:31 (T11)				07:20		07:43 (T13)	
			20:32		19:40				17:12	67	09:36 (T12)	65
17	06:12		06:42		18:50 (T11)				07:45		07:51	
	21:03	57	07:48 (T10)	42	19:32 (T11)				07:21		07:44 (T13)	
			20:30		19:39				17:11	68	09:37 (T12)	65
18	06:13		06:43		18:49 (T11)				07:46		07:52	
	21:03	56	07:48 (T10)	44	19:33 (T11)				07:23		07:45 (T13)	
			20:29		19:37				17:10	68	09:38 (T12)	65
19	06:14		06:44		18:48 (T11)				07:47		07:53	
	21:02	56	07:48 (T10)	46	19:34 (T11)				07:24		07:47 (T13)	
			20:27		19:35				17:10	68	09:40 (T12)	64
20	06:15		06:45		18:47 (T11)				07:48		07:53	
	21:01	56	07:47 (T10)	47	19:34 (T11)				07:25		07:48 (T13)	
			20:26		19:34				17:09	66	09:41 (T12)	64
21	06:16		06:46		18:46 (T11)				07:49		07:54	
	21:00	55	07:47 (T10)	48	19:34 (T11)				07:26		07:50 (T13)	
			20:25		19:32				17:08	64	09:42 (T12)	64
22	06:17		06:47		18:46 (T11)				07:51		07:54	
	21:00	56	07:48 (T10)	49	19:35 (T11)				07:27		07:53 (T13)	
			20:23		19:30				17:08	60	09:43 (T12)	64
23	06:18		06:48		18:45 (T11)				07:52		07:55	
	20:59	55	07:48 (T10)	50	19:35 (T11)				07:29		08:51 (T12)	
			20:22		19:28				17:07	54	09:45 (T12)	64
24	06:19		06:49		18:44 (T11)				07:53		07:55	
	20:58	55	07:48 (T10)	51	19:35 (T11)				07:30		08:50 (T12)	
			20:20		19:27				17:06	56	09:46 (T12)	64
25	06:19		06:50		18:44 (T11)				07:54		07:56	
	20:57	54	07:47 (T10)	51	19:35 (T11)				07:31		08:50 (T12)	
			20:18		19:25				17:06	56	09:46 (T12)	64
26	06:20		06:51		18:43 (T11)				07:55		08:50 (T12)	
	20:56	53	07:47 (T10)	52	19:35 (T11)				07:32		08:50 (T12)	65
			20:17		19:23				17:05	57	09:47 (T12)	64
27	06:21		06:52		18:43 (T11)				07:56		07:56	
	20:55	53	07:46 (T10)	52	19:35 (T11)				07:33		08:49 (T12)	65
			20:15		19:22				17:05	59	09:48 (T12)	64
28	06:22		06:53		18:42 (T11)				07:58		08:41 (T13)	
	20:54	52	07:46 (T10)	53	19:35 (T11)				07:34		08:50 (T12)	65
			20:14		19:20				17:05	59	09:49 (T12)	64
29	06:23		06:54		18:42 (T11)				07:59		08:40 (T13)	
	20:54	51	07:45 (T10)	52	19:34 (T11)				07:35		08:50 (T12)	65
			20:12		19:18				17:04	60	09:50 (T12)	64
30	06:24		06:55		18:42 (T11)				07:36		08:50 (T12)	
	20:53	50	07:45 (T10)	52	19:34 (T11)				07:37		09:50 (T12)	65
			20:11		19:16				17:04	60	17:11	64
31	06:25		06:56		18:41 (T11)				07:38 (T13)		07:57	
	20:51	49	07:45 (T10)	53	19:34 (T11)				07:39		17:12	65
			20:09						17:03	61	09:51 (T12)	65
									07:40		08:50 (T12)	
									17:03	61	09:51 (T12)	
									07:41		08:51 (T12)	
									17:03	62	09:53 (T12)	
									07:42		08:51 (T12)	
									17:02	63	09:54 (T12)	
									07:43		08:51 (T12)	
									17:02	63	09:54 (T12)	
									07:44		08:52 (T12)	
									17:02	63	09:55 (T12)	
									07:45		08:52 (T12)	
									17:02	64	09:56 (T12)	
									07:46		08:52 (T12)	
									09:21 (T12)	64	09:56 (T12)	
									07:47		08:52 (T12)	
									09:25 (T12)	64	09:56 (T12)	
									07:48		08:53 (T12)	
									09:28 (T12)	64	09:57 (T12)	
									07:48		08:53 (T12)	
									09:30 (T12)	65	09:58 (T12)	
									07:49		08:54 (T12)	
									09:32 (T12)	64	09:58 (T12)	
									07:50		08:54 (T12)	
									09:35 (T12)	65	09:59 (T12)	
									07:51		08:54 (T12)	
									09:36 (T12)	65	09:59 (T12)	
									07:51		08:55 (T12)	
									09:37 (T12)	65	10:00 (T12)	
									07:52		08:56 (T12)	
									09:38 (T12)	65	10:01 (T12)	
									07:53		08:56 (T12)	
									09:40 (T12)	64	10:00 (T12)	
									07:53		08:57 (T12)	
									09:41 (T12)	64	10:01 (T12)	
									07:54		08:57 (T12)	
									09:42 (T12)	64	10:01 (T12)	
									07:55		08:58 (T12)	
									09:43 (T12)	64	10:02 (T12)	
									07:55		08:58 (T12)	
									09:45 (T12)	64	10:02 (T12)	
									07:56		08:59 (T12)	
									09:46 (T12)	64	10:02 (T12)	
									07:56		08:59 (T12)	
									09:46 (T12)	65	10:04 (T12)	
									07:56		08:59 (T12)	
									09:47 (T12)	65	10:04 (T12)	
									07:56		08:59 (T12)	
									09:48 (T12)	65	10:04 (T12)	
									07:57		09:00 (T12)	
									09:49 (T12)	65	10:05 (T12)	
									07:57		09:01 (T12)	
									09:50 (T12)	64	10:05 (T12)	
									07:57		09:01 (T12)	
									09:50 (T12)	64	10:05 (T12)	
									07:57		09:01 (T12)	
									17:12	65	10:06 (T12)	
Potential sun hours	460		429		375		345		297		287	
Total, worst case		1700		1376		569		178		1597		1980
Sun reduction		0.66		0.61		0.59		0.48		0.30		0.22
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.70		0.64		0.61		0.53		0.53		0.53
Total reduction		0.44		0.37		0.35		0.25		0.15		0.11
Total, real		753		516		198		44		244		221

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1067 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7053)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		07:43		16:16 (T35)	07:07	07:38 (T36)	07:16	06:30		06:50 (T31)	06:01
	17:13		17:47	52	17:08 (T35)	18:22	23	08:01 (T36)	19:56	20:27	23	07:13 (T31)	20:57
2	07:57		07:43		16:16 (T35)	07:06	07:39 (T36)	07:14	06:29		06:49 (T31)	06:01
	17:14		17:49	53	17:09 (T35)	18:23	20	07:59 (T36)	19:57	20:28	25	07:14 (T31)	20:58
3	07:58		07:41		16:16 (T35)	07:04	07:40 (T36)	07:13	06:28		06:47 (T31)	06:00
	17:15		17:50	53	17:09 (T35)	18:24	17	07:57 (T36)	19:58	20:29	27	07:14 (T31)	20:58
4	07:58		07:40		16:16 (T35)	07:02	07:43 (T36)	07:11	06:26		06:46 (T31)	06:00
	17:15		17:51	53	17:09 (T35)	18:25	12	07:55 (T36)	19:59	20:30	28	07:14 (T31)	20:59
5	07:58		07:39		16:16 (T35)	07:01		07:09	06:25		06:45 (T31)	06:00
	17:16		17:52	54	17:10 (T35)	18:26		20:00	20:31	30	07:15 (T31)	21:00
6	07:57		07:38		16:16 (T35)	06:59		07:08	06:24		06:44 (T31)	05:59
	17:17		17:54	53	17:09 (T35)	18:27		20:00	20:32	31	07:15 (T31)	21:01
7	07:57	16:31 (T35)	07:37		16:16 (T35)	06:58		07:06	06:23		06:43 (T31)	05:59
	17:18	8 16:39 (T35)	17:55	53	17:09 (T35)	18:29		20:01	20:33	32	07:15 (T31)	21:01
8	07:57	16:28 (T35)	07:36		16:17 (T35)	07:56		07:05	06:21		06:42 (T31)	05:59
	17:19	13 16:41 (T35)	17:56	52	17:09 (T35)	19:30		20:02	20:34	34	07:16 (T31)	21:02
9	07:57	16:26 (T35)	07:35		16:17 (T35)	07:54		07:03	06:20		06:41 (T31)	05:59
	17:20	18 16:44 (T35)	17:57	52	17:09 (T35)	19:31		20:03	20:35	34	07:15 (T31)	21:02
10	07:57	16:25 (T35)	07:34		16:18 (T35)	07:53		07:01	06:19		06:41 (T31)	05:58
	17:21	21 16:46 (T35)	17:59	51	17:09 (T35)	19:32		20:05	20:36	34	07:15 (T31)	21:03
11	07:57	16:24 (T35)	07:32		16:18 (T35)	07:51		07:00	06:18		06:42 (T31)	05:58
	17:22	23 16:47 (T35)	18:00	50	17:08 (T35)	19:33		20:06	20:38	33	07:15 (T31)	21:04
12	07:56	16:23 (T35)	07:31		16:19 (T35)	07:50		06:58	06:17		06:42 (T31)	05:58
	17:23	26 16:49 (T35)	18:01	49	17:08 (T35)	19:34		20:07	20:39	32	07:14 (T31)	21:04
13	07:56	16:23 (T35)	07:30		16:20 (T35)	07:48		06:56	06:16		06:42 (T31)	05:58
	17:25	28 16:51 (T35)	18:02	47	17:07 (T35)	19:35		20:08	20:40	32	07:14 (T31)	21:05
14	07:56	16:21 (T35)	07:29		07:49 (T36)	07:46		06:55	06:15		06:42 (T31)	05:58
	17:26	31 16:52 (T35)	18:04	55	17:07 (T35)	19:36		20:09	20:41	32	07:14 (T31)	21:05
15	07:55	16:21 (T35)	07:27		07:47 (T36)	07:45		06:53	06:14		06:42 (T31)	05:58
	17:27	33 16:54 (T35)	18:05	57	17:06 (T35)	19:38		20:10	20:42	31	07:13 (T31)	21:06
16	07:55	16:20 (T35)	07:26		07:46 (T36)	07:43		06:52	06:13		06:43 (T31)	05:58
	17:28	35 16:55 (T35)	18:06	57	17:05 (T35)	19:39		20:11	20:43	30	07:13 (T31)	21:06
17	07:55	16:20 (T35)	07:25		07:44 (T36)	07:41		06:50	06:12		06:44 (T31)	05:58
	17:29	36 16:56 (T35)	18:07	58	17:03 (T35)	19:40		20:12	20:44	29	07:13 (T31)	21:06
18	07:54	16:19 (T35)	07:23		07:43 (T36)	07:40		06:49	06:11		06:45 (T31)	05:58
	17:30	38 16:57 (T35)	18:09	57	17:02 (T35)	19:41		20:13	20:45	27	07:12 (T31)	21:07
19	07:53	16:19 (T35)	07:22		07:42 (T36)	07:38		06:47	06:10		06:45 (T31)	05:58
	17:31	40 16:59 (T35)	18:10	56	17:01 (T35)	19:42		20:14	20:46	27	07:12 (T31)	21:07
20	07:53	16:18 (T35)	07:21		07:40 (T36)	07:36		06:46	06:09		06:46 (T31)	05:58
	17:33	42 17:00 (T35)	18:11	55	16:59 (T35)	19:43		20:15	20:46	25	07:11 (T31)	21:07
21	07:52	16:17 (T35)	07:19		07:39 (T36)	07:35		06:44	06:08		06:46 (T31)	05:59
	17:34	43 17:00 (T35)	18:12	52	16:57 (T35)	19:44		20:16	20:47	24	07:10 (T31)	21:08
22	07:52	16:18 (T35)	07:18		07:37 (T36)	07:33		06:43	06:08		06:48 (T31)	05:59
	17:35	44 17:02 (T35)	18:13	47	16:53 (T35)	19:45		20:17	20:48	22	07:10 (T31)	21:08
23	07:51	16:17 (T35)	07:16		07:36 (T36)	07:31		06:41	06:07		06:49 (T31)	05:59
	17:36	46 17:03 (T35)	18:15	39	16:49 (T35)	19:46		20:18	20:49	19	07:08 (T31)	21:08
24	07:50	16:17 (T35)	07:15		07:35 (T36)	07:30		06:40	06:06		06:50 (T31)	05:59
	17:37	46 17:03 (T35)	18:16	29	08:04 (T36)	19:47		20:20	20:50	17	07:07 (T31)	21:08
25	07:50	16:16 (T35)	07:13		07:36 (T36)	07:28		06:38	06:05		06:52 (T31)	06:00
	17:39	48 17:04 (T35)	18:17	29	08:05 (T36)	19:48		20:21	20:51	14	07:06 (T31)	21:08
26	07:49	16:17 (T35)	07:12		07:36 (T36)	07:26		06:37	06:56 (T31)	06:05		06:53 (T31)	06:00
	17:40	49 17:06 (T35)	18:18	28	08:04 (T36)	19:50		20:22	8 07:04 (T31)	20:52	11	07:04 (T31)	21:09
27	07:48	16:16 (T35)	07:10		07:37 (T36)	07:24		06:36	06:55 (T31)	06:04		06:56 (T31)	06:00
	17:41	50 17:06 (T35)	18:19	26	08:03 (T36)	19:51		20:23	12 07:07 (T31)	20:53	5	07:01 (T31)	21:09
28	07:47	16:16 (T35)	07:09		07:37 (T36)	07:23		06:34	06:54 (T31)	06:03			06:01
	17:42	51 17:07 (T35)	18:20	25	08:02 (T36)	19:52		20:24	16 07:10 (T31)	20:54			21:09
29	07:46	16:16 (T35)				07:21		06:33	06:52 (T31)	06:03			06:01
	17:44	51 17:07 (T35)				19:53		20:25	18 07:10 (T31)	20:55			21:09
30	07:45	16:16 (T35)				07:19		06:31	06:51 (T31)	06:02			06:01
	17:45	52 17:08 (T35)				19:54		20:26	21 07:12 (T31)	20:55			21:09
31	07:44	16:16 (T35)				07:18				06:02			
	17:46	52 17:08 (T35)				19:55				20:56			
Potential sun hours	297		297			370		399		449			453
Total, worst case		924		1342			72		75		708		
Sun reduction		0.31		0.40			0.44		0.52		0.57		
Oper. time red.		1.00		1.00			1.00		1.00		1.00		
Wind dir. red.		0.73		0.69			0.56		0.69		0.69		
Total reduction		0.23		0.28			0.25		0.36		0.40		
Total, real		210		371			18		27		281		

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1067 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7053)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September		October			November			December		
1	06:02			06:26		06:52 (T31)	06:57		07:27			07:02		15:47 (T35)	07:37		16:06 (T35)
	21:09			20:50	33	07:25 (T31)	20:07		19:15			17:28	51	16:38 (T35)	17:04	24	16:30 (T35)
2	06:02			06:27		06:52 (T31)	06:58		07:29			07:03		15:47 (T35)	07:38		16:08 (T35)
	21:08			20:49	33	07:25 (T31)	20:06		19:13			17:27	52	16:39 (T35)	17:03	21	16:29 (T35)
3	06:03			06:28		06:52 (T31)	06:59		07:30			07:04		15:47 (T35)	07:39		16:10 (T35)
	21:08			20:48	33	07:25 (T31)	20:04		19:11			17:25	52	16:39 (T35)	17:03	18	16:28 (T35)
4	06:04			06:29		06:52 (T31)	07:00		07:31			07:06		15:46 (T35)	07:40		16:12 (T35)
	21:08			20:47	33	07:25 (T31)	20:02		19:10			17:24	53	16:39 (T35)	17:03	14	16:26 (T35)
5	06:04			06:30		06:52 (T31)	07:01		07:32			07:07		15:46 (T35)	07:41		16:15 (T35)
	21:08			20:46	33	07:25 (T31)	20:01		19:08			17:23	53	16:39 (T35)	17:03	9	16:24 (T35)
6	06:05			06:31		06:53 (T31)	07:02		07:33			07:08		15:46 (T35)	07:42		
	21:08			20:45	32	07:25 (T31)	19:57		19:06			17:22	53	16:39 (T35)	17:03		
7	06:05			06:32		06:54 (T31)	07:03		07:34			07:09		15:46 (T35)	07:43		
	21:07			20:43	31	07:25 (T31)	19:56		19:05			17:21	53	16:39 (T35)	17:02		
8	06:06			06:33		06:55 (T31)	07:04		07:35			07:10		15:46 (T35)	07:44		
	21:07			20:42	29	07:24 (T31)	19:54		19:03			17:20	53	16:39 (T35)	17:02		
9	06:07			06:34		06:56 (T31)	07:05		07:36		08:20 (T36)	07:12		15:47 (T35)	07:45		
	21:07			20:41	28	07:24 (T31)	19:52		19:01	7	08:27 (T36)	17:19	53	16:40 (T35)	17:02		
10	06:07			06:35		06:57 (T31)	07:06		07:37		08:16 (T36)	07:13		15:47 (T35)	07:46		
	21:06			20:40	26	07:23 (T31)	19:51		19:00	14	08:30 (T36)	17:18	52	16:39 (T35)	17:02		
11	06:08			06:36		06:58 (T31)	07:07		07:38		08:14 (T36)	07:14		15:47 (T35)	07:47		
	21:06			20:38	24	07:22 (T31)	19:49		18:58	18	08:32 (T36)	17:17	52	16:39 (T35)	17:03		
12	06:09			06:37		06:59 (T31)	07:08		07:39		08:12 (T36)	07:15		15:47 (T35)	07:47		
	21:06			20:37	22	07:21 (T31)	19:47		18:57	21	08:33 (T36)	17:16	52	16:39 (T35)	17:03		
13	06:09			06:38		07:00 (T31)	07:09		07:40		08:10 (T36)	07:16		15:48 (T35)	07:48		
	21:05			20:36	20	07:20 (T31)	19:45		18:55	24	08:34 (T36)	17:15	51	16:39 (T35)	17:03		
14	06:10			06:39		07:00 (T31)	07:10		07:41		08:10 (T36)	07:18		15:48 (T35)	07:49		
	21:05			20:34	18	07:18 (T31)	19:44		18:53	26	08:36 (T36)	17:14	51	16:39 (T35)	17:03		
15	06:11			06:40		07:01 (T31)	07:11		07:42		08:09 (T36)	07:19		15:48 (T35)	07:50		
	21:04			20:33	15	07:16 (T31)	19:42		18:52	27	08:36 (T36)	17:13	50	16:38 (T35)	17:03		
16	06:12			06:41		07:02 (T31)	07:12		07:44		08:08 (T36)	07:20		15:50 (T35)	07:50		
	21:04			20:32	11	07:13 (T31)	19:40		18:50	28	08:36 (T36)	17:12	49	16:39 (T35)	17:03		
17	06:13		07:04 (T31)	06:42		07:04 (T31)	07:13		07:45		08:07 (T36)	07:21		15:50 (T35)	07:51		
	21:03	8	07:12 (T31)	20:30	5	07:09 (T31)	19:39		18:49	29	08:36 (T36)	17:11	48	16:38 (T35)	17:04		
18	06:13		07:02 (T31)	06:43			07:14		07:46		08:07 (T36)	07:22		15:51 (T35)	07:52		
	21:02	13	07:15 (T31)	20:29			19:37		18:47	29	08:36 (T36)	17:11	46	16:37 (T35)	17:04		
19	06:14		07:01 (T31)	06:44			07:15		07:47		08:07 (T36)	07:24		15:51 (T35)	07:52		
	21:02	16	07:17 (T31)	20:27			19:35		18:46	44	17:22 (T35)	17:10	46	16:37 (T35)	17:04		
20	06:15		06:59 (T31)	06:45			07:16		07:48		08:09 (T36)	07:25		15:53 (T35)	07:53		
	21:01	18	07:17 (T31)	20:26			19:33		18:44	49	17:26 (T35)	17:09	44	16:37 (T35)	17:05		
21	06:16		06:58 (T31)	06:46			07:17		07:49		08:10 (T36)	07:26		15:53 (T35)	07:53		
	21:00	20	07:18 (T31)	20:24			19:32		18:43	53	17:28 (T35)	17:08	43	16:36 (T35)	17:05		
22	06:17		06:57 (T31)	06:47			07:18		07:50		08:11 (T36)	07:27		15:54 (T35)	07:54		
	20:59	23	07:20 (T31)	20:23			19:30		18:41	56	17:30 (T35)	17:08	42	16:36 (T35)	17:06		
23	06:18		06:57 (T31)	06:48			07:19		07:51		08:12 (T36)	07:28		15:55 (T35)	07:54		
	20:59	24	07:21 (T31)	20:21			19:28		18:40	57	17:31 (T35)	17:07	40	16:35 (T35)	17:06		
24	06:19		06:56 (T31)	06:49			07:20		07:53		08:13 (T36)	07:29		15:56 (T35)	07:55		
	20:58	26	07:22 (T31)	20:20			19:27		18:39	58	17:32 (T35)	17:07	38	16:34 (T35)	17:07		
25	06:20		06:55 (T31)	06:50			07:21		07:54		08:15 (T36)	07:31		15:58 (T35)	07:55		
	20:57	28	07:23 (T31)	20:18			19:25		18:37	57	17:34 (T35)	17:06	37	16:35 (T35)	17:08		
26	06:20		06:55 (T31)	06:51			07:22		07:55		08:16 (T36)	07:32		15:59 (T35)	07:56		
	20:56	28	07:23 (T31)	20:17			19:23		18:36	58	17:35 (T35)	17:06	35	16:34 (T35)	17:08		
27	06:21		06:54 (T31)	06:52			07:23		07:56		08:17 (T36)	07:33		16:00 (T35)	07:56		
	20:55	29	07:23 (T31)	20:15			19:21		18:34	55	17:35 (T35)	17:05	33	16:33 (T35)	17:09		
28	06:22		06:53 (T31)	06:53			07:24		07:57		08:18 (T36)	07:34		16:01 (T35)	07:56		
	20:54	31	07:24 (T31)	20:14			19:20		18:33	54	17:36 (T35)	17:05	31	16:32 (T35)	17:09		
29	06:23		06:53 (T31)	06:54			07:25		07:58		16:49 (T35)	07:35		16:03 (T35)	07:57		
	20:53	31	07:24 (T31)	20:12			19:18		18:32	48	17:37 (T35)	17:04	28	16:31 (T35)	17:10		
30	06:24		06:53 (T31)	06:55			07:26		08:00		16:49 (T35)	07:36		16:04 (T35)	07:57		
	20:52	31	07:24 (T31)	20:10			19:16		18:30	48	17:37 (T35)	17:04	26	16:30 (T35)	17:11		
31	06:25		06:52 (T31)	06:56					08:01		16:48 (T35)				07:57		
	20:51	33	07:25 (T31)	20:09					18:29	50	17:38 (T35)				17:12		
Potential sun hours	460			429			375		345			297			287		
Total, worst case		359			426					910			1367			86	
Sun reduction		0.66			0.61					0.48			0.30			0.22	
Oper. time red.		1.00			1.00					1.00			1.00			1.00	
Wind dir. red.		0.69			0.69					0.65			0.73			0.73	
Total reduction		0.46			0.43					0.31			0.22			0.16	
Total, real		165			181					286			300			14	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1085 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7068)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May	June
1	07:57		14:55 (T79)	07:43		16:22 (T62)	07:07		07:16	18:54 (T60)	06:30	06:02
	17:13	71	16:44 (T62)	17:47	39	17:01 (T62)	18:22		19:56	35	19:29 (T60)	20:27	20:56
2	07:57		14:55 (T79)	07:42		16:23 (T62)	07:05		07:14	18:52 (T60)	06:29	06:01
	17:14	72	16:45 (T62)	17:49	38	17:01 (T62)	18:23		19:57	38	19:30 (T60)	20:28	20:57
3	07:57		14:56 (T79)	07:41		16:24 (T62)	07:04		07:13	18:52 (T60)	06:28	06:01
	17:15	72	16:46 (T62)	17:50	36	17:00 (T62)	18:24		19:58	40	19:32 (T60)	20:29	20:58
4	07:57		14:57 (T79)	07:40		16:25 (T62)	07:02		07:11	18:50 (T60)	06:26	06:00
	17:16	72	16:47 (T62)	17:51	35	17:00 (T62)	18:25		19:59	42	19:32 (T60)	20:30	20:59
5	07:57		14:58 (T79)	07:39		16:26 (T62)	07:01		07:09	18:49 (T60)	06:25	06:00
	17:17	72	16:48 (T62)	17:53	33	16:59 (T62)	18:26		20:00	43	19:32 (T60)	20:31	20:59
6	07:57		14:59 (T79)	07:38		16:27 (T62)	06:59		07:08	18:48 (T60)	06:24	06:00
	17:18	72	16:49 (T62)	17:54	31	16:58 (T62)	18:27		20:00	45	19:33 (T60)	20:32	21:00
7	07:57		15:01 (T79)	07:37		16:29 (T62)	06:58		07:06	18:47 (T60)	06:23	05:59
	17:19	71	16:50 (T62)	17:55	28	16:57 (T62)	18:29		20:01	46	19:33 (T60)	20:33	21:01
8	07:57		15:02 (T79)	07:36		16:31 (T62)	07:56		07:05	18:46 (T60)	06:22	05:59
	17:20	71	16:51 (T62)	17:56	25	16:56 (T62)	19:30		20:02	47	19:33 (T60)	20:34	21:01
9	07:57		15:03 (T79)	07:35		16:32 (T62)	07:54		07:03	18:46 (T60)	06:20	05:59
	17:21	71	16:52 (T62)	17:58	21	16:53 (T62)	19:31		20:03	47	19:33 (T60)	20:35	21:02
10	07:56		15:04 (T79)	07:33		16:35 (T62)	07:53		07:01	18:45 (T60)	06:19	05:59
	17:22	70	16:52 (T62)	17:59	16	16:51 (T62)	19:32		20:04	48	19:33 (T60)	20:36	21:03
11	07:56		15:06 (T79)	07:32		16:40 (T62)	07:51		07:00	18:45 (T60)	06:18	05:59
	17:23	69	16:53 (T62)	18:00	7	16:47 (T62)	19:33		20:05	48	19:33 (T60)	20:37	21:03
12	07:56		15:08 (T79)	07:31			07:49		06:58	18:45 (T60)	06:17	05:58
	17:24	68	16:55 (T62)	18:01			19:34		20:06	48	19:33 (T60)	20:38	21:04
13	07:56		15:09 (T79)	07:30			07:48		06:57	18:45 (T60)	06:16	05:58
	17:25	66	16:55 (T62)	18:02			19:35		20:07	48	19:33 (T60)	20:39	21:04
14	07:55		15:11 (T79)	07:28			07:46		06:55	18:45 (T60)	06:15	05:58
	17:26	65	16:56 (T62)	18:04			19:36		20:09	47	19:32 (T60)	20:40	21:05
15	07:55		15:13 (T79)	07:27			07:44		06:53	18:44 (T60)	06:14	05:58
	17:27	61	16:56 (T62)	18:05			19:37		20:10	47	19:31 (T60)	20:41	21:05
16	07:55		15:16 (T79)	07:26			07:43		06:52	18:45 (T60)	06:13	05:58
	17:28	57	16:57 (T62)	18:06			19:39		20:11	46	19:31 (T60)	20:42	21:05
17	07:54		15:19 (T79)	07:24			07:41		06:50	18:45 (T60)	06:12	05:58
	17:29	52	16:58 (T62)	18:07			19:40		20:12	45	19:30 (T60)	20:43	21:06
18	07:54		16:18 (T62)	07:23			07:39		06:49	18:45 (T60)	06:11	05:58
	17:30	41	16:59 (T62)	18:09			19:41		20:13	45	19:30 (T60)	20:44	21:06
19	07:53		16:18 (T62)	07:22			07:38		06:47	18:45 (T60)	06:10	05:59
	17:32	41	16:59 (T62)	18:10			19:42		20:14	43	19:28 (T60)	20:45	21:07
20	07:52		16:19 (T62)	07:20			07:36		06:46	18:46 (T60)	06:09	05:59
	17:33	41	17:00 (T62)	18:11			19:43		20:15	42	19:28 (T60)	20:46	21:07
21	07:52		16:19 (T62)	07:19			07:34		06:44	18:47 (T60)	06:09	05:59
	17:34	41	17:00 (T62)	18:12			19:44		20:16	39	19:26 (T60)	20:47	21:07
22	07:51		16:18 (T62)	07:17			07:33		06:43	18:48 (T60)	06:08	05:59
	17:35	42	17:00 (T62)	18:13			19:45		20:17	37	19:25 (T60)	20:48	21:07
23	07:51		16:18 (T62)	07:16			07:31		06:41	18:49 (T60)	06:07	05:59
	17:36	43	17:01 (T62)	18:15			19:46		20:18	36	19:25 (T60)	20:49	21:08
24	07:50		16:19 (T62)	07:14			07:29		06:40	18:50 (T60)	06:06	06:00
	17:38	43	17:02 (T62)	18:16			19:47		20:19	32	19:22 (T60)	20:50	21:08
25	07:49		16:19 (T62)	07:13			07:28		06:38	18:51 (T60)	06:06	06:00
	17:39	43	17:02 (T62)	18:17			19:48		20:20	30	19:21 (T60)	20:51	21:08
26	07:48		16:20 (T62)	07:11			07:26		06:37	18:52 (T60)	06:05	06:00
	17:40	42	17:02 (T62)	18:18			19:49		20:21	27	19:19 (T60)	20:51	21:08
27	07:48		16:20 (T62)	07:10			07:24		06:36	18:55 (T60)	06:04	06:01
	17:41	42	17:02 (T62)	18:19			19:50		20:22	22	19:17 (T60)	20:52	21:08
28	07:47		16:20 (T62)	07:08			07:23		19:05 (T60)	06:34	18:58 (T60)	06:04	06:01
	17:43	42	17:02 (T62)	18:20			19:51	17	19:22 (T60)	20:23	16	19:14 (T60)	20:53	21:08
29	07:46		16:20 (T62)				07:21		19:01 (T60)	06:33		19:02 (T60)	06:03	06:01
	17:44	42	17:02 (T62)				19:53	23	19:24 (T60)	20:25	6	19:08 (T60)	20:54	21:08
30	07:45		16:21 (T62)				07:19		18:58 (T60)	06:32			06:03	06:02
	17:45	41	17:02 (T62)				19:54	28	19:26 (T60)	20:26			20:55	21:08
31	07:44		16:22 (T62)				07:18		18:57 (T60)				06:02	
	17:46	39	17:01 (T62)				19:55	32	19:29 (T60)				20:56	
Potential sun hours	297			297			370			399			448	452
Total, worst case		1735			309			100			1135			
Sun reduction		0.31			0.40			0.44			0.52			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.73			0.73			0.62			0.62			
Total reduction		0.23			0.30			0.28			0.33			
Total, real		406			93			28			374			

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1085 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7068)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September			October			November			December		
1	06:02		06:26			06:57		18:44 (T60)	07:27			07:02		16:04 (T62)	07:37		14:48 (T79)
	21:08		20:50			20:07	48	19:32 (T60)	19:15			17:28	17	16:21 (T62)	17:04	70	16:36 (T62)
2	06:03		06:27			06:58		18:44 (T60)	07:28			07:03		16:02 (T62)	07:38		14:47 (T79)
	21:08		20:49			20:05	48	19:32 (T60)	19:13			17:27	22	16:24 (T62)	17:04	70	16:35 (T62)
3	06:03		06:28			06:59		18:44 (T60)	07:29			07:04		15:59 (T62)	07:39		14:47 (T79)
	21:08		20:48			20:04	47	19:31 (T60)	19:11			17:26	26	16:25 (T62)	17:03	70	16:35 (T62)
4	06:04		06:29			07:00		18:44 (T60)	07:30			07:05		15:59 (T62)	07:40		14:46 (T79)
	21:08		20:46			20:02	47	19:31 (T60)	19:10			17:24	28	16:27 (T62)	17:03	71	16:35 (T62)
5	06:04		06:30			07:01		18:44 (T60)	07:32			07:06		15:57 (T62)	07:41		14:46 (T79)
	21:07		20:45			20:00	46	19:30 (T60)	19:08			17:23	31	16:28 (T62)	17:03	71	16:35 (T62)
6	06:05		06:31			07:02		18:44 (T60)	07:33			07:08		15:56 (T62)	07:42		14:46 (T79)
	21:07		20:44			19:57	45	19:29 (T60)	19:06			17:22	33	16:29 (T62)	17:03	71	16:35 (T62)
7	06:06		06:32			07:03		18:45 (T60)	07:34			07:09		15:56 (T62)	07:43		14:45 (T79)
	21:07		20:43			19:55	43	19:28 (T60)	19:05			17:21	35	16:31 (T62)	17:03	72	16:35 (T62)
8	06:06		06:33			07:04		18:44 (T60)	07:35			07:10		15:55 (T62)	07:43		14:45 (T79)
	21:07		20:42			19:54	42	19:26 (T60)	19:03			17:20	36	16:31 (T62)	17:03	73	16:35 (T62)
9	06:07		06:34			07:05		18:45 (T60)	07:36			07:11		15:54 (T62)	07:44		14:45 (T79)
	21:06		20:40			19:52	40	19:25 (T60)	19:01			17:19	38	16:32 (T62)	17:03	72	16:35 (T62)
10	06:08		06:35			07:06		18:45 (T60)	07:37			07:12		15:53 (T62)	07:45		14:46 (T79)
	21:06		20:39			19:50	38	19:23 (T60)	19:00			17:18	39	16:32 (T62)	17:03	71	16:35 (T62)
11	06:08		06:36			07:07		18:46 (T60)	07:38			07:14		15:53 (T62)	07:46		14:46 (T79)
	21:06		20:38			19:49	36	19:22 (T60)	18:58			17:17	40	16:33 (T62)	17:03	71	16:35 (T62)
12	06:09		06:37			07:08		18:48 (T60)	07:39			07:15		15:53 (T62)	07:47		14:45 (T79)
	21:05		20:37			19:47	32	19:20 (T60)	18:57			17:16	41	16:34 (T62)	17:03	71	16:34 (T62)
13	06:10		06:38			07:09		18:49 (T60)	07:40			07:16		15:52 (T62)	07:48		14:45 (T79)
	21:05		20:35			19:45	29	19:18 (T60)	18:55			17:15	42	16:34 (T62)	17:03	71	16:34 (T62)
14	06:10		06:39		19:09 (T60)	07:10		18:51 (T60)	07:41			07:17		15:53 (T62)	07:48		14:46 (T79)
	21:04		20:34	10	19:19 (T60)	19:44	24	19:15 (T60)	18:53			17:14	42	16:35 (T62)	17:03	71	16:35 (T62)
15	06:11		06:40		19:05 (T60)	07:11		18:54 (T60)	07:42			07:18		15:53 (T62)	07:49		14:46 (T79)
	21:04		20:33	18	19:23 (T60)	19:42	18	19:12 (T60)	18:52			17:13	42	16:35 (T62)	17:03	71	16:35 (T62)
16	06:12		06:41		19:01 (T60)	07:12		19:00 (T60)	07:43			07:20		15:53 (T62)	07:50		14:46 (T79)
	21:03		20:31	23	19:24 (T60)	19:40	5	19:05 (T60)	18:50			17:12	42	16:35 (T62)	17:04	70	16:34 (T62)
17	06:13		06:42		18:59 (T60)	07:13			07:44			07:21		15:52 (T62)	07:51		14:47 (T79)
	21:02		20:30	27	19:26 (T60)	19:38			18:49			17:11	43	16:35 (T62)	17:04	70	16:35 (T62)
18	06:14		06:43		18:57 (T60)	07:14			07:46			07:22		15:53 (T62)	07:51		14:47 (T79)
	21:02		20:28	30	19:27 (T60)	19:37			18:47			17:11	43	16:36 (T62)	17:04	69	16:35 (T62)
19	06:15		06:44		18:55 (T60)	07:15			07:47			07:23		15:53 (T62)	07:52		14:47 (T79)
	21:01		20:27	34	19:29 (T60)	19:35			18:46			17:10	43	16:36 (T62)	17:05	68	16:35 (T62)
20	06:15		06:45		18:54 (T60)	07:16			07:48			07:24		15:53 (T62)	07:52		14:48 (T79)
	21:00		20:25	36	19:30 (T60)	19:33			18:44			17:09	43	16:36 (T62)	17:05	68	16:36 (T62)
21	06:16		06:46		18:52 (T60)	07:17			07:49			07:25		15:54 (T62)	07:53		14:48 (T79)
	21:00		20:24	38	19:30 (T60)	19:32			18:43			17:09	41	16:35 (T62)	17:06	68	16:36 (T62)
22	06:17		06:47		18:51 (T60)	07:18			07:50			07:27		15:55 (T62)	07:53		14:49 (T79)
	20:59		20:22	40	19:31 (T60)	19:30			18:41			17:08	41	16:36 (T62)	17:06	68	16:37 (T62)
23	06:18		06:48		18:50 (T60)	07:19			07:51			07:28		15:55 (T62)	07:54		14:49 (T79)
	20:58		20:21	42	19:32 (T60)	19:28			18:40			17:07	41	16:36 (T62)	17:07	68	16:37 (T62)
24	06:19		06:49		18:49 (T60)	07:20			07:52			07:29		15:55 (T62)	07:54		14:50 (T79)
	20:57		20:19	43	19:32 (T60)	19:26			18:39			17:07	41	16:36 (T62)	17:07	68	16:38 (T62)
25	06:20		06:50		18:48 (T60)	07:21			07:53			07:30		14:57 (T79)	07:55		14:50 (T79)
	20:56		20:18	45	19:33 (T60)	19:25			18:37			17:06	52	16:36 (T62)	17:08	69	16:38 (T62)
26	06:21		06:51		18:47 (T60)	07:22			07:55			07:31		14:54 (T79)	07:55		14:50 (T79)
	20:56		20:16	46	19:33 (T60)	19:23			18:36			17:06	57	16:35 (T62)	17:08	71	16:39 (T62)
27	06:22		06:52		18:47 (T60)	07:23			07:56			07:32		14:53 (T79)	07:56		14:51 (T79)
	20:55		20:15	46	19:33 (T60)	19:21			18:34			17:05	61	16:36 (T62)	17:09	70	16:39 (T62)
28	06:23		06:53		18:46 (T60)	07:24			07:57			07:33		14:51 (T79)	07:56		14:52 (T79)
	20:54		20:13	47	19:33 (T60)	19:20			18:33			17:05	65	16:36 (T62)	17:10	71	16:41 (T62)
29	06:23		06:54		18:46 (T60)	07:25			07:58			07:34		14:50 (T79)	07:56		14:53 (T79)
	20:53		20:12	47	19:33 (T60)	19:18			18:32			17:04	66	16:36 (T62)	17:11	70	16:41 (T62)
30	06:24		06:55		18:45 (T60)	07:26			07:59			07:36		14:49 (T79)	07:56		14:53 (T79)
	20:52		20:10	48	19:33 (T60)	19:16			18:31			17:04	68	16:36 (T62)	17:11	71	16:42 (T62)
31	06:25		06:56		18:45 (T60)				08:01		17:09 (T62)				07:57		14:54 (T79)
	20:51		20:09	48	19:33 (T60)				18:29	9	17:18 (T62)				17:12	71	16:43 (T62)
Potential sun hours	459		428			375			345			298			288		
Total, worst case				668			588			9			1259			2176	
Sun reduction				0.61			0.59			0.48			0.30			0.22	
Oper. time red.				1.00			1.00			1.00			1.00			1.00	
Wind dir. red.				0.62			0.62			0.73			0.73			0.74	
Total reduction				0.39			0.37			0.36			0.23			0.17	
Total, real				258			220			3			284			363	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1106 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7088)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58			07:44			07:07		17:12 (T37)	07:16		17:57 (T37)	06:30			06:02		19:50 (T34)
	17:13			17:48			18:22	48	18:00 (T38)	19:56	49	18:46 (T37)	20:27			20:57	31	20:21 (T34)
2	07:58			07:43			07:06		17:09 (T37)	07:15		17:59 (T37)	06:29			06:01		19:51 (T34)
	17:14			17:49			18:23	52	18:01 (T38)	19:57	46	18:45 (T37)	20:28			20:58	30	20:21 (T34)
3	07:58			07:42			07:04		17:07 (T37)	07:13		17:59 (T37)	06:28			06:01		19:51 (T34)
	17:15			17:50			18:24	56	18:03 (T38)	19:58	44	18:43 (T37)	20:29			20:59	29	20:20 (T34)
4	07:58			07:41			07:03		17:05 (T37)	07:11		18:01 (T37)	06:26			06:00		19:51 (T34)
	17:16			17:51			18:25	59	18:04 (T38)	19:59	40	18:41 (T37)	20:30			20:59	29	20:20 (T34)
5	07:58			07:40			07:01		17:03 (T37)	07:10		18:03 (T37)	06:25		20:01 (T34)	06:00		19:52 (T34)
	17:17			17:53			18:27	61	18:04 (T38)	20:00	36	18:39 (T37)	20:31	7	20:08 (T34)	21:00	28	20:20 (T34)
6	07:58			07:39			07:00		17:02 (T37)	07:08		18:05 (T37)	06:24		19:57 (T34)	06:00		19:52 (T34)
	17:18			17:54			18:28	64	18:06 (T38)	20:00	31	18:36 (T37)	20:33	13	20:10 (T34)	21:01	28	20:20 (T34)
7	07:58			07:37			06:58		17:00 (T37)	07:06		18:07 (T37)	06:23		19:55 (T34)	05:59		19:53 (T34)
	17:19			17:55			18:29	67	18:07 (T38)	20:02	26	18:33 (T37)	20:34	16	20:11 (T34)	21:01	27	20:20 (T34)
8	07:58			07:36			07:56		18:00 (T37)	07:05		18:11 (T37)	06:22		19:54 (T34)	05:59		19:54 (T34)
	17:20			17:56			19:30	68	19:08 (T38)	20:03	18	18:29 (T37)	20:35	18	20:12 (T34)	21:02	26	20:20 (T34)
9	07:57			07:35			07:55		17:58 (T37)	07:03			06:20		19:52 (T34)	05:59		19:54 (T34)
	17:21			17:58			19:31	70	19:08 (T38)	20:04			20:36	21	20:13 (T34)	21:03	26	20:20 (T34)
10	07:57			07:34			07:53		17:57 (T37)	07:02			06:19		19:51 (T34)	05:59		19:55 (T34)
	17:22			17:59			19:32	70	19:07 (T38)	20:05			20:37	23	20:14 (T34)	21:03	25	20:20 (T34)
11	07:57			07:33			07:51		17:57 (T37)	07:00			06:18		19:50 (T34)	05:58		19:56 (T34)
	17:23			18:00			19:33	70	19:07 (T38)	20:06			20:38	25	20:15 (T34)	21:04	24	20:20 (T34)
12	07:57			07:31			07:50		17:55 (T37)	06:58			06:17		19:50 (T34)	05:58		19:56 (T34)
	17:24			18:01			19:34	71	19:06 (T38)	20:07			20:39	26	20:16 (T34)	21:04	24	20:20 (T34)
13	07:56			07:30			07:48		17:54 (T37)	06:57			06:16		19:49 (T34)	05:58		19:56 (T34)
	17:25			18:03			19:36	71	19:05 (T38)	20:08			20:40	28	20:17 (T34)	21:05	23	20:19 (T34)
14	07:56			07:29			07:46		17:54 (T37)	06:55			06:15		19:49 (T34)	05:58		19:56 (T34)
	17:26			18:04			19:37	70	19:04 (T38)	20:09			20:41	29	20:18 (T34)	21:05	23	20:19 (T34)
15	07:56			07:28			07:45		17:54 (T37)	06:54			06:14		19:48 (T34)	05:58		19:57 (T34)
	17:27			18:05			19:38	68	19:02 (T38)	20:10			20:42	31	20:19 (T34)	21:06	22	20:19 (T34)
16	07:55			07:26			07:43		17:53 (T37)	06:52			06:13		19:48 (T34)	05:58		19:58 (T34)
	17:28			18:06			19:39	67	19:00 (T38)	20:11			20:43	32	20:20 (T34)	21:06	22	20:20 (T34)
17	07:55			07:25			07:41		17:53 (T37)	06:50			06:12		19:47 (T34)	05:58		19:58 (T34)
	17:29			18:08			19:40	66	18:59 (T38)	20:12			20:44	34	20:21 (T34)	21:07	22	20:20 (T34)
18	07:54			07:24			07:40		17:52 (T37)	06:49			06:11		19:47 (T34)	05:58		19:58 (T34)
	17:30			18:09			19:41	65	18:57 (T37)	20:13			20:45	34	20:21 (T34)	21:07	22	20:20 (T34)
19	07:54			07:22			07:38		17:52 (T37)	06:47			06:10		19:47 (T34)	05:58		19:59 (T34)
	17:32			18:10			19:42	65	18:57 (T37)	20:14			20:46	34	20:21 (T34)	21:07	21	20:20 (T34)
20	07:53			07:21			07:36		17:52 (T37)	06:46			06:09		19:47 (T34)	05:59		19:59 (T34)
	17:33			18:11			19:43	65	18:57 (T37)	20:15			20:47	34	20:21 (T34)	21:08	21	20:20 (T34)
21	07:53			07:19			07:35		17:52 (T37)	06:44			06:09		19:47 (T34)	05:59		19:59 (T34)
	17:34			18:12			19:44	65	18:57 (T37)	20:17			20:48	35	20:22 (T34)	21:08	21	20:20 (T34)
22	07:52			07:18			07:33		17:52 (T37)	06:43			06:08		19:47 (T34)	05:59		19:59 (T34)
	17:35			18:14			19:45	64	18:56 (T37)	20:18			20:49	35	20:22 (T34)	21:08	21	20:20 (T34)
23	07:51			07:16			07:31		17:52 (T37)	06:41			06:07		19:47 (T34)	05:59		20:00 (T34)
	17:36			18:15			19:46	63	18:55 (T37)	20:19			20:49	34	20:21 (T34)	21:08	21	20:21 (T34)
24	07:50			07:15			07:30		17:52 (T37)	06:40			06:06		19:47 (T34)	05:59		20:00 (T34)
	17:38			18:16			19:48	63	18:55 (T37)	20:20			20:50	34	20:21 (T34)	21:08	21	20:21 (T34)
25	07:50			07:13			07:28		17:52 (T37)	06:39			06:06		19:48 (T34)	06:00		19:59 (T34)
	17:39			18:17			19:49	62	18:54 (T37)	20:21			20:51	34	20:22 (T34)	21:09	22	20:21 (T34)
26	07:49			07:12		17:26 (T37)	07:26		17:52 (T37)	06:37			06:05		19:48 (T34)	06:00		20:00 (T34)
	17:40			18:18	5	17:31 (T37)	19:50	61	18:53 (T37)	20:22			20:52	33	20:21 (T34)	21:09	22	20:22 (T34)
27	07:48			07:10		17:19 (T37)	07:25		17:54 (T37)	06:36			06:04		19:49 (T34)	06:00		20:00 (T34)
	17:41			18:20	20	17:39 (T37)	19:51	59	18:53 (T37)	20:23			20:53	33	20:22 (T34)	21:09	22	20:22 (T34)
28	07:47			07:09		17:14 (T37)	07:23		17:54 (T37)	06:34			06:04		19:48 (T34)	06:01		19:59 (T34)
	17:43			18:21	37	17:58 (T38)	19:52	57	18:51 (T37)	20:24			20:54	33	20:21 (T34)	21:09	23	20:22 (T34)
29	07:46						07:21		17:54 (T37)	06:33			06:03		19:49 (T34)	06:01		20:00 (T34)
	17:44						19:53	56	18:50 (T37)	20:25			20:55	33	20:22 (T34)	21:09	23	20:23 (T34)
30	07:46						07:20		17:56 (T37)	06:32			06:03		19:49 (T34)	06:02		19:59 (T34)
	17:45						19:54	53	18:49 (T37)	20:26			20:56	32	20:21 (T34)	21:09	24	20:23 (T34)
31	07:45						07:18		17:56 (T37)				06:02		19:50 (T34)			
	17:46						19:55	52	18:48 (T37)				20:56	31	20:21 (T34)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case					62			1948			290			772			723	
Sun reduction					0.40			0.44			0.52			0.57			0.64	
Oper. time red.					1.00			1.00			1.00			1.00			1.00	
Wind dir. red.					0.67			0.67			0.67			0.56			0.56	
Total reduction					0.27			0.30			0.35			0.32			0.36	
Total, real					17			580			102			247			260	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1106 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7088)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		20:00 (T34)	06:26		20:00 (T34)	06:57		07:28	17:35 (T37)	07:02	07:37
	21:09	24	20:24 (T34)	20:50	25	20:25 (T34)	20:07		19:15	70	18:45 (T38)	17:28	17:04
2	06:03		19:59 (T34)	06:27		20:00 (T34)	06:58		07:29		17:35 (T37)	07:03	07:38
	21:09	25	20:24 (T34)	20:49	25	20:25 (T34)	20:06		19:13	70	18:45 (T38)	17:27	17:04
3	06:03		20:00 (T34)	06:28		20:01 (T34)	06:59		07:30		17:35 (T37)	07:05	07:39
	21:09	25	20:25 (T34)	20:48	23	20:24 (T34)	20:04		19:12	70	18:45 (T38)	17:26	17:03
4	06:04		19:59 (T34)	06:29		20:02 (T34)	07:00		18:08 (T37)	07:31		17:35 (T37)	07:06	07:40
	21:08	26	20:25 (T34)	20:47	20	20:22 (T34)	20:02	18	18:26 (T37)	19:10	70	18:45 (T38)	17:24	17:03
5	06:04		19:59 (T34)	06:30		20:04 (T34)	07:01		18:04 (T37)	07:32		17:36 (T37)	07:07	07:41
	21:08	27	20:26 (T34)	20:46	17	20:21 (T34)	20:01	26	18:30 (T37)	19:08	69	18:45 (T38)	17:23	17:03
6	06:05		19:58 (T34)	06:31		20:05 (T34)	07:02		18:01 (T37)	07:33		17:36 (T37)	07:08	07:42
	21:08	28	20:26 (T34)	20:45	15	20:20 (T34)	19:58	31	18:32 (T37)	19:07	68	18:44 (T38)	17:22	17:03
7	06:06		19:59 (T34)	06:32		20:08 (T34)	07:03		17:58 (T37)	07:34		17:37 (T37)	07:09	07:43
	21:08	28	20:27 (T34)	20:44	11	20:19 (T34)	19:56	36	18:34 (T37)	19:05	66	18:43 (T38)	17:21	17:03
8	06:06		19:59 (T34)	06:33			07:04		17:56 (T37)	07:35		17:38 (T37)	07:11	07:44
	21:07	28	20:27 (T34)	20:42			19:54	40	18:36 (T37)	19:03	63	18:41 (T38)	17:20	17:03
9	06:07		19:58 (T34)	06:34			07:05		17:54 (T37)	07:36		17:39 (T37)	07:12	07:45
	21:07	29	20:27 (T34)	20:41			19:52	43	18:37 (T37)	19:02	60	18:39 (T38)	17:19	17:03
10	06:08		19:58 (T34)	06:35			07:06		17:52 (T37)	07:37		17:40 (T37)	07:13	07:46
	21:07	30	20:28 (T34)	20:40			19:51	46	18:38 (T37)	19:00	57	18:37 (T38)	17:18	17:03
11	06:08		19:58 (T34)	06:36			07:07		17:50 (T37)	07:38		17:42 (T37)	07:14	07:47
	21:06	31	20:29 (T34)	20:38			19:49	49	18:39 (T37)	18:58	54	18:36 (T38)	17:17	17:03
12	06:09		19:57 (T34)	06:37			07:08		17:48 (T37)	07:39		17:43 (T37)	07:15	07:48
	21:06	32	20:29 (T34)	20:37			19:47	52	18:40 (T37)	18:57	51	18:34 (T38)	17:16	17:03
13	06:10		19:58 (T34)	06:38			07:09		17:47 (T37)	07:40		17:46 (T37)	07:17	07:48
	21:05	31	20:29 (T34)	20:36			19:46	53	18:40 (T37)	18:55	44	18:33 (T38)	17:15	17:03
14	06:10		19:58 (T34)	06:39			07:10		17:45 (T37)	07:42		17:49 (T37)	07:18	07:49
	21:05	32	20:30 (T34)	20:34			19:44	56	18:41 (T37)	18:54	32	18:31 (T38)	17:14	17:03
15	06:11		19:58 (T34)	06:40			07:11		17:43 (T37)	07:43		17:53 (T37)	07:19	07:50
	21:04	32	20:30 (T34)	20:33			19:42	57	18:40 (T37)	18:52	17	18:10 (T37)	17:13	17:03
16	06:12		19:57 (T34)	06:41			07:12		17:42 (T37)	07:44			07:20	07:51
	21:04	33	20:30 (T34)	20:32			19:41	59	18:41 (T37)	18:51			17:12	17:04
17	06:13		19:57 (T34)	06:42			07:13		17:41 (T37)	07:45			07:21	07:51
	21:03	34	20:31 (T34)	20:30			19:39	60	18:41 (T37)	18:49			17:12	17:04
18	06:14		19:57 (T34)	06:43			07:14		17:40 (T37)	07:46			07:23	07:52
	21:02	34	20:31 (T34)	20:29			19:37	61	18:41 (T37)	18:48			17:11	17:04
19	06:14		19:57 (T34)	06:44			07:15		17:39 (T37)	07:47			07:24	07:53
	21:02	34	20:31 (T34)	20:27			19:35	62	18:41 (T37)	18:46			17:10	17:05
20	06:15		19:57 (T34)	06:45			07:16		17:38 (T37)	07:48			07:25	07:53
	21:01	35	20:32 (T34)	20:26			19:34	63	18:41 (T37)	18:45			17:09	17:05
21	06:16		19:57 (T34)	06:46			07:17		17:37 (T37)	07:49			07:26	07:54
	21:00	34	20:31 (T34)	20:25			19:32	64	18:41 (T37)	18:43			17:09	17:06
22	06:17		19:57 (T34)	06:47			07:18		17:37 (T37)	07:51			07:27	07:54
	21:00	34	20:31 (T34)	20:23			19:30	64	18:41 (T37)	18:42			17:08	17:06
23	06:18		19:57 (T34)	06:48			07:19		17:36 (T37)	07:52			07:28	07:55
	20:59	34	20:31 (T34)	20:22			19:29	65	18:41 (T37)	18:40			17:07	17:07
24	06:19		19:57 (T34)	06:49			07:21		17:35 (T37)	07:53			07:30	07:55
	20:58	35	20:32 (T34)	20:20			19:27	65	18:40 (T37)	18:39			17:07	17:07
25	06:20		19:57 (T34)	06:50			07:22		17:35 (T37)	07:54			07:31	07:56
	20:57	35	20:32 (T34)	20:18			19:25	65	18:40 (T37)	18:37			17:06	17:08
26	06:21		19:58 (T34)	06:51			07:23		17:35 (T37)	07:55			07:32	07:56
	20:56	34	20:32 (T34)	20:17			19:23	64	18:39 (T37)	18:36			17:06	17:08
27	06:22		19:58 (T34)	06:52			07:24		17:34 (T37)	07:56			07:33	07:56
	20:55	33	20:31 (T34)	20:15			19:22	67	18:41 (T38)	18:35			17:05	17:09
28	06:23		19:58 (T34)	06:53			07:25		17:34 (T37)	07:58			07:34	07:57
	20:54	32	20:30 (T34)	20:14			19:20	68	18:42 (T38)	18:33			17:05	17:10
29	06:24		19:59 (T34)	06:54			07:26		17:34 (T37)	07:59			07:35	07:57
	20:53	30	20:29 (T34)	20:12			19:18	69	18:43 (T38)	18:32			17:04	17:10
30	06:24		19:58 (T34)	06:55			07:27		17:34 (T37)	08:00			07:36	07:57
	20:52	29	20:27 (T34)	20:11			19:17	70	18:44 (T38)	18:31			17:04	17:11
31	06:25		19:59 (T34)	06:56						08:01				07:57
	20:51	27	20:26 (T34)	20:09						18:29				17:12
Potential sun hours	460			429			375			345			297	287
Total, worst case		955			136			1473			861			
Sun reduction		0.66			0.61			0.59			0.48			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.56			0.56			0.67			0.67			
Total reduction		0.37			0.34			0.40			0.32			
Total, real		354			47			589			279			

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1136 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7113)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57		08:31 (T36)	07:43			07:07		07:27 (T31)	07:16			06:30		07:04 (T28)	06:01		
	17:13	20	08:51 (T36)	17:47			18:22	69	17:50 (T30)	19:56			20:27	73	19:47 (T27)	20:57		
2	07:57		08:32 (T36)	07:43			07:06		07:25 (T31)	07:14			06:29		07:04 (T28)	06:01		
	17:14	19	08:51 (T36)	17:49			18:23	73	17:50 (T30)	19:57			20:28	69	19:46 (T27)	20:58		
3	07:58		08:33 (T36)	07:41			07:04		07:23 (T31)	07:13			06:28		07:03 (T28)	06:00		
	17:15	18	08:51 (T36)	17:50			18:24	77	17:50 (T30)	19:58			20:29	67	19:44 (T27)	20:58		
4	07:58		08:34 (T36)	07:40			07:02		07:22 (T31)	07:11			06:26		07:04 (T28)	06:00		
	17:15	17	08:51 (T36)	17:51			18:25	80	17:51 (T30)	19:59			20:30	63	19:43 (T27)	20:59		
5	07:58		08:35 (T36)	07:39			07:01		07:20 (T31)	07:09			06:25		07:05 (T28)	06:00		
	17:16	16	08:51 (T36)	17:52			18:26	82	17:50 (T30)	20:00			20:31	57	19:41 (T27)	21:00		
6	07:58		08:36 (T36)	07:38			06:59		07:19 (T31)	07:08			06:24		07:05 (T28)	05:59		
	17:17	14	08:50 (T36)	17:54			18:27	84	17:51 (T30)	20:00			20:32	51	19:38 (T27)	21:01		
7	07:57		08:38 (T36)	07:37			06:58		07:17 (T31)	07:06			06:23		07:06 (T28)	05:59		
	17:18	12	08:50 (T36)	17:55			18:29	86	17:50 (T30)	20:01			20:33	39	07:45 (T28)	21:01		
8	07:57		08:39 (T36)	07:36			07:56		08:15 (T31)	07:05			06:21		07:06 (T28)	05:59		
	17:19	9	08:48 (T36)	17:56			19:30	87	18:49 (T30)	20:02			20:34	37	07:43 (T28)	21:02		
9	07:57		08:41 (T36)	07:35			07:54		08:16 (T31)	07:03			06:20		07:07 (T28)	05:59		
	17:20	6	08:47 (T36)	17:57			19:31	86	18:49 (T30)	20:03			20:35	35	07:42 (T28)	21:02		
10	07:57			07:34			07:53		08:15 (T31)	07:01			06:19		07:08 (T28)	05:58		
	17:21			17:59			19:32	86	18:49 (T30)	20:05			20:37	33	07:41 (T28)	21:03		
11	07:57			07:32			07:51		08:15 (T31)	07:00		07:26 (T28)	06:18		07:09 (T28)	05:58		
	17:22			18:00			19:33	85	18:48 (T30)	20:06	22	19:44 (T27)	20:38	31	07:40 (T28)	21:04		
12	07:56			07:31			07:50		08:16 (T31)	06:58		07:21 (T28)	06:17		07:10 (T28)	05:58		
	17:23			18:01			19:34	82	18:47 (T30)	20:07	37	19:46 (T27)	20:39	29	07:39 (T28)	21:04		
13	07:56			07:30			07:48		08:15 (T31)	06:56		07:18 (T28)	06:16		07:11 (T28)	05:58		
	17:25			18:02			19:35	80	18:46 (T30)	20:08	46	19:47 (T27)	20:40	27	07:38 (T28)	21:05		
14	07:56			07:29			07:46		08:16 (T31)	06:55		07:15 (T28)	06:15		07:12 (T28)	05:58		
	17:26			18:04			19:36	77	18:45 (T30)	20:09	54	19:48 (T27)	20:41	24	07:36 (T28)	21:05		
15	07:55			07:27			07:45		08:17 (T31)	06:53		07:13 (T28)	06:14		07:14 (T28)	05:58		
	17:27			18:05			19:38	74	18:45 (T30)	20:10	59	19:48 (T27)	20:42	20	07:34 (T28)	21:06		
16	07:55			07:26			07:43		08:18 (T31)	06:52		07:12 (T28)	06:13		07:16 (T28)	05:58		
	17:28			18:06			19:39	69	18:43 (T30)	20:11	64	19:50 (T27)	20:43	16	07:32 (T28)	21:06		
17	07:55			07:25		17:17 (T30)	07:41		08:19 (T31)	06:50		07:10 (T28)	06:12		07:20 (T28)	05:58		
	17:29			18:07	16	17:33 (T30)	19:40	62	18:41 (T30)	20:12	68	19:50 (T27)	20:44	10	07:30 (T28)	21:06		
18	07:54			07:23		17:13 (T30)	07:40		08:21 (T31)	06:49		07:09 (T28)	06:11			05:58		
	17:30			18:09	24	17:37 (T30)	19:41	56	18:40 (T30)	20:13	72	19:52 (T27)	20:45			21:07		
19	07:53			07:22		17:11 (T30)	07:38		08:23 (T31)	06:47		07:08 (T28)	06:10			05:58		
	17:31			18:10	29	17:40 (T30)	19:42	47	18:38 (T30)	20:14	74	19:52 (T27)	20:46			21:07		
20	07:53			07:21		17:08 (T30)	07:36		18:04 (T30)	06:46		07:07 (T28)	06:09			05:58		
	17:33			18:11	33	17:41 (T30)	19:43	32	18:36 (T30)	20:15	77	19:53 (T27)	20:46			21:07		
21	07:52			07:19		17:07 (T30)	07:35		18:07 (T30)	06:44		07:06 (T28)	06:08			05:59		
	17:34			18:12	36	17:43 (T30)	19:44	27	18:34 (T30)	20:16	78	19:52 (T27)	20:47			21:08		
22	07:52			07:18		17:05 (T30)	07:33		18:09 (T30)	06:43		07:06 (T28)	06:08			05:59		
	17:35			18:13	39	17:44 (T30)	19:45	21	18:30 (T30)	20:17	80	19:53 (T27)	20:48			21:08		
23	07:51			07:16		17:04 (T30)	07:31		18:14 (T30)	06:41		07:05 (T28)	06:07			05:59		
	17:36			18:15	42	17:46 (T30)	19:46	11	18:25 (T30)	20:18	81	19:53 (T27)	20:49			21:08		
24	07:50			07:15		17:02 (T30)	07:30			06:40		07:04 (T28)	06:06			05:59		
	17:37			18:16	45	17:47 (T30)	19:47			20:20	82	19:52 (T27)	20:50			21:08		
25	07:50			07:13		17:02 (T30)	07:28			06:38		07:04 (T28)	06:05			06:00		
	17:39			18:17	46	17:48 (T30)	19:48			20:21	81	19:52 (T27)	20:51			21:08		
26	07:49			07:12		17:00 (T30)	07:26			06:37		07:03 (T28)	06:05			06:00		
	17:40			18:18	48	17:48 (T30)	19:50			20:22	81	19:51 (T27)	20:52			21:09		
27	07:48			07:10		07:30 (T31)	07:24			06:36		07:03 (T28)	06:04			06:00		
	17:41			18:19	60	17:49 (T30)	19:51			20:23	81	19:51 (T27)	20:53			21:09		
28	07:47			07:09		07:28 (T31)	07:23			06:34		07:04 (T28)	06:03			06:01		
	17:42			18:20	65	17:49 (T30)	19:52			20:24	78	19:50 (T27)	20:54			21:09		
29	07:46						07:21			06:33		07:03 (T28)	06:03			06:01		
	17:44						19:53			20:25	78	19:49 (T27)	20:55			21:09		
30	07:45						07:19			06:31		07:03 (T28)	06:02			06:01		
	17:45						19:54			20:26	76	19:48 (T27)	20:55			21:09		
31	07:44						07:18						06:02					
	17:46						19:55						20:56					
Potential sun hours	297			297			370			399			449			453		
Total, worst case		131			483			1533			1369			681				
Sun reduction		0.31			0.40			0.44			0.52			0.57				
Oper. time red.		1.00			1.00			1.00			1.00			1.00				
Wind dir. red.		0.53			0.69			0.65			0.63			0.65				
Total reduction		0.16			0.27			0.29			0.32			0.37				
Total, real		21			132			438			442			250				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1136 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7113)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		07:20 (T28)	06:57		07:25 (T28)	07:27		07:54 (T31)	07:02		07:37			
	21:09			20:50	30	07:50 (T28)	20:07	22	19:43 (T27)	19:15	82	18:26 (T30)	17:28		17:04			
2	06:02			06:27		07:19 (T28)	06:58			07:29		07:54 (T31)	07:03		07:38			
	21:08			20:49	32	07:51 (T28)	20:06			19:13	83	18:26 (T30)	17:27		17:03			
3	06:03			06:28		07:18 (T28)	06:59			07:30		07:53 (T31)	07:04		07:39		08:25 (T36)	
	21:08			20:48	34	07:52 (T28)	20:04			19:11	85	18:26 (T30)	17:25		17:03	6	08:31 (T36)	
4	06:04			06:29		07:17 (T28)	07:00			07:31		07:52 (T31)	07:06		07:40		08:24 (T36)	
	21:08			20:47	36	07:53 (T28)	20:02			19:10	87	18:26 (T30)	17:24		17:03	9	08:33 (T36)	
5	06:04			06:30		07:16 (T28)	07:01			07:32		07:53 (T31)	07:07		07:41		08:23 (T36)	
	21:08			20:46	38	07:54 (T28)	20:01			19:08	87	18:27 (T30)	17:23		17:03	12	08:35 (T36)	
6	06:05			06:31		07:15 (T28)	07:02			07:33		07:53 (T31)	07:08		07:42		08:22 (T36)	
	21:08			20:45	43	19:44 (T27)	19:57			19:06	87	18:27 (T30)	17:22		17:03	14	08:36 (T36)	
7	06:05			06:32		07:15 (T28)	07:03			07:34		07:54 (T31)	07:09		07:43		08:22 (T36)	
	21:07			20:43	53	19:49 (T27)	19:56			19:05	85	18:26 (T30)	17:21		17:02	16	08:38 (T36)	
8	06:06			06:33		07:14 (T28)	07:04			07:35		07:55 (T31)	07:10		07:44		08:22 (T36)	
	21:07			20:42	59	19:51 (T27)	19:54			19:03	83	18:26 (T30)	17:20		17:02	17	08:39 (T36)	
9	06:07			06:34		07:13 (T28)	07:05			07:36		07:56 (T31)	07:12		07:45		08:21 (T36)	
	21:07			20:41	64	19:53 (T27)	19:52			19:01	80	18:25 (T30)	17:19		17:02	18	08:39 (T36)	
10	06:07			06:35		07:13 (T28)	07:06			07:37		07:57 (T31)	07:13		07:46		08:21 (T36)	
	21:06			20:40	68	19:54 (T27)	19:51			19:00	79	18:25 (T30)	17:18		17:02	19	08:40 (T36)	
11	06:08			06:36		07:13 (T28)	07:07			07:38		07:58 (T31)	07:14		07:47		08:21 (T36)	
	21:06			20:38	70	19:55 (T27)	19:49			18:58	76	18:24 (T30)	17:17		17:02	20	08:41 (T36)	
12	06:09			06:37		07:12 (T28)	07:08			07:39		07:59 (T31)	07:15		07:47		08:22 (T36)	
	21:06			20:37	73	19:56 (T27)	19:47			18:57	72	18:23 (T30)	17:16		17:03	20	08:42 (T36)	
13	06:09			06:38		07:12 (T28)	07:09			07:40		08:00 (T31)	07:16		07:48		08:22 (T36)	
	21:05			20:36	75	19:57 (T27)	19:45			18:55	68	18:22 (T30)	17:15		17:03	21	08:43 (T36)	
14	06:10			06:39		07:11 (T28)	07:10			07:41		08:02 (T31)	07:18		07:49		08:22 (T36)	
	21:05			20:34	78	19:57 (T27)	19:44			18:53	64	18:23 (T30)	17:14		17:03	20	08:42 (T36)	
15	06:11			06:40		07:10 (T28)	07:11			07:42		08:03 (T31)	07:19		07:50		08:22 (T36)	
	21:04			20:33	80	19:57 (T27)	19:42			18:52	56	18:21 (T30)	17:13		17:03	21	08:43 (T36)	
16	06:12			06:41		07:10 (T28)	07:12			07:44		17:33 (T30)	07:20		07:50		08:23 (T36)	
	21:04			20:32	79	19:57 (T27)	19:40			18:50	47	18:20 (T30)	17:12		17:03	21	08:44 (T36)	
17	06:13			06:42		07:10 (T28)	07:13			07:45		17:33 (T30)	07:21		07:51		08:23 (T36)	
	21:03			20:30	81	19:58 (T27)	19:39			18:49	46	18:19 (T30)	17:11		17:04	22	08:45 (T36)	
18	06:13			06:43		07:10 (T28)	07:14			07:46		17:34 (T30)	07:22		07:52		08:23 (T36)	
	21:02			20:29	82	19:58 (T27)	19:37			18:47	44	18:18 (T30)	17:11		17:04	22	08:45 (T36)	
19	06:14			06:44		07:10 (T28)	07:15			07:47		17:35 (T30)	07:24		07:52		08:24 (T36)	
	21:02			20:27	82	19:58 (T27)	19:35			18:46	41	18:16 (T30)	17:10		17:04	22	08:46 (T36)	
20	06:15			06:45		07:10 (T28)	07:16		18:02 (T30)	07:48		17:37 (T30)	07:25		07:53		08:24 (T36)	
	21:01			20:26	81	19:58 (T27)	19:33	7	18:09 (T30)	18:44	38	18:15 (T30)	17:09		17:05	22	08:46 (T36)	
21	06:16			06:46		07:10 (T28)	07:17		17:56 (T30)	07:49		17:38 (T30)	07:26		07:53		08:25 (T36)	
	21:00			20:24	80	19:57 (T27)	19:32	19	18:15 (T30)	18:43	35	18:13 (T30)	17:08		17:05	22	08:47 (T36)	
22	06:17			06:47		07:11 (T28)	07:18		17:52 (T30)	07:50		17:40 (T30)	07:27		07:54		08:25 (T36)	
	20:59			20:23	79	19:57 (T27)	19:30	25	18:17 (T30)	18:41	31	18:11 (T30)	17:08		17:06	22	08:47 (T36)	
23	06:18			06:48		07:11 (T28)	07:19		17:49 (T30)	07:51		17:41 (T30)	07:28		07:54		08:26 (T36)	
	20:59			20:21	77	19:56 (T27)	19:28	30	18:19 (T30)	18:40	28	18:09 (T30)	17:07		17:06	22	08:48 (T36)	
24	06:19			06:49		07:12 (T28)	07:20		08:08 (T31)	07:53		17:44 (T30)	07:29		07:55		08:26 (T36)	
	20:58			20:20	74	19:56 (T27)	19:27	43	18:21 (T30)	18:39	22	18:06 (T30)	17:07		17:07	22	08:48 (T36)	
25	06:20			06:50		07:12 (T28)	07:21		08:04 (T31)	07:54		17:49 (T30)	07:31		07:55		08:26 (T36)	
	20:57			20:18	72	19:55 (T27)	19:25	53	18:22 (T30)	18:37	13	18:02 (T30)	17:06		17:08	22	08:48 (T36)	
26	06:20			06:51		07:13 (T28)	07:22		08:02 (T31)	07:55			07:32		07:56		08:27 (T36)	
	20:56			20:17	68	19:53 (T27)	19:23	60	18:23 (T30)	18:36			17:05		17:08	22	08:49 (T36)	
27	06:21		07:28 (T28)	06:52		07:14 (T28)	07:23		08:00 (T31)	07:56			07:33		07:56		08:28 (T36)	
	20:55	13	07:41 (T28)	20:15	63	19:52 (T27)	19:21	67	18:24 (T30)	18:34			17:05		17:09	21	08:49 (T36)	
28	06:22		07:26 (T28)	06:53		07:15 (T28)	07:24		07:58 (T31)	07:57			07:34		07:56		08:28 (T36)	
	20:54	18	07:44 (T28)	20:14	59	19:50 (T27)	19:20	72	18:25 (T30)	18:33			17:05		17:09	21	08:49 (T36)	
29	06:23		07:24 (T28)	06:54		07:16 (T28)	07:25		07:56 (T31)	07:58			07:35		07:57		08:29 (T36)	
	20:53	22	07:46 (T28)	20:12	54	19:49 (T27)	19:18	76	18:25 (T30)	18:32			17:04		17:10	21	08:50 (T36)	
30	06:24		07:22 (T28)	06:55		07:18 (T28)	07:26		07:55 (T31)	08:00			07:36		07:57		08:30 (T36)	
	20:52	25	07:47 (T28)	20:10	45	19:47 (T27)	19:16	80	18:26 (T30)	18:30			17:04		17:11	21	08:51 (T36)	
31	06:25		07:21 (T28)	06:56		07:21 (T28)				08:01					07:57		08:30 (T36)	
	20:51	28	07:49 (T28)	20:09	36	19:45 (T27)				18:29					17:12	21	08:51 (T36)	
Potential sun hours	460			429			375			345			297		287			
Total, worst case		106			1945			554			1519					559		
Sun reduction		0.66			0.61			0.59			0.48					0.22		
Oper. time red.		1.00			1.00			1.00			1.00					1.00		
Wind dir. red.		0.66			0.63			0.66			0.66					0.53		
Total reduction		0.44			0.38			0.38			0.32					0.11		
Total, real		46			745			213			479					64		

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1137 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7114)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March		April		May		June	July	August		September		October	November	December
1	07:58	07:44	07:07		07:16		07:35 (T37)	06:30	07:57 (T38)	06:02	06:02	06:26		06:58	07:21 (T37)	07:28	07:02	07:37
	17:13	17:48	18:22		19:56	71	08:51 (T38)	20:27	30 08:27 (T38)	20:57	21:09	20:50		20:07	88 08:49 (T38)	19:15	17:28	17:04
2	07:58	07:43	07:06		07:15		07:34 (T37)	06:29	08:00 (T38)	06:01	06:03	06:27		06:59	07:21 (T37)	07:29	07:04	07:38
	17:14	17:49	18:23		19:57	76	08:52 (T38)	20:28	24 08:24 (T38)	20:58	21:09	20:49		20:06	88 08:49 (T38)	19:13	17:27	17:04
3	07:58	07:42	07:04		07:13		07:32 (T37)	06:28	08:03 (T38)	06:01	06:03	06:28		07:00	07:20 (T37)	07:30	07:05	07:39
	17:15	17:50	18:24		19:58	80	08:52 (T38)	20:29	18 08:21 (T38)	20:59	21:09	20:48		20:04	89 08:49 (T38)	19:12	17:26	17:03
4	07:58	07:41	07:03		07:11		07:30 (T37)	06:27	08:07 (T38)	06:00	06:04	06:29		07:01	07:21 (T37)	07:31	07:06	07:40
	17:16	17:51	18:25		19:59	81	08:51 (T38)	20:30	8 08:15 (T38)	20:59	21:08	20:47		20:03	88 08:49 (T38)	19:10	17:25	17:03
5	07:58	07:40	07:01		07:10		07:29 (T37)	06:25		06:00	06:04	06:30		07:02	07:22 (T37)	07:32	07:07	07:41
	17:17	17:53	18:27		20:01	83	08:52 (T38)	20:32		21:00	21:08	20:46		20:01	86 08:48 (T38)	19:08	17:23	17:03
6	07:58	07:39	07:00		07:08		07:27 (T37)	06:24		06:00	06:05	06:31		07:03	07:23 (T37)	07:33	07:08	07:42
	17:18	17:54	18:28		20:01	85	08:52 (T38)	20:33		21:01	21:08	20:45		19:58	85 08:48 (T38)	19:07	17:22	17:03
7	07:58	07:37	06:58		07:06		07:25 (T37)	06:23		05:59	06:06	06:32		07:04	07:24 (T37)	07:34	07:09	07:43
	17:19	17:55	18:29		20:02	86	08:51 (T38)	20:34		21:02	21:08	20:44		19:56	83 08:47 (T38)	19:05	17:21	17:03
8	07:58	07:36	07:56		07:05		07:24 (T37)	06:22		05:59	06:06	06:33		07:05	07:25 (T37)	07:35	07:11	07:44
	17:20	17:56	19:30		20:03	88	08:52 (T38)	20:35		21:02	21:07	20:42		19:54	82 08:47 (T38)	19:03	17:20	17:03
9	07:57	07:35	07:55		07:03		07:22 (T37)	06:21		05:59	06:07	06:34	08:15 (T38)	07:06	07:26 (T37)	07:36	07:12	07:45
	17:21	17:58	19:31		20:04	89	08:51 (T38)	20:36		21:03	21:07	20:41	12 08:27 (T38)	19:53	80 08:46 (T38)	19:02	17:19	17:03
10	07:57	07:34	07:53		07:02		07:23 (T37)	06:19		05:59	06:08	06:35	08:10 (T38)	07:07	07:27 (T37)	07:37	07:13	07:46
	17:22	17:59	19:32		20:05	88	08:51 (T38)	20:37		21:03	21:07	20:40	21 08:31 (T38)	19:51	76 08:45 (T38)	19:00	17:18	17:03
11	07:57	07:33	07:52		07:00		07:22 (T37)	06:18		05:59	06:08	06:36	08:07 (T38)	07:08	07:28 (T37)	07:38	07:14	07:47
	17:23	18:00	19:33		20:06	88	08:50 (T38)	20:38		21:04	21:06	20:39	27 08:34 (T38)	19:49	71 08:44 (T38)	18:59	17:17	17:03
12	07:57	07:31	07:50		06:58		07:22 (T37)	06:17		05:58	06:09	06:37	08:05 (T38)	07:09	07:44 (T38)	07:39	07:16	07:48
	17:24	18:01	19:35		20:07	87	08:49 (T38)	20:39		21:04	21:06	20:37	31 08:36 (T38)	19:47	59 08:43 (T38)	18:57	17:16	17:03
13	07:56	07:30	07:48		06:57		07:22 (T37)	06:16		05:58	06:10	06:38	08:03 (T38)	07:10	07:45 (T38)	07:41	07:17	07:48
	17:25	18:03	19:36		20:08	87	08:49 (T38)	20:40		21:05	21:05	20:36	35 08:38 (T38)	19:46	57 08:42 (T38)	18:55	17:15	17:03
14	07:56	07:29	07:47		06:55		07:22 (T37)	06:15		05:58	06:11	06:39	08:01 (T38)	07:11	07:45 (T38)	07:42	07:18	07:49
	17:26	18:04	19:37		20:09	86	08:48 (T38)	20:41		21:05	21:05	20:35	39 08:40 (T38)	19:44	56 08:41 (T38)	18:54	17:14	17:03
15	07:56	07:28	07:45		06:54		07:23 (T37)	06:14		05:58	06:11	06:40	08:00 (T38)	07:12	07:46 (T38)	07:43	07:19	07:50
	17:27	18:05	19:38		20:10	85	08:48 (T38)	20:42		21:06	21:04	20:33	41 08:41 (T38)	19:42	53 08:39 (T38)	18:52	17:13	17:04
16	07:55	07:26	07:43		06:52		07:23 (T37)	06:13		05:58	06:12	06:41	07:58 (T38)	07:13	07:47 (T38)	07:44	07:20	07:51
	17:28	18:06	19:39		20:11	84	08:47 (T38)	20:43		21:06	21:04	20:32	44 08:42 (T38)	19:41	51 08:38 (T38)	18:51	17:12	17:04
17	07:55	07:25	07:42		06:51		07:25 (T37)	06:12		05:58	06:13	06:42	07:57 (T38)	07:14	07:48 (T38)	07:45	07:21	07:51
	17:29	18:08	19:40		20:12	82	08:47 (T38)	20:44		21:07	21:03	20:30	46 08:43 (T38)	19:39	48 08:36 (T38)	18:49	17:12	17:04
18	07:54	07:24	07:40		06:49		07:26 (T37)	06:11		05:58	06:14	06:43	07:55 (T38)	07:15	07:48 (T38)	07:46	07:23	07:52
	17:31	18:09	19:41		20:13	78	08:45 (T38)	20:45		21:07	21:03	20:29	49 08:44 (T38)	19:37	45 08:33 (T38)	18:48	17:11	17:04
19	07:54	07:22	07:38		06:47		07:28 (T37)	06:10		05:59	06:15	06:44	07:54 (T38)	07:16	07:50 (T38)	07:47	07:24	07:53
	17:32	18:10	19:42		20:14	73	08:45 (T38)	20:46		21:07	21:02	20:28	51 08:45 (T38)	19:35	41 08:31 (T38)	18:46	17:10	17:05
20	07:53	07:21	07:37	08:20 (T38)	06:46		07:30 (T37)	06:10		05:59	06:15	06:45	07:53 (T38)	07:17	07:52 (T38)	07:48	07:25	07:53
	17:33	18:11	19:43	11 08:31 (T38)	20:16	65	08:43 (T38)	20:47		21:08	21:01	20:26	53 08:46 (T38)	19:34	37 08:29 (T38)	18:45	17:09	17:05
21	07:53	07:19	07:35	08:13 (T38)	06:44		07:47 (T38)	06:09		05:59	06:16	06:46	07:52 (T38)	07:18	07:54 (T38)	07:49	07:26	07:54
	17:34	18:12	19:44	23 08:36 (T38)	20:17	56	08:43 (T38)	20:48		21:08	21:00	20:25	55 08:47 (T38)	19:32	32 08:26 (T38)	18:43	17:09	17:06
22	07:52	07:18	07:33	08:09 (T38)	06:43		07:47 (T38)	06:08		05:59	06:17	06:47	07:51 (T38)	07:19	07:57 (T38)	07:51	07:27	07:54
	17:35	18:14	19:45	30 08:39 (T38)	20:18	54	08:41 (T38)	20:49		21:08	21:00	20:23	57 08:48 (T38)	19:30	25 08:22 (T38)	18:42	17:08	17:06
23	07:51	07:16	07:31	08:07 (T38)	06:42		07:48 (T38)	06:07		05:59	06:18	06:48	07:34 (T37)	07:20	08:01 (T38)	07:52	07:29	07:55
	17:36	18:15	19:47	36 08:43 (T38)	20:19	52	08:40 (T38)	20:50		21:08	20:59	20:22	67 08:47 (T38)	19:29	16 08:17 (T38)	18:40	17:07	17:07
24	07:51	07:15	07:30	08:04 (T38)	06:40		07:48 (T38)	06:06		06:00	06:19	06:49	07:30 (T37)	07:21		07:53	07:30	07:55
	17:38	18:16	19:48	40 08:44 (T38)	20:20	50	08:38 (T38)	20:50		21:09	20:58	20:20	74 08:48 (T38)	19:27		18:39	17:07	17:07
25	07:50	07:14	07:28	08:01 (T38)	06:39		07:49 (T38)	06:06		06:00	06:20	06:50	07:28 (T37)	07:22		07:54	07:31	07:56
	17:39	18:17	19:49	44 08:45 (T38)	20:21	48	08:37 (T38)	20:51		21:09	20:57	20:19	79 08:48 (T38)	19:25		18:37	17:06	17:08
26	07:49	07:12	07:26	07:59 (T38)	06:37		07:50 (T38)	06:05		06:00	06:21	06:51	07:26 (T37)	07:23		07:55	07:32	07:56
	17:40	18:18	19:50	48 08:47 (T38)	20:22	46	08:36 (T38)	20:52		21:09	20:56	20:17	83 08:49 (T38)	19:23		18:36	17:06	17:08
27	07:48	07:11	07:25	07:58 (T38)	06:36		07:51 (T38)	06:04		06:01	06:22	06:52	07:25 (T37)	07:24		07:56	07:33	07:56
	17:41	18:20	19:51	50 08:48 (T38)	20:23	43	08:34 (T38)	20:53		21:09	20:55	20:15	84 08:49 (T38)	19:22		18:35	17:05	17:09
28	07:47	07:09	07:23	07:56 (T38)	06:34		07:52 (T38)	06:04		06:01	06:23	06:54	07:24 (T37)	07:25		07:58	07:34	07:57
	17:43	18:21	19:52	53 08:49 (T38)	20:24	41	08:33 (T38)	20:54		21:09	20:54	20:14	85 08:49 (T38)	19:20		18:33	17:05	17:10
29	07:47		07:21	07:54 (T38)	06:33		07:54 (T38)	06:03		06:01	06:24	06:55	07:23 (T37)	07:26		07:59	07:35	07:57
	17:44		19:53	55 08:49 (T38)	20:25	37	08:31 (T38)	20:55		21:09	20:53	20:12	86 08:49 (T38)	19:18		18:32	17:05	17:11
30	07:46		07:20	07:54 (T38)	06:32		07:55 (T38)	06:03		06:02	06:25	06:56	07:22 (T37)	07:27		08:00	07:36	07:57
	17:45		19:54	57 08:51 (T38)	20:26	34	08:29 (T38)	20:56		21:09	20:53	20:11	87 08:49 (T38)	19:17		18:31	17:04	17:11
31	07:45		07:18	07:52 (T38)				06:02			06:26	06:57	07:22 (T37)			08:01		07:57
	17:46		19:55	59 08:51 (T38)				20:56			20:51	20:09	87 08:49 (T38)			18:29		17:12
Potential sun hours	297	297	370		399			449	453	460	429		375		345	297	287
Total, worst case			506		2103			80			1293		1436				
Sun reduction			0.44		0.52			0.57			0.61		0.59				
Oper. time red.			1.00		1.00			1.00			1.00		1.00				
Wind dir. red.			0.62		0.63			0.62			0.63		0.63				
Total reduction			0.27		0.33			0.35			0.38		0.37				
Total, real			138		686			28			494		531				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1146 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7121)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57 17:13	07:43 17:47	07:07 18:22	07:16 19:56	06:30 20:27 40	19:15 (T23) 06:01 19:55 (T23) 20:57 59	19:06 (T23) 06:02 20:05 (T23) 21:09 57	19:13 (T23) 06:26 20:10 (T23) 20:50 57	19:16 (T23) 06:57 20:13 (T23) 20:07	07:27 19:15	07:02 17:28	07:37 17:03
2	07:57 17:14	07:42 17:48	07:06 18:23	07:14 19:57	06:29 20:28 44	19:12 (T23) 06:01 19:56 (T23) 20:58 59	19:06 (T23) 06:02 20:05 (T23) 21:08 56	19:14 (T23) 06:27 20:10 (T23) 20:49 57	19:16 (T23) 06:58 20:13 (T23) 20:06	07:28 19:13	07:03 17:27	07:38 17:03
3	07:58 17:14	07:41 17:50	07:04 18:24	07:13 19:58	06:27 20:29 46	19:11 (T23) 06:00 19:57 (T23) 20:58 58	19:07 (T23) 06:03 20:05 (T23) 21:08 56	19:14 (T23) 06:28 20:10 (T23) 20:48 56	19:16 (T23) 06:59 20:12 (T23) 20:04	07:30 19:11	07:04 17:25	07:39 17:03
4	07:58 17:15	07:40 17:51	07:02 18:25	07:11 19:59	06:26 20:30 48	19:10 (T23) 06:00 19:58 (T23) 20:59 59	19:07 (T23) 06:03 20:06 (T23) 21:08 57	19:14 (T23) 06:29 20:11 (T23) 20:47 55	19:17 (T23) 07:00 20:12 (T23) 20:02	07:31 19:10	07:06 17:24	07:40 17:03
5	07:58 17:16	07:39 17:52	07:01 18:26	07:09 20:00	06:25 20:31 49	19:10 (T23) 06:00 19:59 (T23) 21:00 58	19:07 (T23) 06:04 20:05 (T23) 21:08 57	19:15 (T23) 06:30 20:12 (T23) 20:46 54	19:17 (T23) 07:01 20:11 (T23) 20:01	07:32 19:08	07:07 17:23	07:41 17:03
6	07:58 17:17	07:38 17:54	06:59 18:27	07:08 20:00	06:24 20:32 51	19:09 (T23) 05:59 20:00 (T23) 21:01 57	19:08 (T23) 06:05 20:05 (T23) 21:08 57	19:14 (T23) 06:31 20:11 (T23) 20:44 52	19:18 (T23) 07:02 20:10 (T23) 19:57	07:33 19:06	07:08 17:22	07:42 17:02
7	07:57 17:18	07:37 17:55	06:58 18:28	07:06 20:01	06:22 20:33 53	19:08 (T23) 05:59 20:01 (T23) 21:01 58	19:08 (T23) 06:05 20:06 (T23) 21:07 58	19:14 (T23) 06:32 20:12 (T23) 20:43 50	19:19 (T23) 07:03 20:09 (T23) 19:56	07:34 19:05	07:09 17:21	07:43 17:02
8	07:57 17:19	07:36 17:56	07:56 19:30	07:04 20:02	06:21 20:34 53	19:07 (T23) 05:59 20:00 (T23) 21:02 57	19:09 (T23) 06:06 20:06 (T23) 21:07 58	19:14 (T23) 06:33 20:12 (T23) 20:42 48	19:20 (T23) 07:04 20:08 (T23) 19:54	07:35 19:03	07:10 17:20	07:44 17:02
9	07:57 17:20	07:35 17:57	07:54 19:31	07:03 20:03	06:20 20:35 55	19:06 (T23) 05:58 20:01 (T23) 21:02 57	19:09 (T23) 06:06 20:06 (T23) 21:07 58	19:14 (T23) 06:34 20:12 (T23) 20:41 47	19:20 (T23) 07:05 20:07 (T23) 19:52	07:36 19:01	07:12 17:19	07:45 17:02
10	07:57 17:21	07:34 17:59	07:53 19:32	07:01 20:05	06:19 20:36 56	19:06 (T23) 05:58 20:02 (T23) 21:03 56	19:09 (T23) 06:07 20:05 (T23) 21:06 59	19:14 (T23) 06:35 20:13 (T23) 20:40 45	19:21 (T23) 07:06 20:06 (T23) 19:51	07:37 19:00	07:13 17:18	07:46 17:02
11	07:57 17:22	07:32 18:00	07:51 19:33	07:00 20:06	06:18 20:38 57	19:05 (T23) 05:58 20:02 (T23) 21:04 56	19:09 (T23) 06:08 20:05 (T23) 21:06 59	19:14 (T23) 06:36 20:13 (T23) 20:38 43	19:21 (T23) 07:07 20:04 (T23) 19:49	07:38 18:58	07:14 17:17	07:47 17:02
12	07:56 17:23	07:31 18:01	07:50 19:34	06:58 20:07	06:17 20:39 57	19:05 (T23) 05:58 20:02 (T23) 21:04 56	19:10 (T23) 06:09 20:06 (T23) 21:06 59	19:14 (T23) 06:37 20:13 (T23) 20:37 39	19:23 (T23) 07:08 20:02 (T23) 19:47	07:39 18:57	07:15 17:16	07:47 17:03
13	07:56 17:24	07:30 18:02	07:48 19:35	06:56 20:08	06:16 20:40 58	19:05 (T23) 05:58 20:03 (T23) 21:05 56	19:10 (T23) 06:09 20:06 (T23) 21:05 60	19:14 (T23) 06:38 20:14 (T23) 20:36 37	19:24 (T23) 07:09 20:01 (T23) 19:45	07:40 18:55	07:16 17:15	07:48 17:03
14	07:56 17:26	07:29 18:04	07:46 19:36	06:55 20:09	06:15 20:41 59	19:04 (T23) 05:58 20:03 (T23) 21:05 56	19:10 (T23) 06:10 20:06 (T23) 21:05 60	19:14 (T23) 06:39 20:14 (T23) 20:34 33	19:26 (T23) 07:10 19:59 (T23) 19:44	07:41 18:53	07:18 17:14	07:49 17:03
15	07:55 17:27	07:27 18:05	07:45 19:37	06:53 20:10	06:14 20:42 59	19:04 (T23) 05:58 20:03 (T23) 21:06 55	19:11 (T23) 06:11 20:06 (T23) 21:04 60	19:14 (T23) 06:40 20:14 (T23) 20:33 28	19:28 (T23) 07:11 19:56 (T23) 19:42	07:42 18:52	07:19 17:13	07:50 17:03
16	07:55 17:28	07:26 18:06	07:43 19:39	06:52 20:11	06:13 20:43 59	19:04 (T23) 05:58 20:03 (T23) 21:06 55	19:11 (T23) 06:12 20:06 (T23) 21:04 60	19:14 (T23) 06:41 20:14 (T23) 20:31 22	19:31 (T23) 07:12 19:53 (T23) 19:40	07:44 18:50	07:20 17:12	07:50 17:03
17	07:55 17:29	07:25 18:07	07:41 19:40	06:50 20:12	06:12 20:44 61	19:03 (T23) 05:58 20:04 (T23) 21:06 55	19:11 (T23) 06:12 20:06 (T23) 21:03 60	19:14 (T23) 06:42 20:14 (T23) 20:30 15	19:34 (T23) 07:13 19:49 (T23) 19:39	07:45 18:49	07:21 17:11	07:51 17:04
18	07:54 17:30	07:23 18:08	07:40 19:41	06:49 20:13	06:11 20:45 61	19:04 (T23) 05:58 20:05 (T23) 21:07 55	19:11 (T23) 06:13 20:06 (T23) 21:02 61	19:14 (T23) 06:43 20:15 (T23) 20:29	07:14 19:37	07:46 18:47	07:22 17:10	07:52 17:04
19	07:53 17:31	07:22 18:10	07:38 19:42	06:47 20:14	06:10 20:46 61	19:04 (T23) 05:58 20:05 (T23) 21:07 55	19:12 (T23) 06:14 20:07 (T23) 21:02 60	19:14 (T23) 06:44 20:14 (T23) 20:27	07:15 19:35	07:47 18:46	07:24 17:10	07:52 17:04
20	07:53 17:32	07:20 18:11	07:36 19:43	06:46 20:15	06:09 20:46 60	19:04 (T23) 05:58 20:04 (T23) 21:07 55	19:12 (T23) 06:15 20:07 (T23) 21:01 60	19:14 (T23) 06:45 20:14 (T23) 20:26	07:16 19:33	07:48 18:44	07:25 17:09	07:53 17:05
21	07:52 17:34	07:19 18:12	07:35 19:44	06:44 20:16	06:08 20:47 60	19:04 (T23) 05:58 20:04 (T23) 21:08 54	19:13 (T23) 06:16 20:07 (T23) 21:00 61	19:14 (T23) 06:46 20:15 (T23) 20:24	07:17 19:32	07:49 18:43	07:26 17:08	07:53 17:05
22	07:52 17:35	07:18 18:13	07:33 19:45	06:43 20:17	06:07 20:48 61	19:04 (T23) 05:59 20:05 (T23) 21:08 54	19:13 (T23) 06:17 20:07 (T23) 20:59 61	19:14 (T23) 06:47 20:15 (T23) 20:23	07:18 19:30	07:50 18:41	07:27 17:08	07:54 17:06
23	07:51 17:36	07:16 18:14	07:31 19:46	06:41 20:18	06:07 20:49 61	19:04 (T23) 05:59 20:05 (T23) 21:08 55	19:12 (T23) 06:18 20:07 (T23) 20:59 61	19:14 (T23) 06:48 20:15 (T23) 20:21	07:19 19:28	07:51 18:40	07:28 17:07	07:54 17:06
24	07:50 17:37	07:15 18:16	07:29 19:47	06:40 20:20	06:06 20:50 61	19:04 (T23) 05:59 20:05 (T23) 21:08 55	19:13 (T23) 06:19 20:08 (T23) 20:58 61	19:14 (T23) 06:49 20:15 (T23) 20:20	07:20 19:27	07:53 18:38	07:29 17:06	07:55 17:07
25	07:50 17:39	07:13 18:17	07:28 19:48	06:38 20:21	06:05 20:51 60	19:04 (T23) 05:59 20:04 (T23) 21:08 55	19:13 (T23) 06:19 20:08 (T23) 20:57 60	19:15 (T23) 06:50 20:15 (T23) 20:18	07:21 19:25	07:54 18:37	07:31 17:06	07:55 17:07
26	07:49 17:40	07:12 18:18	07:26 19:49	06:37 19:27 (T23) 20:22 16 19:43 (T23)	06:05 20:52 60	19:05 (T23) 06:00 20:05 (T23) 21:09 55	19:13 (T23) 06:20 20:08 (T23) 20:56 60	19:14 (T23) 06:51 20:14 (T23) 20:17	07:22 19:23	07:55 18:36	07:32 17:05	07:56 17:08
27	07:48 17:41	07:10 18:19	07:24 19:51	06:35 19:23 (T23) 20:23 24 19:47 (T23)	06:04 20:53 60	19:05 (T23) 06:00 20:05 (T23) 21:09 55	19:14 (T23) 06:21 20:09 (T23) 20:55 60	19:14 (T23) 06:52 20:14 (T23) 20:15	07:23 19:21	07:56 18:34	07:33 17:05	07:56 17:09
28	07:47 17:42	07:09 18:20	07:23 19:52	06:34 19:21 (T23) 20:24 29 19:50 (T23)	06:03 20:54 60	19:05 (T23) 06:00 20:05 (T23) 21:09 55	19:14 (T23) 06:22 20:09 (T23) 20:54 60	19:14 (T23) 06:53 20:14 (T23) 20:14	07:24 19:20	07:57 18:33	07:34 17:04	07:56 17:09
29	07:46 17:43		07:21 19:53	06:33 19:18 (T23) 20:25 33 19:51 (T23)	06:03 20:55 60	19:05 (T23) 06:01 20:05 (T23) 21:09 56	19:13 (T23) 06:23 20:09 (T23) 20:53 59	19:15 (T23) 06:54 20:14 (T23) 20:12	07:25 19:18	07:58 18:32	07:35 17:04	07:57 17:10
30	07:45 17:45		07:19 19:54	06:31 19:16 (T23) 20:26 37 19:53 (T23)	06:02 20:55 59	19:06 (T23) 06:01 20:05 (T23) 21:09 56	19:14 (T23) 06:24 20:10 (T23) 20:52 59	19:15 (T23) 06:55 20:14 (T23) 20:10	07:26 19:16	08:00 18:30	07:36 17:04	07:57 17:11
31	07:44 17:46		07:18 19:55		06:02 20:56 59	19:06 (T23) 20:05 (T23)	06:25 20:51 58	19:15 (T23) 06:56 20:13 (T23) 20:09		08:01 18:29		07:57 17:12
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				139	1748	1682	1832	738				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.57	0.57	0.57	0.57	0.57				
Total reduction				0.29	0.32	0.36	0.37	0.35				
Total, real				41	564	610	685	255				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1151 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7125)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March			April			May			June	
1	07:57	07:43	07:07			07:16		07:57 (T49)	06:30		07:41 (T49)	06:02	
	17:13	17:48	18:22			19:56	65	09:02 (T49)	20:27	78	08:59 (T49)	20:57	
2	07:57	07:42	07:06			07:15		07:55 (T49)	06:29		07:41 (T49)	06:01	
	17:14	17:49	18:23			19:57	68	09:03 (T49)	20:28	78	08:59 (T49)	20:58	
3	07:57	07:41	07:04			07:13		07:54 (T49)	06:28		07:42 (T49)	06:01	
	17:15	17:50	18:24			19:58	70	09:04 (T49)	20:29	76	08:58 (T49)	20:58	
4	07:57	07:40	07:03			07:11		07:52 (T49)	06:27		07:41 (T49)	06:00	
	17:16	17:51	18:25			19:59	73	09:05 (T49)	20:30	76	08:57 (T49)	20:59	
5	07:57	07:39	07:01			07:10		07:52 (T49)	06:25		07:42 (T49)	06:00	
	17:17	17:53	18:26			20:00	74	09:06 (T49)	20:31	74	08:56 (T49)	21:00	
6	07:57	07:38	06:59			07:08		07:50 (T49)	06:24		07:43 (T49)	06:00	
	17:18	17:54	18:28			20:00	76	09:06 (T49)	20:32	72	08:55 (T49)	21:00	
7	07:57	07:37	06:58			07:06		07:49 (T49)	06:23		07:43 (T49)	05:59	
	17:19	17:55	18:29			20:01	77	09:06 (T49)	20:33	72	08:55 (T49)	21:01	
8	07:57	07:36	07:56			07:05		07:48 (T49)	06:22		07:44 (T49)	05:59	
	17:20	17:56	19:30			20:02	79	09:07 (T49)	20:34	70	08:54 (T49)	21:02	
9	07:57	07:35	07:55			07:03		07:47 (T49)	06:21		07:45 (T49)	05:59	
	17:21	17:58	19:31			20:03	80	09:07 (T49)	20:35	68	08:53 (T49)	21:02	
10	07:57	07:34	07:53			07:01		07:46 (T49)	06:19		07:45 (T49)	05:59	
	17:22	17:59	19:32			20:05	81	09:07 (T49)	20:36	67	08:52 (T49)	21:03	
11	07:57	07:32	07:51			07:00		07:45 (T49)	06:18		07:46 (T49)	05:59	
	17:23	18:00	19:33			20:06	82	09:07 (T49)	20:37	65	08:51 (T49)	21:03	
12	07:56	07:31	07:50			06:58		07:44 (T49)	06:17		07:47 (T49)	05:59	
	17:24	18:01	19:34			20:07	83	09:07 (T49)	20:38	63	08:50 (T49)	21:04	
13	07:56	07:30	07:48			06:57		07:44 (T49)	06:16		07:47 (T49)	05:58	
	17:25	18:03	19:35			20:08	84	09:08 (T49)	20:39	62	08:49 (T49)	21:04	
14	07:56	07:29	07:46			06:55		07:43 (T49)	06:15		07:48 (T49)	05:58	
	17:26	18:04	19:37			20:09	84	09:07 (T49)	20:40	60	08:48 (T49)	21:05	
15	07:55	07:27	07:45			06:54		07:43 (T49)	06:14		07:49 (T49)	05:58	
	17:27	18:05	19:38			20:10	84	09:07 (T49)	20:41	58	08:47 (T49)	21:05	
16	07:55	07:26	07:43			06:52		07:42 (T49)	06:13		07:50 (T49)	05:58	
	17:28	18:06	19:39			20:11	85	09:07 (T49)	20:42	56	08:46 (T49)	21:06	
17	07:54	07:25	07:41			06:50		07:42 (T49)	06:12		07:51 (T49)	05:58	
	17:29	18:08	19:40			20:12	85	09:07 (T49)	20:43	54	08:45 (T49)	21:06	
18	07:54	07:23	07:40			06:49		07:41 (T49)	06:11		07:51 (T49)	05:58	
	17:31	18:09	19:41			20:13	85	09:06 (T49)	20:44	53	08:44 (T49)	21:07	
19	07:53	07:22	07:38			06:47		07:41 (T49)	06:10		07:52 (T49)	05:59	
	17:32	18:10	19:42			20:14	85	09:06 (T49)	20:45	51	08:43 (T49)	21:07	
20	07:53	07:20	07:36			06:46		07:41 (T49)	06:10		07:53 (T49)	05:59	
	17:33	18:11	19:43			20:15	84	09:05 (T49)	20:46	48	08:41 (T49)	21:07	
21	07:52	07:19	07:35			06:44		07:41 (T49)	06:09		07:55 (T49)	05:59	
	17:34	18:12	19:44			20:16	85	09:06 (T49)	20:47	46	08:41 (T49)	21:07	
22	07:52	07:18	07:33			06:43		07:40 (T49)	06:08		07:56 (T49)	05:59	
	17:35	18:14	19:45			20:17	85	09:05 (T49)	20:48	43	08:39 (T49)	21:08	
23	07:51	07:16	07:31		08:25 (T49)	06:41		07:40 (T49)	06:07		07:57 (T49)	05:59	
	17:36	18:15	19:46	15	08:40 (T49)	20:18	84	09:04 (T49)	20:49	41	08:38 (T49)	21:08	
24	07:50	07:15	07:30		08:19 (T49)	06:40		07:40 (T49)	06:06		07:59 (T49)	06:00	
	17:38	18:16	19:47	27	08:46 (T49)	20:19	83	09:03 (T49)	20:50	38	08:37 (T49)	21:08	
25	07:49	07:13	07:28		08:14 (T49)	06:39		07:40 (T49)	06:06		08:00 (T49)	06:00	
	17:39	18:17	19:48	36	08:50 (T49)	20:21	83	09:03 (T49)	20:51	36	08:36 (T49)	21:08	
26	07:49	07:12	07:26		08:11 (T49)	06:37		07:40 (T49)	06:05		08:01 (T49)	06:00	
	17:40	18:18	19:50	42	08:53 (T49)	20:22	83	09:03 (T49)	20:52	33	08:34 (T49)	21:08	
27	07:48	07:10	07:25		08:08 (T49)	06:36		07:40 (T49)	06:04		08:04 (T49)	06:01	
	17:41	18:19	19:51	48	08:56 (T49)	20:23	82	09:02 (T49)	20:53	29	08:33 (T49)	21:08	
28	07:47	07:09	07:23		08:05 (T49)	06:34		07:40 (T49)	06:04		08:05 (T49)	06:01	
	17:43	18:21	19:52	52	08:57 (T49)	20:24	81	09:01 (T49)	20:54	26	08:31 (T49)	21:08	
29	07:46		07:21		08:03 (T49)	06:33		07:41 (T49)	06:03		08:08 (T49)	06:01	
	17:44		19:53	55	08:58 (T49)	20:25	80	09:01 (T49)	20:54	21	08:29 (T49)	21:08	
30	07:45		07:20		08:01 (T49)	06:32		07:40 (T49)	06:03		08:10 (T49)	06:02	
	17:45		19:54	60	09:01 (T49)	20:26	80	09:00 (T49)	20:55	16	08:26 (T49)	21:08	
31	07:44		07:18		07:59 (T49)				06:02		08:13 (T49)		
	17:46		19:55	63	09:02 (T49)				20:56	11	08:24 (T49)		
Potential sun hours	297	297	370			399			448			452	
Total, worst case				398			2410			1641			
Sun reduction				0.44			0.52			0.57			
Oper. time red.				1.00			1.00			1.00			
Wind dir. red.				0.63			0.63			0.63			
Total reduction				0.28			0.33			0.36			
Total, real				110			788			588			

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

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

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1151 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7125)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October		November	December
1	06:02			06:26		07:56 (T49)	06:57		07:44 (T49)	07:28		07:02	07:37
	21:08			20:50	64	09:00 (T49)	20:07	82	09:06 (T49)	19:15		17:28	17:04
2	06:03			06:27		07:55 (T49)	06:58		07:45 (T49)	07:29		07:03	07:38
	21:08			20:49	66	09:01 (T49)	20:06	81	09:06 (T49)	19:13		17:27	17:04
3	06:03			06:28		07:55 (T49)	06:59		07:45 (T49)	07:30		07:04	07:39
	21:08			20:48	67	09:02 (T49)	20:04	80	09:05 (T49)	19:11		17:26	17:03
4	06:04			06:29		07:54 (T49)	07:00		07:45 (T49)	07:31		07:06	07:40
	21:08			20:47	69	09:03 (T49)	20:02	79	09:04 (T49)	19:10		17:24	17:03
5	06:04			06:30		07:53 (T49)	07:01		07:46 (T49)	07:32		07:07	07:41
	21:08			20:46	71	09:04 (T49)	20:01	77	09:03 (T49)	19:08		17:23	17:03
6	06:05			06:31		07:53 (T49)	07:02		07:46 (T49)	07:33		07:08	07:42
	21:08			20:44	71	09:04 (T49)	19:57	76	09:02 (T49)	19:06		17:22	17:03
7	06:06			06:32		07:52 (T49)	07:03		07:47 (T49)	07:34		07:09	07:43
	21:07			20:43	73	09:05 (T49)	19:56	74	09:01 (T49)	19:05		17:21	17:03
8	06:06			06:33		07:51 (T49)	07:04		07:47 (T49)	07:35		07:10	07:44
	21:07			20:42	75	09:06 (T49)	19:54	73	09:00 (T49)	19:03		17:20	17:03
9	06:07			06:34		07:51 (T49)	07:05		07:48 (T49)	07:36		07:12	07:45
	21:07			20:41	75	09:06 (T49)	19:52	71	08:59 (T49)	19:02		17:19	17:03
10	06:08			06:35		07:50 (T49)	07:06		07:49 (T49)	07:37		07:13	07:46
	21:06			20:39	77	09:07 (T49)	19:51	68	08:57 (T49)	19:00		17:18	17:03
11	06:08			06:36		07:50 (T49)	07:07		07:50 (T49)	07:38		07:14	07:46
	21:06			20:38	78	09:08 (T49)	19:49	66	08:56 (T49)	18:58		17:17	17:03
12	06:09		08:24 (T49)	06:37		07:49 (T49)	07:08		07:50 (T49)	07:39		07:15	07:47
	21:05	5	08:29 (T49)	20:37	79	09:08 (T49)	19:47	63	08:53 (T49)	18:57		17:16	17:03
13	06:10		08:19 (T49)	06:38		07:49 (T49)	07:09		07:51 (T49)	07:40		07:16	07:48
	21:05	14	08:33 (T49)	20:36	80	09:09 (T49)	19:45	60	08:51 (T49)	18:55		17:15	17:03
14	06:11		08:17 (T49)	06:39		07:48 (T49)	07:10		07:53 (T49)	07:41		07:18	07:49
	21:04	19	08:36 (T49)	20:34	81	09:09 (T49)	19:44	56	08:49 (T49)	18:54		17:14	17:03
15	06:11		08:15 (T49)	06:40		07:48 (T49)	07:11		07:54 (T49)	07:42		07:19	07:49
	21:04	24	08:39 (T49)	20:33	81	09:09 (T49)	19:42	53	08:47 (T49)	18:52		17:13	17:04
16	06:12		08:13 (T49)	06:41		07:47 (T49)	07:12		07:56 (T49)	07:44		07:20	07:50
	21:03	27	08:40 (T49)	20:31	83	09:10 (T49)	19:40	48	08:44 (T49)	18:51		17:12	17:04
17	06:13		08:11 (T49)	06:42		07:47 (T49)	07:13		07:58 (T49)	07:45		07:21	07:51
	21:03	31	08:42 (T49)	20:30	83	09:10 (T49)	19:39	43	08:41 (T49)	18:49		17:12	17:04
18	06:14		08:10 (T49)	06:43		07:47 (T49)	07:14		08:01 (T49)	07:46		07:22	07:52
	21:02	34	08:44 (T49)	20:29	83	09:10 (T49)	19:37	37	08:38 (T49)	18:47		17:11	17:04
19	06:15		08:09 (T49)	06:44		07:46 (T49)	07:15		08:04 (T49)	07:47		07:23	07:52
	21:01	37	08:46 (T49)	20:27	84	09:10 (T49)	19:35	30	08:34 (T49)	18:46		17:10	17:05
20	06:15		08:08 (T49)	06:45		07:45 (T49)	07:16		08:09 (T49)	07:48		07:25	07:53
	21:01	40	08:48 (T49)	20:26	84	09:09 (T49)	19:34	19	08:28 (T49)	18:45		17:09	17:05
21	06:16		08:07 (T49)	06:46		07:45 (T49)	07:17			07:49		07:26	07:53
	21:00	42	08:49 (T49)	20:24	84	09:09 (T49)	19:32			18:43		17:09	17:06
22	06:17		08:05 (T49)	06:47		07:45 (T49)	07:18			07:50		07:27	07:54
	20:59	45	08:50 (T49)	20:23	84	09:09 (T49)	19:30			18:42		17:08	17:06
23	06:18		08:04 (T49)	06:48		07:44 (T49)	07:19			07:51		07:28	07:54
	20:58	47	08:51 (T49)	20:21	85	09:09 (T49)	19:28			18:40		17:07	17:07
24	06:19		08:03 (T49)	06:49		07:44 (T49)	07:20			07:53		07:29	07:55
	20:58	49	08:52 (T49)	20:20	85	09:09 (T49)	19:27			18:39		17:07	17:07
25	06:20		08:03 (T49)	06:50		07:44 (T49)	07:21			07:54		07:30	07:55
	20:57	51	08:54 (T49)	20:18	85	09:09 (T49)	19:25			18:37		17:06	17:08
26	06:21		08:02 (T49)	06:51		07:44 (T49)	07:22			07:55		07:31	07:56
	20:56	53	08:55 (T49)	20:17	85	09:09 (T49)	19:23			18:36		17:06	17:09
27	06:22		08:01 (T49)	06:52		07:44 (T49)	07:23			07:56		07:33	07:56
	20:55	55	08:56 (T49)	20:15	85	09:09 (T49)	19:22			18:35		17:05	17:09
28	06:23		08:00 (T49)	06:53		07:44 (T49)	07:24			07:57		07:34	07:56
	20:54	57	08:57 (T49)	20:14	84	09:08 (T49)	19:20			18:33		17:05	17:10
29	06:24		07:59 (T49)	06:54		07:44 (T49)	07:25			07:58		07:35	07:56
	20:53	59	08:58 (T49)	20:12	84	09:08 (T49)	19:18			18:32		17:05	17:11
30	06:25		07:58 (T49)	06:55		07:44 (T49)	07:27			08:00		07:36	07:57
	20:52	61	08:59 (T49)	20:10	83	09:07 (T49)	19:17			18:31		17:04	17:11
31	06:26		07:57 (T49)	06:56		07:44 (T49)				08:01			07:57
	20:51	62	08:59 (T49)	20:09	83	09:07 (T49)				18:29			17:12
Potential sun hours	459			428			375			345		297	287
Total, worst case		812			2451			1236					
Sun reduction		0.66			0.61			0.59					
Oper. time red.		1.00			1.00			1.00					
Wind dir. red.		0.63			0.63			0.63					
Total reduction		0.41			0.38			0.37					
Total, real		337			940			458					

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1158 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7130)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April		May		June		July		August		September	October	November	December
1	07:57	07:43	07:07	07:16		06:30		19:01 (T36)	06:01	19:03 (T36)	06:02	19:12 (T36)	06:26	19:07 (T36)	06:57	07:27	07:02	07:37
	17:13	17:47	18:22	19:56		20:27	53	19:54 (T36)	20:57 52	19:55 (T36)	21:08 45	19:57 (T36)	20:50 60	20:07 (T36)	20:07	19:15	17:28	17:03
2	07:57	07:42	07:06	07:14		06:29		18:59 (T36)	06:01	19:03 (T36)	06:02	19:12 (T36)	06:27	19:07 (T36)	06:58	07:28	07:03	07:38
	17:14	17:49	18:23	19:57		20:28	55	19:54 (T36)	20:58 51	19:54 (T36)	21:08 46	19:58 (T36)	20:49 60	20:07 (T36)	20:05	19:13	17:27	17:03
3	07:57	07:41	07:04	07:13		06:27		18:59 (T36)	06:00	19:04 (T36)	06:03	19:11 (T36)	06:28	19:07 (T36)	06:59	07:29	07:04	07:39
	17:14	17:50	18:24	19:58		20:29	56	19:55 (T36)	20:58 50	19:54 (T36)	21:08 47	19:58 (T36)	20:48 60	20:07 (T36)	20:04	19:11	17:25	17:03
4	07:57	07:40	07:02	07:11		06:26		18:59 (T36)	06:00	19:04 (T36)	06:03	19:12 (T36)	06:29	19:07 (T36)	07:00	07:31	07:06	07:40
	17:15	17:51	18:25	19:59		20:30	57	19:56 (T36)	20:59 51	19:55 (T36)	21:08 47	19:59 (T36)	20:47 60	20:07 (T36)	20:02	19:10	17:24	17:03
5	07:57	07:39	07:01	07:09		06:25		18:58 (T36)	06:00	19:04 (T36)	06:04	19:12 (T36)	06:30	19:07 (T36)	07:01	07:32	07:07	07:41
	17:16	17:52	18:26	20:00		20:31	58	19:56 (T36)	21:00 50	19:54 (T36)	21:08 48	20:00 (T36)	20:46 60	20:07 (T36)	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08		06:24		18:58 (T36)	05:59	19:05 (T36)	06:05	19:11 (T36)	06:31	19:08 (T36)	07:02	07:33	07:08	07:42
	17:17	17:54	18:27	20:00		20:32	59	19:57 (T36)	21:00 49	19:54 (T36)	21:08 49	20:00 (T36)	20:44 58	20:06 (T36)	19:57	19:06	17:22	17:02
7	07:57	07:37	06:58	07:06		06:23		18:58 (T36)	05:59	19:06 (T36)	06:05	19:12 (T36)	06:32	19:08 (T36)	07:03	07:34	07:09	07:43
	17:18	17:55	18:28	20:01		20:33	59	19:57 (T36)	21:01 48	19:54 (T36)	21:07 49	20:01 (T36)	20:43 58	20:06 (T36)	19:56	19:05	17:21	17:02
8	07:57	07:36	07:56	07:04		06:21		18:57 (T36)	05:59	19:07 (T36)	06:06	19:11 (T36)	06:33	19:08 (T36)	07:04	07:35	07:10	07:44
	17:19	17:56	19:30	20:02		20:34	59	19:56 (T36)	21:02 47	19:54 (T36)	21:07 50	20:01 (T36)	20:42 58	20:06 (T36)	19:54	19:03	17:20	17:02
9	07:57	07:35	07:54	07:03		06:20		18:57 (T36)	05:59	19:07 (T36)	06:07	19:11 (T36)	06:34	19:08 (T36)	07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03		20:35	59	19:56 (T36)	21:02 47	19:54 (T36)	21:07 51	20:02 (T36)	20:41 57	20:05 (T36)	19:52	19:01	17:19	17:02
10	07:57	07:34	07:53	07:01		06:19		18:56 (T36)	05:58	19:07 (T36)	06:07	19:11 (T36)	06:35	19:09 (T36)	07:06	07:37	07:13	07:46
	17:21	17:59	19:32	20:04		20:36	61	19:57 (T36)	21:03 46	19:53 (T36)	21:06 51	20:02 (T36)	20:39 55	20:04 (T36)	19:50	19:00	17:18	17:02
11	07:57	07:32	07:51	07:00		06:18		18:56 (T36)	05:58	19:07 (T36)	06:08	19:10 (T36)	06:36	19:09 (T36)	07:07	07:38	07:14	07:46
	17:22	18:00	19:33	20:06		20:37	61	19:57 (T36)	21:04 46	19:53 (T36)	21:06 52	20:02 (T36)	20:38 55	20:04 (T36)	19:49	18:58	17:17	17:02
12	07:56	07:31	07:49	06:58		06:17		18:56 (T36)	05:58	19:08 (T36)	06:09	19:10 (T36)	06:37	19:09 (T36)	07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:07		20:38	61	19:57 (T36)	21:04 45	19:53 (T36)	21:06 53	20:03 (T36)	20:37 53	20:02 (T36)	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:56		06:16		18:56 (T36)	05:58	19:08 (T36)	06:09	19:10 (T36)	06:38	19:09 (T36)	07:09	07:40	07:16	07:48
	17:24	18:02	19:35	20:08		20:39	61	19:57 (T36)	21:05 45	19:53 (T36)	21:05 54	20:04 (T36)	20:36 52	20:01 (T36)	19:45	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55		06:15		18:56 (T36)	05:58	19:09 (T36)	06:10	19:10 (T36)	06:39	19:10 (T36)	07:10	07:41	07:18	07:49
	17:26	18:04	19:36	20:09		20:40	61	19:57 (T36)	21:05 44	19:53 (T36)	21:05 54	20:04 (T36)	20:34 50	20:00 (T36)	19:44	18:53	17:14	17:03
15	07:55	07:27	07:45	06:53		06:14		18:56 (T36)	05:58	19:09 (T36)	06:11	19:09 (T36)	06:40	19:11 (T36)	07:11	07:42	07:19	07:50
	17:27	18:05	19:37	20:10		20:41	61	19:57 (T36)	21:05 44	19:53 (T36)	21:04 55	20:04 (T36)	20:33 48	19:59 (T36)	19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52		06:13		18:56 (T36)	05:58	19:10 (T36)	06:12	19:09 (T36)	06:41	19:12 (T36)	07:12	07:43	07:20	07:50
	17:28	18:06	19:39	20:11		20:42	61	19:57 (T36)	21:06 44	19:54 (T36)	21:03 56	20:05 (T36)	20:31 46	19:58 (T36)	19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50		06:12		18:57 (T36)	05:58	19:10 (T36)	06:13	19:09 (T36)	06:42	19:13 (T36)	07:13	07:45	07:21	07:51
	17:29	18:07	19:40	20:12		20:43	60	19:57 (T36)	21:06 44	19:54 (T36)	21:03 56	20:05 (T36)	20:30 43	19:56 (T36)	19:39	18:49	17:11	17:04
18	07:54	07:23	07:40	06:49		06:11		18:57 (T36)	05:58	19:10 (T36)	06:13	19:09 (T36)	06:43	19:14 (T36)	07:14	07:46	07:22	07:52
	17:30	18:08	19:41	20:13		20:44	60	19:57 (T36)	21:07 44	19:54 (T36)	21:02 57	20:06 (T36)	20:29 41	19:55 (T36)	19:37	18:47	17:10	17:04
19	07:53	07:22	07:38	06:47		06:10		18:58 (T36)	05:58	19:11 (T36)	06:14	19:09 (T36)	06:44	19:15 (T36)	07:15	07:47	07:23	07:52
	17:31	18:10	19:42	20:14		20:45	59	19:57 (T36)	21:07 44	19:55 (T36)	21:02 57	20:06 (T36)	20:27 38	19:53 (T36)	19:35	18:46	17:10	17:04
20	07:53	07:20	07:36	06:46	19:21 (T36)	06:09		18:58 (T36)	05:58	19:11 (T36)	06:15	19:08 (T36)	06:45	19:17 (T36)	07:16	07:48	07:25	07:53
	17:32	18:11	19:43	20:15	17 19:38 (T36)	20:46	59	19:57 (T36)	21:07 44	19:55 (T36)	21:01 58	20:06 (T36)	20:26 34	19:51 (T36)	19:33	18:44	17:09	17:05
21	07:52	07:19	07:34	06:44	19:16 (T36)	06:08		18:58 (T36)	05:58	19:11 (T36)	06:16	19:08 (T36)	06:46	19:19 (T36)	07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16	25 19:41 (T36)	20:47	58	19:56 (T36)	21:08 44	19:55 (T36)	21:00 58	20:06 (T36)	20:24 30	19:49 (T36)	19:32	18:43	17:08	17:05
22	07:52	07:18	07:33	06:43	19:14 (T36)	06:08		18:59 (T36)	05:59	19:11 (T36)	06:17	19:08 (T36)	06:47	19:22 (T36)	07:18	07:50	07:27	07:54
	17:35	18:13	19:45	20:17	30 19:44 (T36)	20:48	58	19:57 (T36)	21:08 44	19:55 (T36)	20:59 59	20:07 (T36)	20:23 24	19:46 (T36)	19:30	18:41	17:08	17:06
23	07:51	07:16	07:31	06:41	19:11 (T36)	06:07		18:59 (T36)	05:59	19:11 (T36)	06:18	19:08 (T36)	06:48	19:25 (T36)	07:19	07:51	07:28	07:54
	17:36	18:14	19:46	20:18	35 19:46 (T36)	20:49	57	19:56 (T36)	21:08 44	19:55 (T36)	20:59 59	20:07 (T36)	20:21 16	19:41 (T36)	19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:40	19:09 (T36)	06:06		18:59 (T36)	05:59	19:12 (T36)	06:19	19:08 (T36)	06:49		07:20	07:53	07:29	07:55
	17:37	18:16	19:47	20:19	39 19:48 (T36)	20:50	57	19:56 (T36)	21:08 44	19:56 (T36)	20:58 59	20:07 (T36)	20:20		19:27	18:38	17:06	17:07
25	07:49	07:13	07:28	06:38	19:08 (T36)	06:05		19:00 (T36)	05:59	19:12 (T36)	06:19	19:08 (T36)	06:50		07:21	07:54	07:30	07:55
	17:39	18:17	19:48	20:21	41 19:49 (T36)	20:51	56	19:56 (T36)	21:08 44	19:56 (T36)	20:57 60	20:08 (T36)	20:18		19:25	18:37	17:06	17:07
26	07:49	07:12	07:26	06:37	19:06 (T36)	06:05		19:00 (T36)	06:00	19:12 (T36)	06:20	19:08 (T36)	06:51		07:22	07:55	07:32	07:56
	17:40	18:18	19:49	20:22	44 19:50 (T36)	20:52	56	19:56 (T36)	21:08 44	19:56 (T36)	20:56 60	20:08 (T36)	20:17		19:23	18:36	17:05	17:08
27	07:48	07:10	07:24	06:35	19:05 (T36)	06:04		19:00 (T36)	06:00	19:12 (T36)	06:21	19:07 (T36)	06:52		07:23	07:56	07:33	07:56
	17:41	18:19	19:51	20:23	46 19:51 (T36)	20:53	55	19:55 (T36)	21:08 45	19:57 (T36)	20:55 60	20:07 (T36)	20:15		19:21	18:34	17:05	17:09
28	07:47	07:09	07:23	06:34	19:04 (T36)	06:03		19:01 (T36)	06:01	19:12 (T36)	06:22	19:07 (T36)	06:53		07:24	07:57	07:34	07:56
	17:42	18:20	19:52	20:24	48 19:52 (T36)	20:54	55	19:56 (T36)	21:09 44	19:56 (T36)	20:54 60	20:07 (T36)	20:13		19:20	18:33	17:05	17:09
29	07:46		07:21	06:33	19:02 (T36)	06:03		19:01 (T36)	06:01	19:13 (T36)	06:23	19:07 (T36)	06:54		07:25	07:58	07:35	07:57
	17:44		19:53	20:25	51 19:53 (T36)	20:54	54	19:55 (T36)	21:09 44	19:57 (T36)	20:53 60	20:07 (T36)	20:12		19:18	18:32	17:04	17:10
30	07:45		07:19	06:31	19:01 (T36)	06:02		19:02 (T36)	06:01	19:12 (T36)	06:24	19:07 (T36)	06:55		07:26	08:00	07:36	07:57
	17:45		19:54	20:26	53 19:54 (T36)	20:55	53	19:55 (T36)	21:09 45	19:57 (T36)	20:52 60	20:07 (T36)	20:10		19:16	18:30	17:04	17:11
31	07:44		07:18			06:02		19:02 (T36)			06:25	19:07 (T36)	06:56			08:01		07:57
	17:46		19:55			20:56	53	19:55 (T36)			20:51 60	20:07 (T36)	20:09			18:29		17:12
Potential sun hours	297	297	370	399		449		453		460		429		375	345	297	287	
Total, worst case				429		1792		1377		1690		1116						
Sun reduction				0.52		0.57		0.64		0.66		0.61						
Oper. time red.				1.00		1.00		1.00		1.00		1.00						
Wind dir. red.				0.57		0.57		0.57		0.57		0.57						
Total reduction				0.30		0.33		0.37		0.38		0.35						
Total, real				127		583		503		637		389						

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1174 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7143)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March			April			May			June		
1	07:57		07:43		07:07			07:16		18:35 (T59)	06:31		18:33 (T59)	06:02		19:59 (T78)
	17:13		17:48		18:22			19:56	48	19:23 (T59)	20:27	41	19:14 (T59)	20:57	27	20:26 (T78)
2	07:57		07:42		07:06			07:15		18:34 (T59)	06:29		18:35 (T59)	06:01		19:59 (T78)
	17:14		17:49		18:23			19:57	51	19:25 (T59)	20:28	37	19:12 (T59)	20:58	28	20:27 (T78)
3	07:57		07:41		07:04			07:13		18:33 (T59)	06:28		18:37 (T59)	06:01		19:58 (T78)
	17:15		17:50		18:24			19:58	52	19:25 (T59)	20:29	34	19:11 (T59)	20:58	31	20:29 (T78)
4	07:57		07:40		07:03			07:11		18:31 (T59)	06:27		18:38 (T59)	06:01		19:57 (T78)
	17:16		17:52		18:25			19:59	55	19:26 (T59)	20:30	31	19:09 (T59)	20:59	32	20:29 (T78)
5	07:57		07:39		07:01			07:10		18:31 (T59)	06:25		18:40 (T59)	06:00		19:57 (T78)
	17:17		17:53		18:27			20:00	56	19:27 (T59)	20:31	26	19:06 (T59)	21:00	33	20:30 (T78)
6	07:57		07:38		06:59			07:08		18:29 (T59)	06:24		18:42 (T59)	06:00		19:57 (T78)
	17:18		17:54		18:28			20:00	58	19:27 (T59)	20:32	22	19:04 (T59)	21:00	34	20:31 (T78)
7	07:57		07:37		06:58			07:06		18:28 (T59)	06:23		18:46 (T59)	06:00		19:57 (T78)
	17:19		17:55		18:29			20:01	59	19:27 (T59)	20:33	14	19:00 (T59)	21:01	35	20:32 (T78)
8	07:57		07:36		07:56			07:05		18:28 (T59)	06:22			05:59		19:56 (T78)
	17:20		17:57		19:30			20:02	60	19:28 (T59)	20:34			21:02	36	20:32 (T78)
9	07:57		07:35		07:55			07:03		18:27 (T59)	06:21			05:59		19:56 (T78)
	17:21		17:58		19:31			20:04	60	19:27 (T59)	20:35			21:02	37	20:33 (T78)
10	07:57		07:34		07:53			07:02		18:27 (T59)	06:20			05:59		19:56 (T78)
	17:22		17:59		19:32			20:05	61	19:28 (T59)	20:36			21:03	37	20:33 (T78)
11	07:57		07:32		07:51			07:00		18:26 (T59)	06:18			05:59		19:56 (T78)
	17:23		18:00		19:33			20:06	62	19:28 (T59)	20:37			21:03	38	20:34 (T78)
12	07:56		07:31		07:50			06:58		18:25 (T59)	06:17			05:59		19:56 (T78)
	17:24		18:02		19:34			20:07	62	19:27 (T59)	20:38			21:04	38	20:34 (T78)
13	07:56		07:30		07:48			06:57		18:26 (T59)	06:16			05:59		19:56 (T78)
	17:25		18:03		19:36			20:08	61	19:27 (T59)	20:39			21:04	39	20:35 (T78)
14	07:56		07:29		07:46			06:55		18:25 (T59)	06:15			05:59		19:56 (T78)
	17:26		18:04		19:37			20:09	62	19:27 (T59)	20:41			21:05	39	20:35 (T78)
15	07:55		07:27		07:45			06:54		18:25 (T59)	06:14			05:59		19:56 (T78)
	17:27		18:05		19:38			20:10	62	19:27 (T59)	20:42			21:05	40	20:36 (T78)
16	07:55		07:26		07:43			06:52		18:25 (T59)	06:13			05:59		19:56 (T78)
	17:28		18:06		19:39			20:11	61	19:26 (T59)	20:42			21:06	40	20:36 (T78)
17	07:54		07:25		07:41			06:51		18:25 (T59)	06:12			05:59		19:56 (T78)
	17:30		18:08		19:40			20:12	61	19:26 (T59)	20:43			21:06	40	20:36 (T78)
18	07:54		07:23		07:40			06:49		18:25 (T59)	06:12			05:59		19:56 (T78)
	17:31		18:09		19:41			20:13	60	19:25 (T59)	20:44			21:07	40	20:36 (T78)
19	07:53		07:22		07:38			06:48		18:26 (T59)	06:11			05:59		19:56 (T78)
	17:32		18:10		19:42			20:14	59	19:25 (T59)	20:45			21:07	41	20:37 (T78)
20	07:53		07:21		07:36			06:46		18:25 (T59)	06:10			05:59		19:56 (T78)
	17:33		18:11		19:43			20:15	59	19:24 (T59)	20:46			21:07	41	20:37 (T78)
21	07:52		07:19		07:35			06:45		18:26 (T59)	06:09			05:59		19:57 (T78)
	17:34		18:13		19:44			20:16	58	19:24 (T59)	20:47			21:07	41	20:38 (T78)
22	07:52		07:18		07:33			06:43		18:26 (T59)	06:08			05:59		19:57 (T78)
	17:35		18:14		19:45			20:17	57	19:23 (T59)	20:48			21:08	41	20:38 (T78)
23	07:51		07:16		07:31			06:42		18:27 (T59)	06:07			06:00		19:57 (T78)
	17:37		18:15		19:46			20:18	56	19:23 (T59)	20:49			21:08	41	20:38 (T78)
24	07:50		07:15		07:30			06:40		18:28 (T59)	06:07			06:00		19:57 (T78)
	17:38		18:16		19:48			20:20	54	19:22 (T59)	20:50			21:08	41	20:38 (T78)
25	07:49		07:13		07:28		18:56 (T59)	06:39		18:28 (T59)	06:06			06:00		19:58 (T78)
	17:39		18:17		19:49	12	19:08 (T59)	20:21	53	19:21 (T59)	20:51			21:08	40	20:38 (T78)
26	07:49		07:12		07:26		18:50 (T59)	06:37		18:29 (T59)	06:05			06:00		19:58 (T78)
	17:40		18:18		19:50	22	19:12 (T59)	20:22	51	19:20 (T59)	20:52			21:08	40	20:38 (T78)
27	07:48		07:10		07:25		18:47 (T59)	06:36		18:29 (T59)	06:05		20:07 (T78)	06:01		19:58 (T78)
	17:42		18:20		19:51	29	19:16 (T59)	20:23	49	19:18 (T59)	20:53	10	20:17 (T78)	21:08	40	20:38 (T78)
28	07:47		07:09		07:23		18:43 (T59)	06:35		18:30 (T59)	06:04		20:04 (T78)	06:01		19:59 (T78)
	17:43		18:21		19:52	35	19:18 (T59)	20:24	48	19:18 (T59)	20:54	16	20:20 (T78)	21:08	39	20:38 (T78)
29	07:46				07:21		18:41 (T59)	06:33		18:31 (T59)	06:03		20:03 (T78)	06:02		19:59 (T78)
	17:44				19:53	39	19:20 (T59)	20:25	46	19:17 (T59)	20:54	19	20:22 (T78)	21:08	39	20:38 (T78)
30	07:45				07:20		18:39 (T59)	06:32		18:32 (T59)	06:03		20:01 (T78)	06:02		20:00 (T78)
	17:45				19:54	43	19:22 (T59)	20:26	43	19:15 (T59)	20:55	23	20:24 (T78)	21:08	39	20:39 (T78)
31	07:44				07:18		18:37 (T59)				06:02		20:00 (T78)			
	17:47				19:55	46	19:23 (T59)				20:56	25	20:25 (T78)			
Potential sun hours	297		297		370			399			448			452		
Total, worst case						226			1684			298			1127	
Sun reduction						0.44			0.52			0.57			0.64	
Oper. time red.						1.00			1.00			1.00			1.00	
Wind dir. red.						0.62			0.62			0.60			0.54	
Total reduction						0.28			0.33			0.34			0.34	
Total, real						62			548			102			388	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1174 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7143)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December
1	06:03		20:00 (T78)	06:27		06:58	18:25 (T59)	07:28	07:02	07:37
	21:08	38	20:38 (T78)	20:50		20:07	62	19:27 (T59)	19:15	17:28	17:04
2	06:03		20:01 (T78)	06:28		06:59		18:25 (T59)	07:29	07:03	07:38
	21:08	38	20:39 (T78)	20:49		20:06	61	19:26 (T59)	19:13	17:27	17:04
3	06:04		20:01 (T78)	06:29		07:00		18:25 (T59)	07:30	07:04	07:39
	21:08	37	20:38 (T78)	20:48		20:04	60	19:25 (T59)	19:12	17:26	17:04
4	06:04		20:02 (T78)	06:30		07:01		18:25 (T59)	07:31	07:06	07:40
	21:08	36	20:38 (T78)	20:47		20:02	60	19:25 (T59)	19:10	17:25	17:03
5	06:05		20:02 (T78)	06:31	19:00 (T59)	07:02		18:25 (T59)	07:32	07:07	07:41
	21:08	35	20:37 (T78)	20:46	6	19:06 (T59)	20:01	59	19:24 (T59)	19:08	17:24	17:03
6	06:05		20:03 (T78)	06:32	18:54 (T59)	07:03		18:25 (T59)	07:33	07:08	07:42
	21:08	34	20:37 (T78)	20:44	17	19:11 (T59)	19:57	58	19:23 (T59)	19:07	17:22	17:03
7	06:06		20:03 (T78)	06:33	18:51 (T59)	07:04		18:26 (T59)	07:34	07:09	07:43
	21:07	34	20:37 (T78)	20:43	23	19:14 (T59)	19:56	56	19:22 (T59)	19:05	17:21	17:03
8	06:07		20:04 (T78)	06:34	18:49 (T59)	07:05		18:26 (T59)	07:35	07:10	07:44
	21:07	32	20:36 (T78)	20:42	28	19:17 (T59)	19:54	55	19:21 (T59)	19:03	17:20	17:03
9	06:07		20:05 (T78)	06:35	18:47 (T59)	07:06		18:27 (T59)	07:36	07:12	07:45
	21:07	31	20:36 (T78)	20:41	31	19:18 (T59)	19:52	53	19:20 (T59)	19:02	17:19	17:03
10	06:08		20:05 (T78)	06:36	18:45 (T59)	07:07		18:27 (T59)	07:37	07:13	07:46
	21:06	30	20:35 (T78)	20:40	35	19:20 (T59)	19:51	51	19:18 (T59)	19:00	17:18	17:03
11	06:09		20:07 (T78)	06:37	18:43 (T59)	07:07		18:28 (T59)	07:38	07:14	07:46
	21:06	28	20:35 (T78)	20:38	38	19:21 (T59)	19:49	49	19:17 (T59)	18:59	17:17	17:03
12	06:09		20:08 (T78)	06:37	18:41 (T59)	07:08		18:29 (T59)	07:39	07:15	07:47
	21:05	26	20:34 (T78)	20:37	42	19:23 (T59)	19:47	46	19:15 (T59)	18:57	17:16	17:03
13	06:10		20:09 (T78)	06:39	18:40 (T59)	07:09		18:30 (T59)	07:40	07:16	07:48
	21:05	23	20:32 (T78)	20:36	44	19:24 (T59)	19:46	43	19:13 (T59)	18:55	17:15	17:03
14	06:11		20:10 (T78)	06:40	18:39 (T59)	07:10		18:32 (T59)	07:41	07:18	07:49
	21:05	21	20:31 (T78)	20:34	46	19:25 (T59)	19:44	39	19:11 (T59)	18:54	17:14	17:04
15	06:12		20:12 (T78)	06:41	18:37 (T59)	07:11		18:32 (T59)	07:43	07:19	07:50
	21:04	18	20:30 (T78)	20:33	49	19:26 (T59)	19:42	36	19:08 (T59)	18:52	17:13	17:04
16	06:12		20:15 (T78)	06:42	18:36 (T59)	07:12		18:34 (T59)	07:44	07:20	07:50
	21:03	13	20:28 (T78)	20:32	50	19:26 (T59)	19:40	31	19:05 (T59)	18:51	17:13	17:04
17	06:13		20:18 (T78)	06:43	18:35 (T59)	07:13		18:37 (T59)	07:45	07:21	07:51
	21:03	6	20:24 (T78)	20:30	52	19:27 (T59)	19:39	25	19:02 (T59)	18:49	17:12	17:04
18	06:14			06:44	18:34 (T59)	07:14		18:42 (T59)	07:46	07:22	07:52
	21:02			20:29	54	19:28 (T59)	19:37	15	18:57 (T59)	18:48	17:11	17:05
19	06:15			06:45	18:33 (T59)	07:15			07:47	07:24	07:52
	21:01			20:27	55	19:28 (T59)	19:35			18:46	17:10	17:05
20	06:16			06:46	18:32 (T59)	07:16			07:48	07:25	07:53
	21:01			20:26	56	19:28 (T59)	19:34			18:45	17:10	17:05
21	06:16			06:47	18:31 (T59)	07:17			07:49	07:26	07:53
	21:00			20:24	58	19:29 (T59)	19:32			18:43	17:09	17:06
22	06:17			06:48	18:31 (T59)	07:18			07:50	07:27	07:54
	20:59			20:23	58	19:29 (T59)	19:30			18:42	17:08	17:06
23	06:18			06:49	18:30 (T59)	07:19			07:52	07:28	07:54
	20:58			20:21	59	19:29 (T59)	19:29			18:40	17:08	17:07
24	06:19			06:50	18:28 (T59)	07:20			07:53	07:29	07:55
	20:58			20:20	60	19:28 (T59)	19:27			18:39	17:07	17:07
25	06:20			06:51	18:28 (T59)	07:22			07:54	07:30	07:55
	20:57			20:18	60	19:28 (T59)	19:25			18:37	17:07	17:08
26	06:21			06:52	18:27 (T59)	07:23			07:55	07:32	07:56
	20:56			20:17	61	19:28 (T59)	19:23			18:36	17:06	17:09
27	06:22			06:53	18:27 (T59)	07:24			07:56	07:33	07:56
	20:55			20:15	61	19:28 (T59)	19:22			18:35	17:06	17:09
28	06:23			06:54	18:26 (T59)	07:25			07:57	07:34	07:56
	20:54			20:14	62	19:28 (T59)	19:20			18:33	17:05	17:10
29	06:24			06:55	18:26 (T59)	07:26			07:58	07:35	07:57
	20:53			20:12	62	19:28 (T59)	19:18			18:32	17:05	17:11
30	06:25			06:56	18:26 (T59)	07:27			08:00	07:36	07:57
	20:52			20:10	61	19:27 (T59)	19:17			18:31	17:04	17:12
31	06:26			06:57	18:25 (T59)				08:01			07:57
	20:51			20:09	62	19:27 (T59)				18:30		17:12
Potential sun hours	459			428		375			345	297	287	
Total, worst case		480			1290			859				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.54			0.62			0.62				
Total reduction		0.35			0.38			0.37				
Total, real		170			492			317				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1179 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7147)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	08:41 (T71)	07:43	07:07			07:16	18:20 (T69)	06:30	06:50 (T67)	06:02	07:05 (T68)
	17:13 48	09:29 (T71)	17:48	18:22			19:56 60	19:20 (T69)	20:27 132	19:13 (T69)	20:57 56	08:01 (T68)
2	07:57	08:41 (T71)	07:42	07:06			07:15	18:19 (T69)	06:29	06:49 (T67)	06:01	07:06 (T68)
	17:14 49	09:30 (T71)	17:49	18:23			19:57 62	19:21 (T69)	20:28 133	19:13 (T69)	20:57 56	08:02 (T68)
3	07:57	08:42 (T71)	07:41	07:04			07:13	18:18 (T69)	06:28	06:48 (T67)	06:01	07:07 (T68)
	17:15 48	09:30 (T71)	17:50	18:24			19:58 63	19:21 (T69)	20:29 132	19:12 (T69)	20:58 55	08:02 (T68)
4	07:57	08:42 (T71)	07:40	07:02			07:11	18:16 (T69)	06:27	06:48 (T67)	06:01	07:07 (T68)
	17:16 48	09:30 (T71)	17:51	18:25			19:59 66	19:22 (T69)	20:30 130	19:10 (T69)	20:59 54	08:01 (T68)
5	07:57	08:43 (T71)	07:39	07:01			07:10	18:16 (T69)	06:25	06:48 (T67)	06:00	07:08 (T68)
	17:17 48	09:31 (T71)	17:53	18:26			20:00 67	19:23 (T69)	20:31 128	19:09 (T69)	20:59 53	08:01 (T68)
6	07:57	08:44 (T71)	07:38	06:59			07:08	18:15 (T69)	06:24	06:49 (T67)	06:00	07:08 (T68)
	17:18 47	09:31 (T71)	17:54	18:28			20:00 68	19:23 (T69)	20:32 124	19:08 (T69)	21:00 53	08:01 (T68)
7	07:57	08:44 (T71)	07:37	06:58			07:06	18:14 (T69)	06:23	06:50 (T67)	06:00	07:09 (T68)
	17:19 48	09:32 (T71)	17:55	18:29			20:01 69	19:23 (T69)	20:33 121	19:07 (T69)	21:01 52	08:01 (T68)
8	07:57	08:45 (T71)	07:36	07:56			07:05	18:14 (T69)	06:22	06:51 (T67)	05:59	07:09 (T68)
	17:20 47	09:32 (T71)	17:57	19:30			20:02 70	19:24 (T69)	20:34 117	19:05 (T69)	21:01 51	08:00 (T68)
9	07:57	08:46 (T71)	07:35	07:54			07:03	18:13 (T69)	06:21	06:52 (T67)	05:59	07:09 (T68)
	17:21 46	09:32 (T71)	17:58	19:31			20:03 70	19:23 (T69)	20:35 114	19:04 (T69)	21:02 51	08:00 (T68)
10	07:57	08:46 (T71)	07:33	07:53			07:02	18:12 (T69)	06:20	06:53 (T67)	05:59	07:10 (T68)
	17:22 46	09:32 (T71)	17:59	19:32			20:04 71	19:23 (T69)	20:36 109	19:02 (T69)	21:03 50	08:00 (T68)
11	07:56	08:47 (T71)	07:32	07:51			07:00	18:12 (T69)	06:18	06:55 (T67)	05:59	07:10 (T68)
	17:23 45	09:32 (T71)	18:00	19:33			20:06 72	19:24 (T69)	20:37 103	19:00 (T69)	21:03 50	08:00 (T68)
12	07:56	08:48 (T71)	07:31	07:50			06:58	18:11 (T69)	06:17	06:57 (T67)	05:59	07:11 (T68)
	17:24 45	09:33 (T71)	18:01	19:34			20:07 72	19:23 (T69)	20:38 97	18:58 (T69)	21:04 49	08:00 (T68)
13	07:56	08:48 (T71)	07:30	07:48			06:57	18:11 (T69)	06:16	07:00 (T68)	05:59	07:11 (T68)
	17:25 44	09:32 (T71)	18:03	19:35			20:08 73	19:24 (T69)	20:39 88	18:56 (T69)	21:04 49	08:00 (T68)
14	07:55	08:49 (T71)	07:28	07:46			06:55	18:10 (T69)	06:15	07:00 (T68)	05:59	07:12 (T68)
	17:26 43	09:32 (T71)	18:04	19:37			20:09 73	19:23 (T69)	20:40 81	18:52 (T69)	21:05 48	08:00 (T68)
15	07:55	08:49 (T71)	07:27	07:45			06:54	18:11 (T69)	06:14	07:00 (T68)	05:59	07:12 (T68)
	17:27 43	09:32 (T71)	18:05	19:38			20:10 72	19:23 (T69)	20:41 66	08:06 (T68)	21:05 48	08:00 (T68)
16	07:55	08:51 (T71)	07:26	07:43			06:52	07:31 (T68)	06:13	07:00 (T68)	05:59	07:13 (T68)
	17:28 41	09:32 (T71)	18:06	19:39			20:11 86	19:23 (T69)	20:42 66	08:06 (T68)	21:06 47	08:00 (T68)
17	07:54	08:51 (T71)	07:25	07:41			06:51	07:26 (T68)	06:12	07:00 (T68)	05:59	07:13 (T68)
	17:30 40	09:31 (T71)	18:08	19:40			20:12 95	19:23 (T69)	20:43 65	08:05 (T68)	21:06 47	08:00 (T68)
18	07:54	08:53 (T71)	07:23	07:40			06:49	07:08 (T67)	06:11	07:00 (T68)	05:59	07:13 (T68)
	17:31 38	09:31 (T71)	18:09	19:41			20:13 105	19:22 (T69)	20:44 65	08:05 (T68)	21:06 47	08:00 (T68)
19	07:53	08:53 (T71)	07:22	07:38			06:47	07:07 (T67)	06:11	07:00 (T68)	05:59	07:13 (T68)
	17:32 38	09:31 (T71)	18:10	19:42			20:14 113	19:22 (T69)	20:45 65	08:05 (T68)	21:07 47	08:00 (T68)
20	07:53	08:55 (T71)	07:20	07:36			06:46	07:05 (T67)	06:10	07:01 (T68)	05:59	07:13 (T68)
	17:33 36	09:31 (T71)	18:11	19:43			20:15 120	19:21 (T69)	20:46 64	08:05 (T68)	21:07 47	08:00 (T68)
21	07:52	08:56 (T71)	07:19	07:35			06:44	07:04 (T67)	06:09	07:01 (T68)	05:59	07:14 (T68)
	17:34 34	09:30 (T71)	18:12	19:44			20:16 124	19:21 (T69)	20:47 64	08:05 (T68)	21:07 47	08:01 (T68)
22	07:51	08:57 (T71)	07:18	07:33			06:43	07:02 (T67)	06:08	07:01 (T68)	05:59	07:14 (T68)
	17:35 32	09:29 (T71)	18:14	19:45			20:17 127	19:20 (T69)	20:48 63	08:04 (T68)	21:07 47	08:01 (T68)
23	07:51	08:59 (T71)	07:16	07:31	18:44 (T69)		06:42	07:01 (T67)	06:07	07:01 (T68)	06:00	07:14 (T68)
	17:37 29	09:28 (T71)	18:15	19:46 17	19:01 (T69)		20:18 129	19:20 (T69)	20:49 63	08:04 (T68)	21:08 47	08:01 (T68)
24	07:50	09:00 (T71)	07:15	07:30	18:39 (T69)		06:40	06:59 (T67)	06:07	07:02 (T68)	06:00	07:14 (T68)
	17:38 27	09:27 (T71)	18:16	19:47 27	19:06 (T69)		20:19 130	19:19 (T69)	20:50 62	08:04 (T68)	21:08 47	08:01 (T68)
25	07:49	09:02 (T71)	07:13	07:28	18:35 (T69)		06:39	06:58 (T67)	06:06	07:02 (T68)	06:00	07:15 (T68)
	17:39 23	09:25 (T71)	18:17	19:48 34	19:09 (T69)		20:20 130	19:18 (T69)	20:51 62	08:04 (T68)	21:08 47	08:02 (T68)
26	07:48	09:04 (T71)	07:12	07:26	18:32 (T69)		06:37	06:57 (T67)	06:05	07:02 (T68)	06:00	07:15 (T68)
	17:40 19	09:23 (T71)	18:18	19:50 39	19:11 (T69)		20:21 131	19:18 (T69)	20:52 61	08:03 (T68)	21:08 47	08:02 (T68)
27	07:48	09:08 (T71)	07:10	07:25	18:30 (T69)		06:36	06:55 (T67)	06:05	07:03 (T68)	06:01	07:14 (T68)
	17:42 12	09:20 (T71)	18:20	19:51 44	19:14 (T69)		20:23 132	19:17 (T69)	20:52 60	08:03 (T68)	21:08 48	08:02 (T68)
28	07:47		07:09	07:23	18:28 (T69)		06:35	06:54 (T67)	06:04	07:03 (T68)	06:01	07:15 (T68)
	17:43		18:21	19:52 47	19:15 (T69)		20:24 133	19:16 (T69)	20:53 60	08:03 (T68)	21:08 48	08:03 (T68)
29	07:46			07:21	18:25 (T69)		06:33	06:53 (T67)	06:03	07:04 (T68)	06:02	07:15 (T68)
	17:44			19:53 51	19:16 (T69)		20:25 134	19:16 (T69)	20:54 59	08:03 (T68)	21:08 48	08:03 (T68)
30	07:45			07:20	18:24 (T69)		06:32	06:51 (T67)	06:03	07:04 (T68)	06:02	07:15 (T68)
	17:45			19:54 54	19:18 (T69)		20:26 133	19:14 (T69)	20:55 58	08:02 (T68)	21:08 49	08:04 (T68)
31	07:44			07:18	18:22 (T69)				06:02	07:05 (T68)		
	17:46			19:55 57	19:19 (T69)				20:56 57	08:02 (T68)		
Potential sun hours	297		297	370			399		448		452	
Total, worst case		1064			370			2850		2669		1485
Sun reduction		0.31			0.44			0.52		0.57		0.64
Oper. time red.		1.00			1.00			1.00		1.00		1.00
Wind dir. red.		0.53			0.63			0.64		0.66		0.67
Total reduction		0.16			0.27			0.33		0.37		0.42
Total, real		171			100			933		989		624

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

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

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1179 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7147)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:03		07:15 (T68)	06:27		07:06 (T67)	06:57		18:11 (T69)	07:28		07:02			07:37		08:29 (T71)
	21:08	49	08:04 (T68)	20:50	99	19:09 (T69)	20:07	72	19:23 (T69)	19:15		17:28			17:04	45	09:14 (T71)
2	06:03		07:15 (T68)	06:28		07:04 (T67)	06:58		18:11 (T69)	07:29		07:03			07:38		08:29 (T71)
	21:08	50	08:05 (T68)	20:49	105	19:11 (T69)	20:05	71	19:22 (T69)	19:13		17:27			17:04	46	09:15 (T71)
3	06:04		07:15 (T68)	06:29		07:02 (T67)	06:59		18:11 (T69)	07:30		07:04			07:39		08:29 (T71)
	21:08	50	08:05 (T68)	20:48	111	19:13 (T69)	20:04	70	19:21 (T69)	19:11		17:26			17:04	46	09:15 (T71)
4	06:04		07:15 (T68)	06:30		07:01 (T67)	07:00		18:11 (T69)	07:31		07:05			07:40		08:29 (T71)
	21:08	51	08:06 (T68)	20:47	115	19:14 (T69)	20:02	70	19:21 (T69)	19:10		17:25			17:03	47	09:16 (T71)
5	06:05		07:14 (T68)	06:31		07:00 (T67)	07:01		18:11 (T69)	07:32		07:07			07:41		08:29 (T71)
	21:08	52	08:06 (T68)	20:45	118	19:15 (T69)	20:01	69	19:20 (T69)	19:08		17:23			17:03	48	09:17 (T71)
6	06:05		07:15 (T68)	06:31		06:59 (T67)	07:02		18:11 (T69)	07:33		07:08			07:42		08:30 (T71)
	21:07	52	08:07 (T68)	20:44	123	19:17 (T69)	19:57	68	19:19 (T69)	19:07		17:22			17:03	47	09:17 (T71)
7	06:06		07:14 (T68)	06:32		06:58 (T67)	07:03		18:11 (T69)	07:34		07:09			07:43		08:30 (T71)
	21:07	53	08:07 (T68)	20:43	126	19:18 (T69)	19:56	67	19:18 (T69)	19:05		17:21			17:03	48	09:18 (T71)
8	06:07		07:14 (T68)	06:33		06:58 (T67)	07:04		18:12 (T69)	07:35		07:10			07:44		08:30 (T71)
	21:07	54	08:08 (T68)	20:42	128	19:19 (T69)	19:54	65	19:17 (T69)	19:03		17:20			17:03	48	09:18 (T71)
9	06:07		07:14 (T68)	06:34		06:57 (T67)	07:05		18:12 (T69)	07:36		07:11			07:44		08:31 (T71)
	21:06	55	08:09 (T68)	20:41	131	19:20 (T69)	19:52	64	19:16 (T69)	19:02		17:19			17:03	48	09:19 (T71)
10	06:08		07:13 (T68)	06:35		06:57 (T67)	07:06		18:13 (T69)	07:37		07:13			07:45		08:31 (T71)
	21:06	56	08:09 (T68)	20:39	133	19:21 (T69)	19:51	61	19:14 (T69)	19:00		17:18			17:03	49	09:20 (T71)
11	06:09		07:14 (T68)	06:36		06:58 (T67)	07:07		18:13 (T69)	07:38		07:14			07:46		08:32 (T71)
	21:06	56	08:10 (T68)	20:38	133	19:22 (T69)	19:49	60	19:13 (T69)	18:58		17:17			17:03	48	09:20 (T71)
12	06:09		07:14 (T68)	06:37		06:59 (T67)	07:08		18:13 (T69)	07:39		07:15			07:47		08:31 (T71)
	21:05	56	08:10 (T68)	20:37	133	19:22 (T69)	19:47	57	19:10 (T69)	18:57		17:16			17:03	49	09:20 (T71)
13	06:10		07:13 (T68)	06:38		07:00 (T67)	07:09		18:14 (T69)	07:40		07:16			07:48		08:32 (T71)
	21:05	57	08:10 (T68)	20:35	133	19:23 (T69)	19:45	55	19:09 (T69)	18:55		17:15			17:03	49	09:21 (T71)
14	06:11		07:13 (T68)	06:39		07:01 (T67)	07:10		18:15 (T69)	07:41		07:17			07:49		08:33 (T71)
	21:04	58	08:11 (T68)	20:34	134	19:24 (T69)	19:44	52	19:07 (T69)	18:54		17:14			17:04	49	09:22 (T71)
15	06:12		07:13 (T68)	06:40		07:02 (T67)	07:11		18:16 (T69)	07:42		07:19		08:41 (T71)	07:49		08:33 (T71)
	21:04	59	08:12 (T68)	20:33	133	19:24 (T69)	19:42	49	19:05 (T69)	18:52		17:13	12	08:53 (T71)	17:04	49	09:22 (T71)
16	06:12		07:13 (T68)	06:41		07:03 (T67)	07:12		18:18 (T69)	07:43		07:20		08:37 (T71)	07:50		08:33 (T71)
	21:03	59	08:12 (T68)	20:31	133	19:25 (T69)	19:40	45	19:03 (T69)	18:51		17:13	19	08:56 (T71)	17:04	49	09:22 (T71)
17	06:13		07:12 (T68)	06:42		07:04 (T67)	07:13		18:20 (T69)	07:45		07:21		08:35 (T71)	07:51		08:34 (T71)
	21:03	60	08:12 (T68)	20:30	132	19:25 (T69)	19:39	40	19:00 (T69)	18:49		17:12	23	08:58 (T71)	17:04	49	09:23 (T71)
18	06:14		07:12 (T68)	06:43		07:05 (T67)	07:14		18:22 (T69)	07:46		07:22		08:34 (T71)	07:51		08:35 (T71)
	21:02	61	08:13 (T68)	20:28	131	19:25 (T69)	19:37	35	18:57 (T69)	18:48		17:11	27	09:01 (T71)	17:05	49	09:24 (T71)
19	06:15		07:12 (T68)	06:44		07:06 (T67)	07:15		18:25 (T69)	07:47		07:23		08:33 (T71)	07:52		08:34 (T71)
	21:01	61	08:13 (T68)	20:27	129	19:26 (T69)	19:35	29	18:54 (T69)	18:46		17:10	29	09:02 (T71)	17:05	50	09:24 (T71)
20	06:16		07:12 (T68)	06:45		07:07 (T67)	07:16		18:29 (T69)	07:48		07:24		08:32 (T71)	07:53		08:35 (T71)
	21:01	62	08:14 (T68)	20:26	128	19:26 (T69)	19:34	20	18:49 (T69)	18:45		17:10	32	09:04 (T71)	17:05	50	09:25 (T71)
21	06:16		07:12 (T68)	06:46		07:08 (T67)	07:17			07:49		07:26		08:31 (T71)	07:53		08:35 (T71)
	21:00	63	08:15 (T68)	20:24	126	19:26 (T69)	19:32			18:43		17:09	34	09:05 (T71)	17:06	50	09:25 (T71)
22	06:17		07:12 (T68)	06:47		07:08 (T67)	07:18			07:50		07:27		08:31 (T71)	07:54		08:36 (T71)
	20:59	63	08:15 (T68)	20:23	124	19:25 (T69)	19:30			18:42		17:08	36	09:07 (T71)	17:06	50	09:26 (T71)
23	06:18		07:11 (T68)	06:48		07:09 (T67)	07:19			07:51		07:28		08:30 (T71)	07:54		08:36 (T71)
	20:58	64	08:15 (T68)	20:21	120	19:25 (T69)	19:28			18:40		17:08	38	09:08 (T71)	17:07	50	09:26 (T71)
24	06:19		07:11 (T68)	06:49		07:10 (T67)	07:20			07:52		07:29		08:30 (T71)	07:55		08:37 (T71)
	20:57	64	08:15 (T68)	20:20	113	19:25 (T69)	19:27			18:39		17:07	38	09:08 (T71)	17:07	50	09:27 (T71)
25	06:20		07:11 (T68)	06:50		07:11 (T67)	07:21			07:54		07:30		08:29 (T71)	07:55		08:37 (T71)
	20:57	64	08:15 (T68)	20:18	103	19:25 (T69)	19:25			18:37		17:06	40	09:09 (T71)	17:08	50	09:27 (T71)
26	06:21		07:11 (T68)	06:51		07:28 (T68)	07:22			07:55		07:31		08:29 (T71)	07:55		08:38 (T71)
	20:56	65	08:16 (T68)	20:17	96	19:25 (T69)	19:23			18:36		17:06	41	09:10 (T71)	17:09	49	09:27 (T71)
27	06:22		07:11 (T68)	06:52		07:34 (T68)	07:23			07:56		07:32		08:29 (T71)	07:56		08:39 (T71)
	20:55	65	08:16 (T68)	20:15	84	19:25 (T69)	19:22			18:35		17:06	43	09:12 (T71)	17:09	49	09:28 (T71)
28	06:23		07:11 (T68)	06:53		18:12 (T69)	07:24			07:57		07:34		08:29 (T71)	07:56		08:39 (T71)
	20:54	65	08:16 (T68)	20:13	72	19:24 (T69)	19:20			18:33		17:05	43	09:12 (T71)	17:10	49	09:28 (T71)
29	06:24		07:11 (T68)	06:54		18:11 (T69)	07:25			07:58		07:35		08:29 (T71)	07:56		08:39 (T71)
	20:53	75	19:00 (T69)	20:12	73	19:24 (T69)	19:18			18:32		17:05	44	09:13 (T71)	17:11	49	09:28 (T71)
30	06:25		07:11 (T68)	06:55		18:11 (T69)	07:26			07:59		07:36		08:29 (T71)	07:56		08:40 (T71)
	20:52	85	19:05 (T69)	20:10	73	19:24 (T69)	19:17			18:31		17:04	45	09:14 (T71)	17:12	49	09:29 (T71)
31	06:26		07:10 (T67)	06:56		18:11 (T69)				08:01					07:57		08:40 (T71)
	20:51	92	19:08 (T69)	20:09	72	19:23 (T69)				18:29					17:12	49	09:29 (T71)
Potential sun hours	459			428			375			345		298			288		
Total, worst case		1876			3564			1119					544			1507	
Sun reduction		0.66			0.61			0.59					0.30			0.22	
Oper. time red.		1.00			1.00			1.00					1.00			1.00	
Wind dir. red.		0.67			0.65			0.63					0.53			0.53	
Total reduction		0.43			0.39			0.36					0.16			0.11	
Total, real		812			1388			407					85			172	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1204 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7169)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June	
1	07:57			07:44		08:06 (T22)	07:07		16:25 (T21)	07:16			06:30		07:03 (T20)	06:01	
	17:13			17:47	89	17:05 (T21)	18:22	24	16:49 (T21)	19:56			20:27	19	07:22 (T20)	20:57	
2	07:58			07:43		08:07 (T22)	07:06		16:28 (T21)	07:14			06:29		07:04 (T20)	06:01	
	17:13			17:48	88	17:05 (T21)	18:23	16	16:44 (T21)	19:57			20:28	16	07:20 (T20)	20:58	
3	07:58			07:42		08:07 (T22)	07:04			07:13			06:27		07:06 (T20)	06:00	
	17:14			17:50	89	17:06 (T21)	18:24			19:58			20:29	12	07:18 (T20)	20:59	
4	07:58			07:40		08:08 (T22)	07:02			07:11			06:26		07:10 (T20)	06:00	
	17:15			17:51	88	17:06 (T21)	18:25			19:59			20:30	4	07:14 (T20)	20:59	
5	07:58			07:39		08:08 (T22)	07:01			07:09			06:25			05:59	
	17:16			17:52	89	17:07 (T21)	18:26			20:00			20:31			21:00	
6	07:58			07:38		08:09 (T22)	06:59			07:08			06:24			05:59	
	17:17			17:53	87	17:07 (T21)	18:27			20:00			20:32			21:01	
7	07:58			07:37		08:09 (T22)	06:58			07:06			06:22			05:59	
	17:18			17:55	87	17:07 (T21)	18:28			20:01			20:33			21:01	
8	07:57			07:36		08:11 (T22)	07:56			07:04			06:21			05:59	
	17:19			17:56	84	17:07 (T21)	19:30			20:02			20:34			21:02	
9	07:57			07:35		08:12 (T22)	07:54			07:03			06:20			05:58	
	17:20			17:57	81	17:07 (T21)	19:31			20:03			20:36			21:03	
10	07:57		16:24 (T21)	07:34		08:14 (T22)	07:53			07:01			06:19			05:58	
	17:21	8	16:32 (T21)	17:59	78	17:08 (T21)	19:32			20:05			20:37			21:03	
11	07:57		16:22 (T21)	07:32		08:17 (T22)	07:51			07:00			06:18			05:58	
	17:22	15	16:37 (T21)	18:00	70	17:07 (T21)	19:33			20:06			20:38			21:04	
12	07:57		16:19 (T21)	07:31		16:05 (T21)	07:50			06:58			06:17			05:58	
	17:23	20	16:39 (T21)	18:01	62	17:07 (T21)	19:34			20:07			20:39			21:04	
13	07:56		16:18 (T21)	07:30		16:06 (T21)	07:48			06:56			06:16			05:58	
	17:24	24	16:42 (T21)	18:02	61	17:07 (T21)	19:35			20:08			20:40			21:05	
14	07:56		16:16 (T21)	07:29		16:06 (T21)	07:46			06:55		07:14 (T20)	06:15			05:58	
	17:25	27	16:43 (T21)	18:03	61	17:07 (T21)	19:36			20:09	7	07:21 (T20)	20:41			21:05	
15	07:55		16:15 (T21)	07:27		16:06 (T21)	07:45			06:53		07:12 (T20)	06:14			05:58	
	17:27	30	16:45 (T21)	18:05	60	17:06 (T21)	19:37			20:10	11	07:23 (T20)	20:42			21:06	
16	07:55		16:14 (T21)	07:26		16:07 (T21)	07:43			06:52		07:11 (T20)	06:13			05:58	
	17:28	33	16:47 (T21)	18:06	59	17:06 (T21)	19:39			20:11	14	07:25 (T20)	20:43			21:06	
17	07:55		08:16 (T22)	07:25		16:07 (T21)	07:41			06:50		07:09 (T20)	06:12			05:58	
	17:29	39	16:49 (T21)	18:07	58	17:05 (T21)	19:40			20:12	17	07:26 (T20)	20:44			21:07	
18	07:54		08:15 (T22)	07:23		16:08 (T21)	07:40			06:49		07:08 (T20)	06:11			05:58	
	17:30	45	16:50 (T21)	18:08	57	17:05 (T21)	19:41			20:13	19	07:27 (T20)	20:45			21:07	
19	07:54		08:15 (T22)	07:22		16:09 (T21)	07:38			06:47		07:06 (T20)	06:10			05:58	
	17:31	50	16:52 (T21)	18:10	56	17:05 (T21)	19:42			20:14	21	07:27 (T20)	20:46			21:07	
20	07:53		08:14 (T22)	07:21		16:09 (T21)	07:36			06:46		07:05 (T20)	06:09			05:58	
	17:32	54	16:53 (T21)	18:11	54	17:03 (T21)	19:43			20:15	23	07:28 (T20)	20:47			21:07	
21	07:52		08:13 (T22)	07:19		16:11 (T21)	07:34			06:44		07:03 (T20)	06:08			05:58	
	17:34	58	16:54 (T21)	18:12	52	17:03 (T21)	19:44			20:16	25	07:28 (T20)	20:47			21:08	
22	07:52		08:13 (T22)	07:18		16:11 (T21)	07:33			06:43		07:02 (T20)	06:07			05:59	
	17:35	62	16:56 (T21)	18:13	50	17:01 (T21)	19:45			20:17	26	07:28 (T20)	20:48			21:08	
23	07:51		08:12 (T22)	07:16		16:13 (T21)	07:31			06:41		07:00 (T20)	06:07			05:59	
	17:36	66	16:57 (T21)	18:14	48	17:01 (T21)	19:46			20:18	27	07:27 (T20)	20:49			21:08	
24	07:50		08:11 (T22)	07:15		16:14 (T21)	07:29			06:40		07:00 (T20)	06:06			05:59	
	17:37	70	16:58 (T21)	18:16	45	16:59 (T21)	19:47			20:20	28	07:28 (T20)	20:50			21:08	
25	07:50		08:10 (T22)	07:13		16:16 (T21)	07:28			06:38		07:00 (T20)	06:05			05:59	
	17:38	73	16:58 (T21)	18:17	42	16:58 (T21)	19:48			20:21	28	07:28 (T20)	20:51			21:09	
26	07:49		08:10 (T22)	07:12		16:17 (T21)	07:26			06:37		06:59 (T20)	06:04			06:00	
	17:40	75	17:00 (T21)	18:18	39	16:56 (T21)	19:49			20:22	27	07:26 (T20)	20:52			21:09	
27	07:48		08:09 (T22)	07:10		16:19 (T21)	07:24			06:35		07:00 (T20)	06:04			06:00	
	17:41	79	17:01 (T21)	18:19	35	16:54 (T21)	19:51			20:23	26	07:26 (T20)	20:53			21:09	
28	07:47		08:08 (T22)	07:09		16:21 (T21)	07:23			06:34		07:01 (T20)	06:03			06:00	
	17:42	81	17:02 (T21)	18:20	30	16:51 (T21)	19:52			20:24	25	07:26 (T20)	20:54			21:09	
29	07:46		08:07 (T22)				07:21			06:33		07:01 (T20)	06:03			06:01	
	17:43	84	17:03 (T21)				19:53			20:25	23	07:24 (T20)	20:55			21:09	
30	07:45		08:06 (T22)				07:19			06:31		07:02 (T20)	06:02			06:01	
	17:45	86	17:03 (T21)				19:54			20:26	21	07:23 (T20)	20:55			21:09	
31	07:44		08:06 (T22)				07:18						06:02				
	17:46	87	17:04 (T21)				19:55						20:56				
Potential sun hours	297			297			370			399			449			453	
Total, worst case		1166			1799			40			368			51			
Sun reduction		0.31			0.40			0.44			0.52			0.57			
Oper. time red.		1.00			1.00			1.00			1.00			1.00			
Wind dir. red.		0.68			0.70			0.73			0.67			0.67			
Total reduction		0.21			0.28			0.32			0.35			0.38			
Total, real		245			503			13			127			19			

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1204 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7169)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September		October			November			December		
1	06:02		06:26			06:57		07:27			07:02		07:43 (T22)	07:37		16:03 (T21)
	21:09		20:50			20:07		19:15			17:28	77	16:36 (T21)	17:03	16	16:19 (T21)
2	06:02		06:27			06:58		07:28			07:03		07:42 (T22)	07:38		16:07 (T21)
	21:09		20:49			20:06		19:13			17:26	81	16:37 (T21)	17:03	9	16:16 (T21)
3	06:03		06:28			06:59		07:30			07:04		07:40 (T22)	07:39		
	21:08		20:48			20:04		19:11			17:25	85	16:37 (T21)	17:03		
4	06:03		06:29			07:00		07:31			07:06		07:39 (T22)	07:40		
	21:08		20:47			20:02		19:10			17:24	86	16:36 (T21)	17:03		
5	06:04		06:30			07:01		07:32			07:07		07:39 (T22)	07:41		
	21:08		20:46			20:01		19:08			17:23	87	16:37 (T21)	17:02		
6	06:04		06:31			07:02		07:33			07:08		07:38 (T22)	07:42		
	21:08		20:45			19:57		19:06			17:22	89	16:37 (T21)	17:02		
7	06:05		06:32			07:03		07:34			07:09		07:37 (T22)	07:43		
	21:08		20:43			19:56		19:05			17:21	89	16:36 (T21)	17:02		
8	06:06		06:33			07:04		07:35			07:10		07:37 (T22)	07:44		
	21:07		20:42			19:54		19:03			17:20	89	16:36 (T21)	17:02		
9	06:06		06:34		07:18 (T20)	07:05		07:36			07:12		07:37 (T22)	07:45		
	21:07		20:41	8	07:26 (T20)	19:52		19:01			17:19	89	16:36 (T21)	17:02		
10	06:07		06:35		07:14 (T20)	07:06		07:37			07:13		07:37 (T22)	07:46		
	21:07		20:40	13	07:27 (T20)	19:51		19:00			17:18	88	16:35 (T21)	17:02		
11	06:08		06:36		07:12 (T20)	07:07		07:38		17:06 (T21)	07:14		07:37 (T22)	07:47		
	21:06		20:38	17	07:29 (T20)	19:49		18:58	8	17:14 (T21)	17:17	88	16:35 (T21)	17:02		
12	06:09		06:37		07:10 (T20)	07:08		07:39		17:00 (T21)	07:15		07:38 (T22)	07:47		
	21:06		20:37	20	07:30 (T20)	19:47		18:57	20	17:20 (T21)	17:16	86	16:35 (T21)	17:02		
13	06:09		06:38		07:09 (T20)	07:09		07:40		16:56 (T21)	07:16		07:39 (T22)	07:48		
	21:05		20:36	22	07:31 (T20)	19:45		18:55	27	17:23 (T21)	17:15	83	16:34 (T21)	17:03		
14	06:10		06:39		07:08 (T20)	07:10		07:41		16:54 (T21)	07:18		07:40 (T22)	07:49		
	21:05		20:34	24	07:32 (T20)	19:44		18:53	32	17:26 (T21)	17:14	81	16:34 (T21)	17:03		
15	06:11		06:40		07:07 (T20)	07:11		07:42		16:51 (T21)	07:19		07:41 (T22)	07:50		
	21:04		20:33	26	07:33 (T20)	19:42		18:52	37	17:28 (T21)	17:13	79	16:33 (T21)	17:03		
16	06:12		06:41		07:07 (T20)	07:12		07:44		16:49 (T21)	07:20		07:43 (T22)	07:50		
	21:04		20:32	26	07:33 (T20)	19:40		18:50	40	17:29 (T21)	17:12	75	16:33 (T21)	17:03		
17	06:12		06:42		07:06 (T20)	07:13		07:45		16:46 (T21)	07:21		07:44 (T22)	07:51		
	21:03		20:30	27	07:33 (T20)	19:39		18:49	44	17:30 (T21)	17:11	73	16:32 (T21)	17:04		
18	06:13		06:43		07:06 (T20)	07:14		07:46		16:45 (T21)	07:22		07:45 (T22)	07:52		
	21:02		20:29	27	07:33 (T20)	19:37		18:47	46	17:31 (T21)	17:10	70	16:32 (T21)	17:04		
19	06:14		06:44		07:05 (T20)	07:15		07:47		16:43 (T21)	07:24		07:46 (T22)	07:52		
	21:02		20:27	28	07:33 (T20)	19:35		18:46	49	17:32 (T21)	17:10	66	16:31 (T21)	17:04		
20	06:15		06:45		07:06 (T20)	07:16		07:48		16:42 (T21)	07:25		07:48 (T22)	07:53		
	21:01		20:26	27	07:33 (T20)	19:33		18:44	51	17:33 (T21)	17:09	62	16:31 (T21)	17:05		
21	06:16		06:46		07:07 (T20)	07:17		07:49		16:41 (T21)	07:26		07:49 (T22)	07:54		
	21:00		20:24	26	07:33 (T20)	19:32		18:43	53	17:34 (T21)	17:08	58	16:30 (T21)	17:05		
22	06:17		06:47		07:08 (T20)	07:18		07:50		16:40 (T21)	07:27		07:50 (T22)	07:54		
	20:59		20:23	24	07:32 (T20)	19:30		18:41	54	17:34 (T21)	17:08	54	16:29 (T21)	17:06		
23	06:18		06:48		07:09 (T20)	07:19		07:51		16:38 (T21)	07:28		07:51 (T22)	07:55		
	20:59		20:21	23	07:32 (T20)	19:28		18:40	57	17:35 (T21)	17:07	50	16:28 (T21)	17:06		
24	06:18		06:49		07:10 (T20)	07:20		07:53		16:37 (T21)	07:29		07:53 (T22)	07:55		
	20:58		20:20	21	07:31 (T20)	19:27		18:38	58	17:35 (T21)	17:06	45	16:28 (T21)	17:07		
25	06:19		06:50		07:11 (T20)	07:21		07:54		16:37 (T21)	07:31		07:54 (T22)	07:55		
	20:57		20:18	19	07:30 (T20)	19:25		18:37	59	17:36 (T21)	17:06	39	16:27 (T21)	17:07		
26	06:20		06:51		07:12 (T20)	07:22		07:55		16:37 (T21)	07:32		15:53 (T21)	07:56		
	20:56		20:17	17	07:29 (T20)	19:23		18:36	59	17:36 (T21)	17:05	33	16:26 (T21)	17:08		
27	06:21		06:52		07:13 (T20)	07:23		07:56		16:36 (T21)	07:33		15:54 (T21)	07:56		
	20:55		20:15	14	07:27 (T20)	19:21		18:34	60	17:36 (T21)	17:05	30	16:24 (T21)	17:09		
28	06:22		06:53		07:14 (T20)	07:24		07:57		16:35 (T21)	07:34		15:56 (T21)	07:56		
	20:54		20:14	11	07:25 (T20)	19:20		18:33	61	17:36 (T21)	17:04	27	16:23 (T21)	17:09		
29	06:23		06:54		07:15 (T20)	07:25		07:58		16:35 (T21)	07:35		15:58 (T21)	07:57		
	20:53		20:12	7	07:22 (T20)	19:18		18:32	62	17:37 (T21)	17:04	24	16:22 (T21)	17:10		
30	06:24		06:55			07:26		08:00		16:35 (T21)	07:36		16:01 (T21)	07:57		
	20:52		20:10			19:16		18:30	62	17:37 (T21)	17:04	20	16:21 (T21)	17:11		
31	06:25		06:56					08:01		08:46 (T22)				07:57		
	20:51		20:09					18:29	73	17:37 (T21)				17:12		
Potential sun hours	460		429			375		345			297			287		
Total, worst case				427					1012			2003			25	
Sun reduction				0.61					0.48			0.30			0.22	
Oper. time red.				1.00					1.00			1.00			1.00	
Wind dir. red.				0.67					0.73			0.68			0.73	
Total reduction				0.41					0.35			0.20			0.16	
Total, real				174					352			405			4	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1236 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7193)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		08:22 (T4)	07:43		08:04 (T5)	07:07		07:16		07:59 (T3)	06:30		08:12 (T3)	06:01	
	17:12	32	08:54 (T4)	17:47	58	09:07 (T4)	18:21		19:56	74	09:13 (T3)	20:27	27	08:39 (T3)	20:57	
2	07:57		08:22 (T4)	07:42		08:03 (T5)	07:05		07:14		07:58 (T3)	06:28		08:15 (T3)	06:00	
	17:13	33	08:55 (T4)	17:48	58	09:06 (T4)	18:22		19:57	75	09:13 (T3)	20:28	21	08:36 (T3)	20:58	
3	07:58		08:22 (T4)	07:41		08:02 (T5)	07:04		07:12		07:57 (T3)	06:27		08:20 (T3)	06:00	
	17:14	34	08:56 (T4)	17:49	59	09:06 (T4)	18:24		19:58	75	09:12 (T3)	20:29	11	08:31 (T3)	20:58	
4	07:58		08:22 (T4)	07:40		08:01 (T5)	07:02		07:11		07:57 (T3)	06:26			05:59	
	17:15	35	08:57 (T4)	17:51	59	09:05 (T4)	18:25		19:59	76	09:13 (T3)	20:30			20:59	
5	07:58		08:22 (T4)	07:39		08:00 (T5)	07:01		07:09		07:56 (T3)	06:25			05:59	
	17:16	36	08:58 (T4)	17:52	57	09:04 (T4)	18:26		20:00	76	09:12 (T3)	20:31			21:00	
6	07:57		08:22 (T4)	07:38		07:58 (T5)	06:59		07:07		07:56 (T3)	06:23			05:59	
	17:17	36	08:58 (T4)	17:53	57	09:02 (T4)	18:27		20:00	75	09:11 (T3)	20:32			21:01	
7	07:57		08:22 (T4)	07:37		07:57 (T5)	06:57		07:06		07:56 (T3)	06:22			05:58	
	17:18	37	08:59 (T4)	17:54	55	09:00 (T4)	18:28		20:01	75	09:11 (T3)	20:33			21:01	
8	07:57		08:22 (T4)	07:36		07:57 (T5)	07:56		07:04		07:55 (T3)	06:21			05:58	
	17:19	37	08:59 (T4)	17:56	50	08:58 (T4)	19:29		20:02	75	09:10 (T3)	20:34			21:02	
9	07:57		08:22 (T4)	07:35		07:57 (T5)	07:54		07:03		07:56 (T3)	06:20			05:58	
	17:20	38	09:00 (T4)	17:57	44	08:55 (T4)	19:30		20:03	74	09:10 (T3)	20:35			21:02	
10	07:57		08:22 (T4)	07:34		07:57 (T5)	07:53		07:01		07:55 (T3)	06:19			05:58	
	17:21	39	09:01 (T4)	17:58	32	08:29 (T5)	19:32		20:04	74	09:09 (T3)	20:36			21:03	
11	07:57		08:23 (T4)	07:32		07:57 (T5)	07:51		06:59		07:55 (T3)	06:18			05:58	
	17:22	39	09:02 (T4)	17:59	31	08:28 (T5)	19:33		20:05	73	09:08 (T3)	20:37			21:04	
12	07:56		08:22 (T4)	07:31		07:58 (T5)	07:49		06:58		07:56 (T3)	06:16			05:58	
	17:23	40	09:02 (T4)	18:01	30	08:28 (T5)	19:34		20:06	72	09:08 (T3)	20:38			21:04	
13	07:56		08:23 (T4)	07:30		07:58 (T5)	07:48	08:34 (T3)	06:56		07:55 (T3)	06:15			05:57	
	17:24	41	09:04 (T4)	18:02	30	08:28 (T5)	19:35	17 08:51 (T3)	20:08	72	09:07 (T3)	20:40			21:05	
14	07:56		08:22 (T4)	07:29		07:58 (T5)	07:46	08:28 (T3)	06:55		07:56 (T3)	06:14			05:57	
	17:25	42	09:04 (T4)	18:03	28	08:26 (T5)	19:36	27 08:55 (T3)	20:09	71	09:07 (T3)	20:41			21:05	
15	07:55		08:23 (T4)	07:27		07:59 (T5)	07:44	08:25 (T3)	06:53		07:56 (T3)	06:13			05:57	
	17:26	42	09:05 (T4)	18:04	27	08:26 (T5)	19:37	34 08:59 (T3)	20:10	69	09:05 (T3)	20:42			21:06	
16	07:55		08:22 (T4)	07:26		08:01 (T5)	07:43	08:21 (T3)	06:51		07:57 (T3)	06:12			05:57	
	17:27	43	09:05 (T4)	18:06	24	08:25 (T5)	19:38	41 09:02 (T3)	20:11	68	09:05 (T3)	20:43			21:06	
17	07:54		08:23 (T4)	07:25		08:01 (T5)	07:41	08:18 (T3)	06:50		07:56 (T3)	06:11			05:57	
	17:29	43	09:06 (T4)	18:07	22	08:23 (T5)	19:39	45 09:03 (T3)	20:12	67	09:03 (T3)	20:44			21:06	
18	07:54		08:23 (T4)	07:23		08:03 (T5)	07:39	08:16 (T3)	06:48		07:56 (T3)	06:10			05:57	
	17:30	43	09:06 (T4)	18:08	19	08:22 (T5)	19:41	49 09:05 (T3)	20:13	66	09:02 (T3)	20:45			21:07	
19	07:53		08:24 (T4)	07:22		08:05 (T5)	07:38	08:14 (T3)	06:47		07:57 (T3)	06:10			05:58	
	17:31	43	09:07 (T4)	18:09	14	08:19 (T5)	19:42	53 09:07 (T3)	20:14	64	09:01 (T3)	20:45			21:07	
20	07:53		08:23 (T4)	07:20		08:10 (T5)	07:36	08:12 (T3)	06:45		07:58 (T3)	06:09			05:58	
	17:32	44	09:07 (T4)	18:11	5	08:15 (T5)	19:43	56 09:08 (T3)	20:15	62	09:00 (T3)	20:46			21:07	
21	07:52		08:23 (T4)	07:19			07:34	08:10 (T3)	06:44		07:59 (T3)	06:08			05:58	
	17:33	44	09:07 (T4)	18:12			19:44	59 09:09 (T3)	20:16	59	08:58 (T3)	20:47			21:08	
22	07:52		08:24 (T4)	07:17			07:33	08:09 (T3)	06:42		08:00 (T3)	06:07			05:58	
	17:34	44	09:08 (T4)	18:13			19:45	61 09:10 (T3)	20:17	57	08:57 (T3)	20:48			21:08	
23	07:51		08:24 (T4)	07:16			07:31	08:07 (T3)	06:41		08:00 (T3)	06:06			05:58	
	17:36	44	09:08 (T4)	18:14			19:46	64 09:11 (T3)	20:18	55	08:55 (T3)	20:49			21:08	
24	07:50		08:24 (T4)	07:15			07:29	08:06 (T3)	06:39		08:01 (T3)	06:06			05:59	
	17:37	44	09:08 (T4)	18:15			19:47	65 09:11 (T3)	20:19	53	08:54 (T3)	20:50			21:08	
25	07:49		08:25 (T4)	07:13			07:28	08:05 (T3)	06:38		08:02 (T3)	06:05			05:59	
	17:38	43	09:08 (T4)	18:17			19:48	68 09:13 (T3)	20:20	50	08:52 (T3)	20:51			21:08	
26	07:49		08:25 (T4)	07:12			07:26	08:04 (T3)	06:36		08:03 (T3)	06:04			05:59	
	17:39	43	09:08 (T4)	18:18			19:49	69 09:13 (T3)	20:22	48	08:51 (T3)	20:52			21:09	
27	07:48		08:26 (T4)	07:10			07:24	08:02 (T3)	06:35		08:05 (T3)	06:03			06:00	
	17:41	43	09:09 (T4)	18:19			19:50	71 09:13 (T3)	20:23	44	08:49 (T3)	20:53			21:09	
28	07:47		08:08 (T5)	07:09			07:22	08:01 (T3)	06:34		08:06 (T3)	06:03			06:00	
	17:42	50	09:08 (T4)	18:20			19:51	72 09:13 (T3)	20:24	41	08:47 (T3)	20:54			21:09	
29	07:46		08:07 (T5)				07:21	08:01 (T3)	06:32		08:08 (T3)	06:02			06:00	
	17:43	53	09:08 (T4)				19:52	72 09:13 (T3)	20:25	37	08:45 (T3)	20:55			21:09	
30	07:45		08:06 (T5)				07:19	08:00 (T3)	06:31		08:10 (T3)	06:02			06:01	
	17:44	55	09:08 (T4)				19:54	73 09:13 (T3)	20:26	33	08:43 (T3)	20:55			21:09	
31	07:44		08:05 (T5)				07:17	07:59 (T3)				06:01				
	17:46	57	09:07 (T4)				19:55	74 09:13 (T3)				20:56				
Potential sun hours	297			297			370		399			449			453	
Total, worst case		1297			759			1070		1910			59			
Sun reduction		0.31			0.40			0.44		0.52			0.57			
Oper. time red.		1.00			1.00			1.00		1.00			1.00			
Wind dir. red.		0.52			0.54			0.60		0.60			0.60			
Total reduction		0.16			0.21			0.26		0.31			0.34			
Total, real		206			159			279		588			20			

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1236 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7193)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August			September			October			November			December		
1	06:01		06:26			06:57		07:54 (T3)	07:27		08:20 (T3)	07:02		07:26 (T5)	07:37		08:05 (T4)
	21:09		20:50			20:07	73	09:07 (T3)	19:14	3	08:23 (T3)	17:27	31	07:57 (T5)	17:03	39	08:44 (T4)
2	06:02		06:27			06:58		07:53 (T3)	07:28			07:03		07:27 (T5)	07:38		08:05 (T4)
	21:08		20:49			20:05	74	09:07 (T3)	19:13			17:26	44	08:25 (T4)	17:03	39	08:44 (T4)
3	06:02		06:28			06:59		07:53 (T3)	07:29			07:04		07:27 (T5)	07:39		08:06 (T4)
	21:08		20:48			20:04	74	09:07 (T3)	19:11			17:25	51	08:28 (T4)	17:02	38	08:44 (T4)
4	06:03		06:29			07:00		07:53 (T3)	07:30			07:05		07:27 (T5)	07:40		08:07 (T4)
	21:08		20:47			20:02	74	09:07 (T3)	19:09			17:24	54	08:30 (T4)	17:02	37	08:44 (T4)
5	06:04		06:30			07:01		07:52 (T3)	07:31			07:07		07:28 (T5)	07:41		08:07 (T4)
	21:08		20:46			20:00	75	09:07 (T3)	19:08			17:23	57	08:32 (T4)	17:02	38	08:45 (T4)
6	06:04		06:31			07:02		07:52 (T3)	07:32			07:08		07:30 (T5)	07:42		08:08 (T4)
	21:08		20:44			19:57	75	09:07 (T3)	19:06			17:21	58	08:34 (T4)	17:02	37	08:45 (T4)
7	06:05		06:32			07:03		07:52 (T3)	07:34			07:09		07:31 (T5)	07:43		08:09 (T4)
	21:07		20:43			19:55	75	09:07 (T3)	19:04			17:20	59	08:35 (T4)	17:02	36	08:45 (T4)
8	06:05		06:33			07:04		07:51 (T3)	07:35			07:10		07:32 (T5)	07:44		08:10 (T4)
	21:07		20:42			19:54	76	09:07 (T3)	19:03			17:19	59	08:36 (T4)	17:02	35	08:45 (T4)
9	06:06		06:34			07:05		07:51 (T3)	07:36			07:12		07:34 (T5)	07:45		08:10 (T4)
	21:07		20:41			19:52	76	09:07 (T3)	19:01			17:18	58	08:37 (T4)	17:02	34	08:44 (T4)
10	06:07		06:35		08:27 (T3)	07:06		07:51 (T3)	07:37			07:13		07:35 (T5)	07:46		08:11 (T4)
	21:06		20:39	14	08:41 (T3)	19:50	75	09:06 (T3)	18:59			17:17	58	08:38 (T4)	17:02	33	08:44 (T4)
11	06:07		06:36		08:23 (T3)	07:07		07:51 (T3)	07:38			07:14		07:36 (T5)	07:47		08:12 (T4)
	21:06		20:38	23	08:46 (T3)	19:49	75	09:06 (T3)	18:58			17:16	56	08:38 (T4)	17:02	32	08:44 (T4)
12	06:08		06:37		08:20 (T3)	07:08		07:51 (T3)	07:39			07:15		07:37 (T5)	07:47		08:12 (T4)
	21:06		20:37	29	08:49 (T3)	19:47	74	09:05 (T3)	18:56			17:15	55	08:39 (T4)	17:02	33	08:45 (T4)
13	06:09		06:38		08:17 (T3)	07:09		07:51 (T3)	07:40			07:16		07:39 (T5)	07:48		08:13 (T4)
	21:05		20:36	34	08:51 (T3)	19:45	73	09:04 (T3)	18:55			17:14	53	08:40 (T4)	17:02	32	08:45 (T4)
14	06:10		06:39		08:15 (T3)	07:10		07:51 (T3)	07:41			07:18		07:40 (T5)	07:49		08:14 (T4)
	21:05		20:34	38	08:53 (T3)	19:44	73	09:04 (T3)	18:53			17:13	50	08:40 (T4)	17:02	32	08:46 (T4)
15	06:10		06:40		08:13 (T3)	07:11		07:51 (T3)	07:42			07:19		07:58 (T4)	07:50		08:14 (T4)
	21:04		20:33	42	08:55 (T3)	19:42	72	09:03 (T3)	18:52			17:12	43	08:41 (T4)	17:03	31	08:45 (T4)
16	06:11		06:41		08:11 (T3)	07:12		07:52 (T3)	07:43			07:20		07:59 (T4)	07:50		08:15 (T4)
	21:04		20:31	45	08:56 (T3)	19:40	70	09:02 (T3)	18:50			17:12	43	08:42 (T4)	17:03	31	08:46 (T4)
17	06:12		06:42		08:10 (T3)	07:13		07:52 (T3)	07:44			07:21		07:59 (T4)	07:51		08:16 (T4)
	21:03		20:30	48	08:58 (T3)	19:38	69	09:01 (T3)	18:48			17:11	43	08:42 (T4)	17:03	30	08:46 (T4)
18	06:13		06:43		08:08 (T3)	07:14		07:52 (T3)	07:46			07:22		07:58 (T4)	07:52		08:16 (T4)
	21:02		20:29	51	08:59 (T3)	19:37	68	09:00 (T3)	18:47			17:10	44	08:42 (T4)	17:04	30	08:46 (T4)
19	06:14		06:44		08:07 (T3)	07:15		07:53 (T3)	07:47			07:24		07:58 (T4)	07:52		08:17 (T4)
	21:02		20:27	53	09:00 (T3)	19:35	66	08:59 (T3)	18:45			17:09	44	08:42 (T4)	17:04	30	08:47 (T4)
20	06:15		06:45		08:06 (T3)	07:16		07:54 (T3)	07:48			07:25		07:59 (T4)	07:53		08:17 (T4)
	21:01		20:26	55	09:01 (T3)	19:33	64	08:58 (T3)	18:44			17:09	44	08:43 (T4)	17:04	30	08:47 (T4)
21	06:15		06:46		08:04 (T3)	07:17		07:54 (T3)	07:49			07:26		07:59 (T4)	07:53		08:18 (T4)
	21:00		20:24	58	09:02 (T3)	19:31	62	08:56 (T3)	18:42			17:08	44	08:43 (T4)	17:05	29	08:47 (T4)
22	06:16		06:47		08:03 (T3)	07:18		07:55 (T3)	07:50		08:39 (T5)	07:27		07:59 (T4)	07:54		08:18 (T4)
	20:59		20:23	60	09:03 (T3)	19:30	60	08:55 (T3)	18:41	8	08:47 (T5)	17:07	44	08:43 (T4)	17:05	29	08:47 (T4)
23	06:17		06:48		08:02 (T3)	07:19		07:56 (T3)	07:51		08:35 (T5)	07:28		08:00 (T4)	07:54		08:19 (T4)
	20:59		20:21	62	09:04 (T3)	19:28	57	08:53 (T3)	18:40	15	08:50 (T5)	17:07	43	08:43 (T4)	17:06	29	08:48 (T4)
24	06:18		06:49		08:01 (T3)	07:20		07:57 (T3)	07:52		08:32 (T5)	07:29		08:00 (T4)	07:55		08:19 (T4)
	20:58		20:20	64	09:05 (T3)	19:26	54	08:51 (T3)	18:38	20	08:52 (T5)	17:06	43	08:43 (T4)	17:06	30	08:49 (T4)
25	06:19		06:50		08:00 (T3)	07:21		07:59 (T3)	07:54		08:31 (T5)	07:30		08:01 (T4)	07:55		08:19 (T4)
	20:57		20:18	65	09:05 (T3)	19:25	50	08:49 (T3)	18:37	22	08:53 (T5)	17:05	43	08:44 (T4)	17:07	30	08:49 (T4)
26	06:20		06:51		07:59 (T3)	07:22		08:00 (T3)	07:55		08:30 (T5)	07:32		08:01 (T4)	07:56		08:20 (T4)
	20:56		20:17	67	09:06 (T3)	19:23	47	08:47 (T3)	18:35	25	08:55 (T5)	17:05	43	08:44 (T4)	17:08	30	08:50 (T4)
27	06:21		06:52		07:58 (T3)	07:23		08:02 (T3)	07:56		08:29 (T5)	07:33		08:02 (T4)	07:56		08:20 (T4)
	20:55		20:15	69	09:07 (T3)	19:21	42	08:44 (T3)	18:34	27	08:56 (T5)	17:04	42	08:44 (T4)	17:08	30	08:50 (T4)
28	06:22		06:53		07:58 (T3)	07:24		08:04 (T3)	07:57		08:28 (T5)	07:34		08:02 (T4)	07:56		08:20 (T4)
	20:54		20:13	69	09:07 (T3)	19:19	37	08:41 (T3)	18:33	28	08:56 (T5)	17:04	42	08:44 (T4)	17:09	31	08:51 (T4)
29	06:23		06:54		07:57 (T3)	07:25		08:07 (T3)	07:58		08:27 (T5)	07:35		08:03 (T4)	07:57		08:21 (T4)
	20:53		20:12	70	09:07 (T3)	19:18	31	08:38 (T3)	18:31	29	08:56 (T5)	17:04	41	08:44 (T4)	17:10	31	08:52 (T4)
30	06:24		06:55		07:56 (T3)	07:26		08:11 (T3)	08:00		08:27 (T5)	07:36		08:03 (T4)	07:57		08:21 (T4)
	20:52		20:10	72	09:08 (T3)	19:16	22	08:33 (T3)	18:30	31	08:58 (T5)	17:03	41	08:44 (T4)	17:10	32	08:53 (T4)
31	06:25		06:56		07:55 (T3)				08:01		08:27 (T5)				07:57		08:21 (T4)
	20:51		20:09	72	09:07 (T3)				18:29	31	08:58 (T5)				17:11	33	08:54 (T4)
Potential sun hours	460		429			375			345			297			287		
Total, worst case				1160			1913			239			1430			1011	
Sun reduction				0.61			0.59			0.48			0.30			0.22	
Oper. time red.				1.00			1.00			1.00			1.00			1.00	
Wind dir. red.				0.60			0.60			0.54			0.53			0.52	
Total reduction				0.36			0.35			0.26			0.15			0.11	
Total, real				419			668			61			221			114	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1237 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7194)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58			07:44		16:29 (T13)	07:07		16:31 (T13)	07:16		06:30			06:01		20:04 (T10)
	17:13			17:47	44	17:13 (T13)	18:22	63	18:00 (T12)	19:56		20:27			20:57	29	20:33 (T10)
2	07:58			07:43		16:28 (T13)	07:06		16:32 (T13)	07:14		06:29			06:01		20:03 (T10)
	17:14			17:48	46	17:14 (T13)	18:23	63	18:01 (T12)	19:57		20:28			20:58	30	20:33 (T10)
3	07:58			07:42		16:27 (T13)	07:04		16:34 (T13)	07:13		06:27			06:00		20:03 (T10)
	17:14			17:50	48	17:15 (T13)	18:24	62	18:03 (T12)	19:58		20:29			20:59	31	20:34 (T10)
4	07:58			07:41		16:27 (T13)	07:03		16:36 (T13)	07:11		06:26			06:00		20:03 (T10)
	17:15			17:51	49	17:16 (T13)	18:25	59	18:03 (T12)	19:59		20:30			20:59	32	20:35 (T10)
5	07:58			07:40		16:26 (T13)	07:01		16:38 (T13)	07:09		06:25			05:59		20:02 (T10)
	17:16			17:52	51	17:17 (T13)	18:26	56	18:04 (T12)	20:00		20:31			21:00	33	20:35 (T10)
6	07:58			07:38		16:26 (T13)	06:59		16:42 (T13)	07:08		06:24			05:59		20:02 (T10)
	17:17			17:54	52	17:18 (T13)	18:27	51	18:06 (T12)	20:00		20:33			21:01	34	20:36 (T10)
7	07:58			07:37		16:24 (T13)	06:58		16:48 (T13)	07:06		06:22			05:59		20:02 (T10)
	17:18			17:55	54	17:18 (T13)	18:29	38	18:05 (T12)	20:01		20:34			21:01	34	20:36 (T10)
8	07:58			07:36		16:24 (T13)	07:56		18:32 (T12)	07:05		06:21			05:59		20:02 (T10)
	17:19			17:56	55	17:19 (T13)	19:30	33	19:05 (T12)	20:03		20:35			21:02	35	20:37 (T10)
9	07:57			07:35		16:24 (T13)	07:55		18:33 (T12)	07:03		06:20			05:58		20:01 (T10)
	17:20			17:57	56	17:20 (T13)	19:31	32	19:05 (T12)	20:04		20:36			21:03	36	20:37 (T10)
10	07:57			07:34		16:24 (T13)	07:53		18:32 (T12)	07:01		06:19			05:58		20:01 (T10)
	17:21			17:59	56	17:20 (T13)	19:32	33	19:05 (T12)	20:05		20:37			21:03	36	20:37 (T10)
11	07:57			07:33		16:24 (T13)	07:51		18:33 (T12)	07:00		06:18			05:58		20:02 (T10)
	17:22			18:00	57	17:21 (T13)	19:33	32	19:05 (T12)	20:06		20:38			21:04	36	20:38 (T10)
12	07:57			07:31		16:23 (T13)	07:50		18:33 (T12)	06:58		06:17			05:58		20:02 (T10)
	17:23			18:01	58	17:21 (T13)	19:34	31	19:04 (T12)	20:07		20:39			21:04	36	20:38 (T10)
13	07:56			07:30		16:23 (T13)	07:48		18:33 (T12)	06:56		06:16			05:58		20:02 (T10)
	17:24			18:02	58	17:21 (T13)	19:35	29	19:02 (T12)	20:08		20:40			21:05	37	20:39 (T10)
14	07:56			07:29		16:23 (T13)	07:46		18:35 (T12)	06:55		06:15			05:58		20:02 (T10)
	17:26			18:04	59	17:22 (T13)	19:36	27	19:02 (T12)	20:09		20:41			21:05	37	20:39 (T10)
15	07:56			07:27		16:23 (T13)	07:45		18:35 (T12)	06:53		06:14			05:58		20:02 (T10)
	17:27			18:05	58	17:21 (T13)	19:38	25	19:00 (T12)	20:10		20:42			21:06	37	20:39 (T10)
16	07:55			07:26		16:23 (T13)	07:43		18:36 (T12)	06:52		06:13			05:58		20:02 (T10)
	17:28			18:06	58	17:21 (T13)	19:39	22	18:58 (T12)	20:11		20:43			21:06	37	20:39 (T10)
17	07:55			07:25		16:23 (T13)	07:41		18:37 (T12)	06:50		06:12			05:58		20:02 (T10)
	17:29			18:07	59	17:22 (T13)	19:40	19	18:56 (T12)	20:12		20:44			21:07	38	20:40 (T10)
18	07:54			07:23		16:23 (T13)	07:40		18:41 (T12)	06:49		06:11			05:58		20:02 (T10)
	17:30			18:08	58	17:21 (T13)	19:41	12	18:53 (T12)	20:13		20:45			21:07	38	20:40 (T10)
19	07:54			07:22		16:24 (T13)	07:38			06:47		06:10			05:58		20:02 (T10)
	17:31			18:10	57	17:21 (T13)	19:42			20:14		20:46			21:07	38	20:40 (T10)
20	07:53			07:21		16:23 (T13)	07:36			06:46		06:09			05:58		20:03 (T10)
	17:32			18:11	57	17:20 (T13)	19:43			20:15		20:47			21:08	38	20:41 (T10)
21	07:53			07:19		16:24 (T13)	07:35			06:44		06:08			05:58		20:03 (T10)
	17:34			18:12	56	17:20 (T13)	19:44			20:16		20:48			21:08	38	20:41 (T10)
22	07:52			07:18		16:24 (T13)	07:33			06:43		06:07			05:59		20:03 (T10)
	17:35			18:13	55	17:19 (T13)	19:45			20:18		20:49			21:08	38	20:41 (T10)
23	07:51		16:47 (T13)	07:16		16:25 (T13)	07:31			06:41		06:07			05:59		20:03 (T10)
	17:36	3	16:50 (T13)	18:15	54	17:19 (T13)	19:46			20:19		20:50			21:08	38	20:41 (T10)
24	07:50		16:41 (T13)	07:15		16:25 (T13)	07:30			06:40		06:06		20:15 (T10)	05:59		20:04 (T10)
	17:37	15	16:56 (T13)	18:16	53	17:18 (T13)	19:47			20:20		20:50	4	20:19 (T10)	21:09	38	20:42 (T10)
25	07:50		16:39 (T13)	07:13		16:26 (T13)	07:28			06:38		06:05		20:11 (T10)	05:59		20:04 (T10)
	17:38	22	17:01 (T13)	18:17	52	17:18 (T13)	19:48			20:21		20:51	12	20:23 (T10)	21:09	38	20:42 (T10)
26	07:49		16:37 (T13)	07:12		16:27 (T13)	07:26			06:37		06:05		20:09 (T10)	06:00		20:04 (T10)
	17:40	26	17:03 (T13)	18:18	54	17:53 (T12)	19:50			20:22		20:52	17	20:26 (T10)	21:09	38	20:42 (T10)
27	07:48		16:35 (T13)	07:10		16:28 (T13)	07:24			06:35		06:04		20:07 (T10)	06:00		20:05 (T10)
	17:41	30	17:05 (T13)	18:19	61	17:57 (T12)	19:51			20:23		20:53	20	20:27 (T10)	21:09	37	20:42 (T10)
28	07:47		16:33 (T13)	07:09		16:29 (T13)	07:23			06:34		06:03		20:07 (T10)	06:00		20:05 (T10)
	17:42	34	17:07 (T13)	18:20	62	17:58 (T12)	19:52			20:24		20:54	22	20:29 (T10)	21:09	37	20:42 (T10)
29	07:46		16:32 (T13)				07:21			06:33		06:03		20:05 (T10)	06:01		20:05 (T10)
	17:43	36	17:08 (T13)				19:53			20:25		20:55	25	20:30 (T10)	21:09	37	20:42 (T10)
30	07:46		16:31 (T13)				07:19			06:31		06:02		20:05 (T10)	06:01		20:06 (T10)
	17:45	39	17:10 (T13)				19:54			20:26		20:56	26	20:31 (T10)	21:09	36	20:42 (T10)
31	07:45		16:30 (T13)				07:18					06:02		20:04 (T10)			
	17:46	41	17:11 (T13)				19:55					20:56	27	20:31 (T10)			
Potential sun hours	297			297			370			399		449			453		
Total, worst case		246			1537			687					153			1077	
Sun reduction		0.31			0.40			0.44					0.57			0.64	
Oper. time red.		1.00			1.00			1.00					1.00			1.00	
Wind dir. red.		0.72			0.72			0.68					0.54			0.54	
Total reduction		0.23			0.30			0.31					0.31			0.35	
Total, real		57			455			212					48			380	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1237 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7194)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August	September			October			November			December
1	06:02		20:06 (T10)	06:26	06:57			07:28		18:12 (T12)	07:02		15:54 (T13)	07:37
	21:09	36	20:42 (T10)	20:50	20:07			19:15	30	18:42 (T12)	17:28	56	16:50 (T13)	17:03
2	06:02		20:06 (T10)	06:27	06:58			07:29		18:11 (T12)	07:03		15:54 (T13)	07:38
	21:09	36	20:42 (T10)	20:49	20:06			19:13	31	18:42 (T12)	17:27	55	16:49 (T13)	17:03
3	06:03		20:06 (T10)	06:28	06:59			07:30		18:11 (T12)	07:05		15:54 (T13)	07:39
	21:09	36	20:42 (T10)	20:48	20:04			19:11	32	18:43 (T12)	17:25	54	16:48 (T13)	17:03
4	06:03		20:07 (T10)	06:29	07:00			07:31		18:10 (T12)	07:06		15:54 (T13)	07:40
	21:08	35	20:42 (T10)	20:47	20:02			19:10	33	18:43 (T12)	17:24	54	16:48 (T13)	17:03
5	06:04		20:08 (T10)	06:30	07:01			07:32		18:10 (T12)	07:07		15:56 (T13)	07:41
	21:08	35	20:43 (T10)	20:46	20:01			19:08	33	18:43 (T12)	17:23	52	16:48 (T13)	17:03
6	06:05		20:08 (T10)	06:31	07:02			07:33		18:10 (T12)	07:08		15:56 (T13)	07:42
	21:08	34	20:42 (T10)	20:45	19:57			19:06	32	18:42 (T12)	17:22	51	16:47 (T13)	17:02
7	06:05		20:09 (T10)	06:32	07:03			07:34		17:20 (T13)	07:09		15:57 (T13)	07:43
	21:08	33	20:42 (T10)	20:43	19:56			19:05	47	18:42 (T12)	17:21	49	16:46 (T13)	17:02
8	06:06		20:09 (T10)	06:33	07:04			07:35		17:15 (T13)	07:11		15:58 (T13)	07:44
	21:07	32	20:41 (T10)	20:42	19:54			19:03	55	18:41 (T12)	17:20	48	16:46 (T13)	17:02
9	06:06		20:10 (T10)	06:34	07:05			07:36		17:12 (T13)	07:12		15:59 (T13)	07:45
	21:07	31	20:41 (T10)	20:41	19:52			19:01	58	18:39 (T12)	17:19	46	16:45 (T13)	17:02
10	06:07		20:11 (T10)	06:35	07:06			07:37		17:09 (T13)	07:13		16:00 (T13)	07:46
	21:07	30	20:41 (T10)	20:40	19:51			19:00	60	18:37 (T12)	17:18	43	16:43 (T13)	17:02
11	06:08		20:11 (T10)	06:36	07:07			07:38		17:07 (T13)	07:14		16:01 (T13)	07:47
	21:06	29	20:40 (T10)	20:38	19:49			18:58	62	18:35 (T12)	17:17	41	16:42 (T13)	17:02
12	06:09		20:12 (T10)	06:37	07:08			07:39		17:05 (T13)	07:15		16:03 (T13)	07:48
	21:06	28	20:40 (T10)	20:37	19:47			18:57	63	18:34 (T12)	17:16	39	16:42 (T13)	17:02
13	06:09		20:13 (T10)	06:38	07:09			07:40		17:04 (T13)	07:17		16:04 (T13)	07:48
	21:05	27	20:40 (T10)	20:36	19:46			18:55	63	18:33 (T12)	17:15	36	16:40 (T13)	17:03
14	06:10		20:14 (T10)	06:39	07:10			07:41		17:02 (T13)	07:18		16:05 (T13)	07:49
	21:05	25	20:39 (T10)	20:34	19:44			18:53	62	18:31 (T12)	17:14	34	16:39 (T13)	17:03
15	06:11		20:15 (T10)	06:40	07:11			07:43		17:00 (T13)	07:19		16:08 (T13)	07:50
	21:04	23	20:38 (T10)	20:33	19:42			18:52	60	18:29 (T12)	17:13	30	16:38 (T13)	17:03
16	06:12		20:16 (T10)	06:41	07:12			07:44		16:59 (T13)	07:20		16:10 (T13)	07:51
	21:04	21	20:37 (T10)	20:32	19:40			18:50	50	17:49 (T13)	17:12	26	16:36 (T13)	17:03
17	06:12		20:18 (T10)	06:42	07:13			07:45		16:58 (T13)	07:21		16:12 (T13)	07:51
	21:03	18	20:36 (T10)	20:30	19:39			18:49	51	17:49 (T13)	17:11	22	16:34 (T13)	17:04
18	06:13		20:20 (T10)	06:43	07:14			07:46		16:57 (T13)	07:23		16:15 (T13)	07:52
	21:03	14	20:34 (T10)	20:29	19:37			18:47	53	17:50 (T13)	17:10	15	16:30 (T13)	17:04
19	06:14		20:22 (T10)	06:44	07:15			07:47		16:55 (T13)	07:24		16:22 (T13)	07:53
	21:02	9	20:31 (T10)	20:27	19:35			18:46	55	17:50 (T13)	17:10	3	16:25 (T13)	17:04
20	06:15			06:45	07:16			07:48		16:56 (T13)	07:25			07:53
	21:01			20:26	19:34			18:44	55	17:51 (T13)	17:09			17:05
21	06:16			06:46	07:17			07:49		16:55 (T13)	07:26			07:54
	21:00			20:24	19:32			18:43	56	17:51 (T13)	17:08			17:05
22	06:17			06:47	07:18			07:50		16:54 (T13)	07:27			07:54
	21:00			20:23	19:30			18:41	57	17:51 (T13)	17:08			17:06
23	06:18			06:48	07:19			07:52		16:53 (T13)	07:28			07:55
	20:59			20:21	19:28			18:40	58	17:51 (T13)	17:07			17:06
24	06:18			06:49	07:20			07:53		16:54 (T13)	07:30			07:55
	20:58			20:20	19:27			18:38	58	17:52 (T13)	17:06			17:07
25	06:19			06:50	07:21		18:25 (T12)	07:54		16:53 (T13)	07:31			07:56
	20:57			20:18	19:25	9	18:34 (T12)	18:37	58	17:51 (T13)	17:06			17:07
26	06:20			06:51	07:22		18:21 (T12)	07:55		16:53 (T13)	07:32			07:56
	20:56			20:17	19:23	16	18:37 (T12)	18:36	58	17:51 (T13)	17:05			17:08
27	06:21			06:52	07:23		18:18 (T12)	07:56		16:52 (T13)	07:33			07:56
	20:55			20:15	19:22	21	18:39 (T12)	18:34	59	17:51 (T13)	17:05			17:09
28	06:22			06:53	07:24		18:16 (T12)	07:57		16:52 (T13)	07:34			07:57
	20:54			20:14	19:20	24	18:40 (T12)	18:33	58	17:50 (T13)	17:04			17:09
29	06:23			06:54	07:25		18:14 (T12)	07:59		16:53 (T13)	07:35			07:57
	20:53			20:12	19:18	27	18:41 (T12)	18:32	58	17:51 (T13)	17:04			17:10
30	06:24			06:55	07:27		18:13 (T12)	08:00		16:53 (T13)	07:36			07:57
	20:52			20:11	19:16	29	18:42 (T12)	18:30	57	17:50 (T13)	17:04			17:11
31	06:25			06:56				08:01		16:53 (T13)				07:57
	20:51			20:09				18:29	57	17:50 (T13)				17:12
Potential sun hours	460			429	375			345			297			287
Total, worst case		532				126			1619			754		
Sun reduction		0.66				0.59			0.48			0.30		
Oper. time red.		1.00				1.00			1.00			1.00		
Wind dir. red.		0.54				0.67			0.71			0.72		
Total reduction		0.36				0.40			0.35			0.22		
Total, real		193				51			565			168		

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1253 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7208)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:43	07:07	07:16	06:30	06:51 (T4)	06:01	06:48 (T4)	06:01	06:59 (T4)	06:26	06:55 (T4)	06:57	07:27	07:02	07:37
	17:12	17:47	18:21	19:56	20:27 37	07:28 (T5) 20:57 39	07:27 (T4) 21:09 30	07:29 (T4) 20:50 46	07:41 (T4) 20:07	19:14	17:27	17:03
2	07:57	07:42	07:05	07:14	06:28	06:50 (T4) 06:00	06:49 (T4) 06:02	06:58 (T4) 06:27	06:55 (T4) 06:58	07:28	07:03	07:38
	17:13	17:48	18:22	19:57	20:28 37	07:27 (T5) 20:58 38	07:27 (T4) 21:08 31	07:29 (T4) 20:49 45	07:40 (T4) 20:05	19:13	17:26	17:03
3	07:57	07:41	07:04	07:12	06:27	06:49 (T4) 06:00	06:50 (T4) 06:02	06:58 (T4) 06:28	06:55 (T4) 06:59	07:29	07:04	07:39
	17:14	17:49	18:24	19:58	20:29 37	07:26 (T4) 20:58 37	07:27 (T4) 21:08 32	07:30 (T4) 20:48 45	07:40 (T4) 20:04	19:11	17:25	17:02
4	07:58	07:40	07:02	07:11	06:26	06:49 (T4) 05:59	06:50 (T4) 06:03	06:59 (T4) 06:29	06:55 (T4) 07:00	07:30	07:05	07:40
	17:15	17:51	18:25	19:59	20:30 38	07:27 (T4) 20:59 36	07:26 (T4) 21:08 32	07:31 (T4) 20:47 44	07:39 (T4) 20:02	19:09	17:24	17:02
5	07:58	07:39	07:01	07:09	06:25	06:47 (T4) 05:59	06:51 (T4) 06:04	06:58 (T4) 06:30	06:55 (T4) 07:01	07:31	07:07	07:41
	17:16	17:52	18:26	20:00	20:31 40	07:27 (T4) 21:00 35	07:26 (T4) 21:08 33	07:31 (T4) 20:46 43	07:38 (T4) 20:00	19:08	17:23	17:02
6	07:57	07:38	06:59	07:07	06:23	06:46 (T4) 05:59	06:52 (T4) 06:04	06:58 (T4) 06:31	06:56 (T4) 07:02	07:32	07:08	07:42
	17:17	17:53	18:27	20:00	20:32 42	07:28 (T4) 21:01 34	07:26 (T4) 21:08 34	07:32 (T4) 20:44 42	07:38 (T4) 19:57	19:06	17:21	17:02
7	07:57	07:37	06:57	07:06	06:22	06:46 (T4) 05:58	06:51 (T4) 06:05	06:57 (T4) 06:32	06:56 (T4) 07:03	07:34	07:09	07:43
	17:18	17:54	18:28	20:01	20:33 42	07:28 (T4) 21:01 34	07:25 (T4) 21:07 35	07:32 (T4) 20:43 41	07:37 (T4) 19:55	19:04	17:20	17:02
8	07:57	07:36	07:56	07:04	06:21	06:45 (T4) 05:58	06:52 (T4) 06:05	06:57 (T4) 06:33	06:57 (T4) 07:04	07:35	07:10	07:44
	17:19	17:56	19:29	20:02	20:34 44	07:29 (T4) 21:02 33	07:25 (T4) 21:07 36	07:33 (T4) 20:42 39	07:36 (T4) 19:54	19:03	17:19	17:02
9	07:57	07:35	07:54	07:03	06:20	06:45 (T4) 05:58	06:53 (T4) 06:06	06:57 (T4) 06:34	06:58 (T4) 07:05	07:36	07:12	07:45
	17:20	17:57	19:31	20:03	20:35 44	07:29 (T4) 21:02 32	07:25 (T4) 21:07 37	07:34 (T4) 20:41 38	07:36 (T4) 19:52	19:01	17:18	17:02
10	07:57	07:34	07:53	07:01	06:19	06:45 (T4) 05:58	06:54 (T4) 06:07	06:57 (T4) 06:35	06:58 (T4) 07:06	07:37	07:13	07:46
	17:21	17:58	19:32	20:04	20:36 45	07:30 (T4) 21:03 31	07:25 (T4) 21:06 37	07:34 (T4) 20:39 37	07:35 (T4) 19:50	18:59	17:17	17:02
11	07:57	07:32	07:51	06:59	06:18	06:44 (T4) 05:58	06:54 (T4) 06:07	06:57 (T4) 06:36	06:59 (T4) 07:07	07:38	07:14	07:47
	17:22	17:59	19:33	20:05	20:37 46	07:30 (T4) 21:04 31	07:25 (T4) 21:06 38	07:35 (T4) 20:38 37	07:36 (T5) 19:49	18:58	17:16	17:02
12	07:56	07:31	07:49	06:58	06:16	06:44 (T4) 05:58	06:55 (T4) 06:08	06:57 (T4) 06:37	07:01 (T4) 07:08	07:39	07:15	07:47
	17:23	18:01	19:34	20:06	20:38 46	07:30 (T4) 21:04 30	07:25 (T4) 21:06 39	07:36 (T4) 20:37 36	07:37 (T5) 19:47	18:56	17:15	17:02
13	07:56	07:30	07:48	06:56	07:15 (T5) 06:15	06:44 (T4) 05:57	06:55 (T4) 06:09	06:56 (T4) 06:38	07:02 (T4) 07:09	07:40	07:16	07:48
	17:24	18:02	19:35	20:08 7	07:22 (T5) 20:39 46	07:30 (T4) 21:05 30	07:25 (T4) 21:05 39	07:35 (T4) 20:36 35	07:37 (T5) 19:45	18:55	17:14	17:02
14	07:56	07:28	07:46	06:55	07:14 (T5) 06:14	06:44 (T4) 05:57	06:56 (T4) 06:10	06:56 (T4) 06:39	07:04 (T4) 07:10	07:41	07:18	07:49
	17:25	18:03	19:36	20:09 13	07:27 (T5) 20:41 46	07:30 (T4) 21:05 29	07:25 (T4) 21:05 40	07:36 (T4) 20:34 34	07:38 (T5) 19:44	18:53	17:13	17:02
15	07:55	07:27	07:44	06:53	07:12 (T5) 06:13	06:44 (T4) 05:57	06:56 (T4) 06:10	06:56 (T4) 06:40	07:06 (T4) 07:11	07:42	07:19	07:50
	17:26	18:04	19:37	20:10 16	07:28 (T5) 20:42 46	07:30 (T4) 21:06 29	07:25 (T4) 21:04 41	07:37 (T4) 20:33 32	07:38 (T5) 19:42	18:52	17:12	17:03
16	07:55	07:26	07:43	06:51	07:11 (T5) 06:12	06:44 (T4) 05:57	06:57 (T4) 06:11	06:56 (T4) 06:41	07:07 (T5) 07:12	07:43	07:20	07:50
	17:27	18:06	19:38	20:11 19	07:30 (T5) 20:43 46	07:30 (T4) 21:06 28	07:25 (T4) 21:03 42	07:38 (T4) 20:31 31	07:38 (T5) 19:40	18:50	17:12	17:03
17	07:54	07:25	07:41	06:50	07:09 (T5) 06:11	06:44 (T4) 05:57	06:57 (T4) 06:12	06:55 (T4) 06:42	07:07 (T5) 07:13	07:44	07:21	07:51
	17:29	18:07	19:39	20:12 22	07:31 (T5) 20:44 46	07:30 (T4) 21:06 28	07:25 (T4) 21:03 42	07:37 (T4) 20:30 31	07:38 (T5) 19:38	18:48	17:11	17:03
18	07:54	07:23	07:39	06:48	07:07 (T5) 06:10	06:44 (T4) 05:58	06:57 (T4) 06:13	06:55 (T4) 06:43	07:07 (T5) 07:14	07:46	07:22	07:52
	17:30	18:08	19:41	20:13 24	07:31 (T5) 20:44 46	07:30 (T4) 21:07 28	07:25 (T4) 21:02 43	07:38 (T4) 20:29 31	07:38 (T5) 19:37	18:47	17:10	17:04
19	07:53	07:22	07:38	06:47	07:06 (T5) 06:10	06:43 (T4) 05:58	06:57 (T4) 06:14	06:55 (T4) 06:44	07:07 (T5) 07:15	07:47	07:23	07:52
	17:31	18:09	19:42	20:14 26	07:32 (T5) 20:45 46	07:29 (T4) 21:07 28	07:25 (T4) 21:02 44	07:39 (T4) 20:27 31	07:38 (T5) 19:35	18:45	17:09	17:04
20	07:53	07:20	07:36	06:45	07:05 (T5) 06:09	06:44 (T4) 05:58	06:58 (T4) 06:15	06:55 (T4) 06:45	07:06 (T5) 07:16	07:48	07:25	07:53
	17:32	18:11	19:43	20:15 28	07:33 (T5) 20:46 46	07:30 (T4) 21:07 27	07:25 (T4) 21:01 44	07:39 (T4) 20:26 32	07:38 (T5) 19:33	18:44	17:09	17:04
21	07:52	07:19	07:34	06:44	07:03 (T5) 06:08	06:44 (T4) 05:58	06:58 (T4) 06:15	06:55 (T4) 06:46	07:07 (T5) 07:17	07:49	07:26	07:53
	17:33	18:12	19:44	20:16 29	07:32 (T5) 20:47 46	07:30 (T4) 21:08 27	07:25 (T4) 21:00 45	07:40 (T4) 20:24 31	07:38 (T5) 19:31	18:42	17:08	17:05
22	07:52	07:17	07:33	06:42	07:02 (T5) 06:07	06:44 (T4) 05:58	06:59 (T4) 06:16	06:55 (T4) 06:47	07:08 (T5) 07:18	07:50	07:27	07:54
	17:34	18:13	19:45	20:17 31	07:33 (T5) 20:48 45	07:29 (T4) 21:08 27	07:26 (T4) 20:59 45	07:40 (T4) 20:23 29	07:37 (T5) 19:30	18:41	17:07	17:05
23	07:51	07:16	07:31	06:41	07:01 (T5) 06:06	06:44 (T4) 05:58	06:59 (T4) 06:17	06:54 (T4) 06:48	07:09 (T5) 07:19	07:51	07:28	07:54
	17:36	18:14	19:46	20:18 31	07:32 (T5) 20:49 45	07:29 (T4) 21:08 27	07:26 (T4) 20:59 45	07:39 (T4) 20:21 27	07:36 (T5) 19:28	18:40	17:07	17:06
24	07:50	07:15	07:29	06:39	07:01 (T5) 06:06	06:45 (T4) 05:59	06:58 (T4) 06:18	06:54 (T4) 06:49	07:10 (T5) 07:20	07:52	07:29	07:55
	17:37	18:15	19:47	20:19 31	07:32 (T5) 20:50 44	07:29 (T4) 21:08 28	07:26 (T4) 20:58 46	07:40 (T4) 20:20 26	07:36 (T5) 19:26	18:38	17:06	17:06
25	07:49	07:13	07:28	06:38	07:00 (T5) 06:05	06:45 (T4) 05:59	06:59 (T4) 06:19	06:54 (T4) 06:50	07:11 (T5) 07:21	07:54	07:30	07:55
	17:38	18:17	19:48	20:20 32	07:32 (T5) 20:51 44	07:29 (T4) 21:08 28	07:27 (T4) 20:57 46	07:40 (T4) 20:18 24	07:35 (T5) 19:25	18:37	17:05	17:07
26	07:49	07:12	07:26	06:36	07:00 (T5) 06:04	06:45 (T4) 05:59	06:59 (T4) 06:20	06:54 (T4) 06:51	07:12 (T5) 07:22	07:55	07:32	07:56
	17:39	18:18	19:49	20:22 32	07:32 (T5) 20:52 43	07:28 (T4) 21:09 28	07:27 (T4) 20:56 46	07:40 (T4) 20:17 21	07:33 (T5) 19:23	18:35	17:05	17:08
27	07:48	07:10	07:24	06:35	07:01 (T4) 06:04	06:46 (T4) 06:00	06:59 (T4) 06:21	06:54 (T4) 06:52	07:13 (T5) 07:23	07:56	07:33	07:56
	17:41	18:19	19:50	20:23 30	07:31 (T5) 20:53 43	07:29 (T4) 21:09 28	07:27 (T4) 20:55 47	07:41 (T4) 20:15 19	07:32 (T5) 19:21	18:34	17:05	17:08
28	07:47	07:08	07:22	06:34	06:57 (T4) 06:03	06:46 (T4) 06:00	06:59 (T4) 06:22	06:54 (T4) 06:53	07:14 (T5) 07:24	07:57	07:34	07:56
	17:42	18:20	19:51	20:24 33	07:30 (T5) 20:54 42	07:28 (T4) 21:09 29	07:28 (T4) 20:54 47	07:41 (T4) 20:13 16	07:30 (T5) 19:19	18:33	17:04	17:09
29	07:46		07:21	06:32	06:55 (T4) 06:02	06:47 (T4) 06:00	06:59 (T4) 06:23	06:54 (T4) 06:54	07:15 (T5) 07:25	07:58	07:35	07:57
	17:43		19:52	20:25 35	07:30 (T5) 20:55 41	07:28 (T4) 21:09 29	07:28 (T4) 20:53 47	07:41 (T4) 20:12 12	07:27 (T5) 19:18	18:31	17:04	17:10
30	07:45		07:19	06:31	06:54 (T4) 06:02	06:47 (T4) 06:01	06:59 (T4) 06:24	06:55 (T4) 06:55	07:17 (T5) 07:26	08:00	07:36	07:57
	17:44		19:54	20:26 35	07:29 (T5) 20:55 40	07:27 (T4) 21:09 30	07:29 (T4) 20:52 46	07:41 (T4) 20:10 6	07:23 (T5) 19:16	18:30	17:03	17:10
31	07:44		07:17		06:01	06:48 (T4)	06:25	06:55 (T4) 06:56		08:01		07:57
	17:46		19:55		20:56 40	07:28 (T4)	20:51 46	07:41 (T4) 20:09		18:29		17:11
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				474	1339	918	1255	961				
Sun reduction				0.52	0.57	0.64	0.66	0.61				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.67	0.69	0.69	0.69	0.68				
Total reduction				0.35	0.39	0.44	0.46	0.41				
Total, real				165	527	406	573	398				

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1264 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7214)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:44	07:07	07:16	06:30	07:16 (T39) 06:02	06:02	06:26	07:29 (T39) 06:57	07:30 (T39) 07:28	07:02	07:37
	17:13	17:48	18:22	19:56	20:27 63	08:19 (T39) 20:57	21:09	20:50 55	08:24 (T39) 20:07 43	08:13 (T39) 19:15	17:28	17:04
2	07:58	07:43	07:06	07:15	06:29	07:16 (T39) 06:01	06:03	06:27	07:28 (T39) 06:58	07:31 (T39) 07:29	07:03	07:38
	17:14	17:49	18:23	19:57	20:28 63	08:19 (T39) 20:58	21:09	20:49 56	08:24 (T39) 20:06 40	08:11 (T39) 19:13	17:27	17:03
3	07:58	07:42	07:04	07:13	06:28	07:16 (T39) 06:01	06:03	06:28	07:28 (T39) 06:59	07:33 (T39) 07:30	07:05	07:39
	17:15	17:50	18:24	19:58	20:29 63	08:19 (T39) 20:59	21:08	20:48 57	08:25 (T39) 20:04 36	08:09 (T39) 19:12	17:26	17:03
4	07:58	07:41	07:03	07:11	06:26	07:15 (T39) 06:00	06:04	06:29	07:27 (T39) 07:00	07:35 (T39) 07:31	07:06	07:40
	17:16	17:51	18:25	19:59	20:30 63	08:18 (T39) 20:59	21:08	20:47 59	08:26 (T39) 20:02 31	08:06 (T39) 19:10	17:24	17:03
5	07:58	07:40	07:01	07:10	06:25	07:16 (T39) 06:00	06:04	06:30	07:27 (T39) 07:01	07:38 (T39) 07:32	07:07	07:41
	17:17	17:53	18:26	20:00	20:31 61	08:17 (T39) 21:00	21:08	20:46 59	08:26 (T39) 20:01 24	08:02 (T39) 19:08	17:23	17:03
6	07:58	07:38	06:59	07:08 07:47 (T39)	06:24	07:16 (T39) 06:00	06:05	06:31	07:26 (T39) 07:02	07:43 (T39) 07:33	07:08	07:42
	17:18	17:54	18:28	20:00 14 08:01 (T39)	20:32 61	08:17 (T39) 21:01	21:08	20:45 61	08:27 (T39) 19:57 14	07:57 (T39) 19:07	17:22	17:03
7	07:58	07:37	06:58	07:06 07:41 (T39)	06:23	07:17 (T39) 05:59	06:06	06:32	07:26 (T39) 07:03	07:34	07:09	07:43
	17:19	17:55	18:29	20:02 24 08:05 (T39)	20:34 60	08:17 (T39) 21:01	21:08	20:43 61	08:27 (T39) 19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05 07:38 (T39)	06:22	07:17 (T39) 05:59	06:06	06:33	07:25 (T39) 07:04	07:35	07:11	07:44
	17:20	17:56	19:30	20:03 31 08:09 (T39)	20:35 59	08:16 (T39) 21:02	21:07	20:42 62	08:27 (T39) 19:54	19:03	17:20	17:03
9	07:57	07:35	07:55	07:03 07:35 (T39)	06:20	07:18 (T39) 05:59	06:07	06:34	07:25 (T39) 07:05	07:36	07:12	07:45
	17:21	17:58	19:31	20:04 36 08:11 (T39)	20:36 58	08:16 (T39) 21:03	21:07	20:41 63	08:28 (T39) 19:52	19:02	17:19	17:03
10	07:57	07:34	07:53	07:01 07:32 (T39)	06:19	07:18 (T39) 05:59	06:08	06:35	07:25 (T39) 07:06	07:37	07:13	07:46
	17:22	17:59	19:32	20:05 40 08:12 (T39)	20:37 57	08:15 (T39) 21:03	21:07	20:40 63	08:28 (T39) 19:51	19:00	17:18	17:03
11	07:57	07:33	07:51	07:00 07:31 (T39)	06:18	07:19 (T39) 05:58	06:08	06:36	07:24 (T39) 07:07	07:38	07:14	07:47
	17:23	18:00	19:33	20:06 43 08:14 (T39)	20:38 56	08:15 (T39) 21:04	21:06	20:38 64	08:28 (T39) 19:49	18:58	17:17	17:03
12	07:57	07:31	07:50	06:58 07:29 (T39)	06:17	07:18 (T39) 05:58	06:09	06:37	07:24 (T39) 07:08	07:39	07:15	07:48
	17:24	18:01	19:34	20:07 46 08:15 (T39)	20:39 55	08:13 (T39) 21:04	21:06	20:37 64	08:28 (T39) 19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57 07:28 (T39)	06:16	07:20 (T39) 05:58	06:10 07:49 (T39)	06:38	07:24 (T39) 07:09	07:40	07:17	07:48
	17:25	18:03	19:36	20:08 49 08:17 (T39)	20:40 53	08:13 (T39) 21:05	21:05 11 08:00 (T39)	20:36 64	08:28 (T39) 19:46	18:55	17:15	17:03
14	07:56	07:29	07:46	06:55 07:26 (T39)	06:15	07:20 (T39) 05:58	06:10 07:47 (T39)	06:39	07:24 (T39) 07:10	07:42	07:18	07:49
	17:26	18:04	19:37	20:09 51 08:17 (T39)	20:41 52	08:12 (T39) 21:05	21:05 16 08:03 (T39)	20:34 64	08:28 (T39) 19:44	18:54	17:14	17:03
15	07:56	07:28	07:45	06:54 07:25 (T39)	06:14	07:21 (T39) 05:58	06:11 07:45 (T39)	06:40	07:24 (T39) 07:11	07:43	07:19	07:50
	17:27	18:05	19:38	20:10 54 08:19 (T39)	20:42 51	08:12 (T39) 21:06	21:04 21 08:06 (T39)	20:33 64	08:28 (T39) 19:42	18:52	17:13	17:03
16	07:55	07:26	07:43	06:52 07:23 (T39)	06:13	07:22 (T39) 05:58	06:12 07:43 (T39)	06:41	07:24 (T39) 07:12	07:44	07:20	07:51
	17:28	18:06	19:39	20:11 56 08:19 (T39)	20:43 49	08:11 (T39) 21:06	21:04 24 08:07 (T39)	20:32 64	08:28 (T39) 19:41	18:51	17:12	17:04
17	07:55	07:25	07:41	06:50 07:23 (T39)	06:12	07:22 (T39) 05:58	06:13 07:42 (T39)	06:42	07:24 (T39) 07:13	07:45	07:21	07:51
	17:29	18:08	19:40	20:12 57 08:20 (T39)	20:44 48	08:10 (T39) 21:07	21:03 27 08:09 (T39)	20:30 64	08:28 (T39) 19:39	18:49	17:12	17:04
18	07:54	07:23	07:40	06:49 07:21 (T39)	06:11	07:23 (T39) 05:58	06:14 07:41 (T39)	06:43	07:24 (T39) 07:14	07:46	07:23	07:52
	17:30	18:09	19:41	20:13 59 08:20 (T39)	20:45 46	08:09 (T39) 21:07	21:02 29 08:10 (T39)	20:29 63	08:27 (T39) 19:37	18:48	17:11	17:04
19	07:54	07:22	07:38	06:47 07:21 (T39)	06:10	07:24 (T39) 05:58	06:14 07:40 (T39)	06:44	07:24 (T39) 07:15	07:47	07:24	07:52
	17:32	18:10	19:42	20:14 60 08:21 (T39)	20:46 44	08:08 (T39) 21:07	21:02 32 08:12 (T39)	20:27 63	08:27 (T39) 19:35	18:46	17:10	17:05
20	07:53	07:21	07:36	06:46 07:19 (T39)	06:09	07:24 (T39) 05:59	06:15 07:39 (T39)	06:45	07:23 (T39) 07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15 61 08:20 (T39)	20:47 43	08:07 (T39) 21:08	21:01 34 08:13 (T39)	20:26 63	08:26 (T39) 19:34	18:45	17:09	17:05
21	07:52	07:19	07:35	06:44 07:19 (T39)	06:09	07:26 (T39) 05:59	06:16 07:37 (T39)	06:46	07:23 (T39) 07:17	07:49	07:26	07:54
	17:34	18:12	19:44	20:16 62 08:21 (T39)	20:48 40	08:06 (T39) 21:08	21:00 37 08:14 (T39)	20:24 62	08:25 (T39) 19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43 07:18 (T39)	06:08	07:27 (T39) 05:59	06:17 07:36 (T39)	06:47	07:23 (T39) 07:18	07:51	07:27	07:54
	17:35	18:14	19:45	20:18 63 08:21 (T39)	20:49 38	08:05 (T39) 21:08	21:00 39 08:15 (T39)	20:23 62	08:25 (T39) 19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:41 07:18 (T39)	06:07	07:28 (T39) 05:59	06:18 07:35 (T39)	06:48	07:23 (T39) 07:19	07:52	07:28	07:55
	17:36	18:15	19:46	20:19 63 08:21 (T39)	20:49 36	08:04 (T39) 21:08	20:59 41 08:16 (T39)	20:21 61	08:24 (T39) 19:28	18:40	17:07	17:07
24	07:50	07:15	07:30	06:40 07:17 (T39)	06:06	07:29 (T39) 05:59	06:19 07:35 (T39)	06:49	07:24 (T39) 07:20	07:53	07:30	07:55
	17:38	18:16	19:48	20:20 63 08:20 (T39)	20:50 33	08:02 (T39) 21:08	20:58 43 08:18 (T39)	20:20 59	08:23 (T39) 19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:39 07:17 (T39)	06:06	07:31 (T39) 06:00	06:20 07:34 (T39)	06:50	07:24 (T39) 07:21	07:54	07:31	07:55
	17:39	18:17	19:49	20:21 64 08:21 (T39)	20:51 31	08:02 (T39) 21:09	20:57 45 08:19 (T39)	20:18 59	08:23 (T39) 19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37 07:17 (T39)	06:05	07:32 (T39) 06:00	06:21 07:33 (T39)	06:51	07:25 (T39) 07:23	07:55	07:32	07:56
	17:40	18:18	19:50	20:22 64 08:21 (T39)	20:52 28	08:00 (T39) 21:09	20:56 47 08:20 (T39)	20:17 57	08:22 (T39) 19:23	18:36	17:06	17:08
27	07:48	07:10	07:25	06:36 07:16 (T39)	06:04	07:34 (T39) 06:00	06:22 07:33 (T39)	06:52	07:25 (T39) 07:24	07:56	07:33	07:56
	17:41	18:20	19:51	20:23 64 08:20 (T39)	20:53 25	07:59 (T39) 21:09	20:55 48 08:21 (T39)	20:15 56	08:21 (T39) 19:22	18:35	17:05	17:09
28	07:47	07:09	07:23	06:34 07:16 (T39)	06:04	07:35 (T39) 06:01	06:23 07:32 (T39)	06:53	07:26 (T39) 07:25	07:57	07:34	07:57
	17:43	18:21	19:52	20:24 64 08:20 (T39)	20:54 22	07:57 (T39) 21:09	20:54 50 08:22 (T39)	20:14 53	08:19 (T39) 19:20	18:33	17:05	17:10
29	07:46		07:21	06:33 07:16 (T39)	06:03	07:37 (T39) 06:01	06:23 07:31 (T39)	06:54	07:27 (T39) 07:26	07:59	07:35	07:57
	17:44		19:53	20:25 64 08:20 (T39)	20:55 19	07:56 (T39) 21:09	20:53 51 08:22 (T39)	20:12 51	08:18 (T39) 19:18	18:32	17:04	17:10
30	07:46		07:20	06:32 07:15 (T39)	06:03	07:39 (T39) 06:02	06:24 07:30 (T39)	06:55	07:28 (T39) 07:27	08:00	07:36	07:57
	17:45		19:54	20:26 64 08:19 (T39)	20:56 14	07:53 (T39) 21:09	20:52 52 08:22 (T39)	20:11 49	08:17 (T39) 19:17	18:31	17:04	17:11
31	07:45		07:18		06:02	07:43 (T39)	06:25 07:29 (T39)	06:56	07:29 (T39)	08:01		07:57
	17:46		19:55		20:56 8	07:51 (T39)	20:51 54 08:23 (T39)	20:09 46	08:15 (T39)	18:29		17:12
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Total, worst case				1316	1399		701	1848	188			
Sun reduction				0.52	0.57		0.66	0.61	0.59			
Oper. time red.				1.00	1.00		1.00	1.00	1.00			
Wind dir. red.				0.66	0.66		0.66	0.66	0.66			
Total reduction				0.34	0.37		0.43	0.40	0.39			
Total, real				449	523		304	740	73			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1269 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7219)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March	April		May		June	
1	07:57	15:57 (T35)	07:43	08:08 (T36)	07:07	07:16		06:30	07:21 (T31)	06:01	20:05 (T27)
	17:13 42	16:39 (T35)	17:47 30	08:38 (T36)	18:22	19:56		20:27 64	19:54 (T30)	20:57 28	20:33 (T27)
2	07:57	15:58 (T35)	07:42	08:08 (T36)	07:06	07:14		06:29	07:25 (T31)	06:01	20:05 (T27)
	17:14 41	16:39 (T35)	17:49 30	08:38 (T36)	18:23	19:57		20:28 57	19:55 (T30)	20:58 29	20:34 (T27)
3	07:58	15:58 (T35)	07:41	08:09 (T36)	07:04	07:13		06:28	19:05 (T30)	06:00	20:05 (T27)
	17:15 42	16:40 (T35)	17:50 29	08:38 (T36)	18:24	19:58		20:29 49	19:54 (T30)	20:58 29	20:34 (T27)
4	07:58	15:58 (T35)	07:40	08:10 (T36)	07:02	07:11		06:26	19:05 (T30)	06:00	20:05 (T27)
	17:15 42	16:40 (T35)	17:51 28	08:38 (T36)	18:25	19:59		20:30 49	19:54 (T30)	20:59 30	20:35 (T27)
5	07:58	15:59 (T35)	07:39	08:11 (T36)	07:01	07:09		06:25	19:05 (T30)	06:00	20:05 (T27)
	17:16 42	16:41 (T35)	17:52 26	08:37 (T36)	18:26	20:00		20:31 49	19:54 (T30)	21:00 31	20:36 (T27)
6	07:57	15:59 (T35)	07:38	08:11 (T36)	06:59	07:08	07:27 (T31)	06:24	19:05 (T30)	05:59	20:05 (T27)
	17:17 42	16:41 (T35)	17:54 25	08:36 (T36)	18:27	20:00 14	07:41 (T31)	20:32 49	19:54 (T30)	21:01 31	20:36 (T27)
7	07:57	16:00 (T35)	07:37	08:12 (T36)	06:58	07:06	07:25 (T31)	06:23	19:06 (T30)	05:59	20:05 (T27)
	17:18 42	16:42 (T35)	17:55 23	08:35 (T36)	18:29	20:01 19	07:44 (T31)	20:33 47	19:53 (T30)	21:01 31	20:36 (T27)
8	07:57	16:00 (T35)	07:36	08:13 (T36)	07:56	07:05	07:24 (T31)	06:21	19:05 (T30)	05:59	20:05 (T27)
	17:19 42	16:42 (T35)	17:56 21	08:34 (T36)	19:30	20:02 22	07:46 (T31)	20:34 47	19:52 (T30)	21:02 32	20:37 (T27)
9	07:57	16:00 (T35)	07:35	08:15 (T36)	07:54	07:03	07:22 (T31)	06:20	19:06 (T30)	05:59	20:06 (T27)
	17:20 42	16:42 (T35)	17:57 17	08:32 (T36)	19:31	20:03 25	07:47 (T31)	20:35 46	19:52 (T30)	21:02 31	20:37 (T27)
10	07:57	16:01 (T35)	07:34	08:18 (T36)	07:53	07:01	07:20 (T31)	06:19	19:06 (T30)	05:58	20:05 (T27)
	17:21 42	16:43 (T35)	17:59 12	08:30 (T36)	19:32	20:05 28	07:48 (T31)	20:36 45	19:51 (T30)	21:03 32	20:37 (T27)
11	07:57	16:01 (T35)	07:32		07:51	07:00	07:19 (T31)	06:18	19:07 (T30)	05:58	20:05 (T27)
	17:22 41	16:42 (T35)	18:00		19:33	20:06 30	07:49 (T31)	20:38 44	19:51 (T30)	21:04 32	20:37 (T27)
12	07:56	16:02 (T35)	07:31		07:50	06:58	07:17 (T31)	06:17	19:07 (T30)	05:58	20:06 (T27)
	17:23 41	16:43 (T35)	18:01		19:34	20:07 32	07:49 (T31)	20:39 44	19:51 (T30)	21:04 31	20:37 (T27)
13	07:56	16:03 (T35)	07:30		07:48	06:56	07:16 (T31)	06:16	19:08 (T30)	05:58	20:06 (T27)
	17:25 41	16:44 (T35)	18:02		19:35	20:08 34	07:50 (T31)	20:40 42	19:50 (T30)	21:05 32	20:38 (T27)
14	07:56	08:17 (T36)	07:29		07:46	06:55	07:14 (T31)	06:15	19:08 (T30)	05:58	20:06 (T27)
	17:26 45	16:43 (T35)	18:04		19:36	20:09 36	07:50 (T31)	20:41 41	19:49 (T30)	21:05 32	20:38 (T27)
15	07:55	08:17 (T36)	07:27		07:45	06:53	07:13 (T31)	06:14	19:09 (T30)	05:58	20:06 (T27)
	17:27 48	16:44 (T35)	18:05		19:38	20:10 54	19:41 (T30)	20:42 40	19:49 (T30)	21:06 32	20:38 (T27)
16	07:55	08:16 (T36)	07:26		07:43	06:52	07:13 (T31)	06:13	19:10 (T30)	05:58	20:07 (T27)
	17:28 51	16:44 (T35)	18:06		19:39	20:11 60	19:44 (T30)	20:43 38	19:48 (T30)	21:06 31	20:38 (T27)
17	07:55	08:16 (T36)	07:25		07:41	06:50	07:12 (T31)	06:12	19:11 (T30)	05:58	20:07 (T27)
	17:29 52	16:44 (T35)	18:07		19:40	20:12 66	19:46 (T30)	20:44 37	19:48 (T30)	21:06 31	20:38 (T27)
18	07:54	08:15 (T36)	07:23		07:40	06:49	07:12 (T31)	06:11	19:12 (T30)	05:58	20:07 (T27)
	17:30 54	16:44 (T35)	18:09		19:41	20:13 70	19:48 (T30)	20:45 41	20:21 (T27)	21:07 31	20:38 (T27)
19	07:53	08:15 (T36)	07:22		07:38	06:47	07:11 (T31)	06:10	19:13 (T30)	05:58	20:08 (T27)
	17:31 53	16:44 (T35)	18:10		19:42	20:14 73	19:49 (T30)	20:46 43	20:22 (T27)	21:07 31	20:39 (T27)
20	07:53	08:14 (T36)	07:21		07:36	06:46	07:12 (T31)	06:09	19:14 (T30)	05:58	20:08 (T27)
	17:33 55	16:44 (T35)	18:11		19:43	20:15 74	19:50 (T30)	20:46 44	20:23 (T27)	21:07 32	20:40 (T27)
21	07:52	08:13 (T36)	07:19		07:35	06:44	07:11 (T31)	06:08	19:15 (T30)	05:59	20:08 (T27)
	17:34 55	16:43 (T35)	18:12		19:44	20:16 77	19:51 (T30)	20:47 42	20:23 (T27)	21:08 32	20:40 (T27)
22	07:52	08:13 (T36)	07:18		07:33	06:43	07:12 (T31)	06:08	19:17 (T30)	05:59	20:08 (T27)
	17:35 57	16:44 (T35)	18:13		19:45	20:17 78	19:52 (T30)	20:48 42	20:25 (T27)	21:08 32	20:40 (T27)
23	07:51	08:12 (T36)	07:16		07:31	06:41	07:12 (T31)	06:07	19:18 (T30)	05:59	20:08 (T27)
	17:36 56	16:43 (T35)	18:15		19:46	20:18 79	19:53 (T30)	20:49 42	20:26 (T27)	21:08 32	20:40 (T27)
24	07:50	08:11 (T36)	07:15		07:30	06:40	07:12 (T31)	06:06	19:19 (T30)	05:59	20:09 (T27)
	17:37 56	16:42 (T35)	18:16		19:47	20:20 79	19:53 (T30)	20:50 41	20:26 (T27)	21:08 31	20:40 (T27)
25	07:50	08:10 (T36)	07:13		07:28	06:38	07:13 (T31)	06:05	19:22 (T30)	06:00	20:09 (T27)
	17:39 55	16:41 (T35)	18:17		19:48	20:21 79	19:54 (T30)	20:51 38	20:28 (T27)	21:08 31	20:40 (T27)
26	07:49	08:10 (T36)	07:12		07:26	06:37	07:13 (T31)	06:05	19:24 (T30)	06:00	20:09 (T27)
	17:40 54	16:41 (T35)	18:18		19:50	20:22 77	19:53 (T30)	20:52 34	20:28 (T27)	21:09 31	20:40 (T27)
27	07:48	08:09 (T36)	07:10		07:24	06:36	07:14 (T31)	06:04	19:28 (T30)	06:00	20:10 (T27)
	17:41 53	16:40 (T35)	18:19		19:51	20:23 77	19:54 (T30)	20:53 26	20:28 (T27)	21:09 31	20:41 (T27)
28	07:47	08:08 (T36)	07:09		07:23	06:34	07:16 (T31)	06:03	20:05 (T27)	06:01	20:09 (T27)
	17:42 50	16:38 (T35)	18:20		19:52	20:24 74	19:54 (T30)	20:54 25	20:30 (T27)	21:09 32	20:41 (T27)
29	07:46	08:07 (T36)			07:21	06:33	07:16 (T31)	06:03	20:05 (T27)	06:01	20:10 (T27)
	17:44 47	16:36 (T35)			19:53	20:25 73	19:54 (T30)	20:55 25	20:30 (T27)	21:09 32	20:42 (T27)
30	07:45	08:07 (T36)			07:19	06:31	07:18 (T31)	06:02	20:05 (T27)	06:01	20:10 (T27)
	17:45 40	16:33 (T35)			19:54	20:26 69	19:54 (T30)	20:55 26	20:31 (T27)	21:09 32	20:42 (T27)
31	07:44	08:07 (T36)			07:18			06:02	20:04 (T27)		
	17:46 31	08:38 (T36)			19:55			20:56 27	20:31 (T27)		
Potential sun hours	297		297		370	399		449		453	
Total, worst case	1454		241			1399		1284		935	
Sun reduction	0.31		0.40			0.52		0.57		0.64	
Oper. time red.	1.00		1.00			1.00		1.00		1.00	
Wind dir. red.	0.68		0.53			0.62		0.57		0.54	
Total reduction	0.22		0.22			0.33		0.33		0.36	
Total, real	317		52			464		428		334	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1269 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7219)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02		20:11 (T27)	06:26		19:18 (T30)	06:57		07:18 (T31)	07:27		07:02		07:46 (T36)	07:37		15:44 (T35)
	21:09	31	20:42 (T27)	20:50	43	20:01 (T30)	20:07	30	07:48 (T31)	19:15		17:28	14	08:00 (T36)	17:04	42	16:26 (T35)
2	06:02		20:10 (T27)	06:27		19:17 (T30)	06:58		07:19 (T31)	07:29		07:03		07:45 (T36)	07:38		15:44 (T35)
	21:08	32	20:42 (T27)	20:49	45	20:02 (T30)	20:06	28	07:47 (T31)	19:13		17:27	18	08:03 (T36)	17:03	42	16:26 (T35)
3	06:03		20:11 (T27)	06:28		19:17 (T30)	06:59		07:20 (T31)	07:30		07:04		07:43 (T36)	07:39		15:44 (T35)
	21:08	32	20:43 (T27)	20:48	45	20:02 (T30)	20:04	25	07:45 (T31)	19:11		17:25	21	08:04 (T36)	17:03	42	16:26 (T35)
4	06:04		20:11 (T27)	06:29		19:16 (T30)	07:00		07:21 (T31)	07:31		07:06		07:42 (T36)	07:40		15:45 (T35)
	21:08	31	20:42 (T27)	20:47	47	20:03 (T30)	20:02	22	07:43 (T31)	19:10		17:24	23	08:05 (T36)	17:03	42	16:27 (T35)
5	06:04		20:11 (T27)	06:30		19:16 (T30)	07:01		07:22 (T31)	07:32		07:07		07:40 (T36)	07:41		15:45 (T35)
	21:08	32	20:43 (T27)	20:46	47	20:03 (T30)	20:01	19	07:41 (T31)	19:08		17:23	26	08:06 (T36)	17:03	42	16:27 (T35)
6	06:05		20:11 (T27)	06:31		19:15 (T30)	07:02		07:23 (T31)	07:33		07:08		07:40 (T36)	07:42		15:45 (T35)
	21:08	31	20:42 (T27)	20:45	48	20:03 (T30)	19:57	15	07:38 (T31)	19:06		17:22	27	08:07 (T36)	17:03	42	16:27 (T35)
7	06:05		20:12 (T27)	06:32		19:15 (T30)	07:03			07:34		07:09		07:39 (T36)	07:43		15:46 (T35)
	21:07	30	20:42 (T27)	20:43	48	20:03 (T30)	19:56			19:05		17:21	29	08:08 (T36)	17:02	42	16:28 (T35)
8	06:06		20:11 (T27)	06:33		19:15 (T30)	07:04			07:35		07:10		07:39 (T36)	07:44		15:46 (T35)
	21:07	30	20:41 (T27)	20:42	48	20:03 (T30)	19:54			19:03		17:20	29	08:08 (T36)	17:02	42	16:28 (T35)
9	06:07		20:12 (T27)	06:34		19:14 (T30)	07:05			07:36		07:12		07:39 (T36)	07:45		15:46 (T35)
	21:07	29	20:41 (T27)	20:41	49	20:03 (T30)	19:52			19:01		17:19	30	08:09 (T36)	17:02	42	16:28 (T35)
10	06:07		20:12 (T27)	06:35		19:14 (T30)	07:06			07:37		07:13		07:39 (T36)	07:46		15:47 (T35)
	21:06	29	20:41 (T27)	20:40	49	20:03 (T30)	19:51			19:00		17:18	30	08:09 (T36)	17:02	41	16:28 (T35)
11	06:08		20:12 (T27)	06:36		07:32 (T31)	07:07			07:38		07:14		07:38 (T36)	07:47		15:47 (T35)
	21:06	28	20:40 (T27)	20:38	59	20:03 (T30)	19:49			18:58		17:17	31	08:09 (T36)	17:03	42	16:29 (T35)
12	06:09		20:13 (T27)	06:37		07:29 (T31)	07:08			07:39		07:15		07:38 (T36)	07:47		15:48 (T35)
	21:06	27	20:40 (T27)	20:37	65	20:03 (T30)	19:47			18:57		17:16	41	16:04 (T35)	17:03	41	16:29 (T35)
13	06:09		20:13 (T27)	06:38		07:26 (T31)	07:09			07:40		07:16		07:39 (T36)	07:48		15:49 (T35)
	21:05	27	20:40 (T27)	20:36	70	20:03 (T30)	19:45			18:55		17:15	47	16:08 (T35)	17:03	41	16:30 (T35)
14	06:10		20:14 (T27)	06:39		07:24 (T31)	07:10			07:41		07:18		07:40 (T36)	07:49		15:48 (T35)
	21:05	26	20:40 (T27)	20:34	73	20:02 (T30)	19:44			18:53		17:14	50	16:10 (T35)	17:03	42	16:30 (T35)
15	06:11		20:14 (T27)	06:40		07:22 (T31)	07:11			07:42		07:19		07:41 (T36)	07:50		15:49 (T35)
	21:04	24	20:38 (T27)	20:33	75	20:01 (T30)	19:42			18:52		17:13	53	16:12 (T35)	17:03	41	16:30 (T35)
16	06:12		20:14 (T27)	06:41		07:21 (T31)	07:12			07:44		07:20		07:43 (T36)	07:50		15:50 (T35)
	21:04	24	20:38 (T27)	20:32	77	20:01 (T30)	19:40			18:50		17:12	54	16:14 (T35)	17:03	41	16:31 (T35)
17	06:13		19:35 (T30)	06:42		07:20 (T31)	07:13			07:45		07:21		07:44 (T36)	07:51		15:51 (T35)
	21:03	32	20:38 (T27)	20:30	78	20:00 (T30)	19:39			18:49		17:11	55	16:15 (T35)	17:04	41	16:32 (T35)
18	06:13		19:32 (T30)	06:43		07:19 (T31)	07:14			07:46		07:22		07:45 (T36)	07:52		15:51 (T35)
	21:02	36	20:37 (T27)	20:29	77	19:59 (T30)	19:37			18:47		17:11	56	16:16 (T35)	17:04	41	16:32 (T35)
19	06:14		19:31 (T30)	06:44		07:18 (T31)	07:15			07:47		07:24		07:46 (T36)	07:52		15:51 (T35)
	21:02	38	20:37 (T27)	20:27	78	19:58 (T30)	19:35			18:46		17:10	56	16:17 (T35)	17:04	42	16:33 (T35)
20	06:15		19:28 (T30)	06:45		07:17 (T31)	07:16			07:48		07:25		07:48 (T36)	07:53		15:51 (T35)
	21:01	41	20:35 (T27)	20:26	78	19:58 (T30)	19:33			18:44		17:09	57	16:19 (T35)	17:05	42	16:33 (T35)
21	06:16		19:27 (T30)	06:46		07:16 (T31)	07:17			07:49		07:26		07:49 (T36)	07:53		15:52 (T35)
	21:00	43	20:35 (T27)	20:24	79	19:57 (T30)	19:32			18:43		17:08	55	16:19 (T35)	17:05	41	16:33 (T35)
22	06:17		19:26 (T30)	06:47		07:16 (T31)	07:18			07:50		07:27		07:50 (T36)	07:54		15:52 (T35)
	20:59	42	20:34 (T27)	20:23	76	19:55 (T30)	19:30			18:41		17:08	55	16:20 (T35)	17:06	41	16:33 (T35)
23	06:18		19:25 (T30)	06:48		07:15 (T31)	07:19			07:51		07:28		07:51 (T36)	07:54		15:53 (T35)
	20:59	44	20:34 (T27)	20:21	75	19:54 (T30)	19:28			18:40		17:07	53	16:20 (T35)	17:06	41	16:34 (T35)
24	06:19		19:24 (T30)	06:49		07:15 (T31)	07:20			07:53		07:29		07:52 (T36)	07:55		15:53 (T35)
	20:58	44	20:33 (T27)	20:20	72	19:52 (T30)	19:27			18:39		17:07	54	16:21 (T35)	17:07	42	16:35 (T35)
25	06:20		19:23 (T30)	06:50		07:15 (T31)	07:21			07:54		07:31		07:54 (T36)	07:55		15:53 (T35)
	20:57	42	20:32 (T27)	20:18	70	19:51 (T30)	19:25			18:37		17:06	52	16:22 (T35)	17:08	42	16:35 (T35)
26	06:20		19:22 (T30)	06:51		07:15 (T31)	07:22			07:55		07:32		07:55 (T36)	07:56		15:55 (T35)
	20:56	41	20:32 (T27)	20:17	64	19:48 (T30)	19:23			18:36		17:05	51	16:23 (T35)	17:08	41	16:36 (T35)
27	06:21		19:21 (T30)	06:52		07:14 (T31)	07:23			07:56		07:33		07:56 (T36)	07:56		15:55 (T35)
	20:55	37	19:58 (T30)	20:15	61	19:46 (T30)	19:21			18:34		17:05	48	16:23 (T35)	17:09	41	16:36 (T35)
28	06:22		19:20 (T30)	06:53		07:14 (T31)	07:24			07:57		07:34		07:57 (T36)	07:56		15:55 (T35)
	20:54	39	19:59 (T30)	20:14	54	19:42 (T30)	19:20			18:33		17:05	45	16:23 (T35)	17:09	41	16:36 (T35)
29	06:23		19:19 (T30)	06:54		07:15 (T31)	07:25			07:58		07:35		15:43 (T35)	07:57		15:55 (T35)
	20:53	40	19:59 (T30)	20:12	36	07:51 (T31)	19:18			18:32		17:04	41	16:24 (T35)	17:10	42	16:37 (T35)
30	06:24		19:19 (T30)	06:55		07:16 (T31)	07:26			08:00		07:36		15:43 (T35)	07:57		15:56 (T35)
	20:52	41	20:00 (T30)	20:10	34	07:50 (T31)	19:16			18:30		17:04	41	16:24 (T35)	17:11	42	16:38 (T35)
31	06:25		19:18 (T30)	06:56		07:17 (T31)				08:01	08:51 (T36)				07:57		15:57 (T35)
	20:51	43	20:01 (T30)	20:09	32	07:49 (T31)				18:29	5 08:56 (T36)				17:12	41	16:38 (T35)
Potential sun hours	460			429			375			345		297			287		
Total, worst case		1066			1852			139			5		1242			1288	
Sun reduction		0.66			0.61			0.59			0.48		0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00		1.00			1.00	
Wind dir. red.		0.56			0.60			0.66			0.53		0.63			0.74	
Total reduction		0.38			0.38			0.40			0.26		0.19			0.17	
Total, real		402			702			56			1		242			215	

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1314 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7257)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February			March			April		May			June		
1	07:58		07:44		16:57 (T13)	07:07		16:42 (T13)	07:16		06:30			06:01		19:58 (T10)
	17:13		17:47	13	17:10 (T13)	18:22	57	18:00 (T12)	19:56		20:27			20:57	35	20:33 (T10)
2	07:58		07:43		16:54 (T13)	07:06		16:42 (T13)	07:14		06:29			06:01		19:57 (T10)
	17:14		17:48	20	17:14 (T13)	18:23	60	18:01 (T12)	19:57		20:28			20:58	36	20:33 (T10)
3	07:58		07:42		16:51 (T13)	07:04		16:44 (T13)	07:13		06:27			06:00		19:58 (T10)
	17:14		17:50	26	17:17 (T13)	18:24	60	18:03 (T12)	19:58		20:29			20:59	36	20:34 (T10)
4	07:58		07:41		16:49 (T13)	07:03		16:45 (T13)	07:11		06:26			06:00		19:58 (T10)
	17:15		17:51	30	17:19 (T13)	18:25	59	18:03 (T12)	19:59		20:30			20:59	36	20:34 (T10)
5	07:58		07:40		16:48 (T13)	07:01		16:46 (T13)	07:09		06:25			05:59		19:57 (T10)
	17:16		17:52	33	17:21 (T13)	18:26	59	18:04 (T12)	20:00		20:31			21:00	37	20:34 (T10)
6	07:58		07:38		16:47 (T13)	06:59		16:48 (T13)	07:08		06:24			05:59		19:58 (T10)
	17:17		17:54	36	17:23 (T13)	18:27	58	18:06 (T12)	20:00		20:33			21:01	37	20:35 (T10)
7	07:58		07:37		16:45 (T13)	06:58		16:50 (T13)	07:06		06:22			05:59		19:58 (T10)
	17:18		17:55	38	17:23 (T13)	18:29	55	18:07 (T12)	20:01		20:34			21:01	37	20:35 (T10)
8	07:58		07:36		16:44 (T13)	07:56		17:52 (T13)	07:05		06:21			05:59		19:58 (T10)
	17:19		17:56	41	17:25 (T13)	19:30	51	19:08 (T12)	20:02		20:35			21:02	38	20:36 (T10)
9	07:57		07:35		16:43 (T13)	07:55		17:57 (T13)	07:03		06:20			05:58		19:57 (T10)
	17:20		17:57	43	17:26 (T13)	19:31	43	19:08 (T12)	20:04		20:36			21:03	38	20:35 (T10)
10	07:57		07:34		16:42 (T13)	07:53		18:37 (T12)	07:01		06:19			05:58		19:58 (T10)
	17:21		17:59	45	17:27 (T13)	19:32	31	19:08 (T12)	20:05		20:37			21:03	38	20:36 (T10)
11	07:57		07:33		16:42 (T13)	07:51		18:38 (T12)	07:00		06:18			05:58		19:58 (T10)
	17:22		18:00	46	17:28 (T13)	19:33	30	19:08 (T12)	20:06		20:38			21:04	38	20:36 (T10)
12	07:57		07:31		16:41 (T13)	07:50		18:37 (T12)	06:58		06:17			05:58		19:58 (T10)
	17:23		18:01	47	17:28 (T13)	19:34	30	19:07 (T12)	20:07		20:39			21:04	38	20:36 (T10)
13	07:56		07:30		16:40 (T13)	07:48		18:37 (T12)	06:56		06:16			05:58		19:58 (T10)
	17:24		18:02	49	17:29 (T13)	19:35	29	19:06 (T12)	20:08		20:40			21:05	39	20:37 (T10)
14	07:56		07:29		16:40 (T13)	07:46		18:38 (T12)	06:55		06:15			05:58		19:58 (T10)
	17:25		18:04	50	17:30 (T13)	19:36	28	19:06 (T12)	20:09		20:41			21:05	39	20:37 (T10)
15	07:56		07:27		16:39 (T13)	07:45		18:39 (T12)	06:53		06:14			05:58		19:59 (T10)
	17:27		18:05	51	17:30 (T13)	19:38	26	19:05 (T12)	20:10		20:42			21:06	38	20:37 (T10)
16	07:55		07:26		16:39 (T13)	07:43		18:39 (T12)	06:52		06:13			05:58		19:59 (T10)
	17:28		18:06	52	17:31 (T13)	19:39	24	19:03 (T12)	20:11		20:43			21:06	38	20:37 (T10)
17	07:55		07:25		16:39 (T13)	07:41		18:40 (T12)	06:50		06:12			05:58		19:59 (T10)
	17:29		18:07	52	17:31 (T13)	19:40	21	19:01 (T12)	20:12		20:44			21:07	38	20:37 (T10)
18	07:54		07:23		16:38 (T13)	07:40		18:43 (T12)	06:49		06:11			05:58		19:59 (T10)
	17:30		18:08	53	17:31 (T13)	19:41	16	18:59 (T12)	20:13		20:45			21:07	39	20:38 (T10)
19	07:54		07:22		16:39 (T13)	07:38		18:45 (T12)	06:47		06:10		20:09 (T10)	05:58		19:59 (T10)
	17:31		18:10	53	17:32 (T13)	19:42	10	18:55 (T12)	20:14		20:46	11	20:20 (T10)	21:07	39	20:38 (T10)
20	07:53		07:21		16:38 (T13)	07:36			06:46		06:09		20:06 (T10)	05:58		20:00 (T10)
	17:32		18:11	53	17:31 (T13)	19:43			20:15		20:47	16	20:22 (T10)	21:08	39	20:39 (T10)
21	07:53		07:19		16:38 (T13)	07:35			06:44		06:08		20:04 (T10)	05:58		20:00 (T10)
	17:34		18:12	53	17:31 (T13)	19:44			20:16		20:48	20	20:24 (T10)	21:08	39	20:39 (T10)
22	07:52		07:18		16:38 (T13)	07:33			06:43		06:07		20:04 (T10)	05:59		20:00 (T10)
	17:35		18:13	53	17:31 (T13)	19:45			20:18		20:49	21	20:25 (T10)	21:08	39	20:39 (T10)
23	07:51		07:16		16:39 (T13)	07:31			06:41		06:07		20:02 (T10)	05:59		20:00 (T10)
	17:36		18:15	52	17:31 (T13)	19:46			20:19		20:50	24	20:26 (T10)	21:08	39	20:39 (T10)
24	07:50		07:15		16:38 (T13)	07:30			06:40		06:06		20:01 (T10)	05:59		20:01 (T10)
	17:37		18:16	52	17:30 (T13)	19:47			20:20		20:50	25	20:26 (T10)	21:09	39	20:40 (T10)
25	07:50		07:13		16:39 (T13)	07:28			06:38		06:05		20:00 (T10)	05:59		20:01 (T10)
	17:38		18:17	51	17:30 (T13)	19:48			20:21		20:51	27	20:27 (T10)	21:09	38	20:39 (T10)
26	07:49		07:12		16:39 (T13)	07:26			06:37		06:05		20:00 (T10)	06:00		20:01 (T10)
	17:40		18:18	50	17:29 (T13)	19:50			20:22		20:52	28	20:28 (T10)	21:09	38	20:39 (T10)
27	07:48		07:10		16:40 (T13)	07:24			06:35		06:04		19:59 (T10)	06:00		20:02 (T10)
	17:41		18:19	49	17:29 (T13)	19:51			20:23		20:53	30	20:29 (T10)	21:09	38	20:40 (T10)
28	07:47		07:09		16:40 (T13)	07:23			06:34		06:03		19:59 (T10)	06:00		20:02 (T10)
	17:42		18:20	52	17:57 (T12)	19:52			20:24		20:54	31	20:30 (T10)	21:09	38	20:40 (T10)
29	07:46					07:21			06:33		06:03		19:58 (T10)	06:01		20:01 (T10)
	17:43					19:53			20:25		20:55	32	20:30 (T10)	21:09	39	20:40 (T10)
30	07:46					07:19			06:31		06:02		19:59 (T10)	06:01		20:02 (T10)
	17:45					19:54			20:26		20:56	33	20:32 (T10)	21:09	38	20:40 (T10)
31	07:45					07:18					06:02		19:58 (T10)			
	17:46					19:55					20:56	34	20:32 (T10)			
Potential sun hours	297		297			370			399		449			453		
Total, worst case				1243			747					332			1138	
Sun reduction				0.40			0.44					0.57			0.64	
Oper. time red.				1.00			1.00					1.00			1.00	
Wind dir. red.				0.72			0.69					0.54			0.54	
Total reduction				0.29			0.31					0.32			0.36	
Total, real				364			231					105			404	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1314 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7257)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August		September			October			November			December
1	06:02		20:02 (T10)	06:26		06:57			07:28		18:16 (T12)	07:02		16:12 (T13)	07:37
	21:09	38	20:40 (T10)	20:50		20:07			19:15	30	18:46 (T12)	17:28	45	16:57 (T13)	17:03
2	06:02		20:03 (T10)	06:27		06:58			07:29		18:15 (T12)	07:03		16:13 (T13)	07:38
	21:09	38	20:41 (T10)	20:49		20:06			19:13	31	18:46 (T12)	17:27	43	16:56 (T13)	17:03
3	06:03		20:02 (T10)	06:28		06:59			07:30		18:16 (T12)	07:05		16:14 (T13)	07:39
	21:09	38	20:40 (T10)	20:48		20:04			19:11	30	18:46 (T12)	17:25	40	16:54 (T13)	17:03
4	06:03		20:03 (T10)	06:29		07:00			07:31		17:39 (T13)	07:06		16:15 (T13)	07:40
	21:08	38	20:41 (T10)	20:47		20:02			19:10	35	18:46 (T12)	17:24	38	16:53 (T13)	17:03
5	06:04		20:04 (T10)	06:30		07:01			07:32		17:31 (T13)	07:07		16:17 (T13)	07:41
	21:08	37	20:41 (T10)	20:46		20:01			19:08	49	18:46 (T12)	17:23	35	16:52 (T13)	17:03
6	06:05		20:04 (T10)	06:31		07:02			07:33		17:28 (T13)	07:08		16:18 (T13)	07:42
	21:08	37	20:41 (T10)	20:45		19:57			19:06	53	18:44 (T12)	17:22	33	16:51 (T13)	17:02
7	06:05		20:04 (T10)	06:32		07:03			07:34		17:25 (T13)	07:09		16:20 (T13)	07:43
	21:08	37	20:41 (T10)	20:43		19:56			19:05	56	18:42 (T12)	17:21	29	16:49 (T13)	17:02
8	06:06		20:04 (T10)	06:33		07:04			07:35		17:22 (T13)	07:11		16:22 (T13)	07:44
	21:07	37	20:41 (T10)	20:42		19:54			19:03	60	18:41 (T12)	17:20	25	16:47 (T13)	17:02
9	06:06		20:05 (T10)	06:34		07:05			07:36		17:20 (T13)	07:12		16:25 (T13)	07:45
	21:07	36	20:41 (T10)	20:41		19:52			19:01	60	18:39 (T12)	17:19	20	16:45 (T13)	17:02
10	06:07		20:06 (T10)	06:35		07:06			07:37		17:18 (T13)	07:13		16:28 (T13)	07:46
	21:07	35	20:41 (T10)	20:40		19:51			19:00	60	18:37 (T12)	17:18	13	16:41 (T13)	17:02
11	06:08		20:05 (T10)	06:36		07:07			07:38		17:17 (T13)	07:14			07:47
	21:06	35	20:40 (T10)	20:38		19:49			18:58	59	18:35 (T12)	17:17			17:02
12	06:09		20:06 (T10)	06:37		07:08			07:39		17:15 (T13)	07:15			07:48
	21:06	34	20:40 (T10)	20:37		19:47			18:57	59	18:34 (T12)	17:16			17:02
13	06:09		20:07 (T10)	06:38		07:09			07:40		17:15 (T13)	07:17			07:48
	21:05	33	20:40 (T10)	20:36		19:46			18:55	56	18:33 (T12)	17:15			17:03
14	06:10		20:08 (T10)	06:39		07:10			07:41		17:13 (T13)	07:18			07:49
	21:05	32	20:40 (T10)	20:34		19:44			18:53	48	18:01 (T13)	17:14			17:03
15	06:11		20:07 (T10)	06:40		07:11			07:43		17:12 (T13)	07:19			07:50
	21:04	32	20:39 (T10)	20:33		19:42			18:52	49	18:01 (T13)	17:13			17:03
16	06:12		20:08 (T10)	06:41		07:12			07:44		17:11 (T13)	07:20			07:51
	21:04	30	20:38 (T10)	20:32		19:40			18:50	51	18:02 (T13)	17:12			17:03
17	06:12		20:09 (T10)	06:42		07:13			07:45		17:11 (T13)	07:21			07:51
	21:03	29	20:38 (T10)	20:30		19:39			18:49	51	18:02 (T13)	17:11			17:04
18	06:13		20:10 (T10)	06:43		07:14			07:46		17:10 (T13)	07:23			07:52
	21:03	28	20:38 (T10)	20:29		19:37			18:47	52	18:02 (T13)	17:10			17:04
19	06:14		20:10 (T10)	06:44		07:15			07:47		17:09 (T13)	07:24			07:53
	21:02	26	20:36 (T10)	20:27		19:35			18:46	52	18:01 (T13)	17:10			17:04
20	06:15		20:11 (T10)	06:45		07:16			07:48		17:09 (T13)	07:25			07:53
	21:01	25	20:36 (T10)	20:26		19:34			18:44	53	18:02 (T13)	17:09			17:05
21	06:16		20:12 (T10)	06:46		07:17			07:49		17:09 (T13)	07:26			07:54
	21:00	23	20:35 (T10)	20:24		19:32			18:43	53	18:02 (T13)	17:08			17:05
22	06:17		20:14 (T10)	06:47		07:18			07:50		17:09 (T13)	07:27			07:54
	21:00	21	20:35 (T10)	20:23		19:30			18:41	53	18:02 (T13)	17:08			17:06
23	06:18		20:15 (T10)	06:48		07:19			07:52		17:08 (T13)	07:28			07:55
	20:59	19	20:34 (T10)	20:21		19:28			18:40	53	18:01 (T13)	17:07			17:06
24	06:18		20:18 (T10)	06:49		07:20		18:31 (T12)	07:53		17:09 (T13)	07:30			07:55
	20:58	14	20:32 (T10)	20:20		19:27	6	18:37 (T12)	18:38	53	18:02 (T13)	17:06			17:07
25	06:19		20:21 (T10)	06:50		07:21		18:26 (T12)	07:54		17:09 (T13)	07:31			07:56
	20:57	8	20:29 (T10)	20:18		19:25	15	18:41 (T12)	18:37	52	18:01 (T13)	17:06			17:07
26	06:20			06:51		07:22		18:23 (T12)	07:55		17:09 (T13)	07:32			07:56
	20:56			20:17		19:23	20	18:43 (T12)	18:36	51	18:00 (T13)	17:05			17:08
27	06:21			06:52		07:23		18:21 (T12)	07:56		17:09 (T13)	07:33			07:56
	20:55			20:15		19:22	23	18:44 (T12)	18:34	51	18:00 (T13)	17:05			17:09
28	06:22			06:53		07:24		18:20 (T12)	07:57		17:09 (T13)	07:34			07:57
	20:54			20:14		19:20	25	18:45 (T12)	18:33	50	17:59 (T13)	17:04			17:09
29	06:23			06:54		07:25		18:18 (T12)	07:59		17:10 (T13)	07:35			07:57
	20:53			20:12		19:18	27	18:45 (T12)	18:32	49	17:59 (T13)	17:04			17:10
30	06:24			06:55		07:27		18:17 (T12)	08:00		17:10 (T13)	07:36			07:57
	20:52			20:11		19:16	29	18:46 (T12)	18:30	48	17:58 (T13)	17:04			17:11
31	06:25			06:56					08:01		17:11 (T13)				07:57
	20:51			20:09					18:29	46	17:57 (T13)				17:12
Potential sun hours	460			429		375			345			297			287
Total, worst case		760					145			1553			321		
Sun reduction		0.66					0.59			0.48			0.30		
Oper. time red.		1.00					1.00			1.00			1.00		
Wind dir. red.		0.54					0.67			0.71			0.72		
Total reduction		0.37					0.40			0.35			0.22		
Total, real		279					58			538			71		

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1375 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7298)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February	March			April			May			June		
1	07:57		08:49 (T71)	07:43	07:07			07:16		18:14 (T69)	06:30		06:50 (T67)	06:02		07:11 (T68)
	17:13	46	09:35 (T71)	17:48	18:22			19:56	65	19:19 (T69)	20:27	120	18:59 (T69)	20:57	56	08:07 (T68)
2	07:57		08:50 (T71)	07:42	07:06			07:15		18:14 (T69)	06:29		06:50 (T67)	06:01		07:12 (T68)
	17:14	46	09:36 (T71)	17:49	18:23			19:57	66	19:20 (T69)	20:28	117	18:58 (T69)	20:57	55	08:07 (T68)
3	07:57		08:51 (T71)	07:41	07:04			07:13		18:13 (T69)	06:28		06:51 (T67)	06:01		07:13 (T68)
	17:15	45	09:36 (T71)	17:50	18:24			19:58	66	19:19 (T69)	20:29	112	18:56 (T69)	20:58	54	08:07 (T68)
4	07:57		08:51 (T71)	07:40	07:02			07:11		18:12 (T69)	06:27		06:50 (T67)	06:01		07:13 (T68)
	17:16	45	09:36 (T71)	17:51	18:25			19:59	67	19:19 (T69)	20:30	107	18:52 (T69)	20:59	53	08:06 (T68)
5	07:57		08:52 (T71)	07:39	07:01			07:10		18:12 (T69)	06:25		06:51 (T67)	06:00		07:14 (T68)
	17:17	44	09:36 (T71)	17:53	18:26			20:00	68	19:20 (T69)	20:31	98	18:48 (T69)	20:59	52	08:06 (T68)
6	07:57		08:53 (T71)	07:38	06:59			07:08		18:11 (T69)	06:24		06:52 (T67)	06:00		07:15 (T68)
	17:18	44	09:37 (T71)	17:54	18:28			20:00	69	19:20 (T69)	20:32	82	08:14 (T68)	21:00	51	08:06 (T68)
7	07:57		08:54 (T71)	07:37	06:58			07:06		18:10 (T69)	06:23		06:53 (T67)	06:00		07:16 (T68)
	17:19	43	09:37 (T71)	17:55	18:29			20:01	69	19:19 (T69)	20:33	81	08:14 (T68)	21:01	50	08:06 (T68)
8	07:57		08:55 (T71)	07:36	07:56			07:05		18:10 (T69)	06:22		06:54 (T67)	05:59		07:15 (T68)
	17:20	42	09:37 (T71)	17:57	19:30			20:02	70	19:20 (T69)	20:34	80	08:14 (T68)	21:01	50	08:05 (T68)
9	07:57		08:56 (T71)	07:35	07:54			07:03		18:10 (T69)	06:21		06:56 (T67)	05:59		07:16 (T68)
	17:21	41	09:37 (T71)	17:58	19:31			20:03	69	19:19 (T69)	20:35	78	08:14 (T68)	21:02	49	08:05 (T68)
10	07:57		08:56 (T71)	07:33	07:53			07:02		18:09 (T69)	06:20		06:57 (T67)	05:59		07:17 (T68)
	17:22	41	09:37 (T71)	17:59	19:32			20:04	69	19:18 (T69)	20:36	77	08:14 (T68)	21:03	48	08:05 (T68)
11	07:56		08:57 (T71)	07:32	07:51			07:00		18:10 (T69)	06:18		07:00 (T67)	05:59		07:17 (T68)
	17:23	40	09:37 (T71)	18:00	19:33			20:06	69	19:19 (T69)	20:37	74	08:14 (T68)	21:03	48	08:05 (T68)
12	07:56		08:58 (T71)	07:31	07:50			06:58		18:09 (T69)	06:17		07:05 (T68)	05:59		07:18 (T68)
	17:24	39	09:37 (T71)	18:01	19:34			20:07	69	19:18 (T69)	20:38	68	08:13 (T68)	21:04	47	08:05 (T68)
13	07:56		08:58 (T71)	07:30	07:48			06:57		07:38 (T68)	06:16		07:05 (T68)	05:59		07:18 (T68)
	17:25	38	09:36 (T71)	18:03	19:35			20:08	82	19:18 (T69)	20:39	68	08:13 (T68)	21:04	47	08:05 (T68)
14	07:55		09:00 (T71)	07:28	07:46			06:55		07:32 (T68)	06:15		07:05 (T68)	05:59		07:19 (T68)
	17:26	36	09:36 (T71)	18:04	19:37			20:09	92	19:17 (T69)	20:40	68	08:13 (T68)	21:05	46	08:05 (T68)
15	07:55		09:00 (T71)	07:27	07:45			06:54		07:29 (T68)	06:14		07:05 (T68)	05:59		07:19 (T68)
	17:27	35	09:35 (T71)	18:05	19:38			20:10	98	19:17 (T69)	20:41	68	08:13 (T68)	21:05	46	08:05 (T68)
16	07:55		09:02 (T71)	07:26	07:43			06:52		07:25 (T68)	06:13		07:05 (T68)	05:59		07:19 (T68)
	17:28	33	09:35 (T71)	18:06	19:39			20:11	103	19:16 (T69)	20:42	67	08:12 (T68)	21:06	46	08:05 (T68)
17	07:54		09:03 (T71)	07:25	07:41			06:51		07:10 (T67)	06:12		07:05 (T68)	05:59		07:20 (T68)
	17:30	31	09:34 (T71)	18:08	19:40			20:12	112	19:16 (T69)	20:43	67	08:12 (T68)	21:06	45	08:05 (T68)
18	07:54		09:05 (T71)	07:23	07:40			06:49		07:08 (T67)	06:11		07:06 (T68)	05:59		07:20 (T68)
	17:31	29	09:34 (T71)	18:09	19:41			20:13	118	19:15 (T69)	20:44	65	08:11 (T68)	21:06	45	08:05 (T68)
19	07:53		09:06 (T71)	07:22	07:38		18:42 (T69)	06:47		07:07 (T67)	06:11		07:06 (T68)	05:59		07:20 (T68)
	17:32	26	09:32 (T71)	18:10	19:42	17	18:59 (T69)	20:14	123	19:15 (T69)	20:45	65	08:11 (T68)	21:07	45	08:05 (T68)
20	07:53		09:09 (T71)	07:20	07:36		18:36 (T69)	06:46		07:05 (T67)	06:10		07:07 (T68)	05:59		07:20 (T68)
	17:33	22	09:31 (T71)	18:11	19:43	27	19:03 (T69)	20:15	125	19:13 (T69)	20:46	64	08:11 (T68)	21:07	45	08:05 (T68)
21	07:52		09:11 (T71)	07:19	07:35		18:33 (T69)	06:44		07:04 (T67)	06:09		07:07 (T68)	05:59		07:21 (T68)
	17:34	18	09:29 (T71)	18:12	19:44	34	19:07 (T69)	20:16	126	19:13 (T69)	20:47	64	08:11 (T68)	21:07	45	08:06 (T68)
22	07:51		09:13 (T71)	07:18	07:33		18:30 (T69)	06:43		07:02 (T67)	06:08		07:07 (T68)	05:59		07:21 (T68)
	17:35	13	09:26 (T71)	18:14	19:45	39	19:09 (T69)	20:17	127	19:11 (T69)	20:48	63	08:10 (T68)	21:07	45	08:06 (T68)
23	07:51			07:16	07:31		18:27 (T69)	06:42		07:01 (T67)	06:07		07:07 (T68)	06:00		07:21 (T68)
	17:37			18:15	19:46	43	19:10 (T69)	20:18	128	19:11 (T69)	20:49	63	08:10 (T68)	21:08	45	08:06 (T68)
24	07:50			07:15	07:30		18:26 (T69)	06:40		06:59 (T67)	06:07		07:08 (T68)	06:00		07:21 (T68)
	17:38			18:16	19:47	47	19:13 (T69)	20:19	127	19:09 (T69)	20:50	62	08:10 (T68)	21:08	45	08:06 (T68)
25	07:49			07:13	07:28		18:23 (T69)	06:39		06:58 (T67)	06:06		07:08 (T68)	06:00		07:22 (T68)
	17:39			18:17	19:48	51	19:14 (T69)	20:20	127	19:08 (T69)	20:51	61	08:09 (T68)	21:08	45	08:07 (T68)
26	07:48			07:12	07:26		18:21 (T69)	06:37		06:57 (T67)	06:05		07:08 (T68)	06:00		07:22 (T68)
	17:40			18:18	19:50	54	19:15 (T69)	20:21	127	19:07 (T69)	20:52	61	08:09 (T68)	21:08	45	08:07 (T68)
27	07:48			07:10	07:25		18:20 (T69)	06:36		06:55 (T67)	06:05		07:09 (T68)	06:01		07:21 (T68)
	17:42			18:20	19:51	56	19:16 (T69)	20:23	126	19:06 (T69)	20:52	60	08:09 (T68)	21:08	46	08:07 (T68)
28	07:47			07:09	07:23		18:19 (T69)	06:35		06:54 (T67)	06:04		07:09 (T68)	06:01		07:22 (T68)
	17:43			18:21	19:52	58	19:17 (T69)	20:24	125	19:04 (T69)	20:53	59	08:08 (T68)	21:08	46	08:08 (T68)
29	07:46				07:21		18:17 (T69)	06:33		06:53 (T67)	06:03		07:10 (T68)	06:02		07:22 (T68)
	17:44				19:53	60	19:17 (T69)	20:25	124	19:03 (T69)	20:54	58	08:08 (T68)	21:08	46	08:08 (T68)
30	07:45				07:20		18:17 (T69)	06:32		06:51 (T67)	06:03		07:10 (T68)	06:02		07:22 (T68)
	17:45				19:54	61	19:18 (T69)	20:26	122	19:01 (T69)	20:55	57	08:07 (T68)	21:08	47	08:09 (T68)
31	07:44				07:18		18:15 (T69)				06:02		07:11 (T68)			
	17:46				19:55	64	19:19 (T69)				20:56	57	08:08 (T68)			
Potential sun hours	297			297	370			399			448			452		
Total, worst case		797				611			2928			2291			1433	
Sun reduction		0.31				0.44			0.52			0.57			0.64	
Oper. time red.		1.00				1.00			1.00			1.00			1.00	
Wind dir. red.		0.53				0.64			0.65			0.67			0.67	
Total reduction		0.16				0.28			0.33			0.37			0.42	
Total, real		128				169			972			854			600	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1375 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7298)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:03		07:21 (T68)	06:27		07:13 (T67)	06:57		18:08 (T69)	07:28		07:02			07:37		08:39 (T71)
	21:08	48	08:09 (T68)	20:50	70	08:23 (T68)	20:07	70	19:18 (T69)	19:15		17:28			17:04	40	09:19 (T71)
2	06:03		07:22 (T68)	06:28		07:09 (T67)	06:58		18:08 (T69)	07:29		07:03			07:38		08:39 (T71)
	21:08	48	08:10 (T68)	20:49	74	08:23 (T68)	20:05	69	19:17 (T69)	19:13		17:27			17:04	41	09:20 (T71)
3	06:04		07:21 (T68)	06:29		07:06 (T67)	06:59		18:08 (T69)	07:30		07:04			07:39		08:39 (T71)
	21:08	49	08:10 (T68)	20:48	77	08:23 (T68)	20:04	69	19:17 (T69)	19:11		17:26			17:04	41	09:20 (T71)
4	06:04		07:22 (T68)	06:30		07:05 (T67)	07:00		18:07 (T69)	07:31		07:05			07:40		08:39 (T71)
	21:08	49	08:11 (T68)	20:47	79	08:24 (T68)	20:02	70	19:17 (T69)	19:10		17:25			17:03	42	09:21 (T71)
5	06:05		07:21 (T68)	06:31		07:03 (T67)	07:01		18:07 (T69)	07:32		07:07			07:41		08:39 (T71)
	21:08	50	08:11 (T68)	20:45	81	08:24 (T68)	20:01	69	19:16 (T69)	19:08		17:23			17:03	43	09:22 (T71)
6	06:05		07:21 (T68)	06:31		07:02 (T67)	07:02		18:07 (T69)	07:33		07:08			07:42		08:39 (T71)
	21:07	51	08:12 (T68)	20:44	82	08:24 (T68)	19:57	69	19:16 (T69)	19:07		17:22			17:03	44	09:23 (T71)
7	06:06		07:20 (T68)	06:32		07:01 (T67)	07:03		18:07 (T69)	07:34		07:09			07:43		08:39 (T71)
	21:07	52	08:12 (T68)	20:43	89	18:54 (T69)	19:56	68	19:15 (T69)	19:05		17:21			17:03	44	09:23 (T71)
8	06:07		07:21 (T68)	06:33		07:00 (T67)	07:04		18:07 (T69)	07:35		07:10			07:44		08:39 (T71)
	21:07	52	08:13 (T68)	20:42	101	18:59 (T69)	19:54	67	19:14 (T69)	19:03		17:20			17:03	45	09:24 (T71)
9	06:07		07:21 (T68)	06:34		07:00 (T67)	07:05		18:07 (T69)	07:36		07:11			07:44		08:40 (T71)
	21:06	53	08:14 (T68)	20:41	107	19:02 (T69)	19:52	67	19:14 (T69)	19:02		17:19			17:03	45	09:25 (T71)
10	06:08		07:20 (T68)	06:35		06:59 (T67)	07:06		18:07 (T69)	07:37		07:13			07:45		08:40 (T71)
	21:06	54	08:14 (T68)	20:39	114	19:05 (T69)	19:51	66	19:13 (T69)	19:00		17:18			17:03	46	09:26 (T71)
11	06:09		07:20 (T68)	06:36		06:59 (T67)	07:07		18:07 (T69)	07:38		07:14			07:46		08:40 (T71)
	21:06	55	08:15 (T68)	20:38	118	19:07 (T69)	19:49	65	19:12 (T69)	18:58		17:17			17:03	46	09:26 (T71)
12	06:09		07:20 (T68)	06:37		06:59 (T67)	07:08		18:06 (T69)	07:39		07:15			07:47		08:40 (T71)
	21:05	56	08:16 (T68)	20:37	121	19:09 (T69)	19:47	64	19:10 (T69)	18:57		17:16			17:03	46	09:26 (T71)
13	06:10		07:19 (T68)	06:38		07:00 (T67)	07:09		18:07 (T69)	07:40		07:16			07:48		08:40 (T71)
	21:05	56	08:15 (T68)	20:35	123	19:10 (T69)	19:45	62	19:09 (T69)	18:55		17:15			17:03	47	09:27 (T71)
14	06:11		07:19 (T68)	06:39		07:01 (T67)	07:10		18:07 (T69)	07:41		07:17			07:49		08:41 (T71)
	21:04	57	08:16 (T68)	20:34	124	19:11 (T69)	19:44	61	19:08 (T69)	18:54		17:14			17:04	47	09:28 (T71)
15	06:12		07:19 (T68)	06:40		07:02 (T67)	07:11		18:08 (T69)	07:42		07:19			07:49		08:42 (T71)
	21:04	58	08:17 (T68)	20:33	125	19:12 (T69)	19:42	58	19:06 (T69)	18:52		17:13			17:04	47	09:29 (T71)
16	06:12		07:19 (T68)	06:41		07:03 (T67)	07:12		18:09 (T69)	07:43		07:20			07:50		08:41 (T71)
	21:03	59	08:18 (T68)	20:31	127	19:14 (T69)	19:40	56	19:05 (T69)	18:51		17:13			17:04	48	09:29 (T71)
17	06:13		07:18 (T68)	06:42		07:04 (T67)	07:13		18:09 (T69)	07:45		07:21			07:51		08:42 (T71)
	21:03	60	08:18 (T68)	20:30	126	19:14 (T69)	19:39	54	19:03 (T69)	18:49		17:12			17:04	47	09:29 (T71)
18	06:14		07:18 (T68)	06:43		07:05 (T67)	07:14		18:10 (T69)	07:46		07:22			07:51		08:43 (T71)
	21:02	60	08:18 (T68)	20:28	126	19:15 (T69)	19:37	51	19:01 (T69)	18:48		17:11			17:05	47	09:30 (T71)
19	06:15		07:18 (T68)	06:44		07:06 (T67)	07:15		18:12 (T69)	07:47		07:23			07:52		08:43 (T71)
	21:01	61	08:19 (T68)	20:27	127	19:16 (T69)	19:35	47	18:59 (T69)	18:46		17:10			17:05	47	09:30 (T71)
20	06:16		07:18 (T68)	06:45		07:07 (T67)	07:16		18:13 (T69)	07:48		07:24		08:48 (T71)	07:53		08:44 (T71)
	21:01	62	08:20 (T68)	20:26	127	19:17 (T69)	19:34	44	18:57 (T69)	18:45		17:10	13	09:01 (T71)	17:05	47	09:31 (T71)
21	06:16		07:18 (T68)	06:46		07:08 (T67)	07:17		18:15 (T69)	07:49		07:26		08:46 (T71)	07:53		08:44 (T71)
	21:00	62	08:20 (T68)	20:24	126	19:17 (T69)	19:32	40	18:55 (T69)	18:43		17:09	18	09:04 (T71)	17:06	47	09:31 (T71)
22	06:17		07:18 (T68)	06:47		07:08 (T67)	07:18		18:17 (T69)	07:50		07:27		08:45 (T71)	07:54		08:45 (T71)
	20:59	63	08:21 (T68)	20:23	126	19:17 (T69)	19:30	35	18:52 (T69)	18:42		17:08	22	09:07 (T71)	17:06	47	09:32 (T71)
23	06:18		07:16 (T68)	06:48		07:09 (T67)	07:19		18:20 (T69)	07:51		07:28		08:43 (T71)	07:54		08:45 (T71)
	20:58	65	08:21 (T68)	20:21	124	19:17 (T69)	19:28	29	18:49 (T69)	18:40		17:08	26	09:09 (T71)	17:07	47	09:32 (T71)
24	06:19		07:16 (T68)	06:49		07:10 (T67)	07:20		18:23 (T69)	07:52		07:29		08:42 (T71)	07:55		08:46 (T71)
	20:57	65	08:21 (T68)	20:20	122	19:17 (T69)	19:27	21	18:44 (T69)	18:39		17:07	29	09:11 (T71)	17:07	47	09:33 (T71)
25	06:20		07:16 (T68)	06:50		07:11 (T67)	07:21		18:32 (T69)	07:54		07:30		08:41 (T71)	07:55		08:46 (T71)
	20:57	66	08:22 (T68)	20:18	117	19:18 (T69)	19:25	3	18:35 (T69)	18:37		17:06	31	09:12 (T71)	17:08	47	09:33 (T71)
26	06:21		07:16 (T68)	06:51		07:12 (T67)	07:22			07:55		07:31		08:40 (T71)	07:55		08:46 (T71)
	20:56	66	08:22 (T68)	20:17	110	19:18 (T69)	19:23			18:36		17:06	33	09:13 (T71)	17:09	47	09:33 (T71)
27	06:22		07:16 (T68)	06:52		07:27 (T68)	07:23			07:56		07:32		08:41 (T71)	07:56		08:47 (T71)
	20:55	67	08:23 (T68)	20:15	102	19:18 (T69)	19:22			18:35		17:06	34	09:15 (T71)	17:09	48	09:35 (T71)
28	06:23		07:16 (T68)	06:53		07:30 (T68)	07:24			07:57		07:34		08:40 (T71)	07:56		08:48 (T71)
	20:54	67	08:23 (T68)	20:13	97	19:18 (T69)	19:20			18:33		17:05	36	09:16 (T71)	17:10	47	09:35 (T71)
29	06:24		07:16 (T68)	06:54		07:33 (T68)	07:25			07:58		07:35		08:40 (T71)	07:56		08:48 (T71)
	20:53	67	08:23 (T68)	20:12	92	19:18 (T69)	19:18			18:32		17:05	37	09:17 (T71)	17:11	47	09:35 (T71)
30	06:25		07:16 (T68)	06:55		07:38 (T68)	07:26			07:59		07:36		08:39 (T71)	07:56		08:48 (T71)
	20:52	68	08:24 (T68)	20:10	81	19:18 (T69)	19:17			18:31		17:04	39	09:18 (T71)	17:12	47	09:35 (T71)
31	06:26		07:16 (T68)	06:56		18:09 (T69)				08:01					07:57		08:49 (T71)
	20:51	68	08:24 (T68)	20:09	69	19:18 (T69)				18:29					17:12	46	09:35 (T71)
Potential sun hours	459			428			375			345		298			288		
Total, worst case		1814			3284			1374					318			1417	
Sun reduction		0.66			0.61			0.59					0.30			0.22	
Oper. time red.		1.00			1.00			1.00					1.00			1.00	
Wind dir. red.		0.67			0.66			0.64					0.53			0.53	
Total reduction		0.43			0.39			0.37					0.16			0.11	
Total, real		784			1294			508					50			162	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1396 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7313)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58		08:20 (T39)	07:44		07:07		07:16		18:21 (T37)	06:30			06:02		19:56 (T34)
	17:13	15	08:35 (T39)	17:48		18:22		19:56	55	19:16 (T37)	20:27			20:57	28	20:24 (T34)
2	07:58		08:20 (T39)	07:43		07:06		07:15		18:21 (T37)	06:29			06:01		19:57 (T34)
	17:14	15	08:35 (T39)	17:49		18:23		19:57	55	19:16 (T37)	20:28			20:58	27	20:24 (T34)
3	07:58		08:20 (T39)	07:42		07:04		07:13		18:21 (T37)	06:28			06:01		19:57 (T34)
	17:15	16	08:36 (T39)	17:50		18:24		19:58	54	19:15 (T37)	20:29			20:59	27	20:24 (T34)
4	07:58		08:20 (T39)	07:41		07:03		07:11		18:21 (T37)	06:26			06:00		19:58 (T34)
	17:16	17	08:37 (T39)	17:51		18:25		19:59	53	19:14 (T37)	20:30			20:59	26	20:24 (T34)
5	07:58		08:20 (T39)	07:40		07:01		07:10		18:22 (T37)	06:25			06:00		19:59 (T34)
	17:17	17	08:37 (T39)	17:53		18:26		20:00	52	19:14 (T37)	20:31			21:00	25	20:24 (T34)
6	07:58		08:20 (T39)	07:38		07:00		07:08		18:21 (T37)	06:24			06:00		19:58 (T34)
	17:18	18	08:38 (T39)	17:54		18:28		20:00	52	19:13 (T37)	20:33			21:01	25	20:23 (T34)
7	07:58		08:20 (T39)	07:37		06:58	18:01 (T38)	07:06		18:22 (T37)	06:23			05:59		19:59 (T34)
	17:19	19	08:39 (T39)	17:55		18:29	6	18:07 (T38)	20:02	50	19:12 (T37)	20:34		21:01	24	20:23 (T34)
8	07:58		08:20 (T39)	07:36		07:56		18:58 (T38)	07:05		18:23 (T37)	06:22		20:04 (T34)	05:59		20:00 (T34)
	17:20	20	08:40 (T39)	17:56		19:30	11	19:09 (T38)	20:03	48	19:11 (T37)	20:35	8	20:12 (T34)	21:02	23	20:23 (T34)
9	07:57		08:19 (T39)	07:35		07:55		18:55 (T38)	07:03		18:23 (T37)	06:20		20:02 (T34)	05:59		20:00 (T34)
	17:21	21	08:40 (T39)	17:58		19:31	15	19:10 (T38)	20:04	47	19:10 (T37)	20:36	11	20:13 (T34)	21:03	23	20:23 (T34)
10	07:57		08:19 (T39)	07:34		07:53		18:53 (T38)	07:02		18:24 (T37)	06:19		20:00 (T34)	05:59		20:01 (T34)
	17:22	21	08:40 (T39)	17:59		19:32	17	19:10 (T38)	20:05	45	19:09 (T37)	20:37	14	20:14 (T34)	21:03	22	20:23 (T34)
11	07:57		08:19 (T39)	07:33		07:51		18:53 (T38)	07:00		18:25 (T37)	06:18		19:59 (T34)	05:58		20:02 (T34)
	17:23	22	08:41 (T39)	18:00		19:33	19	19:12 (T38)	20:06	42	19:07 (T37)	20:38	16	20:15 (T34)	21:04	21	20:23 (T34)
12	07:57		08:18 (T39)	07:31		07:50		18:51 (T38)	06:58		18:25 (T37)	06:17		19:58 (T34)	05:58		20:02 (T34)
	17:24	23	08:41 (T39)	18:01		19:34	22	19:13 (T38)	20:07	40	19:05 (T37)	20:39	18	20:16 (T34)	21:04	21	20:23 (T34)
13	07:56		08:18 (T39)	07:30		07:48		18:50 (T38)	06:57		18:27 (T37)	06:16		19:57 (T34)	05:58		20:02 (T34)
	17:25	24	08:42 (T39)	18:03		19:36	24	19:14 (T38)	20:08	37	19:04 (T37)	20:40	20	20:17 (T34)	21:05	20	20:22 (T34)
14	07:56		08:18 (T39)	07:29		07:46		18:45 (T37)	06:55		18:28 (T37)	06:15		19:56 (T34)	05:58		20:02 (T34)
	17:26	25	08:43 (T39)	18:04		19:37	31	19:16 (T38)	20:09	34	19:02 (T37)	20:41	22	20:18 (T34)	21:05	20	20:22 (T34)
15	07:56		08:17 (T39)	07:28		07:45		18:41 (T37)	06:54		18:30 (T37)	06:14		19:56 (T34)	05:58		20:03 (T34)
	17:27	25	08:42 (T39)	18:05		19:38	35	19:16 (T38)	20:10	30	19:00 (T37)	20:42	23	20:19 (T34)	21:06	19	20:22 (T34)
16	07:55		08:18 (T39)	07:26		07:43		18:37 (T37)	06:52		18:32 (T37)	06:13		19:55 (T34)	05:58		20:04 (T34)
	17:28	25	08:43 (T39)	18:06		19:39	39	19:16 (T38)	20:11	25	18:57 (T37)	20:43	25	20:20 (T34)	21:06	19	20:23 (T34)
17	07:55		08:18 (T39)	07:25		07:41		18:36 (T37)	06:50		18:35 (T37)	06:12		19:55 (T34)	05:58		20:04 (T34)
	17:29	25	08:43 (T39)	18:08		19:40	40	19:16 (T38)	20:12	20	18:55 (T37)	20:44	26	20:21 (T34)	21:07	19	20:23 (T34)
18	07:54		08:18 (T39)	07:24		07:40		18:33 (T37)	06:49		18:40 (T37)	06:11		19:54 (T34)	05:58		20:05 (T34)
	17:30	24	08:42 (T39)	18:09		19:41	42	19:15 (T38)	20:13	9	18:49 (T37)	20:45	27	20:21 (T34)	21:07	18	20:23 (T34)
19	07:54		08:19 (T39)	07:22		07:38		18:31 (T37)	06:47			06:10		19:54 (T34)	05:58		20:05 (T34)
	17:32	24	08:43 (T39)	18:10		19:42	43	19:14 (T38)	20:14			20:46	28	20:22 (T34)	21:07	18	20:23 (T34)
20	07:53		08:20 (T39)	07:21		07:36		18:30 (T37)	06:46			06:09		19:53 (T34)	05:59		20:05 (T34)
	17:33	23	08:43 (T39)	18:11		19:43	44	19:14 (T37)	20:15			20:47	30	20:23 (T34)	21:08	18	20:23 (T34)
21	07:53		08:21 (T39)	07:19		07:35		18:28 (T37)	06:44			06:09		19:54 (T34)	05:59		20:05 (T34)
	17:34	22	08:43 (T39)	18:12		19:44	47	19:15 (T37)	20:17			20:48	30	20:24 (T34)	21:08	18	20:23 (T34)
22	07:52		08:22 (T39)	07:18		07:33		18:27 (T37)	06:43			06:08		19:54 (T34)	05:59		20:05 (T34)
	17:35	21	08:43 (T39)	18:14		19:45	48	19:15 (T37)	20:18			20:49	31	20:25 (T34)	21:08	18	20:23 (T34)
23	07:51		08:22 (T39)	07:16		07:31		18:26 (T37)	06:41			06:07		19:54 (T34)	05:59		20:06 (T34)
	17:36	20	08:42 (T39)	18:15		19:46	49	19:15 (T37)	20:19			20:49	31	20:25 (T34)	21:08	18	20:24 (T34)
24	07:50		08:23 (T39)	07:15		07:30		18:25 (T37)	06:40			06:06		19:53 (T34)	05:59		20:06 (T34)
	17:38	18	08:41 (T39)	18:16		19:48	52	19:17 (T37)	20:20			20:50	31	20:24 (T34)	21:08	18	20:24 (T34)
25	07:50		08:26 (T39)	07:13		07:28		18:24 (T37)	06:39			06:06		19:54 (T34)	06:00		20:06 (T34)
	17:39	15	08:41 (T39)	18:17		19:49	53	19:17 (T37)	20:21			20:51	31	20:25 (T34)	21:09	18	20:24 (T34)
26	07:49		08:27 (T39)	07:12		07:26		18:23 (T37)	06:37			06:05		19:54 (T34)	06:00		20:06 (T34)
	17:40	12	08:39 (T39)	18:18		19:50	53	19:16 (T37)	20:22			20:52	31	20:25 (T34)	21:09	19	20:25 (T34)
27	07:48		08:30 (T39)	07:10		07:25		18:23 (T37)	06:36			06:04		19:55 (T34)	06:00		20:06 (T34)
	17:41	6	08:36 (T39)	18:20		19:51	54	19:17 (T37)	20:23			20:53	30	20:25 (T34)	21:09	19	20:25 (T34)
28	07:47			07:09		07:23		18:22 (T37)	06:34			06:04		19:55 (T34)	06:01		20:06 (T34)
	17:43			18:21		19:52	55	19:17 (T37)	20:24			20:54	30	20:25 (T34)	21:09	19	20:25 (T34)
29	07:46					07:21		18:21 (T37)	06:33			06:03		19:56 (T34)	06:01		20:06 (T34)
	17:44					19:53	55	19:16 (T37)	20:25			20:55	29	20:25 (T34)	21:09	20	20:26 (T34)
30	07:46					07:20		18:22 (T37)	06:32			06:03		19:56 (T34)	06:02		20:06 (T34)
	17:45					19:54	55	19:17 (T37)	20:26			20:56	29	20:25 (T34)	21:09	20	20:26 (T34)
31	07:45					07:18		18:21 (T37)				06:02		19:56 (T34)			
	17:46					19:55	55	19:16 (T37)				20:56	29	20:25 (T34)			
Potential sun hours	297			297		370			399			449			453		
Total, worst case		533					964			748			600			630	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.52					0.65			0.65			0.55			0.55	
Total reduction		0.16					0.28			0.33			0.31			0.35	
Total, real		85					274			250			188			221	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1396 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7313)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		20:06 (T34)	06:26		20:08 (T34)	06:57		18:24 (T37)	07:28		18:30 (T38)	07:02			07:37		08:01 (T39)
	21:09	21	20:27 (T34)	20:50	17	20:25 (T34)	20:07	42	19:06 (T37)	19:15	23	18:53 (T38)	17:28			17:04	22	08:23 (T39)
2	06:03		20:05 (T34)	06:27		20:09 (T34)	06:58		18:22 (T37)	07:29		18:31 (T38)	07:03			07:38		08:02 (T39)
	21:09	22	20:27 (T34)	20:49	16	20:25 (T34)	20:06	45	19:07 (T37)	19:13	20	18:51 (T38)	17:27			17:04	21	08:23 (T39)
3	06:03		20:06 (T34)	06:28		20:10 (T34)	06:59		18:21 (T37)	07:30		18:31 (T38)	07:05			07:39		08:03 (T39)
	21:09	22	20:28 (T34)	20:48	14	20:24 (T34)	20:04	47	19:08 (T37)	19:12	19	18:50 (T38)	17:26			17:03	21	08:24 (T39)
4	06:04		20:05 (T34)	06:29		20:12 (T34)	07:00		18:20 (T37)	07:31		18:32 (T38)	07:06			07:40		08:04 (T39)
	21:08	23	20:28 (T34)	20:47	10	20:22 (T34)	20:02	48	19:08 (T37)	19:10	16	18:48 (T38)	17:24			17:03	20	08:24 (T39)
5	06:04		20:05 (T34)	06:30		20:15 (T34)	07:01		18:19 (T37)	07:32		18:34 (T38)	07:07			07:41		08:05 (T39)
	21:08	24	20:29 (T34)	20:46	6	20:21 (T34)	20:01	50	19:09 (T37)	19:08	12	18:46 (T38)	17:23			17:03	19	08:24 (T39)
6	06:05		20:05 (T34)	06:31			07:02		18:18 (T37)	07:33		18:36 (T38)	07:08			07:42		08:06 (T39)
	21:08	24	20:29 (T34)	20:45			19:58	51	19:09 (T37)	19:07	8	18:44 (T38)	17:22			17:03	18	08:24 (T39)
7	06:06		20:05 (T34)	06:32			07:03		18:17 (T37)	07:34			07:09			07:43		08:07 (T39)
	21:08	25	20:30 (T34)	20:44			19:56	52	19:09 (T37)	19:05			17:21			17:03	17	08:24 (T39)
8	06:06		20:05 (T34)	06:33			07:04		18:16 (T37)	07:35			07:11			07:44		08:08 (T39)
	21:07	26	20:31 (T34)	20:42			19:54	53	19:09 (T37)	19:03			17:20			17:03	17	08:25 (T39)
9	06:07		20:04 (T34)	06:34			07:05		18:15 (T37)	07:36			07:12			07:45		08:09 (T39)
	21:07	27	20:31 (T34)	20:41			19:52	54	19:09 (T37)	19:02			17:19			17:03	16	08:25 (T39)
10	06:08		20:04 (T34)	06:35			07:06		18:14 (T37)	07:37			07:13			07:46		08:09 (T39)
	21:07	28	20:32 (T34)	20:40			19:51	55	19:09 (T37)	19:00			17:18			17:03	15	08:24 (T39)
11	06:08		20:05 (T34)	06:36			07:07		18:14 (T37)	07:38			07:14			07:47		08:10 (T39)
	21:06	27	20:32 (T34)	20:38			19:49	55	19:09 (T37)	18:58			17:17			17:03	15	08:25 (T39)
12	06:09		20:04 (T34)	06:37			07:08		18:13 (T37)	07:39			07:15			07:48		08:11 (T39)
	21:06	28	20:32 (T34)	20:37			19:47	56	19:09 (T37)	18:57			17:16			17:03	14	08:25 (T39)
13	06:10		20:04 (T34)	06:38			07:09		18:13 (T37)	07:40			07:17			07:48		08:12 (T39)
	21:05	29	20:33 (T34)	20:36			19:46	55	19:08 (T37)	18:55			17:15			17:03	13	08:25 (T39)
14	06:10		20:04 (T34)	06:39			07:10		18:13 (T37)	07:42			07:18			07:49		08:13 (T39)
	21:05	29	20:33 (T34)	20:34			19:44	55	19:08 (T37)	18:54			17:14			17:03	13	08:26 (T39)
15	06:11		20:04 (T34)	06:40			07:11		18:11 (T37)	07:43			07:19		08:03 (T39)	07:50		08:13 (T39)
	21:04	30	20:34 (T34)	20:33			19:42	55	19:06 (T37)	18:52			17:13	6	08:09 (T39)	17:03	12	08:25 (T39)
16	06:12		20:03 (T34)	06:41			07:12		18:11 (T37)	07:44			07:20		08:00 (T39)	07:51		08:14 (T39)
	21:04	30	20:33 (T34)	20:32			19:41	55	19:06 (T37)	18:51			17:12	12	08:12 (T39)	17:04	12	08:26 (T39)
17	06:13		20:04 (T34)	06:42			07:13		18:11 (T37)	07:45			07:21		07:59 (T39)	07:51		08:15 (T39)
	21:03	30	20:34 (T34)	20:30			19:39	54	19:05 (T37)	18:49			17:12	15	08:14 (T39)	17:04	12	08:27 (T39)
18	06:14		20:04 (T34)	06:43			07:14		18:11 (T37)	07:46			07:23		07:57 (T39)	07:52		08:15 (T39)
	21:02	30	20:34 (T34)	20:29			19:37	53	19:04 (T37)	18:48			17:11	18	08:15 (T39)	17:04	11	08:26 (T39)
19	06:14		20:04 (T34)	06:44			07:15		18:11 (T37)	07:47			07:24		07:57 (T39)	07:53		08:16 (T39)
	21:02	31	20:35 (T34)	20:27			19:35	52	19:03 (T37)	18:46			17:10	20	08:17 (T39)	17:05	11	08:27 (T39)
20	06:15		20:04 (T34)	06:45			07:16		18:12 (T37)	07:48			07:25		07:57 (T39)	07:53		08:16 (T39)
	21:01	31	20:35 (T34)	20:26			19:34	50	19:02 (T37)	18:45			17:09	21	08:18 (T39)	17:05	11	08:27 (T39)
21	06:16		20:03 (T34)	06:46			07:17		18:12 (T37)	07:49			07:26		07:56 (T39)	07:54		08:17 (T39)
	21:00	31	20:34 (T34)	20:25			19:32	49	19:01 (T37)	18:43			17:09	22	08:18 (T39)	17:06	11	08:28 (T39)
22	06:17		20:04 (T34)	06:47			07:18		18:13 (T37)	07:51			07:27		07:56 (T39)	07:54		08:17 (T39)
	21:00	30	20:34 (T34)	20:23			19:30	47	19:00 (T37)	18:42			17:08	23	08:19 (T39)	17:06	11	08:28 (T39)
23	06:18		20:04 (T34)	06:48			07:19		18:13 (T37)	07:52			07:28		07:55 (T39)	07:55		08:18 (T39)
	20:59	30	20:34 (T34)	20:22			19:29	45	18:58 (T37)	18:40			17:07	24	08:19 (T39)	17:07	11	08:29 (T39)
24	06:19		20:04 (T34)	06:49			07:20		18:14 (T37)	07:53			07:30		07:56 (T39)	07:55		08:18 (T39)
	20:58	29	20:33 (T34)	20:20			19:27	43	18:57 (T38)	18:39			17:07	25	08:21 (T39)	17:07	11	08:29 (T39)
25	06:20		20:04 (T34)	06:50		18:42 (T37)	07:22		18:15 (T37)	07:54			07:31		07:56 (T39)	07:56		08:19 (T39)
	20:57	28	20:32 (T34)	20:18	11	18:53 (T37)	19:25	42	18:57 (T38)	18:37			17:06	25	08:21 (T39)	17:08	11	08:30 (T39)
26	06:21		20:05 (T34)	06:51		18:37 (T37)	07:23		18:16 (T37)	07:55			07:32		07:56 (T39)	07:56		08:19 (T39)
	20:56	27	20:32 (T34)	20:17	20	18:57 (T37)	19:23	42	18:58 (T38)	18:36			17:06	25	08:21 (T39)	17:08	12	08:31 (T39)
27	06:22		20:05 (T34)	06:52		18:34 (T37)	07:24		18:18 (T37)	07:56			07:33		07:56 (T39)	07:56		08:19 (T39)
	20:55	26	20:31 (T34)	20:15	25	18:59 (T37)	19:22	39	18:57 (T38)	18:35			17:05	25	08:21 (T39)	17:09	12	08:31 (T39)
28	06:23		20:06 (T34)	06:53		18:31 (T37)	07:25		18:20 (T37)	07:58			07:34		07:57 (T39)	07:57		08:19 (T39)
	20:54	24	20:30 (T34)	20:14	30	19:01 (T37)	19:20	37	18:57 (T38)	18:33			17:05	25	08:22 (T39)	17:10	12	08:31 (T39)
29	06:24		20:06 (T34)	06:54		18:29 (T37)	07:26		18:23 (T37)	07:59			07:35		07:59 (T39)	07:57		08:20 (T39)
	20:53	23	20:29 (T34)	20:12	34	19:03 (T37)	19:18	33	18:56 (T38)	18:32			17:04	24	08:23 (T39)	17:10	13	08:33 (T39)
30	06:24		20:06 (T34)	06:55		18:27 (T37)	07:27		18:28 (T37)	08:00			07:36		08:00 (T39)	07:57		08:20 (T39)
	20:52	21	20:27 (T34)	20:11	37	19:04 (T37)	19:17	26	18:54 (T38)	18:31			17:04	23	08:23 (T39)	17:11	13	08:33 (T39)
31	06:25		20:07 (T34)	06:56		18:25 (T37)				08:01						07:57		08:20 (T39)
	20:51	19	20:26 (T34)	20:09	40	19:05 (T37)				18:29						17:12	14	08:34 (T39)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		825			260			1440			98			333			441	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.55			0.62			0.65			0.66			0.52			0.52	
Total reduction		0.36			0.38			0.38			0.31			0.15			0.11	
Total, real		299			98			547			31			51			50	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1422 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7334)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:57		15:26 (T48)	07:43	15:31 (T48)	07:07	07:16	06:30	06:02	06:02	06:27	06:57	07:28		07:02	15:06 (T48)	07:37	15:09 (T48)
	17:13	60	16:26 (T48)	17:48 71	16:42 (T48)	18:22	19:56	20:27	20:57	21:08	20:50	20:07	19:15		17:28 63	16:09 (T48)	17:04 66	16:15 (T48)
2	07:57		15:26 (T48)	07:42	15:32 (T48)	07:06	07:15	06:29	06:01	06:03	06:28	06:58	07:29		07:03	15:06 (T48)	07:38	15:09 (T48)
	17:14	61	16:27 (T48)	17:49 70	16:42 (T48)	18:23	19:57	20:28	20:58	21:08	20:49	20:06	19:13		17:27 64	16:10 (T48)	17:04 66	16:15 (T48)
3	07:57		15:26 (T48)	07:41	15:32 (T48)	07:04	07:13	06:28	06:01	06:03	06:28	06:59	07:30		07:04	15:05 (T48)	07:39	15:11 (T48)
	17:15	61	16:27 (T48)	17:50 70	16:42 (T48)	18:24	19:58	20:29	20:58	21:08	20:48	20:04	19:12		17:26 66	16:11 (T48)	17:03 65	16:16 (T48)
4	07:57		15:27 (T48)	07:40	15:33 (T48)	07:03	07:11	06:27	06:00	06:04	06:29	07:00	07:31		07:06	15:04 (T48)	07:40	15:12 (T48)
	17:16	61	16:28 (T48)	17:51 69	16:42 (T48)	18:25	19:59	20:30	20:59	21:08	20:47	20:02	19:10		17:25 67	16:11 (T48)	17:03 64	16:16 (T48)
5	07:57		15:27 (T48)	07:39	15:34 (T48)	07:01	07:10	06:25	06:00	06:05	06:30	07:01	07:32		07:07	15:03 (T48)	07:41	15:12 (T48)
	17:17	62	16:29 (T48)	17:53 68	16:42 (T48)	18:27	20:00	20:31	21:00	21:08	20:46	20:01	19:08		17:23 68	16:11 (T48)	17:03 64	16:16 (T48)
6	07:57		15:27 (T48)	07:38	15:33 (T48)	06:59	07:08	06:24	06:00	06:05	06:31	07:02	07:33		07:08	15:03 (T48)	07:42	15:13 (T48)
	17:18	63	16:30 (T48)	17:54 68	16:41 (T48)	18:28	20:00	20:32	21:00	21:08	20:44	19:57	19:07		17:22 69	16:12 (T48)	17:03 63	16:16 (T48)
7	07:57		15:26 (T48)	07:37	15:34 (T48)	06:58	07:06	06:23	05:59	06:06	06:32	07:03	07:34		07:09	15:03 (T48)	07:43	15:13 (T48)
	17:19	64	16:30 (T48)	17:55 67	16:41 (T48)	18:29	20:01	20:33	21:01	21:07	20:43	19:56	19:05		17:21 69	16:12 (T48)	17:03 62	16:15 (T48)
8	07:57		15:27 (T48)	07:36	15:35 (T48)	07:56	07:05	06:22	05:59	06:06	06:33	07:04	07:35		07:10	15:02 (T48)	07:44	15:14 (T48)
	17:20	64	16:31 (T48)	17:56 66	16:41 (T48)	19:30	20:02	20:34	21:02	21:07	20:42	19:54	19:03		17:20 70	16:12 (T48)	17:03 61	16:15 (T48)
9	07:57		15:27 (T48)	07:35	15:36 (T48)	07:55	07:03	06:21	05:59	06:07	06:34	07:05	07:36		07:12	15:03 (T48)	07:45	15:15 (T48)
	17:21	65	16:32 (T48)	17:58 65	16:41 (T48)	19:31	20:04	20:35	21:02	21:07	20:41	19:52	19:02		17:19 70	16:13 (T48)	17:03 61	16:16 (T48)
10	07:57		15:27 (T48)	07:34	15:37 (T48)	07:53	07:02	06:20	05:59	06:08	06:35	07:06	07:37		07:13	15:02 (T48)	07:46	15:15 (T48)
	17:22	66	16:33 (T48)	17:59 63	16:40 (T48)	19:32	20:05	20:36	21:03	21:06	20:40	19:51	19:00		17:18 71	16:13 (T48)	17:03 61	16:16 (T48)
11	07:57		15:27 (T48)	07:32	15:37 (T48)	07:51	07:00	06:18	05:59	06:08	06:36	07:07	07:38		07:14	15:02 (T48)	07:46	15:16 (T48)
	17:23	66	16:33 (T48)	18:00 62	16:39 (T48)	19:33	20:06	20:37	21:04	21:06	20:38	19:49	18:58		17:17 71	16:13 (T48)	17:03 60	16:16 (T48)
12	07:56		15:27 (T48)	07:31	15:39 (T48)	07:50	06:58	06:17	05:59	06:09	06:37	07:08	07:39		07:15	15:01 (T48)	07:47	15:17 (T48)
	17:24	67	16:34 (T48)	18:01 59	16:38 (T48)	19:34	20:07	20:39	21:04	21:06	20:37	19:47	18:57		17:16 72	16:13 (T48)	17:03 60	16:17 (T48)
13	07:56		15:28 (T48)	07:30	15:40 (T48)	07:48	06:57	06:16	05:58	06:10	06:38	07:09	07:40		07:16	15:02 (T48)	07:48	15:18 (T48)
	17:25	67	16:35 (T48)	18:03 58	16:38 (T48)	19:36	20:08	20:40	21:05	21:05	20:36	19:46	18:55		17:15 72	16:14 (T48)	17:03 59	16:17 (T48)
14	07:56		15:27 (T48)	07:29	15:42 (T48)	07:46	06:55	06:15	05:58	06:11	06:39	07:10	07:41		07:18	15:02 (T48)	07:49	15:18 (T48)
	17:26	68	16:35 (T48)	18:04 55	16:37 (T48)	19:37	20:09	20:41	21:05	21:05	20:34	19:44	18:54		17:14 72	16:14 (T48)	17:03 59	16:17 (T48)
15	07:55		15:28 (T48)	07:27	15:42 (T48)	07:45	06:54	06:14	05:58	06:11	06:40	07:11	07:43		07:19	15:02 (T48)	07:50	15:19 (T48)
	17:27	68	16:36 (T48)	18:05 53	16:35 (T48)	19:38	20:10	20:42	21:05	21:04	20:33	19:42	18:52		17:13 72	16:14 (T48)	17:04 58	16:17 (T48)
16	07:55		15:27 (T48)	07:26	15:44 (T48)	07:43	06:52	06:13	05:58	06:12	06:41	07:12	07:44		07:20	15:03 (T48)	07:50	15:20 (T48)
	17:28	69	16:36 (T48)	18:06 51	16:35 (T48)	19:39	20:11	20:43	21:06	21:03	20:32	19:40	18:51		17:12 72	16:15 (T48)	17:04 58	16:18 (T48)
17	07:54		15:28 (T48)	07:25	15:45 (T48)	07:41	06:51	06:12	05:58	06:13	06:42	07:13	07:45		07:21	15:03 (T48)	07:51	15:20 (T48)
	17:29	69	16:37 (T48)	18:08 48	16:33 (T48)	19:40	20:12	20:44	21:06	21:03	20:30	19:39	18:49		17:12 72	16:15 (T48)	17:04 57	16:17 (T48)
18	07:54		15:28 (T48)	07:23	15:47 (T48)	07:40	06:49	06:11	05:59	06:14	06:43	07:14	07:46		07:22	15:03 (T48)	07:52	15:21 (T48)
	17:31	69	16:37 (T48)	18:09 44	16:31 (T48)	19:41	20:13	20:44	21:07	21:02	20:29	19:37	18:48		17:11 71	16:14 (T48)	17:05 57	16:18 (T48)
19	07:53		15:28 (T48)	07:22	15:50 (T48)	07:38	06:47	06:11	05:59	06:15	06:44	07:15	07:47	16:32 (T48)	07:24	15:03 (T48)	07:52	15:21 (T48)
	17:32	71	16:39 (T48)	18:10 40	16:30 (T48)	19:42	20:14	20:45	21:07	21:02	20:27	19:35	18:46 17	16:49 (T48)	17:10 71	16:14 (T48)	17:05 58	16:19 (T48)
20	07:53		15:28 (T48)	07:21	15:51 (T48)	07:36	06:46	06:10	05:59	06:16	06:45	07:16	07:48	16:28 (T48)	07:25	15:04 (T48)	07:53	15:21 (T48)
	17:33	71	16:39 (T48)	18:11 36	16:27 (T48)	19:43	20:15	20:46	21:07	21:01	20:26	19:34	18:45 26	16:54 (T48)	17:09 71	16:15 (T48)	17:05 58	16:19 (T48)
21	07:52		15:28 (T48)	07:19	15:55 (T48)	07:35	06:44	06:09	05:59	06:16	06:46	07:17	07:49	16:24 (T48)	07:26	15:04 (T48)	07:53	15:22 (T48)
	17:34	71	16:39 (T48)	18:12 30	16:25 (T48)	19:44	20:16	20:47	21:08	21:00	20:24	19:32	18:43 33	16:57 (T48)	17:09 71	16:15 (T48)	17:06 58	16:20 (T48)
22	07:52		15:29 (T48)	07:18	15:58 (T48)	07:33	06:43	06:08	05:59	06:17	06:47	07:18	07:50	16:21 (T48)	07:27	15:04 (T48)	07:54	15:22 (T48)
	17:35	71	16:40 (T48)	18:14 23	16:21 (T48)	19:45	20:17	20:48	21:08	20:59	20:23	19:30	18:42 38	16:59 (T48)	17:08 71	16:15 (T48)	17:06 58	16:20 (T48)
23	07:51		15:29 (T48)	07:16	16:03 (T48)	07:31	06:42	06:07	05:59	06:18	06:48	07:19	07:52	16:19 (T48)	07:28	15:04 (T48)	07:54	15:23 (T48)
	17:37	71	16:40 (T48)	18:15 14	16:17 (T48)	19:46	20:18	20:49	21:08	20:59	20:21	19:28	18:40 41	17:00 (T48)	17:08 71	16:15 (T48)	17:07 58	16:21 (T48)
24	07:50		15:29 (T48)	07:15		07:30	06:40	06:07	06:00	06:19	06:49	07:20	07:53	16:16 (T48)	07:29	15:05 (T48)	07:55	15:23 (T48)
	17:38	71	16:40 (T48)	18:16		19:48	20:20	20:50	21:08	20:58	20:20	19:27	18:39 45	17:01 (T48)	17:07 69	16:14 (T48)	17:07 58	16:21 (T48)
25	07:50		15:29 (T48)	07:13		07:28	06:39	06:06	06:00	06:20	06:50	07:21	07:54	16:15 (T48)	07:30	15:06 (T48)	07:55	15:23 (T48)
	17:39	72	16:41 (T48)	18:17		19:49	20:21	20:51	21:08	20:57	20:18	19:25	18:37 49	17:04 (T48)	17:06 69	16:15 (T48)	17:08 58	16:21 (T48)
26	07:49		15:29 (T48)	07:12		07:26	06:37	06:05	06:00	06:21	06:51	07:22	07:55	16:13 (T48)	07:32	15:06 (T48)	07:56	15:25 (T48)
	17:40	72	16:41 (T48)	18:18		19:50	20:22	20:52	21:08	20:56	20:17	19:23	18:36 52	17:05 (T48)	17:06 69	16:15 (T48)	17:09 57	16:22 (T48)
27	07:48		15:30 (T48)	07:10		07:25	06:36	06:04	06:01	06:22	06:52	07:24	07:56	16:12 (T48)	07:33	15:07 (T48)	07:56	15:25 (T48)
	17:41	72	16:42 (T48)	18:20		19:51	20:23	20:53	21:08	20:55	20:15	19:22	18:35 53	17:05 (T48)	17:05 68	16:15 (T48)	17:09 58	16:23 (T48)
28	07:47		15:30 (T48)	07:09		07:23	06:34	06:04	06:01	06:23	06:53	07:25	07:57	16:10 (T48)	07:34	15:07 (T48)	07:56	15:25 (T48)
	17:43	72	16:42 (T48)	18:21		19:52	20:24	20:54	21:09	20:54	20:14	19:20	18:33 56	17:06 (T48)	17:05 68	16:15 (T48)	17:10 58	16:23 (T48)
29	07:46		15:30 (T48)			07:21	06:33	06:03	06:01	06:24	06:54	07:26	07:59	16:09 (T48)	07:35	15:08 (T48)	07:57	15:25 (T48)
	17:44	72	16:42 (T48)			19:53	20:25	20:54	21:09	20:53	20:12	19:18	18:32 59	17:08 (T48)	17:05 67	16:15 (T48)	17:11 58	16:23 (T48)
30	07:45		15:30 (T48)			07:20	06:32	06:03	06:02	06:25	06:55	07:27	08:00	16:08 (T48)	07:36	15:08 (T48)	07:57	15:26 (T48)
	17:45	72	16:42 (T48)			19:54	20:26	20:55	21:09	20:52	20:10	19:17	18:31 60	17:08 (T48)	17:04 67	16:15 (T48)	17:11 59	16:25 (T48)
31	07:44		15:31 (T48)			07:18		06:02		06:26	06:56		08:01	16:07 (T48)			07:57	15:26 (T48)
	17:46	71	16:42 (T48)			19:55		20:56		20:51	20:09		18:29 62	17:09 (T48)			17:12 59	16:25 (T48)
Potential sun hours	297		297		370	399	448	452	459	428	375	345		297		287		
Total, worst case		2099		1250									591		2083		1856	
Sun reduction		0.31		0.40									0.48		0.30		0.22	
Oper. time red.		1.00		1.00									1.00		1.00		1.00	
Wind dir. red.		0.74		0.74									0.74		0.74		0.74	
Total reduction		0.23		0.30									0.36		0.22		0.16	
Total, real		482		370									210		463		303	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1431 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7342)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February		March			April			May			June		
1	07:57		15:31 (T44)	07:43		07:07			07:16		07:35 (T76)	06:30		18:51 (T77)	06:01		19:52 (T42)
	17:13	50	16:21 (T44)	17:47		18:22			19:56	59	19:27 (T77)	20:27	22	19:13 (T77)	20:57	38	20:30 (T42)
2	07:57		15:31 (T44)	07:42		07:06			07:14		07:33 (T76)	06:29		18:54 (T77)	06:01		19:52 (T42)
	17:14	50	16:21 (T44)	17:49		18:23			19:57	64	19:28 (T77)	20:28	16	19:10 (T77)	20:58	39	20:31 (T42)
3	07:57		15:32 (T44)	07:41		07:04			07:13		07:32 (T76)	06:28		19:00 (T77)	06:01		19:51 (T42)
	17:15	49	16:21 (T44)	17:50		18:24			19:58	69	19:29 (T77)	20:29	3	19:03 (T77)	20:58	40	20:31 (T42)
4	07:57		15:33 (T44)	07:40		07:02			07:11		07:30 (T76)	06:26			06:00		19:52 (T42)
	17:16	49	16:22 (T44)	17:51		18:25			19:59	74	19:30 (T77)	20:30			20:59	40	20:32 (T42)
5	07:57		15:33 (T44)	07:39		07:01			07:09		07:28 (T76)	06:25			06:00		19:52 (T42)
	17:17	49	16:22 (T44)	17:52		18:26			20:00	78	19:30 (T77)	20:31			21:00	40	20:32 (T42)
6	07:57		15:34 (T44)	07:38		06:59			07:08		07:28 (T76)	06:24			05:59		19:51 (T42)
	17:17	49	16:23 (T44)	17:54		18:27			20:00	79	19:31 (T77)	20:32			21:00	41	20:32 (T42)
7	07:57		15:34 (T44)	07:37		06:58			07:06		07:27 (T76)	06:23			05:59		19:51 (T42)
	17:18	48	16:22 (T44)	17:55		18:29			20:01	81	19:31 (T77)	20:33			21:01	42	20:33 (T42)
8	07:57		15:35 (T44)	07:36		07:56			07:05		07:27 (T76)	06:22			05:59		19:51 (T42)
	17:19	47	16:22 (T44)	17:56		19:30			20:02	82	19:32 (T77)	20:34			21:02	42	20:33 (T42)
9	07:57		15:35 (T44)	07:35		07:54			07:03		07:26 (T76)	06:20			05:59		19:52 (T42)
	17:20	48	16:23 (T44)	17:57		19:31			20:03	85	19:32 (T77)	20:35			21:02	42	20:34 (T42)
10	07:57		15:36 (T44)	07:34		07:53			07:01		07:26 (T76)	06:19			05:59		19:52 (T42)
	17:21	47	16:23 (T44)	17:59		19:32			20:05	83	19:31 (T77)	20:36			21:03	42	20:34 (T42)
11	07:57		15:36 (T44)	07:32		07:51			07:00		07:26 (T76)	06:18			05:58		19:52 (T42)
	17:23	47	16:23 (T44)	18:00		19:33			20:06	84	19:32 (T77)	20:37			21:03	43	20:35 (T42)
12	07:56		15:37 (T44)	07:31		07:50			06:58		07:26 (T76)	06:17			05:58		19:51 (T42)
	17:24	46	16:23 (T44)	18:01		19:34			20:07	82	19:31 (T77)	20:38			21:04	43	20:34 (T42)
13	07:56		15:39 (T44)	07:30		07:48			06:57		07:27 (T76)	06:16			05:58		19:51 (T42)
	17:25	45	16:24 (T44)	18:02		19:35			20:08	82	19:32 (T77)	20:39			21:05	43	20:34 (T42)
14	07:56		15:39 (T44)	07:29		07:46			06:55		07:27 (T76)	06:15			05:58		19:51 (T42)
	17:26	44	16:23 (T44)	18:04		19:36			20:09	81	19:31 (T77)	20:40			21:05	44	20:35 (T42)
15	07:55		15:40 (T44)	07:27		07:45			06:53		07:27 (T76)	06:14			05:58		19:52 (T42)
	17:27	43	16:23 (T44)	18:05		19:38			20:10	78	19:30 (T77)	20:41			21:05	43	20:35 (T42)
16	07:55		15:41 (T44)	07:26		07:43			06:52		07:29 (T76)	06:13			05:58		19:52 (T42)
	17:28	42	16:23 (T44)	18:06		19:39			20:11	75	19:30 (T77)	20:42			21:06	43	20:35 (T42)
17	07:54		15:42 (T44)	07:25		07:41			06:50		07:30 (T76)	06:12			05:58		19:53 (T42)
	17:29	41	16:23 (T44)	18:07		19:40			20:12	70	19:29 (T77)	20:43			21:06	43	20:36 (T42)
18	07:54		15:43 (T44)	07:23		07:40			06:49		07:32 (T76)	06:11			05:58		19:53 (T42)
	17:30	39	16:22 (T44)	18:09		19:41			20:13	66	19:29 (T77)	20:44			21:07	44	20:37 (T42)
19	07:53		15:44 (T44)	07:22		07:38			06:47		07:35 (T76)	06:10		20:06 (T42)	05:58		19:53 (T42)
	17:32	38	16:22 (T44)	18:10		19:42			20:14	58	19:28 (T77)	20:45	8	20:14 (T42)	21:07	44	20:37 (T42)
20	07:53		15:45 (T44)	07:20		07:36			06:46		18:39 (T77)	06:09		20:02 (T42)	05:59		19:53 (T42)
	17:33	37	16:22 (T44)	18:11		19:43			20:15	49	19:28 (T77)	20:46	15	20:17 (T42)	21:07	44	20:37 (T42)
21	07:52		15:46 (T44)	07:19		07:35			06:44		18:40 (T77)	06:09		20:00 (T42)	05:59		19:53 (T42)
	17:34	35	16:21 (T44)	18:12		19:44			20:16	48	19:28 (T77)	20:47	19	20:19 (T42)	21:08	44	20:37 (T42)
22	07:52		15:48 (T44)	07:18		07:33			06:43		18:40 (T77)	06:08		19:59 (T42)	05:59		19:53 (T42)
	17:35	33	16:21 (T44)	18:13		19:45			20:17	46	19:26 (T77)	20:48	23	20:22 (T42)	21:08	44	20:37 (T42)
23	07:51		15:50 (T44)	07:16		07:31			06:41		18:41 (T77)	06:07		19:57 (T42)	05:59		19:54 (T42)
	17:36	30	16:20 (T44)	18:15		19:46			20:18	45	19:26 (T77)	20:49	26	20:23 (T42)	21:08	44	20:38 (T42)
24	07:50		15:51 (T44)	07:15		07:30			06:40		18:41 (T77)	06:06		19:56 (T42)	05:59		19:54 (T42)
	17:38	27	16:18 (T44)	18:16		19:47			20:19	43	19:24 (T77)	20:50	28	20:24 (T42)	21:08	44	20:38 (T42)
25	07:49		15:53 (T44)	07:13		07:28			06:38		18:42 (T77)	06:06		19:56 (T42)	06:00		19:54 (T42)
	17:39	23	16:16 (T44)	18:17		19:48			20:21	41	19:23 (T77)	20:51	29	20:25 (T42)	21:08	44	20:38 (T42)
26	07:49		15:55 (T44)	07:12		07:26			06:37		18:43 (T77)	06:05		19:55 (T42)	06:00		19:55 (T42)
	17:40	19	16:14 (T44)	18:18		19:50			20:22	38	19:21 (T77)	20:52	31	20:26 (T42)	21:08	43	20:38 (T42)
27	07:48		16:00 (T44)	07:10		07:24			06:36		18:44 (T77)	06:04		19:54 (T42)	06:00		19:55 (T42)
	17:41	12	16:12 (T44)	18:19		19:51			20:23	36	19:20 (T77)	20:53	33	20:27 (T42)	21:08	43	20:38 (T42)
28	07:47			07:09		07:23		19:01 (T77)	06:34		18:46 (T77)	06:04		19:53 (T42)	06:01		19:54 (T42)
	17:42			18:21		19:52	17	19:18 (T77)	20:24	33	19:19 (T77)	20:54	35	20:28 (T42)	21:09	44	20:38 (T42)
29	07:46					07:21		07:43 (T76)	06:33		18:47 (T77)	06:03		19:53 (T42)	06:01		19:55 (T42)
	17:44					19:53	30	19:21 (T77)	20:25	30	19:17 (T77)	20:54	35	20:28 (T42)	21:09	44	20:39 (T42)
30	07:45					07:19		07:38 (T76)	06:32		18:49 (T77)	06:02		19:53 (T42)	06:02		19:55 (T42)
	17:45					19:54	44	19:23 (T77)	20:26	26	19:15 (T77)	20:55	36	20:29 (T42)	21:08	43	20:38 (T42)
31	07:44					07:18		07:37 (T76)				06:02		19:52 (T42)			
	17:46					19:55	52	19:26 (T77)				20:56	37	20:29 (T42)			
Potential sun hours	297			297		370			399			448			453		
Total, worst case		1087					143			1865			396			1277	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.74					0.62			0.62			0.55			0.54	
Total reduction		0.24					0.29			0.34			0.33			0.36	
Total, real		261					41			629			129			461	

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

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

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1431 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7342)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October	November			December		
1	06:02		19:56 (T42)	06:26			06:57		07:25 (T76)	07:27	07:02			07:37		15:18 (T44)
	21:08	43	20:39 (T42)	20:50			20:07	84	19:31 (T77)	19:15	17:28			17:04	47	16:05 (T44)
2	06:03		19:56 (T42)	06:27			06:58		07:25 (T76)	07:29	07:03			07:38		15:18 (T44)
	21:08	42	20:38 (T42)	20:49			20:06	83	19:30 (T77)	19:13	17:27			17:03	47	16:05 (T44)
3	06:03		19:57 (T42)	06:28			06:59		07:24 (T76)	07:30	07:04			07:39		15:18 (T44)
	21:08	42	20:39 (T42)	20:48			20:04	85	19:30 (T77)	19:11	17:26			17:03	48	16:06 (T44)
4	06:04		19:56 (T42)	06:29			07:00		07:24 (T76)	07:31	07:06			07:40		15:20 (T44)
	21:08	43	20:39 (T42)	20:47			20:02	82	19:29 (T77)	19:10	17:24			17:03	47	16:07 (T44)
5	06:04		19:57 (T42)	06:30			07:01		07:24 (T76)	07:32	07:07			07:41		15:20 (T44)
	21:08	42	20:39 (T42)	20:46			20:01	81	19:28 (T77)	19:08	17:23			17:03	48	16:08 (T44)
6	06:05		19:57 (T42)	06:31			07:02		07:24 (T76)	07:33	07:08			07:42		15:19 (T44)
	21:08	41	20:38 (T42)	20:44			19:57	79	19:27 (T77)	19:06	17:22			17:03	49	16:08 (T44)
7	06:05		19:58 (T42)	06:32			07:03		07:24 (T76)	07:34	07:09			07:43		15:19 (T44)
	21:07	41	20:39 (T42)	20:43			19:56	78	19:26 (T77)	19:05	17:21			17:03	49	16:08 (T44)
8	06:06		19:59 (T42)	06:33			07:04		07:25 (T76)	07:35	07:10			07:44		15:20 (T44)
	21:07	40	20:39 (T42)	20:42			19:54	74	19:25 (T77)	19:03	17:20			17:03	49	16:09 (T44)
9	06:07		19:58 (T42)	06:34			07:05		07:26 (T76)	07:36	07:12			07:45		15:20 (T44)
	21:07	40	20:38 (T42)	20:41			19:52	69	19:23 (T77)	19:01	17:19			17:03	49	16:09 (T44)
10	06:07		19:59 (T42)	06:35		19:06 (T77)	07:06		07:26 (T76)	07:37	07:13			07:46		15:20 (T44)
	21:06	39	20:38 (T42)	20:39	10	19:16 (T77)	19:51	64	19:21 (T77)	19:00	17:18			17:03	50	16:10 (T44)
11	06:08		20:00 (T42)	06:36		19:02 (T77)	07:07		07:27 (T76)	07:38	07:14			07:46		15:21 (T44)
	21:06	38	20:38 (T42)	20:38	18	19:20 (T77)	19:49	59	19:19 (T77)	18:58	17:17			17:03	50	16:11 (T44)
12	06:09		20:00 (T42)	06:37		18:59 (T77)	07:08		07:28 (T76)	07:39	07:15			07:47		15:22 (T44)
	21:05	38	20:38 (T42)	20:37	23	19:22 (T77)	19:47	53	19:17 (T77)	18:57	17:16			17:03	49	16:11 (T44)
13	06:10		20:01 (T42)	06:38		18:57 (T77)	07:09		07:29 (T76)	07:40	07:16			07:48		15:22 (T44)
	21:05	37	20:38 (T42)	20:36	27	19:24 (T77)	19:45	45	19:15 (T77)	18:55	17:15			17:03	50	16:12 (T44)
14	06:10		20:02 (T42)	06:39		18:55 (T77)	07:10		07:32 (T76)	07:41	07:18			07:49		15:22 (T44)
	21:05	35	20:37 (T42)	20:34	31	19:26 (T77)	19:44	33	19:12 (T77)	18:54	17:14			17:03	50	16:12 (T44)
15	06:11		20:03 (T42)	06:40		18:53 (T77)	07:11		18:50 (T77)	07:42	07:19		15:32 (T44)	07:50		15:22 (T44)
	21:04	34	20:37 (T42)	20:33	34	19:27 (T77)	19:42	18	19:08 (T77)	18:52	17:13	12	15:44 (T44)	17:03	51	16:13 (T44)
16	06:12		20:02 (T42)	06:41		18:51 (T77)	07:12		18:56 (T77)	07:44	07:20		15:28 (T44)	07:50		15:23 (T44)
	21:03	34	20:36 (T42)	20:31	36	19:27 (T77)	19:40	5	19:01 (T77)	18:50	17:12	19	15:47 (T44)	17:04	50	16:13 (T44)
17	06:13		20:04 (T42)	06:42		18:49 (T77)	07:13			07:45	07:21		15:27 (T44)	07:51		15:23 (T44)
	21:03	32	20:36 (T42)	20:30	39	19:28 (T77)	19:39			18:49	17:11	24	15:51 (T44)	17:04	50	16:13 (T44)
18	06:14		20:05 (T42)	06:43		18:48 (T77)	07:14			07:46	07:22		15:25 (T44)	07:52		15:24 (T44)
	21:02	30	20:35 (T42)	20:29	41	19:29 (T77)	19:37			18:47	17:11	27	15:52 (T44)	17:04	50	16:14 (T44)
19	06:14		20:06 (T42)	06:44		18:47 (T77)	07:15			07:47	07:23		15:24 (T44)	07:52		15:25 (T44)
	21:01	28	20:34 (T42)	20:27	43	19:30 (T77)	19:35			18:46	17:10	30	15:54 (T44)	17:05	50	16:15 (T44)
20	06:15		20:07 (T42)	06:45		18:46 (T77)	07:16			07:48	07:25		15:22 (T44)	07:53		15:25 (T44)
	21:01	27	20:34 (T42)	20:26	45	19:31 (T77)	19:33			18:44	17:09	33	15:55 (T44)	17:05	50	16:15 (T44)
21	06:16		20:08 (T42)	06:46		18:45 (T77)	07:17			07:49	07:26		15:22 (T44)	07:53		15:25 (T44)
	21:00	24	20:32 (T42)	20:24	46	19:31 (T77)	19:32			18:43	17:09	35	15:57 (T44)	17:06	51	16:16 (T44)
22	06:17		20:09 (T42)	06:47		18:44 (T77)	07:18			07:50	07:27		15:21 (T44)	07:54		15:25 (T44)
	20:59	21	20:30 (T42)	20:23	48	19:32 (T77)	19:30			18:41	17:08	37	15:58 (T44)	17:06	51	16:16 (T44)
23	06:18		20:11 (T42)	06:48		18:43 (T77)	07:19			07:51	07:28		15:20 (T44)	07:54		15:26 (T44)
	20:58	18	20:29 (T42)	20:21	49	19:32 (T77)	19:28			18:40	17:07	38	15:58 (T44)	17:07	51	16:17 (T44)
24	06:19		20:14 (T42)	06:49		07:38 (T76)	07:20			07:53	07:29		15:20 (T44)	07:55		15:27 (T44)
	20:58	12	20:26 (T42)	20:20	60	19:32 (T77)	19:27			18:39	17:07	39	15:59 (T44)	17:07	50	16:17 (T44)
25	06:20			06:50		07:35 (T76)	07:21			07:54	07:30		15:20 (T44)	07:55		15:27 (T44)
	20:57			20:18	67	19:32 (T77)	19:25			18:37	17:06	41	16:01 (T44)	17:08	50	16:17 (T44)
26	06:21			06:51		07:32 (T76)	07:22			07:55	07:32		15:20 (T44)	07:56		15:28 (T44)
	20:56			20:17	72	19:32 (T77)	19:23			18:36	17:06	42	16:02 (T44)	17:08	50	16:18 (T44)
27	06:22			06:52		07:31 (T76)	07:23			07:56	07:33		15:19 (T44)	07:56		15:28 (T44)
	20:55			20:15	75	19:32 (T77)	19:22			18:34	17:05	43	16:02 (T44)	17:09	50	16:18 (T44)
28	06:22			06:53		07:29 (T76)	07:24			07:57	07:34		15:19 (T44)	07:56		15:28 (T44)
	20:54			20:14	78	19:32 (T77)	19:20			18:33	17:05	44	16:03 (T44)	17:10	51	16:19 (T44)
29	06:23			06:54		07:28 (T76)	07:25			07:58	07:35		15:19 (T44)	07:57		15:29 (T44)
	20:53			20:12	81	19:32 (T77)	19:18			18:32	17:04	45	16:04 (T44)	17:10	50	16:19 (T44)
30	06:24			06:55		07:27 (T76)	07:26			08:00	07:36		15:19 (T44)	07:57		15:30 (T44)
	20:52			20:10	82	19:32 (T77)	19:16			18:31	17:04	45	16:04 (T44)	17:11	50	16:20 (T44)
31	06:25			06:56		07:26 (T76)				08:01				07:57		15:30 (T44)
	20:51			20:09	82	19:31 (T77)				18:29				17:12	50	16:20 (T44)
Potential sun hours	460			429			375			345	297			287		
Total, worst case		821			1087			992				554			1537	
Sun reduction		0.66			0.61			0.59				0.30			0.22	
Oper. time red.		1.00			1.00			1.00				1.00			1.00	
Wind dir. red.		0.54			0.62			0.63				0.74			0.74	
Total reduction		0.37			0.39			0.38				0.23			0.17	
Total, real		305			428			382				129			262	

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

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

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1438 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7348)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March		April		May		June	
1	07:57	07:44	07:07		07:16		06:30		06:01	
	17:13	17:47	18:22		19:56	39	08:25 (T22)	20:27	20:57	48
2	07:58	07:43	07:06		07:14		06:29		06:01	
	17:13	17:48	18:23		19:57	38	08:24 (T22)	20:28	20:58	49
3	07:58	07:42	07:04		07:13		06:27		06:00	
	17:14	17:50	18:24		19:58	37	08:24 (T22)	20:29	20:59	48
4	07:58	07:40	07:02		07:11		06:26		06:00	
	17:15	17:51	18:25		19:59	36	08:23 (T22)	20:30	20:59	49
5	07:58	07:39	07:01		07:09		06:25		05:59	
	17:16	17:52	18:26		20:00	34	08:21 (T22)	20:31	19:57 (T21)	7
6	07:58	07:38	06:59		07:08		06:24		05:59	
	17:17	17:53	18:27		20:00	32	08:20 (T22)	20:32	20:02 (T21)	16
7	07:57	07:37	06:58		07:06		06:22		05:59	
	17:18	17:55	18:28		20:01	29	08:18 (T22)	20:33	20:04 (T21)	22
8	07:57	07:36	07:56		07:04		06:21		05:59	
	17:19	17:56	19:30		20:02	26	08:16 (T22)	20:34	20:06 (T21)	26
9	07:57	07:35	07:54		07:03		06:20		05:58	
	17:20	17:57	19:31		20:03	23	08:15 (T22)	20:35	20:08 (T21)	30
10	07:57	07:34	07:53		07:01		06:19		05:58	
	17:21	17:59	19:32		20:05	17	08:11 (T22)	20:37	20:09 (T21)	32
11	07:57	07:32	07:51		07:00		06:18		05:58	
	17:22	18:00	19:33		20:06	10	08:08 (T22)	20:38	20:10 (T21)	34
12	07:56	07:31	07:50		06:58		06:17		05:58	
	17:23	18:01	19:34		20:07		20:39	36	20:11 (T21)	47
13	07:56	07:30	07:48		06:56		06:16		05:58	
	17:24	18:02	19:35		20:08		20:40	38	20:12 (T21)	47
14	07:56	07:29	07:46		06:55		06:15		05:58	
	17:25	18:03	19:36		20:09		20:41	40	20:13 (T21)	47
15	07:55	07:27	07:45		06:53		06:14		05:58	
	17:27	18:05	19:37		20:10		20:42	41	20:13 (T21)	47
16	07:55	07:26	07:43		06:52		06:13		05:58	
	17:28	18:06	19:39		20:11		20:43	42	20:14 (T21)	47
17	07:55	07:25	07:41	08:05 (T22)	06:50		06:12		05:58	
	17:29	18:07	19:40	11 08:16 (T22)	20:12		20:44	43	20:14 (T21)	47
18	07:54	07:23	07:40	08:01 (T22)	06:49		06:11		05:58	
	17:30	18:08	19:41	19 08:20 (T22)	20:13		20:45	45	20:16 (T21)	47
19	07:54	07:22	07:38	07:58 (T22)	06:47		06:10		05:58	
	17:31	18:10	19:42	24 08:22 (T22)	20:14		20:46	45	20:16 (T21)	47
20	07:53	07:20	07:36	07:56 (T22)	06:46		06:09		05:58	
	17:32	18:11	19:43	27 08:23 (T22)	20:15		20:47	46	20:16 (T21)	47
21	07:52	07:19	07:34	07:55 (T22)	06:44		06:08		05:58	
	17:34	18:12	19:44	30 08:25 (T22)	20:16		20:47	46	20:16 (T21)	46
22	07:52	07:18	07:33	07:53 (T22)	06:43		06:07		05:59	
	17:35	18:13	19:45	33 08:26 (T22)	20:17		20:48	46	20:16 (T21)	47
23	07:51	07:16	07:31	07:51 (T22)	06:41		06:07		05:59	
	17:36	18:14	19:46	35 08:26 (T22)	20:18		20:49	47	20:17 (T21)	47
24	07:50	07:15	07:29	07:50 (T22)	06:40		06:06		05:59	
	17:37	18:16	19:47	36 08:26 (T22)	20:20		20:50	47	20:17 (T21)	47
25	07:50	07:13	07:28	07:49 (T22)	06:38		06:05		05:59	
	17:38	18:17	19:48	38 08:27 (T22)	20:21		20:51	48	20:17 (T21)	47
26	07:49	07:12	07:26	07:48 (T22)	06:37		06:04		06:00	
	17:40	18:18	19:49	39 08:27 (T22)	20:22		20:52	48	20:18 (T21)	47
27	07:48	07:10	07:24	07:47 (T22)	06:35		06:04		06:00	
	17:41	18:19	19:51	40 08:27 (T22)	20:23		20:53	48	20:18 (T21)	47
28	07:47	07:09	07:23	07:48 (T22)	06:34		06:03		06:00	
	17:42	18:20	19:52	39 08:27 (T22)	20:24		20:54	49	20:19 (T21)	47
29	07:46		07:21	07:47 (T22)	06:33		06:03		06:01	
	17:43		19:53	40 08:27 (T22)	20:25		20:55	48	20:18 (T21)	48
30	07:45		07:19	07:46 (T22)	06:31		06:02		06:01	
	17:45		19:54	40 08:26 (T22)	20:26		20:55	49	20:19 (T21)	47
31	07:44		07:18	07:47 (T22)			06:02			
	17:46		19:55	39 08:26 (T22)			20:56	49	20:19 (T21)	
Potential sun hours	297	297	370		399		449		453	
Total, worst case			490		321		1068		1423	
Sun reduction			0.44		0.52		0.57		0.64	
Oper. time red.			1.00		1.00		1.00		1.00	
Wind dir. red.			0.62		0.62		0.56		0.56	
Total reduction			0.27		0.32		0.32		0.36	
Total, real			134		103		340		509	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1438 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7348)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December
1	06:02		19:37 (T21)	06:26		19:46 (T21)	06:57		07:57 (T22)	07:27	07:02	07:37
	21:09	47	20:24 (T21)	20:50	35	20:21 (T21)	20:07	10	08:07 (T22)	19:15	17:28	17:03
2	06:02		19:37 (T21)	06:27		19:47 (T21)	06:58		07:53 (T22)	07:28	07:03	07:38
	21:09	48	20:25 (T21)	20:49	33	20:20 (T21)	20:06	17	08:10 (T22)	19:13	17:26	17:03
3	06:03		19:37 (T21)	06:28		19:48 (T21)	06:59		07:50 (T22)	07:30	07:04	07:39
	21:08	48	20:25 (T21)	20:48	31	20:19 (T21)	20:04	23	08:13 (T22)	19:11	17:25	17:03
4	06:03		19:38 (T21)	06:29		19:50 (T21)	07:00		07:48 (T22)	07:31	07:06	07:40
	21:08	47	20:25 (T21)	20:47	28	20:18 (T21)	20:02	26	08:14 (T22)	19:10	17:24	17:03
5	06:04		19:37 (T21)	06:30		19:51 (T21)	07:01		07:46 (T22)	07:32	07:07	07:41
	21:08	48	20:25 (T21)	20:46	25	20:16 (T21)	20:01	29	08:15 (T22)	19:08	17:23	17:02
6	06:04		19:38 (T21)	06:31		19:53 (T21)	07:02		07:45 (T22)	07:33	07:08	07:42
	21:08	48	20:26 (T21)	20:45	21	20:14 (T21)	19:57	31	08:16 (T22)	19:06	17:22	17:02
7	06:05		19:38 (T21)	06:32		19:57 (T21)	07:03		07:42 (T22)	07:34	07:09	07:43
	21:08	48	20:26 (T21)	20:43	13	20:10 (T21)	19:56	34	08:16 (T22)	19:05	17:21	17:02
8	06:06		19:38 (T21)	06:33			07:04		07:41 (T22)	07:35	07:10	07:44
	21:07	48	20:26 (T21)	20:42			19:54	36	08:17 (T22)	19:03	17:20	17:02
9	06:06		19:38 (T21)	06:34			07:05		07:40 (T22)	07:36	07:12	07:45
	21:07	48	20:26 (T21)	20:41			19:52	37	08:17 (T22)	19:01	17:19	17:02
10	06:07		19:38 (T21)	06:35			07:06		07:39 (T22)	07:37	07:13	07:46
	21:07	49	20:27 (T21)	20:40			19:51	38	08:17 (T22)	19:00	17:18	17:02
11	06:08		19:38 (T21)	06:36			07:07		07:39 (T22)	07:38	07:14	07:47
	21:06	48	20:26 (T21)	20:38			19:49	38	08:17 (T22)	18:58	17:17	17:02
12	06:09		19:38 (T21)	06:37			07:08		07:38 (T22)	07:39	07:15	07:47
	21:06	49	20:27 (T21)	20:37			19:47	39	08:17 (T22)	18:57	17:16	17:02
13	06:09		19:39 (T21)	06:38			07:09		07:37 (T22)	07:40	07:16	07:48
	21:05	48	20:27 (T21)	20:36			19:45	40	08:17 (T22)	18:55	17:15	17:03
14	06:10		19:38 (T21)	06:39			07:10		07:37 (T22)	07:41	07:18	07:49
	21:05	49	20:27 (T21)	20:34			19:44	40	08:17 (T22)	18:53	17:14	17:03
15	06:11		19:38 (T21)	06:40			07:11		07:37 (T22)	07:42	07:19	07:50
	21:04	49	20:27 (T21)	20:33			19:42	40	08:17 (T22)	18:52	17:13	17:03
16	06:12		19:39 (T21)	06:41			07:12		07:37 (T22)	07:44	07:20	07:50
	21:04	48	20:27 (T21)	20:32			19:40	39	08:16 (T22)	18:50	17:12	17:03
17	06:12		19:39 (T21)	06:42			07:13		07:37 (T22)	07:45	07:21	07:51
	21:03	49	20:28 (T21)	20:30			19:39	39	08:16 (T22)	18:49	17:11	17:04
18	06:13		19:40 (T21)	06:43			07:14		07:37 (T22)	07:46	07:22	07:52
	21:02	48	20:28 (T21)	20:29			19:37	38	08:15 (T22)	18:47	17:10	17:04
19	06:14		19:39 (T21)	06:44			07:15		07:37 (T22)	07:47	07:24	07:52
	21:02	48	20:27 (T21)	20:27			19:35	37	08:14 (T22)	18:46	17:10	17:04
20	06:15		19:39 (T21)	06:45			07:16		07:37 (T22)	07:48	07:25	07:53
	21:01	48	20:27 (T21)	20:26			19:33	36	08:13 (T22)	18:44	17:09	17:05
21	06:16		19:40 (T21)	06:46			07:17		07:38 (T22)	07:49	07:26	07:54
	21:00	47	20:27 (T21)	20:24			19:32	34	08:12 (T22)	18:43	17:08	17:05
22	06:17		19:40 (T21)	06:47			07:18		07:39 (T22)	07:50	07:27	07:54
	20:59	47	20:27 (T21)	20:23			19:30	31	08:10 (T22)	18:41	17:08	17:06
23	06:18		19:41 (T21)	06:48			07:19		07:40 (T22)	07:51	07:28	07:55
	20:59	46	20:27 (T21)	20:21			19:28	28	08:08 (T22)	18:40	17:07	17:06
24	06:18		19:41 (T21)	06:49			07:20		07:41 (T22)	07:53	07:29	07:55
	20:58	46	20:27 (T21)	20:20			19:27	25	08:06 (T22)	18:38	17:06	17:07
25	06:19		19:42 (T21)	06:50			07:21		07:43 (T22)	07:54	07:31	07:55
	20:57	44	20:26 (T21)	20:18			19:25	21	08:04 (T22)	18:37	17:06	17:07
26	06:20		19:41 (T21)	06:51			07:22		07:46 (T22)	07:55	07:32	07:56
	20:56	44	20:25 (T21)	20:17			19:23	14	08:00 (T22)	18:36	17:05	17:08
27	06:21		19:42 (T21)	06:52			07:23			07:56	07:33	07:56
	20:55	43	20:25 (T21)	20:15			19:21			18:34	17:05	17:09
28	06:22		19:42 (T21)	06:53			07:24			07:57	07:34	07:56
	20:54	42	20:24 (T21)	20:14			19:20			18:33	17:04	17:09
29	06:23		19:43 (T21)	06:54			07:25			07:58	07:35	07:57
	20:53	41	20:24 (T21)	20:12			19:18			18:32	17:04	17:10
30	06:24		19:44 (T21)	06:55			07:26			08:00	07:36	07:57
	20:52	39	20:23 (T21)	20:10			19:16			18:30	17:04	17:11
31	06:25		19:45 (T21)	06:56						08:01		07:57
	20:51	37	20:22 (T21)	20:09						18:29		17:12
Potential sun hours	460			429			375			345	297	287
Total, worst case		1439			186			820				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.56			0.56			0.62				
Total reduction		0.37			0.34			0.37				
Total, real		531			63			300				

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

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

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1461 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7365)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March			April			May			June		
1	07:57	07:43	07:07			07:16		18:57 (T5)	06:30		18:38 (T5)	06:01		19:58 (T3)
	17:12	17:47	18:21			19:56	37	19:34 (T4)	20:27	48	19:26 (T5)	20:57	27	20:25 (T3)
2	07:57	07:42	07:05			07:14		18:53 (T5)	06:28		18:39 (T5)	06:00		19:59 (T3)
	17:13	17:48	18:22			19:57	42	19:35 (T4)	20:28	47	19:26 (T5)	20:58	27	20:26 (T3)
3	07:57	07:41	07:04			07:12		18:50 (T5)	06:27		18:40 (T5)	06:00		20:00 (T3)
	17:14	17:49	18:24			19:58	45	19:35 (T4)	20:29	45	19:25 (T5)	20:58	26	20:26 (T3)
4	07:57	07:40	07:02			07:11		18:49 (T5)	06:26		18:41 (T5)	05:59		20:00 (T3)
	17:15	17:51	18:25			19:59	47	19:36 (T4)	20:30	43	19:24 (T5)	20:59	25	20:25 (T3)
5	07:57	07:39	07:01			07:09		18:47 (T5)	06:24		18:42 (T5)	05:59		20:00 (T3)
	17:16	17:52	18:26			20:00	49	19:36 (T4)	20:31	40	19:22 (T5)	21:00	25	20:25 (T3)
6	07:57	07:38	06:59			07:07		18:44 (T5)	06:23		18:43 (T5)	05:59		20:01 (T3)
	17:17	17:53	18:27			20:00	52	19:36 (T4)	20:32	38	19:21 (T5)	21:00	25	20:26 (T3)
7	07:57	07:37	06:57			07:06		18:44 (T5)	06:22		18:45 (T5)	05:58		20:01 (T3)
	17:18	17:54	18:28			20:01	53	19:37 (T4)	20:33	34	19:19 (T5)	21:01	24	20:25 (T3)
8	07:57	07:36	07:56			07:04		18:42 (T5)	06:21		18:46 (T5)	05:58		20:02 (T3)
	17:19	17:56	19:29			20:02	54	19:36 (T4)	20:34	32	19:18 (T5)	21:02	23	20:25 (T3)
9	07:57	07:35	07:54			07:02		18:40 (T5)	06:20		18:48 (T5)	05:58		20:02 (T3)
	17:20	17:57	19:30			20:03	56	19:36 (T4)	20:35	28	19:16 (T5)	21:02	23	20:25 (T3)
10	07:57	07:33	07:53			07:01		18:40 (T5)	06:19		18:50 (T5)	05:58		20:03 (T3)
	17:21	17:58	19:32			20:04	56	19:36 (T4)	20:36	31	20:14 (T3)	21:03	22	20:25 (T3)
11	07:57	07:32	07:51			06:59		18:39 (T5)	06:17		18:53 (T5)	05:58		20:03 (T3)
	17:22	17:59	19:33			20:05	56	19:35 (T4)	20:37	30	20:15 (T3)	21:04	22	20:25 (T3)
12	07:56	07:31	07:49			06:58		18:38 (T5)	06:16		18:56 (T5)	05:57		20:04 (T3)
	17:23	18:01	19:34			20:06	57	19:35 (T4)	20:38	26	20:16 (T3)	21:04	21	20:25 (T3)
13	07:56	07:30	07:48			06:56		18:37 (T5)	06:15		20:01 (T3)	05:57		20:05 (T3)
	17:24	18:02	19:35			20:07	57	19:34 (T4)	20:39	16	20:17 (T3)	21:05	20	20:25 (T3)
14	07:56	07:28	07:46			06:54		18:37 (T5)	06:14		20:00 (T3)	05:57		20:05 (T3)
	17:25	18:03	19:36			20:09	57	19:34 (T4)	20:40	17	20:17 (T3)	21:05	20	20:25 (T3)
15	07:55	07:27	07:44			06:53		18:36 (T5)	06:13		19:59 (T3)	05:57		20:05 (T3)
	17:26	18:04	19:37			20:10	58	19:34 (T5)	20:41	19	20:18 (T3)	21:06	20	20:25 (T3)
16	07:55	07:26	07:43			06:51		18:35 (T5)	06:12		19:58 (T3)	05:57		20:06 (T3)
	17:27	18:06	19:38			20:11	58	19:33 (T5)	20:42	21	20:19 (T3)	21:06	19	20:25 (T3)
17	07:54	07:24	07:41			06:50		18:35 (T5)	06:11		19:58 (T3)	05:57		20:06 (T3)
	17:28	18:07	19:39			20:12	59	19:34 (T5)	20:43	22	20:20 (T3)	21:06	19	20:25 (T3)
18	07:54	07:23	07:39			06:48		18:35 (T5)	06:10		19:57 (T3)	05:57		20:06 (T3)
	17:30	18:08	19:40			20:13	58	19:33 (T5)	20:44	24	20:21 (T3)	21:07	19	20:25 (T3)
19	07:53	07:22	07:38			06:47		18:35 (T5)	06:10		19:57 (T3)	05:58		20:06 (T3)
	17:31	18:09	19:42			20:14	58	19:33 (T5)	20:45	24	20:21 (T3)	21:07	19	20:25 (T3)
20	07:53	07:20	07:36			06:45		18:34 (T5)	06:09		19:57 (T3)	05:58		20:07 (T3)
	17:32	18:10	19:43			20:15	59	19:33 (T5)	20:46	26	20:23 (T3)	21:07	18	20:25 (T3)
21	07:52	07:19	07:34			06:44		18:35 (T5)	06:08		19:57 (T3)	05:58		20:07 (T3)
	17:33	18:12	19:44			20:16	58	19:33 (T5)	20:47	27	20:24 (T3)	21:08	18	20:25 (T3)
22	07:52	07:17	07:33			06:42		18:35 (T5)	06:07		19:57 (T3)	05:58		20:08 (T3)
	17:34	18:13	19:45			20:17	58	19:33 (T5)	20:48	27	20:24 (T3)	21:08	18	20:26 (T3)
23	07:51	07:16	07:31			06:41		18:35 (T5)	06:06		19:56 (T3)	05:58		20:08 (T3)
	17:36	18:14	19:46			20:18	57	19:32 (T5)	20:49	29	20:25 (T3)	21:08	18	20:26 (T3)
24	07:50	07:14	07:29			06:39		18:35 (T5)	06:05		19:57 (T3)	05:59		20:07 (T3)
	17:37	18:15	19:47			20:19	57	19:32 (T5)	20:50	29	20:26 (T3)	21:08	19	20:26 (T3)
25	07:49	07:13	07:27			06:38		18:35 (T5)	06:05		19:57 (T3)	05:59		20:07 (T3)
	17:38	18:16	19:48			20:20	56	19:31 (T5)	20:51	29	20:26 (T3)	21:08	19	20:26 (T3)
26	07:49	07:11	07:26			06:36		18:36 (T5)	06:04		19:57 (T3)	05:59		20:08 (T3)
	17:39	18:18	19:49			20:21	55	19:31 (T5)	20:52	28	20:25 (T3)	21:08	19	20:27 (T3)
27	07:48	07:10	07:24			06:35		18:36 (T5)	06:03		19:57 (T3)	06:00		20:08 (T3)
	17:41	18:19	19:50			20:23	54	19:30 (T5)	20:53	29	20:26 (T3)	21:09	19	20:27 (T3)
28	07:47	07:08	07:22		19:18 (T4)	06:34		18:36 (T5)	06:03		19:57 (T3)	06:00		20:08 (T3)
	17:42	18:20	19:51	6	19:24 (T4)	20:24	53	19:29 (T5)	20:54	29	20:26 (T3)	21:09	20	20:28 (T3)
29	07:46		07:21		19:13 (T4)	06:32		18:37 (T5)	06:02		19:58 (T3)	06:00		20:08 (T3)
	17:43		19:52	16	19:29 (T4)	20:25	51	19:28 (T5)	20:54	28	20:26 (T3)	21:09	20	20:28 (T3)
30	07:45		07:19		19:10 (T4)	06:31		18:38 (T5)	06:02		19:58 (T3)	06:01		20:07 (T3)
	17:44		19:53	21	19:31 (T4)	20:26	50	19:28 (T5)	20:55	28	20:26 (T3)	21:09	21	20:28 (T3)
31	07:44		07:17		19:01 (T5)				06:01		19:59 (T3)			
	17:46		19:55	31	19:32 (T4)				20:56	27	20:26 (T3)			
Potential sun hours	297	297	370			399			449			453		
Total, worst case				74			1617			921			635	
Sun reduction				0.44			0.52			0.57			0.64	
Oper. time red.				1.00			1.00			1.00			1.00	
Wind dir. red.				0.61			0.61			0.58			0.55	
Total reduction				0.27			0.32			0.33			0.35	
Total, real				20			514			304			225	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1461 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7365)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December
1	06:01		20:08 (T3)	06:26		19:05 (T5)	06:57		18:38 (T5)	07:27	07:02	07:37
	21:08	21	20:29 (T3)	20:50	28	20:26 (T3)	20:07	56	19:34 (T4)	19:14	17:27	17:03
2	06:02		20:07 (T3)	06:27		19:01 (T5)	06:58		18:38 (T5)	07:28	07:03	07:38
	21:08	22	20:29 (T3)	20:49	32	20:24 (T3)	20:05	56	19:34 (T4)	19:13	17:26	17:03
3	06:02		20:08 (T3)	06:28		18:59 (T5)	06:59		18:38 (T5)	07:29	07:04	07:39
	21:08	22	20:30 (T3)	20:48	31	20:23 (T3)	20:04	56	19:34 (T4)	19:11	17:25	17:02
4	06:03		20:07 (T3)	06:29		18:57 (T5)	07:00		18:39 (T5)	07:30	07:05	07:40
	21:08	23	20:30 (T3)	20:47	30	19:27 (T5)	20:02	54	19:33 (T4)	19:09	17:24	17:02
5	06:03		20:07 (T3)	06:30		18:55 (T5)	07:01		18:40 (T5)	07:31	07:07	07:41
	21:08	24	20:31 (T3)	20:46	33	19:28 (T5)	20:00	53	19:33 (T4)	19:08	17:23	17:02
6	06:04		20:08 (T3)	06:31		18:54 (T5)	07:02		18:40 (T5)	07:32	07:08	07:42
	21:08	24	20:32 (T3)	20:44	36	19:30 (T5)	19:57	52	19:32 (T4)	19:06	17:21	17:02
7	06:05		20:07 (T3)	06:32		18:52 (T5)	07:03		18:42 (T5)	07:33	07:09	07:43
	21:07	24	20:31 (T3)	20:43	39	19:31 (T5)	19:55	49	19:31 (T4)	19:04	17:20	17:02
8	06:05		20:07 (T3)	06:33		18:51 (T5)	07:04		18:43 (T5)	07:35	07:10	07:44
	21:07	25	20:32 (T3)	20:42	41	19:32 (T5)	19:54	47	19:30 (T4)	19:03	17:19	17:02
9	06:06		20:07 (T3)	06:34		18:50 (T5)	07:05		18:44 (T5)	07:36	07:11	07:45
	21:07	26	20:33 (T3)	20:41	43	19:33 (T5)	19:52	45	19:29 (T4)	19:01	17:18	17:02
10	06:07		20:07 (T3)	06:35		18:49 (T5)	07:06		18:46 (T5)	07:37	07:13	07:46
	21:06	26	20:33 (T3)	20:39	45	19:34 (T5)	19:50	42	19:28 (T4)	18:59	17:17	17:02
11	06:07		20:07 (T3)	06:36		18:48 (T5)	07:07		18:49 (T5)	07:38	07:14	07:46
	21:06	27	20:34 (T3)	20:38	47	19:35 (T5)	19:49	38	19:27 (T4)	18:58	17:16	17:02
12	06:08		20:07 (T3)	06:37		18:47 (T5)	07:08		18:52 (T5)	07:39	07:15	07:47
	21:06	27	20:34 (T3)	20:37	48	19:35 (T5)	19:47	33	19:25 (T4)	18:56	17:15	17:02
13	06:09		20:06 (T3)	06:38		18:46 (T5)	07:09		19:01 (T4)	07:40	07:16	07:48
	21:05	28	20:34 (T3)	20:35	50	19:36 (T5)	19:45	22	19:23 (T4)	18:55	17:14	17:02
14	06:10		20:06 (T3)	06:39		18:45 (T5)	07:10		19:03 (T4)	07:41	07:17	07:49
	21:05	28	20:34 (T3)	20:34	51	19:36 (T5)	19:43	17	19:20 (T4)	18:53	17:13	17:02
15	06:10		20:07 (T3)	06:40		18:44 (T5)	07:11		19:07 (T4)	07:42	07:19	07:50
	21:04	28	20:35 (T3)	20:33	53	19:37 (T5)	19:42	8	19:15 (T4)	18:51	17:12	17:03
16	06:11		20:07 (T3)	06:41		18:43 (T5)	07:12			07:43	07:20	07:50
	21:03	28	20:35 (T3)	20:31	54	19:37 (T5)	19:40			18:50	17:12	17:03
17	06:12		20:06 (T3)	06:42		18:42 (T5)	07:13			07:44	07:21	07:51
	21:03	29	20:35 (T3)	20:30	55	19:37 (T5)	19:38			18:48	17:11	17:03
18	06:13		20:06 (T3)	06:43		18:42 (T5)	07:14			07:46	07:22	07:52
	21:02	29	20:35 (T3)	20:28	56	19:38 (T5)	19:37			18:47	17:10	17:03
19	06:14		20:06 (T3)	06:44		18:41 (T5)	07:15			07:47	07:23	07:52
	21:01	29	20:35 (T3)	20:27	57	19:38 (T5)	19:35			18:45	17:09	17:04
20	06:14		20:07 (T3)	06:45		18:41 (T5)	07:16			07:48	07:25	07:53
	21:01	29	20:36 (T3)	20:26	57	19:38 (T5)	19:33			18:44	17:08	17:04
21	06:15		20:07 (T3)	06:46		18:40 (T5)	07:17			07:49	07:26	07:53
	21:00	28	20:35 (T3)	20:24	58	19:38 (T5)	19:31			18:42	17:08	17:05
22	06:16		20:07 (T3)	06:47		18:40 (T5)	07:18			07:50	07:27	07:54
	20:59	28	20:35 (T3)	20:23	58	19:38 (T5)	19:30			18:41	17:07	17:05
23	06:17		20:07 (T3)	06:48		18:39 (T5)	07:19			07:51	07:28	07:54
	20:58	26	20:33 (T3)	20:21	59	19:38 (T5)	19:28			18:39	17:07	17:06
24	06:18		20:07 (T3)	06:49		18:39 (T5)	07:20			07:52	07:29	07:55
	20:58	25	20:32 (T3)	20:20	58	19:37 (T5)	19:26			18:38	17:06	17:06
25	06:19		20:08 (T3)	06:50		18:39 (T5)	07:21			07:54	07:30	07:55
	20:57	24	20:32 (T3)	20:18	58	19:37 (T5)	19:25			18:37	17:05	17:07
26	06:20		20:08 (T3)	06:51		18:38 (T5)	07:22			07:55	07:32	07:56
	20:56	23	20:31 (T3)	20:16	59	19:37 (T5)	19:23			18:35	17:05	17:08
27	06:21		20:09 (T3)	06:52		18:38 (T5)	07:23			07:56	07:33	07:56
	20:55	21	20:30 (T3)	20:15	58	19:36 (T5)	19:21			18:34	17:04	17:08
28	06:22		20:09 (T3)	06:53		18:38 (T5)	07:24			07:57	07:34	07:56
	20:54	20	20:29 (T3)	20:13	58	19:36 (T5)	19:19			18:33	17:04	17:09
29	06:23		20:10 (T3)	06:54		18:37 (T5)	07:25			07:58	07:35	07:57
	20:53	19	20:29 (T3)	20:12	57	19:34 (T5)	19:18			18:31	17:04	17:10
30	06:24		20:11 (T3)	06:55		18:37 (T5)	07:26			07:59	07:36	07:57
	20:52	17	20:28 (T3)	20:10	57	19:34 (T4)	19:16			18:30	17:03	17:10
31	06:25		19:11 (T5)	06:56		18:37 (T5)				08:01		07:57
	20:51	19	20:27 (T3)	20:09	57	19:34 (T4)				18:29		17:11
Potential sun hours	460			429			375			345	297	287
Total, worst case		769			1523			628				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.55			0.61			0.61				
Total reduction		0.37			0.37			0.36				
Total, real		281			567			227				

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1468 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7370)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May		June		July		August	September	October	November	December
1	07:57	07:43	07:07	07:16	06:31		06:02		06:03		06:27	06:57	07:28	07:02	07:37
	17:13	17:48	18:22	19:56	20:27		20:57	57	21:08	62	20:50	20:07	19:15	17:28	17:04
2	07:57	07:42	07:06	07:15	06:29		06:01		06:03		06:28	06:58	07:29	07:03	07:38
	17:14	17:49	18:23	19:57	20:28		20:57	58	21:08	61	20:49	20:05	19:13	17:27	17:04
3	07:57	07:41	07:04	07:13	06:28		06:01		06:04		06:29	06:59	07:30	07:04	07:39
	17:15	17:50	18:24	19:58	20:29		20:58	58	21:08	61	20:48	20:04	19:11	17:26	17:04
4	07:57	07:40	07:02	07:11	06:27		06:01		06:04		06:30	07:00	07:31	07:05	07:40
	17:16	17:52	18:25	19:59	20:30		20:59	59	21:08	61	20:47	20:02	19:10	17:25	17:03
5	07:57	07:39	07:01	07:10	06:25		06:00		06:05		06:31	07:01	07:32	07:07	07:41
	17:17	17:53	18:26	20:00	20:31		20:59	59	21:08	61	20:45	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59	07:08	06:24		06:00		06:05		06:32	07:02	07:33	07:08	07:42
	17:18	17:54	18:28	20:00	20:32		21:00	60	21:07	60	20:44	19:57	19:07	17:22	17:03
7	07:57	07:37	06:58	07:06	06:23		06:00		06:06		06:32	07:03	07:34	07:09	07:43
	17:19	17:55	18:29	20:01	20:33		21:01	61	21:07	60	20:43	19:56	19:05	17:21	17:03
8	07:57	07:36	07:56	07:05	06:22		05:59		06:07		06:33	07:04	07:35	07:10	07:44
	17:20	17:57	19:30	20:02	20:34		21:01	60	21:07	59	20:42	19:54	19:03	17:20	17:03
9	07:57	07:35	07:54	07:03	06:21		05:59		06:07		06:34	07:05	07:36	07:11	07:44
	17:21	17:58	19:31	20:03	20:35		21:02	61	21:06	58	20:41	19:52	19:02	17:19	17:03
10	07:57	07:33	07:53	07:02	06:20		05:59		06:08		06:35	07:06	07:37	07:13	07:45
	17:22	17:59	19:32	20:04	20:36		21:03	61	21:06	59	20:39	19:51	19:00	17:18	17:03
11	07:56	07:32	07:51	07:00	06:18		05:59		06:09		06:36	07:07	07:38	07:14	07:46
	17:23	18:00	19:33	20:06	20:37		21:03	62	21:06	58	20:38	19:49	18:58	17:17	17:03
12	07:56	07:31	07:50	06:58	06:17		05:59		06:09		06:37	07:08	07:39	07:15	07:47
	17:24	18:01	19:34	20:07	20:38		21:04	62	21:05	57	20:37	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48	06:57	06:16	06:57 (T71)	05:59		06:10		06:38	07:09	07:40	07:16	07:48
	17:25	18:03	19:35	20:08	20:39	8 07:05 (T71)	21:04	62	21:05	56	20:37	19:45	18:55	17:15	17:03
14	07:55	07:28	07:46	06:55	06:15	06:52 (T71)	05:59		06:11		06:39	07:10	07:41	07:17	07:49
	17:26	18:04	19:37	20:09	20:40	18 07:10 (T71)	21:05	62	21:04	55	20:34	19:44	18:54	17:14	17:04
15	07:55	07:27	07:45	06:54	06:14	06:49 (T71)	05:59		06:12		06:40	07:11	07:42	07:19	07:49
	17:27	18:05	19:38	20:10	20:41	24 07:13 (T71)	21:05	62	21:04	54	20:33	19:42	18:52	17:13	17:04
16	07:55	07:26	07:43	06:52	06:13	06:47 (T71)	05:59		06:12		06:41	07:12	07:43	07:20	07:50
	17:28	18:06	19:39	20:11	20:42	28 07:15 (T71)	21:06	62	21:03	53	20:31	19:40	18:51	17:13	17:04
17	07:54	07:25	07:41	06:51	06:12	06:45 (T71)	05:59		06:13		06:42	07:13	07:45	07:21	07:51
	17:30	18:08	19:40	20:12	20:43	32 07:17 (T71)	21:06	62	21:03	52	20:30	19:39	18:49	17:12	17:04
18	07:54	07:23	07:40	06:49	06:12	06:43 (T71)	05:59		06:14		06:43	07:14	07:46	07:22	07:51
	17:31	18:09	19:41	20:13	20:44	36 07:19 (T71)	21:06	63	21:02	51	20:28	19:37	18:48	17:11	17:05
19	07:53	07:22	07:38	06:47	06:11	06:41 (T71)	05:59		06:15		06:44	07:15	07:47	07:23	07:52
	17:32	18:10	19:42	20:14	20:45	39 07:20 (T71)	21:07	63	21:01	50	20:27	19:35	18:46	17:10	17:05
20	07:53	07:20	07:36	06:46	06:10	06:41 (T71)	05:59		06:16		06:45	07:16	07:48	07:24	07:52
	17:33	18:11	19:43	20:15	20:46	41 07:22 (T71)	21:07	63	21:01	48	20:26	19:34	18:45	17:10	17:05
21	07:52	07:19	07:35	06:44	06:09	06:40 (T71)	05:59		06:16		06:46	07:17	07:49	07:26	07:53
	17:34	18:12	19:44	20:16	20:47	43 07:23 (T71)	21:07	63	21:00	46	20:24	19:32	18:43	17:09	17:06
22	07:51	07:18	07:33	06:43	06:08	06:38 (T71)	05:59		06:17		06:47	07:18	07:50	07:27	07:54
	17:35	18:14	19:45	20:17	20:48	46 07:24 (T71)	21:07	63	20:59	44	20:23	19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:42	06:07	06:37 (T71)	06:00		06:18		06:48	07:19	07:51	07:28	07:54
	17:37	18:15	19:46	20:18	20:49	47 07:24 (T71)	21:08	63	20:58	42	20:21	19:28	18:40	17:08	17:07
24	07:50	07:15	07:30	06:40	06:07	06:37 (T71)	06:00		06:19		06:49	07:20	07:52	07:29	07:55
	17:38	18:16	19:47	20:19	20:50	49 07:26 (T71)	21:08	63	20:57	40	20:20	19:27	18:39	17:07	17:07
25	07:49	07:13	07:28	06:39	06:06	06:36 (T71)	06:00		06:20		06:50	07:21	07:54	07:30	07:55
	17:39	18:17	19:48	20:20	20:51	50 07:26 (T71)	21:08	63	20:57	37	20:18	19:25	18:37	17:07	17:08
26	07:48	07:12	07:26	06:37	06:05	06:35 (T71)	06:00		06:21		06:51	07:22	07:55	07:31	07:55
	17:40	18:18	19:50	20:21	20:52	52 07:27 (T71)	21:08	62	20:56	35	20:17	19:23	18:36	17:06	17:09
27	07:48	07:10	07:25	06:36	06:05	06:35 (T71)	06:01		06:22		06:52	07:23	07:56	07:32	07:56
	17:42	18:20	19:51	20:23	20:52	53 07:28 (T71)	21:08	62	20:55	31	20:15	19:22	18:35	17:06	17:09
28	07:47	07:09	07:23	06:35	06:04	06:35 (T71)	06:01		06:23		06:53	07:24	07:57	07:33	07:56
	17:43	18:21	19:52	20:24	20:53	53 07:28 (T71)	21:08	62	20:54	27	20:13	19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:03	06:35 (T71)	06:02		06:24		06:54	07:25	07:58	07:35	07:56
	17:44		19:53	20:25	20:54	54 07:29 (T71)	21:08	63	20:53	22	20:12	19:18	18:32	17:05	17:11
30	07:45		07:20	06:32	06:03	06:34 (T71)	06:02		06:25		06:55	07:26	07:59	07:36	07:56
	17:45		19:54	20:26	20:55	55 07:29 (T71)	21:08	62	20:52	15	20:10	19:17	18:31	17:04	17:12
31	07:44		07:18		06:02	06:34 (T71)			06:26		06:56		08:01		07:57
	17:47		19:55		20:56	56 07:30 (T71)			20:51		20:09		18:29		17:12
Potential sun hours	297	297	370	399	448		452		459		428	375	345	298	288
Total, worst case						784		1843		1475					
Sun reduction						0.57		0.64		0.66					
Oper. time red.						1.00		1.00		1.00					
Wind dir. red.						0.71		0.71		0.71					
Total reduction						0.41		0.46		0.47					
Total, real						319		841		694					

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1472 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7374)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:57			07:43		16:52 (T45)	07:07		16:51 (T45)	07:16			06:30			06:01		19:22 (T44)
	17:13			17:47	26	17:18 (T45)	18:22	29	17:20 (T45)	19:56			20:27			20:57	54	20:16 (T44)
2	07:57			07:42		16:51 (T45)	07:06		16:53 (T45)	07:14			06:29			06:01		19:22 (T44)
	17:14			17:49	29	17:20 (T45)	18:23	25	17:18 (T45)	19:57			20:28			20:58	54	20:16 (T44)
3	07:57			07:41		16:50 (T45)	07:04		16:55 (T45)	07:13			06:28		19:41 (T44)	06:01		19:22 (T44)
	17:15			17:50	31	17:21 (T45)	18:24	19	17:14 (T45)	19:58			20:29	12	19:53 (T44)	20:58	54	20:16 (T44)
4	07:57			07:40		16:48 (T45)	07:02		17:00 (T45)	07:11			06:26		19:37 (T44)	06:00		19:22 (T44)
	17:16			17:51	35	17:23 (T45)	18:25	10	17:10 (T45)	19:59			20:30	21	19:58 (T44)	20:59	54	20:16 (T44)
5	07:57			07:39		16:47 (T45)	07:01			07:09			06:25		19:35 (T44)	06:00		19:23 (T44)
	17:17			17:52	36	17:23 (T45)	18:26			20:00			20:31	25	20:00 (T44)	21:00	54	20:17 (T44)
6	07:57			07:38		16:46 (T45)	06:59			07:08			06:24		19:33 (T44)	06:00		19:22 (T44)
	17:17			17:54	38	17:24 (T45)	18:27			20:00			20:32	29	20:02 (T44)	21:00	54	20:16 (T44)
7	07:57			07:37		16:45 (T45)	06:58			07:06			06:23		19:31 (T44)	05:59		19:23 (T44)
	17:18			17:55	41	17:26 (T45)	18:29			20:01			20:33	33	20:04 (T44)	21:01	54	20:17 (T44)
8	07:57			07:36		16:45 (T45)	07:56			07:05			06:22		19:30 (T44)	05:59		19:23 (T44)
	17:19			17:56	42	17:27 (T45)	19:30			20:02			20:34	36	20:06 (T44)	21:02	54	20:17 (T44)
9	07:57			07:35		16:44 (T45)	07:54			07:03			06:20		19:29 (T44)	05:59		19:24 (T44)
	17:20			17:58	44	17:28 (T45)	19:31			20:03			20:35	38	20:07 (T44)	21:02	53	20:17 (T44)
10	07:57			07:34		16:44 (T45)	07:53			07:01			06:19		19:27 (T44)	05:59		19:24 (T44)
	17:21			17:59	45	17:29 (T45)	19:32			20:04			20:36	40	20:07 (T44)	21:03	54	20:18 (T44)
11	07:57			07:32		16:43 (T45)	07:51			07:00			06:18		19:26 (T44)	05:58		19:24 (T44)
	17:23			18:00	45	17:28 (T45)	19:33			20:06			20:37	42	20:08 (T44)	21:03	54	20:18 (T44)
12	07:56			07:31		16:43 (T45)	07:50			06:58			06:17		19:25 (T44)	05:58		19:24 (T44)
	17:24			18:01	46	17:29 (T45)	19:34			20:07			20:38	44	20:09 (T44)	21:04	53	20:17 (T44)
13	07:56			07:30		16:43 (T45)	07:48			06:57			06:16		19:24 (T44)	05:58		19:24 (T44)
	17:25			18:02	47	17:30 (T45)	19:35			20:08			20:39	45	20:09 (T44)	21:05	53	20:17 (T44)
14	07:56			07:29		16:42 (T45)	07:46			06:55			06:15		19:23 (T44)	05:58		19:24 (T44)
	17:26			18:04	47	17:29 (T45)	19:36			20:09			20:40	47	20:10 (T44)	21:05	53	20:17 (T44)
15	07:55			07:27		16:42 (T45)	07:45			06:53			06:14		19:24 (T44)	05:58		19:25 (T44)
	17:27			18:05	48	17:30 (T45)	19:38			20:10			20:41	48	20:12 (T44)	21:05	53	20:18 (T44)
16	07:55			07:26		16:42 (T45)	07:43			06:52			06:13		19:23 (T44)	05:58		19:25 (T44)
	17:28			18:06	48	17:30 (T45)	19:39			20:11			20:42	49	20:12 (T44)	21:06	53	20:18 (T44)
17	07:54			07:25		16:42 (T45)	07:41			06:50			06:12		19:23 (T44)	05:58		19:26 (T44)
	17:29			18:07	48	17:30 (T45)	19:40			20:12			20:43	49	20:12 (T44)	21:06	53	20:19 (T44)
18	07:54			07:23		16:42 (T45)	07:40			06:49			06:11		19:22 (T44)	05:58		19:26 (T44)
	17:30			18:09	48	17:30 (T45)	19:41			20:13			20:44	51	20:13 (T44)	21:07	53	20:19 (T44)
19	07:53			07:22		16:43 (T45)	07:38			06:47			06:10		19:22 (T44)	05:58		19:26 (T44)
	17:32			18:10	47	17:30 (T45)	19:42			20:14			20:45	51	20:13 (T44)	21:07	53	20:19 (T44)
20	07:53			07:20		16:43 (T45)	07:36			06:46			06:09		19:21 (T44)	05:59		19:26 (T44)
	17:33			18:11	46	17:29 (T45)	19:43			20:15			20:46	52	20:13 (T44)	21:07	53	20:19 (T44)
21	07:52			07:19		16:43 (T45)	07:35			06:44			06:09		19:21 (T44)	05:59		19:26 (T44)
	17:34			18:12	46	17:29 (T45)	19:44			20:16			20:47	52	20:13 (T44)	21:07	53	20:19 (T44)
22	07:52			07:18		16:43 (T45)	07:33			06:43			06:08		19:21 (T44)	05:59		19:26 (T44)
	17:35			18:13	45	17:28 (T45)	19:45			20:17			20:48	53	20:14 (T44)	21:08	53	20:19 (T44)
23	07:51			07:16		16:44 (T45)	07:31			06:41			06:07		19:21 (T44)	05:59		19:27 (T44)
	17:36			18:15	44	17:28 (T45)	19:46			20:18			20:49	53	20:14 (T44)	21:08	53	20:20 (T44)
24	07:50			07:15		16:45 (T45)	07:30			06:40			06:06		19:21 (T44)	05:59		19:27 (T44)
	17:38			18:16	41	17:26 (T45)	19:47			20:19			20:50	53	20:14 (T44)	21:08	53	20:20 (T44)
25	07:49			07:13		16:46 (T45)	07:28			06:38			06:06		19:21 (T44)	06:00		19:27 (T44)
	17:39			18:17	40	17:26 (T45)	19:48			20:21			20:51	54	20:15 (T44)	21:08	53	20:20 (T44)
26	07:49			07:12		16:46 (T45)	07:26			06:37			06:05		19:21 (T44)	06:00		19:28 (T44)
	17:40			18:18	38	17:24 (T45)	19:50			20:22			20:52	54	20:15 (T44)	21:08	53	20:21 (T44)
27	07:48			07:10		16:48 (T45)	07:24			06:36			06:04		19:21 (T44)	06:00		19:28 (T44)
	17:41			18:19	36	17:24 (T45)	19:51			20:23			20:53	55	20:16 (T44)	21:08	53	20:21 (T44)
28	07:47			07:09		16:49 (T45)	07:23			06:34			06:04		19:21 (T44)	06:01		19:27 (T44)
	17:42			18:21	33	17:22 (T45)	19:52			20:24			20:54	54	20:15 (T44)	21:08	54	20:21 (T44)
29	07:46		17:02 (T45)				07:21			06:33			06:03		19:21 (T44)	06:01		19:28 (T44)
	17:44	5	17:07 (T45)				19:53			20:25			20:54	54	20:15 (T44)	21:08	53	20:21 (T44)
30	07:45		16:57 (T45)				07:19			06:32			06:02		19:21 (T44)	06:02		19:28 (T44)
	17:45	15	17:12 (T45)				19:54			20:26			20:55	55	20:16 (T44)	21:08	53	20:21 (T44)
31	07:44		16:54 (T45)				07:18						06:02		19:22 (T44)			
	17:46	21	17:15 (T45)				19:55						20:56	54	20:16 (T44)			
Potential sun hours	297			297			370			399			448			453		
Total, worst case		41			1160			83						1303			1601	
Sun reduction		0.31			0.40			0.44						0.57			0.64	
Oper. time red.		1.00			1.00			1.00						1.00			1.00	
Wind dir. red.		0.72			0.72			0.72						0.56			0.56	
Total reduction		0.23			0.29			0.32						0.33			0.37	
Total, real		9			341			27						425			586	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1472 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7374)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September	October			November			December
1	06:02		19:29 (T44)	06:26		19:36 (T44)	06:57	07:27			07:02		16:13 (T45)	07:37
	21:08	53	20:22 (T44)	20:50	43	20:19 (T44)	20:07	19:15			17:28	44	16:57 (T45)	17:04
2	06:03		19:28 (T44)	06:27		19:37 (T44)	06:58	07:29			07:03		16:14 (T45)	07:38
	21:08	54	20:22 (T44)	20:49	41	20:18 (T44)	20:06	19:13			17:27	43	16:57 (T45)	17:03
3	06:03		19:29 (T44)	06:28		19:38 (T44)	06:59	07:30			07:04		16:15 (T45)	07:39
	21:08	53	20:22 (T44)	20:48	39	20:17 (T44)	20:04	19:11			17:26	41	16:56 (T45)	17:03
4	06:04		19:28 (T44)	06:29		19:39 (T44)	07:00	07:31			07:06		16:15 (T45)	07:40
	21:08	54	20:22 (T44)	20:47	37	20:16 (T44)	20:02	19:10			17:24	40	16:55 (T45)	17:03
5	06:04		19:29 (T44)	06:30		19:40 (T44)	07:01	07:32			07:07		16:16 (T45)	07:41
	21:08	54	20:23 (T44)	20:46	35	20:15 (T44)	20:01	19:08			17:23	38	16:54 (T45)	17:03
6	06:05		19:29 (T44)	06:31		19:42 (T44)	07:02	07:33			07:08		16:18 (T45)	07:42
	21:08	53	20:22 (T44)	20:44	31	20:13 (T44)	19:57	19:06			17:22	36	16:54 (T45)	17:03
7	06:05		19:29 (T44)	06:32		19:43 (T44)	07:03	07:34			07:09		16:18 (T45)	07:43
	21:07	54	20:23 (T44)	20:43	28	20:11 (T44)	19:56	19:05			17:21	35	16:53 (T45)	17:03
8	06:06		19:29 (T44)	06:33		19:45 (T44)	07:04	07:35			07:10		16:20 (T45)	07:44
	21:07	55	20:24 (T44)	20:42	24	20:09 (T44)	19:54	19:03			17:20	31	16:51 (T45)	17:03
9	06:07		19:29 (T44)	06:34		19:48 (T44)	07:05	07:36			07:12		16:21 (T45)	07:45
	21:07	54	20:23 (T44)	20:41	18	20:06 (T44)	19:52	19:01			17:19	28	16:49 (T45)	17:03
10	06:07		19:29 (T44)	06:35		19:53 (T44)	07:06	07:37		17:32 (T45)	07:13		16:23 (T45)	07:46
	21:06	55	20:24 (T44)	20:39	8	20:01 (T44)	19:51	19:00	15	17:47 (T45)	17:18	25	16:48 (T45)	17:03
11	06:08		19:30 (T44)	06:36			07:07	07:38		17:28 (T45)	07:14		16:25 (T45)	07:46
	21:06	54	20:24 (T44)	20:38			19:49	18:58	22	17:50 (T45)	17:17	21	16:46 (T45)	17:03
12	06:09		19:29 (T44)	06:37			07:08	07:39		17:25 (T45)	07:15		16:28 (T45)	07:47
	21:05	55	20:24 (T44)	20:37			19:47	18:57	27	17:52 (T45)	17:16	15	16:43 (T45)	17:03
13	06:10		19:30 (T44)	06:38			07:09	07:40		17:23 (T45)	07:16		16:34 (T45)	07:48
	21:05	54	20:24 (T44)	20:36			19:45	18:55	30	17:53 (T45)	17:15	5	16:39 (T45)	17:03
14	06:10		19:30 (T44)	06:39			07:10	07:41		17:21 (T45)	07:18			07:49
	21:04	54	20:24 (T44)	20:34			19:44	18:54	34	17:55 (T45)	17:14			17:03
15	06:11		19:30 (T44)	06:40			07:11	07:42		17:20 (T45)	07:19			07:50
	21:04	55	20:25 (T44)	20:33			19:42	18:52	37	17:57 (T45)	17:13			17:03
16	06:12		19:30 (T44)	06:41			07:12	07:44		17:18 (T45)	07:20			07:50
	21:03	54	20:24 (T44)	20:31			19:40	18:50	39	17:57 (T45)	17:12			17:04
17	06:13		19:30 (T44)	06:42			07:13	07:45		17:17 (T45)	07:21			07:51
	21:03	54	20:24 (T44)	20:30			19:39	18:49	41	17:58 (T45)	17:11			17:04
18	06:14		19:31 (T44)	06:43			07:14	07:46		17:16 (T45)	07:22			07:52
	21:02	53	20:24 (T44)	20:29			19:37	18:47	42	17:58 (T45)	17:11			17:04
19	06:14		19:31 (T44)	06:44			07:15	07:47		17:15 (T45)	07:23			07:52
	21:01	54	20:25 (T44)	20:27			19:35	18:46	44	17:59 (T45)	17:10			17:05
20	06:15		19:31 (T44)	06:45			07:16	07:48		17:14 (T45)	07:25			07:53
	21:01	54	20:25 (T44)	20:26			19:33	18:44	45	17:59 (T45)	17:09			17:05
21	06:16		19:31 (T44)	06:46			07:17	07:49		17:14 (T45)	07:26			07:53
	21:00	53	20:24 (T44)	20:24			19:32	18:43	46	18:00 (T45)	17:09			17:06
22	06:17		19:31 (T44)	06:47			07:18	07:50		17:13 (T45)	07:27			07:54
	20:59	53	20:24 (T44)	20:23			19:30	18:41	47	18:00 (T45)	17:08			17:06
23	06:18		19:31 (T44)	06:48			07:19	07:51		17:12 (T45)	07:28			07:54
	20:58	53	20:24 (T44)	20:21			19:28	18:40	48	18:00 (T45)	17:07			17:07
24	06:19		19:32 (T44)	06:49			07:20	07:53		17:12 (T45)	07:29			07:55
	20:58	52	20:24 (T44)	20:20			19:27	18:39	47	17:59 (T45)	17:07			17:07
25	06:20		19:32 (T44)	06:50			07:21	07:54		17:11 (T45)	07:30			07:55
	20:57	51	20:23 (T44)	20:18			19:25	18:37	48	17:59 (T45)	17:06			17:08
26	06:21		19:33 (T44)	06:51			07:22	07:55		17:12 (T45)	07:32			07:56
	20:56	50	20:23 (T44)	20:17			19:23	18:36	48	18:00 (T45)	17:06			17:08
27	06:22		19:33 (T44)	06:52			07:23	07:56		17:12 (T45)	07:33			07:56
	20:55	50	20:23 (T44)	20:15			19:21	18:34	47	17:59 (T45)	17:05			17:09
28	06:22		19:34 (T44)	06:53			07:24	07:57		17:12 (T45)	07:34			07:56
	20:54	48	20:22 (T44)	20:14			19:20	18:33	47	17:59 (T45)	17:05			17:10
29	06:23		19:34 (T44)	06:54			07:25	07:58		17:12 (T45)	07:35			07:57
	20:53	47	20:21 (T44)	20:12			19:18	18:32	46	17:58 (T45)	17:04			17:10
30	06:24		19:34 (T44)	06:55			07:26	08:00		17:13 (T45)	07:36			07:57
	20:52	46	20:20 (T44)	20:10			19:16	18:31	46	17:59 (T45)	17:04			17:11
31	06:25		19:35 (T44)	06:56				08:01		17:13 (T45)				07:57
	20:51	45	20:20 (T44)	20:09				18:29	45	17:58 (T45)				17:12
Potential sun hours	460			429			375	345			297			287
Total, worst case		1628			304				891			402		
Sun reduction		0.66			0.61				0.48			0.30		
Oper. time red.		1.00			1.00				1.00			1.00		
Wind dir. red.		0.56			0.56				0.72			0.72		
Total reduction		0.38			0.35				0.35			0.22		
Total, real		615			106				314			89		

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

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

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EDR
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1473 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7375)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February		March			April			May			June		
1	07:57		14:20 (T20)	07:43		07:07			07:16		17:52 (T19)	06:30		19:24 (T17)	06:01		19:33 (T17)
	17:13	48	15:08 (T20)	17:47		18:21			19:56	65	18:57 (T19)	20:27	39	20:03 (T17)	20:57	22	19:55 (T17)
2	07:57		14:20 (T20)	07:42		07:06			07:14		17:52 (T19)	06:29		19:22 (T17)	06:01		19:34 (T17)
	17:13	48	15:08 (T20)	17:48		18:23			19:57	64	18:56 (T19)	20:28	40	20:02 (T17)	20:58	19	19:53 (T17)
3	07:58		14:21 (T20)	07:41		07:04		17:28 (T19)	07:13		17:53 (T19)	06:27		19:22 (T17)	06:00		19:36 (T17)
	17:14	47	15:08 (T20)	17:50		18:24	6	17:34 (T19)	19:58	63	18:56 (T19)	20:29	41	20:03 (T17)	20:59	17	19:53 (T17)
4	07:58		14:23 (T20)	07:40		07:02		17:21 (T19)	07:11		17:53 (T19)	06:26		19:22 (T17)	06:00		19:38 (T17)
	17:15	45	15:08 (T20)	17:51		18:25	21	17:42 (T19)	19:59	61	18:54 (T19)	20:30	42	20:04 (T17)	20:59	14	19:52 (T17)
5	07:58		14:24 (T20)	07:39		07:01		17:16 (T19)	07:09		17:53 (T19)	06:25		19:21 (T17)	05:59		19:39 (T17)
	17:16	44	15:08 (T20)	17:52		18:26	30	17:46 (T19)	20:00	60	18:53 (T19)	20:31	43	20:04 (T17)	21:00	11	19:50 (T17)
6	07:58		14:25 (T20)	07:38		06:59		17:13 (T19)	07:08		17:55 (T19)	06:24		19:21 (T17)	05:59		19:41 (T17)
	17:17	43	15:08 (T20)	17:53		18:27	36	17:49 (T19)	20:00	58	18:53 (T19)	20:32	43	20:04 (T17)	21:01	7	19:48 (T17)
7	07:57		14:27 (T20)	07:37		06:58		17:10 (T19)	07:06		17:55 (T19)	06:22		19:20 (T17)	05:59		
	17:18	41	15:08 (T20)	17:55		18:28	41	17:51 (T19)	20:01	56	18:51 (T19)	20:33	44	20:04 (T17)	21:01		
8	07:57		14:27 (T20)	07:36		07:56		18:08 (T19)	07:04		17:56 (T19)	06:21		19:20 (T17)	05:58		
	17:19	40	15:07 (T20)	17:56		19:30	44	18:52 (T19)	20:02	53	18:49 (T19)	20:34	44	20:04 (T17)	21:02		
9	07:57		14:29 (T20)	07:35		07:54		18:06 (T19)	07:03		17:58 (T19)	06:20		19:20 (T17)	05:58		
	17:20	38	15:07 (T20)	17:57		19:31	48	18:54 (T19)	20:03	50	18:48 (T19)	20:35	44	20:04 (T17)	21:03		
10	07:57		14:31 (T20)	07:34		07:53		18:04 (T19)	07:01		17:58 (T19)	06:19		19:20 (T17)	05:58		
	17:21	35	15:06 (T20)	17:58		19:32	51	18:55 (T19)	20:04	48	18:46 (T19)	20:36	44	20:04 (T17)	21:03		
11	07:57		14:33 (T20)	07:32		07:51		18:02 (T19)	06:59		18:00 (T19)	06:18		19:20 (T17)	05:58		
	17:22	33	15:06 (T20)	18:00		19:33	54	18:56 (T19)	20:06	45	18:45 (T19)	20:38	44	20:04 (T17)	21:04		
12	07:56		14:35 (T20)	07:31		07:49		18:01 (T19)	06:58		18:01 (T19)	06:17		19:20 (T17)	05:58		
	17:23	29	15:04 (T20)	18:01		19:34	57	18:58 (T19)	20:07	42	18:43 (T19)	20:39	44	20:04 (T17)	21:04		
13	07:56		14:37 (T20)	07:30		07:48		18:00 (T19)	06:56		18:03 (T19)	06:16		19:20 (T17)	05:58		
	17:24	26	15:03 (T20)	18:02		19:35	58	18:58 (T19)	20:08	37	18:40 (T19)	20:40	44	20:04 (T17)	21:05		
14	07:56		14:40 (T20)	07:29		07:46		17:58 (T19)	06:55		18:05 (T19)	06:15		19:21 (T17)	05:58		
	17:25	21	15:01 (T20)	18:03		19:36	61	18:59 (T19)	20:09	34	18:39 (T19)	20:41	42	20:03 (T17)	21:05		
15	07:55		14:44 (T20)	07:27		07:44		17:58 (T19)	06:53		18:07 (T19)	06:14		19:21 (T17)	05:58		
	17:26	14	14:58 (T20)	18:05		19:37	62	19:00 (T19)	20:10	28	18:35 (T19)	20:42	42	20:03 (T17)	21:06		
16	07:55			07:26		07:43		17:56 (T19)	06:52		18:11 (T19)	06:13		19:21 (T17)	05:58		
	17:28			18:06		19:38	64	19:00 (T19)	20:11	21	18:32 (T19)	20:43	42	20:03 (T17)	21:06		
17	07:55			07:25		07:41		17:55 (T19)	06:50		18:16 (T19)	06:12		19:21 (T17)	05:58		
	17:29			18:07		19:40	65	19:00 (T19)	20:12	10	18:26 (T19)	20:44	41	20:02 (T17)	21:06		
18	07:54			07:23		07:39		17:55 (T19)	06:48			06:11		19:22 (T17)	05:58		
	17:30			18:08		19:41	66	19:01 (T19)	20:13			20:45	40	20:02 (T17)	21:07		
19	07:53			07:22		07:38		17:54 (T19)	06:47			06:10		19:23 (T17)	05:58		
	17:31			18:10		19:42	67	19:01 (T19)	20:14			20:46	39	20:02 (T17)	21:07		
20	07:53			07:20		07:36		17:53 (T19)	06:45			06:09		19:23 (T17)	05:58		
	17:32			18:11		19:43	68	19:01 (T19)	20:15			20:46	39	20:02 (T17)	21:07		
21	07:52			07:19		07:34		17:53 (T19)	06:44			06:08		19:24 (T17)	05:58		
	17:33			18:12		19:44	69	19:02 (T19)	20:16			20:47	37	20:01 (T17)	21:08		
22	07:52			07:18		07:33		17:53 (T19)	06:42			06:07		19:24 (T17)	05:58		
	17:35			18:13		19:45	68	19:01 (T19)	20:17			20:48	36	20:00 (T17)	21:08		
23	07:51			07:16		07:31		17:52 (T19)	06:41		19:37 (T17)	06:07		19:25 (T17)	05:59		
	17:36			18:14		19:46	69	19:01 (T19)	20:18	14	19:51 (T17)	20:49	36	20:01 (T17)	21:08		
24	07:50			07:15		07:29		17:51 (T19)	06:40		19:34 (T17)	06:06		19:26 (T17)	05:59		
	17:37			18:16		19:47	70	19:01 (T19)	20:19	20	19:54 (T17)	20:50	34	20:00 (T17)	21:08		
25	07:50			07:13		07:28		17:52 (T19)	06:38		19:32 (T17)	06:05		19:26 (T17)	05:59		
	17:38			18:17		19:48	69	19:01 (T19)	20:21	25	19:57 (T17)	20:51	33	19:59 (T17)	21:08		
26	07:49			07:12		07:26		17:51 (T19)	06:37		19:29 (T17)	06:04		19:28 (T17)	06:00		
	17:40			18:18		19:49	69	19:00 (T19)	20:22	29	19:58 (T17)	20:52	31	19:59 (T17)	21:09		
27	07:48			07:10		07:24		17:51 (T19)	06:35		19:28 (T17)	06:04		19:28 (T17)	06:00		
	17:41			18:19		19:50	69	19:00 (T19)	20:23	31	19:59 (T17)	20:53	30	19:58 (T17)	21:09		
28	07:47			07:09		07:23		17:51 (T19)	06:34		19:26 (T17)	06:03		19:29 (T17)	06:00		
	17:42			18:20		19:52	69	19:00 (T19)	20:24	33	19:59 (T17)	20:54	29	19:58 (T17)	21:09		
29	07:46					07:21		17:51 (T19)	06:33		19:25 (T17)	06:03		19:30 (T17)	06:01		
	17:43					19:53	68	18:59 (T19)	20:25	36	20:01 (T17)	20:55	27	19:57 (T17)	21:09		
30	07:45					07:19		17:51 (T19)	06:31		19:24 (T17)	06:02		19:31 (T17)	06:01		
	17:45					19:54	67	18:58 (T19)	20:26	38	20:02 (T17)	20:55	25	19:56 (T17)	21:09		
31	07:44					07:18		17:52 (T19)				06:01		19:32 (T17)			
	17:46					19:55	66	18:58 (T19)				20:56	23	19:55 (T17)			
Potential sun hours	297			297		370			399			449			453		
Total, worst case		552					1652			1021			1182			90	
Sun reduction		0.31					0.44			0.52			0.57			0.64	
Oper. time red.		1.00					1.00			1.00			1.00			1.00	
Wind dir. red.		0.73					0.66			0.64			0.57			0.57	
Total reduction		0.23					0.30			0.34			0.33			0.37	
Total, real		128					494			349			391			33	

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

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

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1473 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7375)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		19:31 (T17)	06:57		17:59 (T19)	07:27		17:39 (T19)	07:02			07:37		14:15 (T20)
	21:09			20:50	43	20:14 (T17)	20:07	45	18:44 (T19)	19:15	58	18:37 (T19)	17:28			17:03	33	14:48 (T20)
2	06:02			06:27		19:31 (T17)	06:58		17:57 (T19)	07:28		17:40 (T19)	07:03			07:38		14:14 (T20)
	21:09			20:49	44	20:15 (T17)	20:05	48	18:45 (T19)	19:13	55	18:35 (T19)	17:26			17:03	35	14:49 (T20)
3	06:03			06:28		19:31 (T17)	06:59		17:56 (T19)	07:29		17:41 (T19)	07:04			07:39		14:13 (T20)
	21:08			20:48	44	20:15 (T17)	20:04	50	18:46 (T19)	19:11	53	18:34 (T19)	17:25			17:03	38	14:51 (T20)
4	06:03			06:29		19:31 (T17)	07:00		17:54 (T19)	07:31		17:42 (T19)	07:06			07:40		14:12 (T20)
	21:08			20:47	43	20:14 (T17)	20:02	53	18:47 (T19)	19:10	50	18:32 (T19)	17:24			17:03	40	14:52 (T20)
5	06:04			06:30		19:31 (T17)	07:01		17:51 (T19)	07:32		17:44 (T19)	07:07			07:41		14:12 (T20)
	21:08			20:46	43	20:14 (T17)	20:01	56	18:47 (T19)	19:08	46	18:30 (T19)	17:23			17:02	41	14:53 (T20)
6	06:04		19:49 (T17)	06:31		19:31 (T17)	07:02		17:50 (T19)	07:33		17:46 (T19)	07:08			07:42		14:11 (T20)
	21:08	4	19:53 (T17)	20:45	43	20:14 (T17)	19:57	58	18:48 (T19)	19:06	42	18:28 (T19)	17:22			17:02	43	14:54 (T20)
7	06:05		19:47 (T17)	06:32		19:31 (T17)	07:03		17:49 (T19)	07:34		17:48 (T19)	07:09			07:43		14:11 (T20)
	21:08	9	19:56 (T17)	20:43	43	20:14 (T17)	19:56	59	18:48 (T19)	19:05	38	18:26 (T19)	17:21			17:02	44	14:55 (T20)
8	06:06		19:44 (T17)	06:33		19:30 (T17)	07:04		17:47 (T19)	07:35		17:50 (T19)	07:10			07:44		14:11 (T20)
	21:07	13	19:57 (T17)	20:42	43	20:13 (T17)	19:54	62	18:49 (T19)	19:03	33	18:23 (T19)	17:20			17:02	45	14:56 (T20)
9	06:06		19:44 (T17)	06:34		19:30 (T17)	07:05		17:46 (T19)	07:36		17:53 (T19)	07:12			07:45		14:10 (T20)
	21:07	15	19:59 (T17)	20:41	42	20:12 (T17)	19:52	63	18:49 (T19)	19:01	26	18:19 (T19)	17:18			17:02	46	14:56 (T20)
10	06:07		19:43 (T17)	06:35		19:31 (T17)	07:06		17:45 (T19)	07:37		17:58 (T19)	07:13			07:46		14:10 (T20)
	21:07	18	20:01 (T17)	20:40	41	20:12 (T17)	19:50	64	18:49 (T19)	19:00	16	18:14 (T19)	17:17			17:02	47	14:57 (T20)
11	06:08		19:41 (T17)	06:36		19:31 (T17)	07:07		17:44 (T19)	07:38			07:14			07:47		14:10 (T20)
	21:06	20	20:01 (T17)	20:38	40	20:11 (T17)	19:49	65	18:49 (T19)	18:58			17:16			17:02	48	14:58 (T20)
12	06:08		19:41 (T17)	06:37		19:32 (T17)	07:08		17:43 (T19)	07:39			07:15			07:47		14:10 (T20)
	21:06	22	20:03 (T17)	20:37	38	20:10 (T17)	19:47	66	18:49 (T19)	18:56			17:15			17:02	49	14:59 (T20)
13	06:09		19:40 (T17)	06:38		19:32 (T17)	07:09		17:42 (T19)	07:40			07:16			07:48		14:10 (T20)
	21:05	24	20:04 (T17)	20:36	37	20:09 (T17)	19:45	67	18:49 (T19)	18:55			17:15			17:02	50	15:00 (T20)
14	06:10		19:39 (T17)	06:39		19:33 (T17)	07:10		17:41 (T19)	07:41			07:18			07:49		14:10 (T20)
	21:05	25	20:04 (T17)	20:34	35	20:08 (T17)	19:44	68	18:49 (T19)	18:53			17:14			17:03	51	15:01 (T20)
15	06:11		19:38 (T17)	06:40		19:34 (T17)	07:11		17:41 (T19)	07:42			07:19			07:50		14:10 (T20)
	21:04	28	20:06 (T17)	20:33	33	20:07 (T17)	19:42	68	18:49 (T19)	18:52			17:13			17:03	51	15:01 (T20)
16	06:11		19:38 (T17)	06:41		19:35 (T17)	07:12		17:40 (T19)	07:44			07:20			07:50		14:10 (T20)
	21:04	29	20:07 (T17)	20:31	31	20:06 (T17)	19:40	69	18:49 (T19)	18:50			17:12			17:03	52	15:02 (T20)
17	06:12		19:37 (T17)	06:42		19:36 (T17)	07:13		17:40 (T19)	07:45			07:21			07:51		14:11 (T20)
	21:03	31	20:08 (T17)	20:30	28	20:04 (T17)	19:39	69	18:49 (T19)	18:49			17:11			17:03	52	15:03 (T20)
18	06:13		19:36 (T17)	06:43		19:38 (T17)	07:14		17:39 (T19)	07:46			07:22			07:52		14:11 (T20)
	21:02	32	20:08 (T17)	20:29	24	20:02 (T17)	19:37	69	18:48 (T19)	18:47			17:10			17:04	52	15:03 (T20)
19	06:14		19:35 (T17)	06:44		19:40 (T17)	07:15		17:39 (T19)	07:47			07:24			07:52		14:11 (T20)
	21:02	34	20:09 (T17)	20:27	19	19:59 (T17)	19:35	69	18:48 (T19)	18:46			17:10			17:04	53	15:04 (T20)
20	06:15		19:35 (T17)	06:45		19:43 (T17)	07:16		17:38 (T19)	07:48			07:25			07:53		14:11 (T20)
	21:01	35	20:10 (T17)	20:26	13	19:56 (T17)	19:33	69	18:47 (T19)	18:44			17:09			17:05	53	15:04 (T20)
21	06:16		19:35 (T17)	06:46			07:17		17:38 (T19)	07:49			07:26			07:54		14:12 (T20)
	21:00	35	20:10 (T17)	20:24			19:32	69	18:47 (T19)	18:43			17:08			17:05	53	15:05 (T20)
22	06:17		19:34 (T17)	06:47			07:18		17:38 (T19)	07:50			07:27			07:54		14:12 (T20)
	20:59	37	20:11 (T17)	20:23			19:30	68	18:46 (T19)	18:41			17:07			17:06	53	15:05 (T20)
23	06:17		19:34 (T17)	06:48			07:19		17:37 (T19)	07:51			07:28			07:55		14:13 (T20)
	20:59	38	20:12 (T17)	20:21			19:28	69	18:46 (T19)	18:40			17:07			17:06	53	15:06 (T20)
24	06:18		19:34 (T17)	06:49			07:20		17:37 (T19)	07:53			07:29			07:55		14:13 (T20)
	20:58	39	20:13 (T17)	20:20			19:26	68	18:45 (T19)	18:38			17:06			17:07	53	15:06 (T20)
25	06:19		19:32 (T17)	06:50			07:21		17:37 (T19)	07:54			07:31			07:55		14:15 (T20)
	20:57	40	20:12 (T17)	20:18			19:25	67	18:44 (T19)	18:37			17:06			17:07	52	15:07 (T20)
26	06:20		19:32 (T17)	06:51		18:18 (T19)	07:22		17:37 (T19)	07:55			07:32			07:56		14:15 (T20)
	20:56	41	20:13 (T17)	20:17	12	18:30 (T19)	19:23	66	18:43 (T19)	18:36			17:05			17:08	52	15:07 (T20)
27	06:21		19:32 (T17)	06:52		18:13 (T19)	07:23		17:38 (T19)	07:56			07:33		14:23 (T20)	07:56		14:15 (T20)
	20:55	41	20:13 (T17)	20:15	22	18:35 (T19)	19:21	64	18:42 (T19)	18:34			17:05	14	14:37 (T20)	17:09	52	15:07 (T20)
28	06:22		19:32 (T17)	06:53		18:09 (T19)	07:24		17:38 (T19)	07:57			07:34		14:20 (T20)	07:56		14:16 (T20)
	20:54	41	20:13 (T17)	20:14	28	18:37 (T19)	19:20	63	18:41 (T19)	18:33			17:04	20	14:40 (T20)	17:09	51	15:07 (T20)
29	06:23		19:31 (T17)	06:54		18:06 (T19)	07:25		17:38 (T19)	07:58			07:35		14:17 (T20)	07:57		14:17 (T20)
	20:53	43	20:14 (T17)	20:12	34	18:40 (T19)	19:18	62	18:40 (T19)	18:31			17:04	26	14:43 (T20)	17:10	51	15:08 (T20)
30	06:24		19:31 (T17)	06:55		18:03 (T19)	07:26		17:39 (T19)	08:00			07:36		14:16 (T20)	07:57		14:18 (T20)
	20:52	43	20:14 (T17)	20:10	38	18:41 (T19)	19:16	59	18:38 (T19)	18:30			17:04	29	14:45 (T20)	17:11	50	15:08 (T20)
31	06:25		19:31 (T17)	06:56		18:01 (T19)				08:01						07:57		14:19 (T20)
	20:51	43	20:14 (T17)	20:09	42	18:43 (T19)				18:29						17:11	49	15:08 (T20)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		780			903			1892			417			89			1492	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.57			0.59			0.66			0.66			0.73			0.73	
Total reduction		0.38			0.37			0.40			0.33			0.22			0.16	
Total, real		299			330			758			136			20			246	

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1493 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7389)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57		15:53 (T77)	07:43		16:08 (T77)	07:07		07:53 (T76)	07:16		06:30		19:28 (T41)	06:01
	17:13	45	16:38 (T77)	17:47	37	16:45 (T77)	18:22	22	17:51 (T42)	19:56		20:27	33	20:01 (T41)	20:57
2	07:57		15:54 (T77)	07:42		16:09 (T77)	07:06		17:31 (T42)	07:14		06:29		19:28 (T41)	06:01
	17:14	45	16:39 (T77)	17:49	36	16:45 (T77)	18:23	23	17:54 (T42)	19:57		20:28	33	20:01 (T41)	20:58
3	07:57		15:54 (T77)	07:41		16:10 (T77)	07:04		17:28 (T42)	07:13		06:28		19:27 (T41)	06:01
	17:15	45	16:39 (T77)	17:50	34	16:44 (T77)	18:24	28	17:56 (T42)	19:58		20:29	33	20:00 (T41)	20:58
4	07:57		15:54 (T77)	07:40		16:12 (T77)	07:02		17:26 (T42)	07:11		06:26		19:28 (T41)	06:00
	17:16	46	16:40 (T77)	17:51	30	16:42 (T77)	18:25	32	17:58 (T42)	19:59		20:30	32	20:00 (T41)	20:59
5	07:57		15:55 (T77)	07:39		16:14 (T77)	07:01		17:24 (T42)	07:09		06:25		19:28 (T41)	06:00
	17:17	46	16:41 (T77)	17:52	27	16:41 (T77)	18:26	35	17:59 (T42)	20:00		20:31	31	19:59 (T41)	21:00
6	07:57		15:55 (T77)	07:38		16:15 (T77)	06:59		17:23 (T42)	07:08		06:24		19:29 (T41)	05:59
	17:17	46	16:41 (T77)	17:54	23	16:38 (T77)	18:27	38	18:01 (T42)	20:00		20:32	30	19:59 (T41)	21:00
7	07:57		15:54 (T77)	07:37		16:19 (T77)	06:58		17:21 (T42)	07:06		06:23		19:29 (T41)	05:59
	17:18	47	16:41 (T77)	17:55	17	16:36 (T77)	18:29	41	18:02 (T42)	20:01		20:33	30	19:59 (T41)	21:01
8	07:57		15:55 (T77)	07:36		16:23 (T77)	07:56		18:19 (T42)	07:05		06:22		19:30 (T41)	05:59
	17:19	47	16:42 (T77)	17:56	9	16:32 (T77)	19:30	43	19:02 (T42)	20:02		20:34	28	19:58 (T41)	21:02
9	07:57		15:55 (T77)	07:35			07:54		18:19 (T42)	07:03		06:20		19:31 (T41)	05:59
	17:20	48	16:43 (T77)	17:57			19:31	44	19:03 (T42)	20:03		20:35	26	19:57 (T41)	21:02
10	07:57		15:56 (T77)	07:34		07:54 (T76)	07:53		18:18 (T42)	07:01		06:19		19:31 (T41)	05:59
	17:21	48	16:44 (T77)	17:59	9	08:03 (T76)	19:32	45	19:03 (T42)	20:05		20:36	24	19:55 (T41)	21:03
11	07:57		15:55 (T77)	07:32		07:52 (T76)	07:51		18:17 (T42)	07:00		06:18		19:32 (T41)	05:58
	17:23	48	16:43 (T77)	18:00	13	08:05 (T76)	19:33	46	19:03 (T42)	20:06		20:37	22	19:54 (T41)	21:04
12	07:56		15:56 (T77)	07:31		07:51 (T76)	07:50		18:16 (T42)	06:58		06:17		19:33 (T41)	05:58
	17:24	48	16:44 (T77)	18:01	16	08:07 (T76)	19:34	48	19:04 (T42)	20:07		20:38	20	19:53 (T41)	21:04
13	07:56		15:57 (T77)	07:30		07:50 (T76)	07:48		18:16 (T42)	06:57		06:16		19:35 (T41)	05:58
	17:25	48	16:45 (T77)	18:02	19	08:09 (T76)	19:35	48	19:04 (T42)	20:08		20:39	16	19:51 (T41)	21:05
14	07:56		15:56 (T77)	07:29		07:48 (T76)	07:46		18:15 (T42)	06:55		06:15		19:37 (T41)	05:58
	17:26	49	16:45 (T77)	18:04	21	08:09 (T76)	19:36	49	19:04 (T42)	20:09		20:41	12	19:49 (T41)	21:05
15	07:55		15:57 (T77)	07:27		07:47 (T76)	07:45		18:15 (T42)	06:53		06:14		19:40 (T41)	05:58
	17:27	49	16:46 (T77)	18:05	23	08:10 (T76)	19:38	49	19:04 (T42)	20:10		20:42	6	19:46 (T41)	21:05
16	07:55		15:57 (T77)	07:26		07:46 (T76)	07:43		18:14 (T42)	06:52		06:13			05:58
	17:28	49	16:46 (T77)	18:06	25	08:11 (T76)	19:39	50	19:04 (T42)	20:11		20:42			21:06
17	07:54		15:58 (T77)	07:25		07:44 (T76)	07:41		18:14 (T42)	06:50		06:12			05:58
	17:29	49	16:47 (T77)	18:07	27	08:11 (T76)	19:40	49	19:03 (T42)	20:12		20:43			21:06
18	07:54		15:58 (T77)	07:23		07:43 (T76)	07:40		18:15 (T42)	06:49		06:11			05:58
	17:30	49	16:47 (T77)	18:09	29	08:12 (T76)	19:41	48	19:03 (T42)	20:13		20:44			21:07
19	07:53		15:59 (T77)	07:22		07:43 (T76)	07:38		18:14 (T42)	06:47		19:39 (T41)	06:10		05:58
	17:32	49	16:48 (T77)	18:10	29	08:12 (T76)	19:42	48	19:02 (T42)	20:14	13	19:52 (T41)	20:45		21:07
20	07:53		15:59 (T77)	07:20		07:42 (T76)	07:36		18:14 (T42)	06:46		19:37 (T41)	06:09		05:59
	17:33	48	16:47 (T77)	18:11	29	08:11 (T76)	19:43	47	19:01 (T42)	20:15	17	19:54 (T41)	20:46		21:07
21	07:52		15:59 (T77)	07:19		07:43 (T76)	07:35		18:15 (T42)	06:44		19:35 (T41)	06:09		05:59
	17:34	48	16:47 (T77)	18:12	29	08:12 (T76)	19:44	46	19:01 (T42)	20:16	20	19:55 (T41)	20:47		21:08
22	07:52		16:00 (T77)	07:18		07:43 (T76)	07:33		18:15 (T42)	06:43		19:33 (T41)	06:08		05:59
	17:35	48	16:48 (T77)	18:13	28	08:11 (T76)	19:45	45	19:00 (T42)	20:17	23	19:56 (T41)	20:48		21:08
23	07:51		16:00 (T77)	07:16		07:43 (T76)	07:31		18:15 (T42)	06:41		19:32 (T41)	06:07		05:59
	17:36	48	16:48 (T77)	18:15	27	08:10 (T76)	19:46	44	18:59 (T42)	20:18	25	19:57 (T41)	20:49		21:08
24	07:50		16:01 (T77)	07:15		07:43 (T76)	07:30		18:17 (T42)	06:40		19:31 (T41)	06:06		05:59
	17:38	47	16:48 (T77)	18:16	26	08:09 (T76)	19:47	41	18:58 (T42)	20:19	27	19:58 (T41)	20:50		21:08
25	07:49		16:01 (T77)	07:13		07:45 (T76)	07:28		18:17 (T42)	06:38		19:30 (T41)	06:06		06:00
	17:39	47	16:48 (T77)	18:17	24	08:09 (T76)	19:48	40	18:57 (T42)	20:21	29	19:59 (T41)	20:51		21:08
26	07:49		16:02 (T77)	07:12		07:45 (T76)	07:26		18:18 (T42)	06:37		19:29 (T41)	06:05		06:00
	17:40	45	16:47 (T77)	18:18	22	08:07 (T76)	19:50	37	18:55 (T42)	20:22	30	19:59 (T41)	20:52		21:08
27	07:48		16:03 (T77)	07:10		07:47 (T76)	07:24		18:19 (T42)	06:36		19:28 (T41)	06:04		06:00
	17:41	45	16:48 (T77)	18:19	19	08:06 (T76)	19:51	34	18:53 (T42)	20:23	33	20:01 (T41)	20:53		21:08
28	07:47		16:04 (T77)	07:09		07:49 (T76)	07:23		18:21 (T42)	06:34		19:28 (T41)	06:04		06:01
	17:42	44	16:48 (T77)	18:21	14	08:03 (T76)	19:52	31	18:52 (T42)	20:24	33	20:01 (T41)	20:54		21:09
29	07:46		16:05 (T77)				07:21		18:22 (T42)	06:33		19:27 (T41)	06:03		06:01
	17:44	42	16:47 (T77)				19:53	27	18:49 (T42)	20:25	34	20:01 (T41)	20:54		21:09
30	07:45		16:05 (T77)				07:19		18:24 (T42)	06:32		19:27 (T41)	06:02		06:02
	17:45	42	16:47 (T77)				19:54	22	18:46 (T42)	20:26	34	20:01 (T41)	20:55		21:09
31	07:44		16:06 (T77)				07:18		18:29 (T42)				06:02		
	17:46	40	16:46 (T77)				19:55	13	18:42 (T42)				20:56		
Potential sun hours	297			297			370			399			448		453
Total, worst case		1445			642			1213			318			376	
Sun reduction		0.31			0.40			0.44			0.52			0.57	
Oper. time red.		1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.74			0.62			0.67			0.57			0.57	
Total reduction		0.23			0.25			0.30			0.30			0.33	
Total, real		339			163			365			97			126	

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

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

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1493 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7389)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December		
1	06:02		06:26		19:43 (T41)	06:57		07:27		17:55 (T42)	07:02		07:23 (T76)	07:37		15:37 (T77)
	21:08		20:50	21	20:04 (T41)	20:07		19:15	48	18:43 (T42)	17:28	8	07:31 (T76)	17:04	49	16:26 (T77)
2	06:03		06:27		19:42 (T41)	06:58		07:29		17:55 (T42)	07:03			07:38		15:38 (T77)
	21:08		20:49	23	20:05 (T41)	20:06		19:13	47	18:42 (T42)	17:27			17:03	48	16:26 (T77)
3	06:03		06:28		19:41 (T41)	06:59		07:30		17:55 (T42)	07:04		15:52 (T77)	07:39		15:39 (T77)
	21:08		20:48	25	20:06 (T41)	20:04		19:11	46	18:41 (T42)	17:26	10	16:02 (T77)	17:03	48	16:27 (T77)
4	06:04		06:29		19:40 (T41)	07:00		07:31		17:55 (T42)	07:06		15:48 (T77)	07:40		15:40 (T77)
	21:08		20:47	27	20:07 (T41)	20:02		19:10	45	18:40 (T42)	17:24	18	16:06 (T77)	17:03	47	16:27 (T77)
5	06:04		06:30		19:39 (T41)	07:01		07:32		17:57 (T42)	07:07		15:45 (T77)	07:41		15:40 (T77)
	21:08		20:46	29	20:08 (T41)	20:01		19:08	43	18:40 (T42)	17:23	23	16:08 (T77)	17:03	47	16:27 (T77)
6	06:05		06:31		19:39 (T41)	07:02		07:33		17:57 (T42)	07:08		15:44 (T77)	07:42		15:41 (T77)
	21:08		20:44	29	20:08 (T41)	19:57		19:06	42	18:39 (T42)	17:22	27	16:11 (T77)	17:03	46	16:27 (T77)
7	06:05		06:32		19:38 (T41)	07:03		07:34		17:58 (T42)	07:09		15:42 (T77)	07:43		15:41 (T77)
	21:07		20:43	31	20:09 (T41)	19:56		19:05	39	18:37 (T42)	17:21	31	16:13 (T77)	17:03	46	16:27 (T77)
8	06:06		06:33		19:38 (T41)	07:04		07:35		17:59 (T42)	07:10		15:40 (T77)	07:44		15:41 (T77)
	21:07		20:42	31	20:09 (T41)	19:54		19:03	37	18:36 (T42)	17:20	34	16:14 (T77)	17:03	46	16:27 (T77)
9	06:07		06:34		19:37 (T41)	07:05		07:36		18:00 (T42)	07:12		15:40 (T77)	07:45		15:42 (T77)
	21:07		20:41	32	20:09 (T41)	19:52		19:01	34	18:34 (T42)	17:19	36	16:16 (T77)	17:03	45	16:27 (T77)
10	06:07		06:35		19:37 (T41)	07:06		07:37		18:01 (T42)	07:13		15:38 (T77)	07:46		15:43 (T77)
	21:06		20:39	33	20:10 (T41)	19:51		19:00	31	18:32 (T42)	17:18	38	16:16 (T77)	17:03	45	16:28 (T77)
11	06:08		06:36		19:36 (T41)	07:07		07:38		18:03 (T42)	07:14		15:37 (T77)	07:46		15:43 (T77)
	21:06		20:38	34	20:10 (T41)	19:49		18:58	26	18:29 (T42)	17:17	40	16:17 (T77)	17:03	45	16:28 (T77)
12	06:09		06:37		19:36 (T41)	07:08	18:21 (T42)	07:39		18:05 (T42)	07:15		15:36 (T77)	07:47		15:44 (T77)
	21:06		20:37	34	20:10 (T41)	19:47	12 18:33 (T42)	18:57	21	18:26 (T42)	17:16	42	16:18 (T77)	17:03	45	16:29 (T77)
13	06:10		06:38		19:36 (T41)	07:09	18:16 (T42)	07:40		08:23 (T76)	07:16		15:36 (T77)	07:48		15:45 (T77)
	21:05		20:36	33	20:09 (T41)	19:45	21 18:37 (T42)	18:55	23	18:21 (T42)	17:15	43	16:19 (T77)	17:03	44	16:29 (T77)
14	06:10		06:39		19:36 (T41)	07:10	18:13 (T42)	07:41		08:20 (T76)	07:18		15:36 (T77)	07:49		15:45 (T77)
	21:05		20:34	33	20:09 (T41)	19:44	26 18:39 (T42)	18:54	16	08:36 (T76)	17:14	44	16:20 (T77)	17:03	44	16:29 (T77)
15	06:11		06:40		19:36 (T41)	07:11	18:10 (T42)	07:42		08:19 (T76)	07:19		15:35 (T77)	07:50		15:46 (T77)
	21:04		20:33	33	20:09 (T41)	19:42	31 18:41 (T42)	18:52	20	08:39 (T76)	17:13	45	16:20 (T77)	17:03	43	16:29 (T77)
16	06:12		06:41		19:35 (T41)	07:12	18:08 (T42)	07:44		08:17 (T76)	07:20		15:35 (T77)	07:50		15:47 (T77)
	21:03		20:31	32	20:07 (T41)	19:40	34 18:42 (T42)	18:50	23	08:40 (T76)	17:12	45	16:20 (T77)	17:04	43	16:30 (T77)
17	06:13		06:42		19:36 (T41)	07:13	18:06 (T42)	07:45		08:16 (T76)	07:21		15:35 (T77)	07:51		15:46 (T77)
	21:03		20:30	30	20:06 (T41)	19:39	37 18:43 (T42)	18:49	24	08:40 (T76)	17:11	47	16:22 (T77)	17:04	44	16:30 (T77)
18	06:14		06:43		19:36 (T41)	07:14	18:05 (T42)	07:46		08:15 (T76)	07:22		15:35 (T77)	07:52		15:47 (T77)
	21:02		20:29	28	20:04 (T41)	19:37	39 18:44 (T42)	18:47	26	08:41 (T76)	17:11	47	16:22 (T77)	17:04	44	16:31 (T77)
19	06:14		06:44		19:36 (T41)	07:15	18:03 (T42)	07:47		08:14 (T76)	07:23		15:34 (T77)	07:52		15:48 (T77)
	21:02		20:27	27	20:03 (T41)	19:35	42 18:45 (T42)	18:46	27	08:41 (T76)	17:10	48	16:22 (T77)	17:05	43	16:31 (T77)
20	06:15		06:45		19:37 (T41)	07:16	18:02 (T42)	07:48		08:13 (T76)	07:25		15:35 (T77)	07:53		15:48 (T77)
	21:01		20:26	25	20:02 (T41)	19:33	43 18:45 (T42)	18:44	28	08:41 (T76)	17:09	48	16:23 (T77)	17:05	43	16:31 (T77)
21	06:16		06:46		19:38 (T41)	07:17	18:01 (T42)	07:49		08:13 (T76)	07:26		15:35 (T77)	07:53		15:49 (T77)
	21:00		20:24	22	20:00 (T41)	19:32	44 18:45 (T42)	18:43	29	08:42 (T76)	17:08	48	16:23 (T77)	17:05	43	16:32 (T77)
22	06:17		06:47		19:39 (T41)	07:18	18:00 (T42)	07:50		08:13 (T76)	07:27		15:35 (T77)	07:54		15:49 (T77)
	20:59		20:23	20	19:59 (T41)	19:30	46 18:46 (T42)	18:41	29	08:42 (T76)	17:08	48	16:23 (T77)	17:06	43	16:32 (T77)
23	06:18		06:48		19:41 (T41)	07:19	17:59 (T42)	07:51		08:13 (T76)	07:28		15:35 (T77)	07:54		15:50 (T77)
	20:59		20:21	16	19:57 (T41)	19:28	47 18:46 (T42)	18:40	29	08:42 (T76)	17:07	49	16:24 (T77)	17:07	43	16:33 (T77)
24	06:19		06:49		19:44 (T41)	07:20	17:58 (T42)	07:53		08:13 (T76)	07:29		15:35 (T77)	07:55		15:50 (T77)
	20:58		20:20	12	19:56 (T41)	19:27	48 18:46 (T42)	18:39	28	08:41 (T76)	17:07	49	16:24 (T77)	17:07	43	16:33 (T77)
25	06:20		06:50			07:21	17:57 (T42)	07:54		08:15 (T76)	07:30		15:36 (T77)	07:55		15:50 (T77)
	20:57		20:18			19:25	49 18:46 (T42)	18:37	26	08:41 (T76)	17:06	49	16:25 (T77)	17:08	43	16:33 (T77)
26	06:21		06:51			07:22	17:57 (T42)	07:55		08:16 (T76)	07:32		15:36 (T77)	07:56		15:51 (T77)
	20:56		20:17			19:23	48 18:45 (T42)	18:36	25	08:41 (T76)	17:06	49	16:25 (T77)	17:08	44	16:35 (T77)
27	06:22		06:52			07:23	17:56 (T42)	07:56		08:17 (T76)	07:33		15:36 (T77)	07:56		15:51 (T77)
	20:55		20:15			19:22	49 18:45 (T42)	18:34	23	08:40 (T76)	17:05	49	16:25 (T77)	17:09	44	16:35 (T77)
28	06:22		06:53			07:24	17:56 (T42)	07:57		08:18 (T76)	07:34		15:36 (T77)	07:56		15:52 (T77)
	20:54		20:14			19:20	49 18:45 (T42)	18:33	20	08:38 (T76)	17:05	49	16:25 (T77)	17:10	43	16:35 (T77)
29	06:23	19:49 (T41)	06:54			07:25	17:55 (T42)	07:58		08:19 (T76)	07:35		15:37 (T77)	07:57		15:52 (T77)
	20:53	9 19:58 (T41)	20:12			19:18	49 18:44 (T42)	18:32	18	08:37 (T76)	17:04	48	16:25 (T77)	17:10	44	16:36 (T77)
30	06:24	19:46 (T41)	06:55			07:26	17:55 (T42)	08:00		08:21 (T76)	07:36		15:37 (T77)	07:57		15:53 (T77)
	20:52	15 20:01 (T41)	20:10			19:16	49 18:44 (T42)	18:30	15	08:36 (T76)	17:04	48	16:25 (T77)	17:11	44	16:37 (T77)
31	06:25	19:45 (T41)	06:56					08:01		08:22 (T76)				07:57		15:53 (T77)
	20:51	18 20:03 (T41)	20:09					18:29	12	08:34 (T76)				17:12	45	16:38 (T77)
Potential sun hours	460		429			375		345			297			287		
Total, worst case		42		660			763		900			1160			1384	
Sun reduction		0.66		0.61			0.59		0.48			0.30			0.22	
Oper. time red.		1.00		1.00			1.00		1.00			1.00			1.00	
Wind dir. red.		0.57		0.57			0.67		0.61			0.74			0.74	
Total reduction		0.39		0.36			0.40		0.30			0.23			0.17	
Total, real		16		236			308		273			263			231	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1495 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7391)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March			April			May			June		
1	07:58		08:20 (T26)	07:44		08:23 (T26)	07:07			07:16		07:44 (T75)	06:30		07:12 (T24)	06:01		07:20 (T24)
	17:13	76	10:18 (T25)	17:47	27	08:50 (T26)	18:22			19:56	31	08:15 (T75)	20:27	70	08:22 (T24)	20:57	52	08:12 (T24)
2	07:58		08:20 (T26)	07:43		08:24 (T26)	07:06			07:15		07:45 (T75)	06:29		07:12 (T24)	06:01		07:21 (T24)
	17:14	78	10:19 (T25)	17:49	25	08:49 (T26)	18:23			19:57	30	08:15 (T75)	20:28	71	08:23 (T24)	20:58	51	08:12 (T24)
3	07:58		08:20 (T26)	07:42		08:25 (T26)	07:04			07:13		07:45 (T75)	06:28		07:11 (T24)	06:01		07:21 (T24)
	17:15	78	10:19 (T25)	17:50	23	08:48 (T26)	18:24			19:58	29	08:14 (T75)	20:29	71	08:22 (T24)	20:59	50	08:11 (T24)
4	07:58		08:20 (T26)	07:41		08:27 (T26)	07:03			07:11		07:45 (T75)	06:26		07:11 (T24)	06:00		07:22 (T24)
	17:16	78	10:19 (T25)	17:51	20	08:47 (T26)	18:25			19:59	27	08:12 (T75)	20:30	71	08:22 (T24)	20:59	49	08:11 (T24)
5	07:58		08:20 (T26)	07:40		08:29 (T26)	07:01			07:10		07:47 (T75)	06:25		07:11 (T24)	06:00		07:23 (T24)
	17:17	79	10:19 (T25)	17:53	16	08:45 (T26)	18:26			20:00	24	08:11 (T75)	20:32	71	08:22 (T24)	21:00	48	08:11 (T24)
6	07:58		08:20 (T26)	07:39		08:32 (T26)	07:00			07:08		07:48 (T75)	06:24		07:11 (T24)	05:59		07:22 (T24)
	17:17	81	10:20 (T25)	17:54	11	08:43 (T26)	18:28			20:00	21	08:09 (T75)	20:33	71	08:22 (T24)	21:01	48	08:10 (T24)
7	07:58		08:20 (T26)	07:37			06:58			07:06		07:49 (T75)	06:23		07:11 (T24)	05:59		07:23 (T24)
	17:18	81	10:20 (T25)	17:55			18:29			20:02	17	08:06 (T75)	20:34	71	08:22 (T24)	21:01	47	08:10 (T24)
8	07:58		08:20 (T26)	07:36			07:56			07:05		07:52 (T75)	06:22		07:11 (T24)	05:59		07:24 (T24)
	17:19	81	10:20 (T25)	17:56			19:30			20:03	11	08:03 (T75)	20:35	71	08:22 (T24)	21:02	46	08:10 (T24)
9	07:57		08:19 (T26)	07:35			07:55			07:03			06:20		07:11 (T24)	05:59		07:25 (T24)
	17:20	81	10:19 (T25)	17:58			19:31			20:04			20:36	71	08:22 (T24)	21:03	45	08:10 (T24)
10	07:57		08:19 (T26)	07:34			07:53			07:01		07:45 (T24)	06:19		07:11 (T24)	05:59		07:26 (T24)
	17:21	82	10:20 (T25)	17:59			19:32			20:05	14	07:59 (T24)	20:37	70	08:21 (T24)	21:03	44	08:10 (T24)
11	07:57		08:19 (T26)	07:33			07:51			07:00		07:40 (T24)	06:18		07:10 (T24)	05:58		07:26 (T24)
	17:23	83	10:20 (T25)	18:00			19:33			20:06	24	08:04 (T24)	20:38	70	08:20 (T24)	21:04	44	08:10 (T24)
12	07:57		08:18 (T26)	07:31			07:50			06:58		07:36 (T24)	06:17		07:11 (T24)	05:58		07:26 (T24)
	17:24	83	10:19 (T25)	18:01			19:34			20:07	31	08:07 (T24)	20:39	69	08:20 (T24)	21:04	43	08:09 (T24)
13	07:56		08:18 (T26)	07:30			07:48			06:57		07:33 (T24)	06:16		07:11 (T24)	05:58		07:26 (T24)
	17:25	83	10:19 (T25)	18:03			19:36			20:08	37	08:10 (T24)	20:40	69	08:20 (T24)	21:05	43	08:09 (T24)
14	07:56		08:18 (T26)	07:29			07:46			06:55		07:30 (T24)	06:15		07:11 (T24)	05:58		07:27 (T24)
	17:26	82	10:19 (T25)	18:04			19:37			20:09	42	08:12 (T24)	20:41	68	08:19 (T24)	21:05	42	08:09 (T24)
15	07:56		08:17 (T26)	07:28			07:45			06:54		07:29 (T24)	06:14		07:12 (T24)	05:58		07:27 (T24)
	17:27	83	10:19 (T25)	18:05			19:38			20:10	45	08:14 (T24)	20:42	68	08:20 (T24)	21:06	42	08:09 (T24)
16	07:55		08:17 (T26)	07:26			07:43			06:52		07:26 (T24)	06:13		07:12 (T24)	05:58		07:28 (T24)
	17:28	83	10:19 (T25)	18:06			19:39			20:11	49	08:15 (T24)	20:43	67	08:19 (T24)	21:06	41	08:09 (T24)
17	07:55		08:16 (T26)	07:25			07:41			06:50		07:25 (T24)	06:12		07:12 (T24)	05:58		07:29 (T24)
	17:29	83	10:18 (T25)	18:07			19:40			20:12	52	08:17 (T24)	20:44	67	08:19 (T24)	21:07	41	08:10 (T24)
18	07:54		08:17 (T26)	07:24			07:40			06:49		07:23 (T24)	06:11		07:13 (T24)	05:58		07:29 (T24)
	17:30	81	10:18 (T25)	18:09			19:41			20:13	54	08:17 (T24)	20:45	65	08:18 (T24)	21:07	41	08:10 (T24)
19	07:54		08:17 (T26)	07:22			07:38		07:58 (T75)	06:47		07:22 (T24)	06:10		07:13 (T24)	05:58		07:29 (T24)
	17:32	79	10:17 (T25)	18:10			19:42	12	08:10 (T75)	20:14	57	08:19 (T24)	20:46	65	08:18 (T24)	21:07	41	08:10 (T24)
20	07:53		08:17 (T26)	07:21			07:36		07:56 (T75)	06:46		07:20 (T24)	06:09		07:13 (T24)	05:58		07:30 (T24)
	17:33	76	10:15 (T25)	18:11			19:43	17	08:13 (T75)	20:15	59	08:19 (T24)	20:47	64	08:17 (T24)	21:08	40	08:10 (T24)
21	07:53		08:17 (T26)	07:19			07:35		07:54 (T75)	06:44		07:19 (T24)	06:09		07:14 (T24)	05:59		07:30 (T24)
	17:34	75	10:15 (T25)	18:12			19:44	21	08:15 (T75)	20:17	61	08:20 (T24)	20:48	63	08:17 (T24)	21:08	39	08:09 (T24)
22	07:52		08:17 (T26)	07:18			07:33		07:52 (T75)	06:43		07:18 (T24)	06:08		07:14 (T24)	05:59		07:30 (T24)
	17:35	73	10:14 (T25)	18:14			19:45	24	08:16 (T75)	20:18	62	08:20 (T24)	20:49	63	08:17 (T24)	21:08	39	08:09 (T24)
23	07:51		08:17 (T26)	07:16			07:31		07:50 (T75)	06:41		07:17 (T24)	06:07		07:15 (T24)	05:59		07:31 (T24)
	17:36	70	10:12 (T25)	18:15			19:46	26	08:16 (T75)	20:19	64	08:21 (T24)	20:50	61	08:16 (T24)	21:08	40	08:11 (T24)
24	07:51		08:17 (T26)	07:15			07:30		07:49 (T75)	06:40		07:16 (T24)	06:06		07:15 (T24)	05:59		07:30 (T24)
	17:38	66	10:10 (T25)	18:16			19:48	29	08:18 (T75)	20:20	65	08:21 (T24)	20:50	60	08:15 (T24)	21:09	41	08:11 (T24)
25	07:50		08:19 (T26)	07:13			07:28		07:47 (T75)	06:39		07:15 (T24)	06:06		07:16 (T24)	06:00		07:30 (T24)
	17:39	61	10:09 (T25)	18:17			19:49	31	08:18 (T75)	20:21	67	08:22 (T24)	20:51	59	08:15 (T24)	21:09	41	08:11 (T24)
26	07:49		08:19 (T26)	07:12			07:26		07:46 (T75)	06:37		07:15 (T24)	06:05		07:16 (T24)	06:00		07:31 (T24)
	17:40	56	10:06 (T25)	18:18			19:50	31	08:17 (T75)	20:22	67	08:22 (T24)	20:52	59	08:15 (T24)	21:09	41	08:12 (T24)
27	07:48		08:19 (T26)	07:10			07:25		07:46 (T75)	06:36		07:14 (T24)	06:04		07:17 (T24)	06:00		07:31 (T24)
	17:41	49	10:03 (T25)	18:19			19:51	32	08:18 (T75)	20:23	68	08:22 (T24)	20:53	58	08:15 (T24)	21:09	41	08:12 (T24)
28	07:47		08:20 (T26)	07:09			07:23		07:45 (T75)	06:34		07:13 (T24)	06:04		07:17 (T24)	06:01		07:30 (T24)
	17:42	32	08:52 (T26)	18:21			19:52	33	08:18 (T75)	20:24	69	08:22 (T24)	20:54	57	08:14 (T24)	21:09	42	08:12 (T24)
29	07:47		08:20 (T26)				07:21		07:44 (T75)	06:33		07:13 (T24)	06:03		07:17 (T24)	06:01		07:31 (T24)
	17:44	32	08:52 (T26)				19:53	33	08:17 (T75)	20:25	70	08:23 (T24)	20:55	56	08:13 (T24)	21:09	42	08:13 (T24)
30	07:46		08:21 (T26)				07:20		07:44 (T75)	06:32		07:12 (T24)	06:02		07:19 (T24)	06:02		07:30 (T24)
	17:45	30	08:51 (T26)				19:54	33	08:17 (T75)	20:26	70	08:22 (T24)	20:56	54	08:13 (T24)	21:09	43	08:13 (T24)
31	07:45		08:22 (T26)				07:18		07:44 (T75)				06:02		07:20 (T24)			
	17:46	29	08:51 (T26)				19:55	32	08:16 (T75)				20:56	53	08:13 (T24)			
Potential sun hours	297			297			370			399			449			453		
Total, worst case		2184			122			354			1317			2023			1307	
Sun reduction		0.31			0.40			0.44			0.52			0.57			0.64	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.52			0.52			0.62			0.66			0.66			0.66	
Total reduction		0.16			0.20			0.26			0.33			0.36			0.41	
Total, real		341			24			93			433			736			534	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1495 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7391)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		07:31 (T24)	06:26		07:21 (T24)	06:57		07:39 (T24)	07:28		07:02			07:37		08:01 (T26)
	21:09	43	08:14 (T24)	20:50	70	08:31 (T24)	20:07	24	08:03 (T24)	19:15		17:28			17:04	83	10:02 (T25)
2	06:03		07:30 (T24)	06:27		07:21 (T24)	06:58		07:44 (T24)	07:29		07:03			07:38		08:02 (T26)
	21:09	44	08:14 (T24)	20:49	70	08:31 (T24)	20:06	13	07:57 (T24)	19:13		17:27			17:03	82	10:03 (T25)
3	06:03		07:30 (T24)	06:28		07:21 (T24)	06:59			07:30		07:05			07:39		08:03 (T26)
	21:09	45	08:15 (T24)	20:48	70	08:31 (T24)	20:04			19:12		17:26			17:03	81	10:03 (T25)
4	06:04		07:29 (T24)	06:29		07:21 (T24)	07:00		07:50 (T75)	07:31		07:06			07:40		08:04 (T26)
	21:08	46	08:15 (T24)	20:47	70	08:31 (T24)	20:03	10	08:00 (T75)	19:10		17:24			17:03	81	10:04 (T25)
5	06:04		07:30 (T24)	06:30		07:21 (T24)	07:01		07:46 (T75)	07:32		07:07		08:01 (T26)	07:41		08:05 (T26)
	21:08	46	08:16 (T24)	20:46	70	08:31 (T24)	20:01	17	08:03 (T75)	19:08		17:23	12	08:13 (T26)	17:03	81	10:05 (T25)
6	06:05		07:29 (T24)	06:31		07:21 (T24)	07:02		07:44 (T75)	07:33		07:08		07:58 (T26)	07:42		08:06 (T26)
	21:08	47	08:16 (T24)	20:45	71	08:32 (T24)	19:58	21	08:05 (T75)	19:07		17:22	17	08:15 (T26)	17:03	81	10:06 (T25)
7	06:05		07:29 (T24)	06:32		07:21 (T24)	07:03		07:42 (T75)	07:34		07:09		07:56 (T26)	07:43		08:07 (T26)
	21:08	48	08:17 (T24)	20:44	71	08:32 (T24)	19:56	24	08:06 (T75)	19:05		17:21	21	08:17 (T26)	17:03	80	10:06 (T25)
8	06:06		07:29 (T24)	06:33		07:21 (T24)	07:04		07:40 (T75)	07:35		07:11		07:56 (T26)	07:44		08:08 (T26)
	21:07	49	08:18 (T24)	20:42	71	08:32 (T24)	19:54	27	08:07 (T75)	19:03		17:20	23	08:19 (T26)	17:03	78	10:07 (T25)
9	06:07		07:28 (T24)	06:34		07:21 (T24)	07:05		07:39 (T75)	07:36		07:12		07:54 (T26)	07:45		08:09 (T26)
	21:07	50	08:18 (T24)	20:41	70	08:31 (T24)	19:52	29	08:08 (T75)	19:02		17:19	26	08:20 (T26)	17:03	78	10:08 (T25)
10	06:07		07:28 (T24)	06:35		07:21 (T24)	07:06		07:38 (T75)	07:37		07:13		07:53 (T26)	07:46		08:10 (T26)
	21:07	51	08:19 (T24)	20:40	70	08:31 (T24)	19:51	30	08:08 (T75)	19:00		17:18	28	08:21 (T26)	17:03	78	10:09 (T25)
11	06:08		07:28 (T24)	06:36		07:21 (T24)	07:07		07:37 (T75)	07:38		07:14		07:52 (T26)	07:47		08:10 (T26)
	21:06	52	08:20 (T24)	20:39	70	08:31 (T24)	19:49	31	08:08 (T75)	18:58		17:17	30	08:22 (T26)	17:03	76	10:08 (T25)
12	06:09		07:27 (T24)	06:37		07:21 (T24)	07:08		07:36 (T75)	07:39		07:15		07:53 (T26)	07:48		08:11 (T26)
	21:06	53	08:20 (T24)	20:37	70	08:31 (T24)	19:47	33	08:09 (T75)	18:57		17:16	30	08:23 (T26)	17:03	76	10:09 (T25)
13	06:10		07:27 (T24)	06:38		07:21 (T24)	07:09		07:36 (T75)	07:40		07:17		07:52 (T26)	07:48		08:12 (T26)
	21:05	54	08:21 (T24)	20:36	70	08:31 (T24)	19:46	32	08:08 (T75)	18:55		17:15	31	08:23 (T26)	17:03	75	10:10 (T25)
14	06:10		07:27 (T24)	06:39		07:21 (T24)	07:10		07:35 (T75)	07:42		07:18		07:51 (T26)	07:49		08:13 (T26)
	21:05	55	08:22 (T24)	20:35	69	08:30 (T24)	19:44	33	08:08 (T75)	18:54		17:14	33	08:24 (T26)	17:03	75	10:11 (T25)
15	06:11		07:27 (T24)	06:40		07:21 (T24)	07:11		07:34 (T75)	07:43		07:19		07:52 (T26)	07:50		08:13 (T26)
	21:04	56	08:23 (T24)	20:33	69	08:30 (T24)	19:42	33	08:07 (T75)	18:52		17:13	49	09:36 (T25)	17:03	74	10:11 (T25)
16	06:12		07:26 (T24)	06:41		07:22 (T24)	07:12		07:34 (T75)	07:44		07:20		07:52 (T26)	07:51		08:14 (T26)
	21:04	57	08:23 (T24)	20:32	67	08:29 (T24)	19:41	32	08:06 (T75)	18:51		17:12	57	09:40 (T25)	17:04	73	10:12 (T25)
17	06:13		07:26 (T24)	06:42		07:22 (T24)	07:13		07:34 (T75)	07:45		07:21		07:52 (T26)	07:51		08:16 (T26)
	21:03	58	08:24 (T24)	20:30	67	08:29 (T24)	19:39	32	08:06 (T75)	18:49		17:11	61	09:42 (T25)	17:04	71	10:12 (T25)
18	06:14		07:25 (T24)	06:43		07:22 (T24)	07:14		07:34 (T75)	07:46		07:23		07:51 (T26)	07:52		08:17 (T26)
	21:03	60	08:25 (T24)	20:29	66	08:28 (T24)	19:37	31	08:05 (T75)	18:47		17:11	66	09:44 (T25)	17:04	69	10:12 (T25)
19	06:14		07:25 (T24)	06:44		07:22 (T24)	07:15		07:35 (T75)	07:47		07:24		07:52 (T26)	07:53		08:18 (T26)
	21:02	60	08:25 (T24)	20:27	64	08:26 (T24)	19:35	29	08:04 (T75)	18:46		17:10	70	09:47 (T25)	17:05	68	10:13 (T25)
20	06:15		07:25 (T24)	06:45		07:22 (T24)	07:16		07:36 (T75)	07:48		07:25		07:52 (T26)	07:53		08:20 (T26)
	21:01	61	08:26 (T24)	20:26	64	08:26 (T24)	19:34	27	08:03 (T75)	18:44		17:09	73	09:49 (T25)	17:05	66	10:14 (T25)
21	06:16		07:24 (T24)	06:46		07:23 (T24)	07:17		07:37 (T75)	07:49		07:26		07:52 (T26)	07:54		09:10 (T25)
	21:00	62	08:26 (T24)	20:25	62	08:25 (T24)	19:32	24	08:01 (T75)	18:43		17:09	75	09:50 (T25)	17:05	64	10:14 (T25)
22	06:17		07:24 (T24)	06:47		07:23 (T24)	07:18		07:38 (T75)	07:51		07:27		07:53 (T26)	07:54		09:11 (T25)
	21:00	63	08:27 (T24)	20:23	61	08:24 (T24)	19:30	22	08:00 (T75)	18:42		17:08	76	09:51 (T25)	17:06	64	10:15 (T25)
23	06:18		07:24 (T24)	06:48		07:24 (T24)	07:19		07:39 (T75)	07:52		07:28		07:54 (T26)	07:55		09:11 (T25)
	20:59	63	08:27 (T24)	20:22	59	08:23 (T24)	19:29	18	07:57 (T75)	18:40		17:07	79	09:54 (T25)	17:07	64	10:15 (T25)
24	06:19		07:23 (T24)	06:49		07:25 (T24)	07:20		07:40 (T75)	07:53		07:30		07:54 (T26)	07:55		08:21 (T26)
	20:58	65	08:28 (T24)	20:20	56	08:21 (T24)	19:27	14	07:54 (T75)	18:39		17:07	81	09:55 (T25)	17:07	67	10:15 (T25)
25	06:20		07:23 (T24)	06:50		07:26 (T24)	07:22		07:45 (T75)	07:54		07:31		07:54 (T26)	07:56		08:21 (T26)
	20:57	65	08:28 (T24)	20:18	54	08:20 (T24)	19:25	3	07:48 (T75)	18:37		17:06	83	09:56 (T25)	17:08	69	10:16 (T25)
26	06:21		07:23 (T24)	06:51		07:27 (T24)	07:23			07:55		07:32		07:55 (T26)	07:56		08:20 (T26)
	20:56	66	08:29 (T24)	20:17	51	08:18 (T24)	19:23			18:36		17:06	83	09:57 (T25)	17:08	71	10:16 (T25)
27	06:22		07:23 (T24)	06:52		07:28 (T24)	07:24			07:56		07:33		07:56 (T26)	07:56		08:20 (T26)
	20:55	67	08:30 (T24)	20:15	49	08:17 (T24)	19:22			18:35		17:05	83	09:58 (T25)	17:09	71	10:17 (T25)
28	06:22		07:23 (T24)	06:53		07:30 (T24)	07:25			07:58		07:34		07:57 (T26)	07:57		08:20 (T26)
	20:54	67	08:30 (T24)	20:14	45	08:15 (T24)	19:20			18:33		17:05	82	09:58 (T25)	17:10	73	10:18 (T25)
29	06:23		07:22 (T24)	06:54		07:31 (T24)	07:26			07:59		07:35		07:59 (T26)	07:57		08:20 (T26)
	20:53	67	08:29 (T24)	20:12	42	08:13 (T24)	19:18			18:32		17:04	83	10:00 (T25)	17:10	74	10:18 (T25)
30	06:24		07:21 (T24)	06:55		07:33 (T24)	07:27			08:00		07:36		08:00 (T26)	07:57		08:20 (T26)
	20:52	69	08:30 (T24)	20:11	37	08:10 (T24)	19:17			18:31		17:04	83	10:01 (T25)	17:11	74	10:18 (T25)
31	06:25		07:21 (T24)	06:56		07:36 (T24)				08:01					07:57		08:20 (T26)
	20:51	69	08:30 (T24)	20:09	31	08:07 (T24)				18:29					17:12	76	10:18 (T25)
Potential sun hours	460			429			375			345		297			287		
Total, worst case		1758			1926			589					1435			2293	
Sun reduction		0.66			0.61			0.59					0.30			0.22	
Oper. time red.		1.00			1.00			1.00					1.00			1.00	
Wind dir. red.		0.66			0.66			0.62					0.52			0.52	
Total reduction		0.42			0.39			0.36					0.15			0.11	
Total, real		740			750			209					216			255	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1526 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7414)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May	June
1	07:57	07:43		07:07		07:48 (T61)	07:16	08:28 (T61)	06:31	06:02
	17:13	17:48		18:22	56	08:44 (T61)	19:56	73 09:41 (T61)	20:27	20:57
2	07:57	07:42		07:06		07:46 (T61)	07:15	08:29 (T61)	06:29	06:01
	17:14	17:49		18:23	59	08:45 (T61)	19:57	72 09:41 (T61)	20:28	20:58
3	07:57	07:41		07:04		07:45 (T61)	07:13	08:29 (T61)	06:28	06:01
	17:15	17:50		18:24	62	08:47 (T61)	19:58	70 09:39 (T61)	20:29	20:58
4	07:57	07:40		07:03		07:43 (T61)	07:11	08:29 (T61)	06:27	06:01
	17:16	17:52		18:25	65	08:48 (T61)	19:59	68 09:37 (T61)	20:30	20:59
5	07:57	07:39		07:01		07:41 (T61)	07:10	08:31 (T61)	06:25	06:00
	17:17	17:53		18:27	68	08:49 (T61)	20:00	66 09:37 (T61)	20:31	21:00
6	07:57	07:38		06:59		07:40 (T61)	07:08	08:31 (T61)	06:24	06:00
	17:18	17:54		18:28	70	08:50 (T61)	20:00	64 09:35 (T61)	20:32	21:00
7	07:57	07:37		06:58		07:39 (T61)	07:06	08:31 (T61)	06:23	06:00
	17:19	17:55		18:29	71	08:50 (T61)	20:01	62 09:33 (T61)	20:33	21:01
8	07:57	07:36		07:56		08:37 (T61)	07:05	08:33 (T61)	06:22	05:59
	17:20	17:57		19:30	74	09:51 (T61)	20:02	58 09:31 (T61)	20:34	21:02
9	07:57	07:35		07:55		08:37 (T61)	07:03	08:33 (T61)	06:21	05:59
	17:21	17:58		19:31	75	09:52 (T61)	20:04	56 09:29 (T61)	20:35	21:02
10	07:57	07:34		07:53		08:35 (T61)	07:02	08:35 (T61)	06:20	05:59
	17:22	17:59		19:32	77	09:52 (T61)	20:05	53 09:28 (T61)	20:36	21:03
11	07:57	07:32		07:51		08:35 (T61)	07:00	08:36 (T61)	06:19	05:59
	17:23	18:00		19:33	78	09:53 (T61)	20:06	49 09:25 (T61)	20:37	21:03
12	07:56	07:31		07:50		08:34 (T61)	06:58	08:37 (T61)	06:17	05:59
	17:24	18:02		19:34	79	09:53 (T61)	20:07	45 09:22 (T61)	20:38	21:04
13	07:56	07:30		07:48		08:33 (T61)	06:57	08:39 (T61)	06:16	05:59
	17:25	18:03		19:36	80	09:53 (T61)	20:08	42 09:21 (T61)	20:39	21:04
14	07:56	07:29		07:46		08:33 (T61)	06:55	08:41 (T61)	06:15	05:59
	17:26	18:04		19:37	80	09:53 (T61)	20:09	36 09:17 (T61)	20:40	21:05
15	07:55	07:27		07:45		08:32 (T61)	06:54	08:44 (T61)	06:14	05:59
	17:27	18:05		19:38	81	09:53 (T61)	20:10	31 09:15 (T61)	20:41	21:05
16	07:55	07:26		07:43		08:31 (T61)	06:52	08:47 (T61)	06:13	05:59
	17:28	18:06		19:39	82	09:53 (T61)	20:11	23 09:10 (T61)	20:42	21:06
17	07:54	07:25		07:41		08:31 (T61)	06:51	08:52 (T61)	06:12	05:59
	17:30	18:08		19:40	82	09:53 (T61)	20:12	13 09:05 (T61)	20:43	21:06
18	07:54	07:23		07:40		08:30 (T61)	06:49		06:12	05:59
	17:31	18:09		19:41	83	09:53 (T61)	20:13		20:44	21:07
19	07:53	07:22		07:38		08:29 (T61)	06:48		06:11	05:59
	17:32	18:10		19:42	83	09:52 (T61)	20:14		20:45	21:07
20	07:53	07:21		07:36		08:28 (T61)	06:46		06:10	05:59
	17:33	18:11		19:43	83	09:51 (T61)	20:15		20:46	21:07
21	07:52	07:19		07:35		08:29 (T61)	06:45		06:09	05:59
	17:34	18:13		19:44	82	09:51 (T61)	20:16		20:47	21:07
22	07:52	07:18	08:14 (T61)	07:33		08:28 (T61)	06:43		06:08	05:59
	17:35	18:14	5 08:19 (T61)	19:45	83	09:51 (T61)	20:17		20:48	21:08
23	07:51	07:16	08:05 (T61)	07:31		08:27 (T61)	06:42		06:07	06:00
	17:37	18:15	23 08:28 (T61)	19:46	83	09:50 (T61)	20:18		20:49	21:08
24	07:50	07:15	08:00 (T61)	07:30		08:28 (T61)	06:40		06:07	06:00
	17:38	18:16	32 08:32 (T61)	19:48	82	09:50 (T61)	20:20		20:50	21:08
25	07:49	07:13	07:58 (T61)	07:28		08:28 (T61)	06:39		06:06	06:00
	17:39	18:17	38 08:36 (T61)	19:49	81	09:49 (T61)	20:21		20:51	21:08
26	07:49	07:12	07:54 (T61)	07:26		08:27 (T61)	06:37		06:05	06:01
	17:40	18:18	44 08:38 (T61)	19:50	81	09:48 (T61)	20:22		20:52	21:08
27	07:48	07:10	07:52 (T61)	07:25		08:28 (T61)	06:36		06:05	06:01
	17:42	18:20	49 08:41 (T61)	19:51	79	09:47 (T61)	20:23		20:53	21:08
28	07:47	07:09	07:50 (T61)	07:23		08:28 (T61)	06:35		06:04	06:01
	17:43	18:21	52 08:42 (T61)	19:52	78	09:46 (T61)	20:24		20:54	21:08
29	07:46			07:21		08:27 (T61)	06:33		06:03	06:02
	17:44			19:53	78	09:45 (T61)	20:25		20:54	21:08
30	07:45			07:20		08:28 (T61)	06:32		06:03	06:02
	17:45			19:54	76	09:44 (T61)	20:26		20:55	21:08
31	07:44			07:18		08:28 (T61)			06:02	
	17:47			19:55	75	09:43 (T61)			20:56	
Potential sun hours	297	297		370			399		448	452
Total, worst case		243		2366			881			
Sun reduction		0.40		0.44			0.52			
Oper. time red.		1.00		1.00			1.00			
Wind dir. red.		0.57		0.57			0.57			
Total reduction		0.23		0.25			0.30			
Total, real		55		592			261			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1526 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7414)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August		September		October		November	December
1	06:03	06:27		06:58	08:35 (T61)	07:28	08:12 (T61)	07:02	07:37
	21:08	20:50		20:07 49	09:24 (T61)	19:15 80	09:32 (T61)	17:28	17:04
2	06:03	06:28		06:59	08:33 (T61)	07:29	08:12 (T61)	07:03	07:38
	21:08	20:49		20:06 53	09:26 (T61)	19:13 79	09:31 (T61)	17:27	17:04
3	06:04	06:29		07:00	08:31 (T61)	07:30	08:14 (T61)	07:04	07:39
	21:08	20:48		20:04 56	09:27 (T61)	19:12 77	09:31 (T61)	17:26	17:04
4	06:04	06:30		07:01	08:30 (T61)	07:31	08:14 (T61)	07:06	07:40
	21:08	20:47		20:02 58	09:28 (T61)	19:10 76	09:30 (T61)	17:25	17:03
5	06:05	06:31		07:02	08:28 (T61)	07:32	08:14 (T61)	07:07	07:41
	21:08	20:46		20:01 62	09:30 (T61)	19:08 75	09:29 (T61)	17:24	17:03
6	06:05	06:32		07:03	08:27 (T61)	07:33	08:15 (T61)	07:08	07:42
	21:08	20:44		19:57 64	09:31 (T61)	19:07 72	09:27 (T61)	17:22	17:03
7	06:06	06:33		07:04	08:26 (T61)	07:34	08:15 (T61)	07:09	07:43
	21:07	20:43		19:56 66	09:32 (T61)	19:05 71	09:26 (T61)	17:21	17:03
8	06:07	06:34		07:05	08:24 (T61)	07:35	08:16 (T61)	07:10	07:44
	21:07	20:42		19:54 68	09:32 (T61)	19:03 69	09:25 (T61)	17:20	17:03
9	06:07	06:35		07:06	08:23 (T61)	07:36	08:17 (T61)	07:12	07:45
	21:07	20:41		19:52 70	09:33 (T61)	19:02 66	09:23 (T61)	17:19	17:03
10	06:08	06:36		07:07	08:22 (T61)	07:37	08:18 (T61)	07:13	07:46
	21:06	20:39		19:51 72	09:34 (T61)	19:00 64	09:22 (T61)	17:18	17:03
11	06:09	06:37		07:07	08:21 (T61)	07:38	08:19 (T61)	07:14	07:46
	21:06	20:38		19:49 74	09:35 (T61)	18:59 61	09:20 (T61)	17:17	17:03
12	06:09	06:38		07:08	08:20 (T61)	07:39	08:20 (T61)	07:15	07:47
	21:05	20:37		19:47 75	09:35 (T61)	18:57 58	09:18 (T61)	17:16	17:03
13	06:10	06:39		07:09	08:19 (T61)	07:40	08:21 (T61)	07:16	07:48
	21:05	20:36		19:46 77	09:36 (T61)	18:55 55	09:16 (T61)	17:15	17:03
14	06:11	06:40		07:10	08:19 (T61)	07:41	08:24 (T61)	07:18	07:49
	21:04	20:34		19:44 77	09:36 (T61)	18:54 51	09:15 (T61)	17:14	17:04
15	06:12	06:41		07:11	08:17 (T61)	07:43	08:26 (T61)	07:19	07:49
	21:04	20:33		19:42 78	09:35 (T61)	18:52 46	09:12 (T61)	17:13	17:04
16	06:12	06:42		07:12	08:16 (T61)	07:44	08:28 (T61)	07:20	07:50
	21:03	20:31		19:40 80	09:36 (T61)	18:51 41	09:09 (T61)	17:13	17:04
17	06:13	06:43		07:13	08:15 (T61)	07:45	08:30 (T61)	07:21	07:51
	21:03	20:30		19:39 81	09:36 (T61)	18:49 36	09:06 (T61)	17:12	17:04
18	06:14	06:44		07:14	08:15 (T61)	07:46	08:33 (T61)	07:22	07:52
	21:02	20:29		19:37 81	09:36 (T61)	18:48 29	09:02 (T61)	17:11	17:05
19	06:15	06:45		07:15	08:14 (T61)	07:47	08:38 (T61)	07:23	07:52
	21:01	20:27		19:35 82	09:36 (T61)	18:46 19	08:57 (T61)	17:10	17:05
20	06:16	06:46		07:16	08:14 (T61)	07:48		07:25	07:53
	21:01	20:26		19:34 82	09:36 (T61)	18:45		17:10	17:06
21	06:17	06:47		07:17	08:13 (T61)	07:49		07:26	07:53
	21:00	20:24		19:32 83	09:36 (T61)	18:43		17:09	17:06
22	06:17	06:48		07:18	08:13 (T61)	07:50		07:27	07:54
	20:59	20:23		19:30 83	09:36 (T61)	18:42		17:08	17:06
23	06:18	06:49		07:19	08:13 (T61)	07:52		07:28	07:54
	20:58	20:21		19:29 83	09:36 (T61)	18:40		17:08	17:07
24	06:19	06:50		07:20	08:12 (T61)	07:53		07:29	07:55
	20:58	20:20		19:27 83	09:35 (T61)	18:39		17:07	17:08
25	06:20	06:51		07:21	08:12 (T61)	07:54		07:30	07:55
	20:57	20:18		19:25 83	09:35 (T61)	18:38		17:07	17:08
26	06:21	06:52	08:53 (T61)	07:23	08:12 (T61)	07:55		07:31	07:56
	20:56	20:17 14	09:07 (T61)	19:23 83	09:35 (T61)	18:36		17:06	17:09
27	06:22	06:53	08:48 (T61)	07:24	08:12 (T61)	07:56		07:33	07:56
	20:55	20:15 24	09:12 (T61)	19:22 82	09:34 (T61)	18:35		17:06	17:09
28	06:23	06:54	08:45 (T61)	07:25	08:12 (T61)	07:57		07:34	07:56
	20:54	20:14 31	09:16 (T61)	19:20 82	09:34 (T61)	18:33		17:05	17:10
29	06:24	06:55	08:42 (T61)	07:26	08:12 (T61)	07:58		07:35	07:56
	20:53	20:12 36	09:18 (T61)	19:18 81	09:33 (T61)	18:32		17:05	17:11
30	06:25	06:56	08:39 (T61)	07:27	08:12 (T61)	08:00		07:36	07:57
	20:52	20:10 42	09:21 (T61)	19:17 80	09:32 (T61)	18:31		17:04	17:12
31	06:26	06:57	08:37 (T61)			08:01			07:57
	20:51	20:09 46	09:23 (T61)			18:30			17:12
Potential sun hours	459	428		375		345		298	288
Total, worst case		193		2228		1125			
Sun reduction		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.57		0.57		0.57			
Total reduction		0.35		0.34		0.27			
Total, real		67		748		307			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1531 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7419)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March		April		May		June	
1	07:58	07:44	07:07		07:16		07:39 (T26)	06:30	07:00 (T25)	06:01	06:28 (T75)
	17:13	17:48	18:22		19:56	30	08:09 (T26)	20:27	52	07:52 (T25)	20:57	75	07:51 (T25)
2	07:58	07:43	07:06		07:15		07:40 (T26)	06:29		07:00 (T25)	06:01		06:29 (T75)
	17:14	17:49	18:23		19:57	29	08:09 (T26)	20:28	53	07:53 (T25)	20:58	74	07:51 (T25)
3	07:58	07:42	07:04		07:13		07:40 (T26)	06:28		06:59 (T25)	06:01		06:29 (T75)
	17:15	17:50	18:24		19:58	28	08:08 (T26)	20:29	54	07:53 (T25)	20:59	72	07:50 (T25)
4	07:58	07:41	07:03		07:11		07:40 (T26)	06:26		06:58 (T25)	06:00		06:30 (T75)
	17:16	17:51	18:25		19:59	27	08:07 (T26)	20:30	55	07:53 (T25)	20:59	70	07:50 (T25)
5	07:58	07:40	07:01		07:10		07:41 (T26)	06:25		06:57 (T25)	06:00		06:31 (T75)
	17:17	17:53	18:26		20:00	25	08:06 (T26)	20:32	57	07:54 (T25)	21:00	68	07:50 (T25)
6	07:58	07:39	07:00		07:08		07:42 (T26)	06:24		06:57 (T25)	06:00		06:30 (T75)
	17:17	17:54	18:28		20:00	22	08:04 (T26)	20:33	57	07:54 (T25)	21:01	68	07:49 (T25)
7	07:58	07:37	06:58		07:06		07:43 (T26)	06:23		06:57 (T25)	05:59		06:31 (T75)
	17:18	17:55	18:29		20:02	19	08:02 (T26)	20:34	57	07:54 (T25)	21:01	67	07:50 (T25)
8	07:58	07:36	07:56		07:05		07:45 (T26)	06:22		06:56 (T25)	05:59		06:32 (T75)
	17:19	17:56	19:30		20:03	15	08:00 (T26)	20:35	59	07:55 (T25)	21:02	65	07:50 (T25)
9	07:57	07:35	07:55		07:03		07:48 (T26)	06:20		06:56 (T25)	05:59		06:33 (T75)
	17:20	17:58	19:31		20:04	8	07:56 (T26)	20:36	59	07:55 (T25)	21:03	64	07:50 (T25)
10	07:57	07:34	07:53		07:01			06:19		06:56 (T25)	05:59		06:33 (T75)
	17:21	17:59	19:32		20:05			20:37	59	07:55 (T25)	21:03	63	07:50 (T25)
11	07:57	07:33	07:51		07:00			06:18		06:38 (T75)	05:58		06:34 (T75)
	17:23	18:00	19:33		20:06			20:38	65	07:54 (T25)	21:04	61	07:50 (T25)
12	07:57	07:31	07:50		06:58			06:17		06:37 (T75)	05:58		06:34 (T75)
	17:24	18:01	19:34		20:07			20:39	68	07:54 (T25)	21:04	60	07:49 (T25)
13	07:56	07:30	07:48		06:57			06:16		06:36 (T75)	05:58		06:34 (T75)
	17:25	18:03	19:36		20:08			20:40	70	07:54 (T25)	21:05	59	07:49 (T25)
14	07:56	07:29	07:46		06:55			06:15		06:36 (T75)	05:58		06:35 (T75)
	17:26	18:04	19:37		20:09			20:41	72	07:55 (T25)	21:05	58	07:49 (T25)
15	07:56	07:28	07:45		06:54			06:14		06:35 (T75)	05:58		06:35 (T75)
	17:27	18:05	19:38		20:10			20:42	74	07:55 (T25)	21:06	58	07:49 (T25)
16	07:55	07:26	07:43		06:52			06:13		06:34 (T75)	05:58		06:36 (T75)
	17:28	18:06	19:39		20:11			20:43	75	07:54 (T25)	21:06	56	07:49 (T25)
17	07:55	07:25	07:41		06:50			06:12		06:33 (T75)	05:58		06:37 (T75)
	17:29	18:08	19:40		20:12			20:44	76	07:54 (T25)	21:07	56	07:50 (T25)
18	07:54	07:24	07:40		06:49			06:11		06:32 (T75)	05:58		06:37 (T75)
	17:30	18:09	19:41		20:13			20:45	77	07:54 (T25)	21:07	56	07:50 (T25)
19	07:54	07:22	07:38		06:47			06:10		06:31 (T75)	05:58		06:38 (T75)
	17:32	18:10	19:42		20:14			20:46	79	07:54 (T25)	21:07	55	07:50 (T25)
20	07:53	07:21	07:36		06:46		07:22 (T25)	06:09		06:30 (T75)	05:59		06:38 (T75)
	17:33	18:11	19:43		20:15	12	07:34 (T25)	20:47	79	07:53 (T25)	21:08	55	07:50 (T25)
21	07:53	07:19	07:35	07:55 (T26)	06:44		07:18 (T25)	06:09		06:30 (T75)	05:59		06:38 (T75)
	17:34	18:12	19:44	6 08:01 (T26)	20:17	21	07:39 (T25)	20:48	80	07:54 (T25)	21:08	55	07:50 (T25)
22	07:52	07:18	07:33	07:52 (T26)	06:43		07:14 (T25)	06:08		06:29 (T75)	05:59		06:38 (T75)
	17:35	18:14	19:45	13 08:05 (T26)	20:18	27	07:41 (T25)	20:49	80	07:53 (T25)	21:08	55	07:50 (T25)
23	07:51	07:16	07:31	07:50 (T26)	06:41		07:12 (T25)	06:07		06:28 (T75)	05:59		06:39 (T75)
	17:36	18:15	19:46	17 08:07 (T26)	20:19	32	07:44 (T25)	20:50	81	07:53 (T25)	21:08	55	07:51 (T25)
24	07:51	07:15	07:30	07:49 (T26)	06:40		07:09 (T25)	06:06		06:27 (T75)	05:59		06:38 (T75)
	17:38	18:16	19:48	20 08:09 (T26)	20:20	36	07:45 (T25)	20:50	80	07:52 (T25)	21:09	56	07:51 (T25)
25	07:50	07:13	07:28	07:47 (T26)	06:39		07:07 (T25)	06:06		06:27 (T75)	06:00		06:38 (T75)
	17:39	18:17	19:49	22 08:09 (T26)	20:21	40	07:47 (T25)	20:51	81	07:53 (T25)	21:09	56	07:51 (T25)
26	07:49	07:12	07:26	07:45 (T26)	06:37		07:06 (T25)	06:05		06:27 (T75)	06:00		06:39 (T75)
	17:40	18:18	19:50	25 08:10 (T26)	20:22	42	07:48 (T25)	20:52	80	07:52 (T25)	21:09	56	07:52 (T25)
27	07:48	07:10	07:25	07:44 (T26)	06:36		07:04 (T25)	06:04		06:27 (T75)	06:00		06:38 (T75)
	17:41	18:20	19:51	27 08:11 (T26)	20:23	45	07:49 (T25)	20:53	79	07:52 (T25)	21:09	58	07:52 (T25)
28	07:47	07:09	07:23	07:42 (T26)	06:34		07:03 (T25)	06:04		06:27 (T75)	06:01		06:38 (T75)
	17:43	18:21	19:52	28 08:10 (T26)	20:24	47	07:50 (T25)	20:54	80	07:52 (T25)	21:09	58	07:52 (T25)
29	07:47		07:21	07:40 (T26)	06:33		07:02 (T25)	06:03		06:27 (T75)	06:01		06:38 (T75)
	17:44		19:53	30 08:10 (T26)	20:25	49	07:51 (T25)	20:55	78	07:51 (T25)	21:09	59	07:53 (T25)
30	07:46		07:20	07:40 (T26)	06:32		07:01 (T25)	06:02		06:28 (T75)	06:02		06:38 (T75)
	17:45		19:54	31 08:11 (T26)	20:26	50	07:51 (T25)	20:56	77	07:51 (T25)	21:09	60	07:53 (T25)
31	07:45		07:18	07:40 (T26)				06:02		06:29 (T75)			
	17:46		19:55	30 08:10 (T26)				20:56	76	07:52 (T25)			
Potential sun hours	297	297	370		399			449			453		
Total, worst case				249		604			2169			1828	
Sun reduction				0.44		0.52			0.57			0.64	
Oper. time red.				1.00		1.00			1.00			1.00	
Wind dir. red.				0.63		0.66			0.68			0.69	
Total reduction				0.28		0.34			0.39			0.44	
Total, real				69		207			845			802	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1531 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7419)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November	December
1	06:02		06:38 (T75)	06:26		06:48 (T75)	06:57		07:28	07:02	07:37
	21:09	61	07:54 (T25)	20:50	68	08:05 (T25)	20:07		19:15	17:28	17:04
2	06:03		06:38 (T75)	06:27		06:49 (T75)	06:58		07:29	07:03	07:38
	21:09	62	07:54 (T25)	20:49	63	08:05 (T25)	20:06		19:13	17:27	17:03
3	06:03		06:38 (T75)	06:28		07:06 (T25)	06:59		07:46 (T26)	07:30	07:05	07:39
	21:09	63	07:55 (T25)	20:48	58	08:04 (T25)	20:04	8	07:54 (T26)	19:12	17:26	17:03
4	06:04		06:37 (T75)	06:29		07:06 (T25)	07:00		07:42 (T26)	07:31	07:06	07:40
	21:08	65	07:55 (T25)	20:47	58	08:04 (T25)	20:03	15	07:57 (T26)	19:10	17:24	17:03
5	06:04		06:38 (T75)	06:30		07:06 (T25)	07:01		07:40 (T26)	07:32	07:07	07:41
	21:08	66	07:56 (T25)	20:46	58	08:04 (T25)	20:01	19	07:59 (T26)	19:08	17:23	17:03
6	06:05		06:37 (T75)	06:31		07:06 (T25)	07:02		07:38 (T26)	07:33	07:08	07:42
	21:08	66	07:55 (T25)	20:45	58	08:04 (T25)	19:58	22	08:00 (T26)	19:07	17:22	17:03
7	06:05		06:37 (T75)	06:32		07:07 (T25)	07:03		07:36 (T26)	07:34	07:09	07:43
	21:08	68	07:56 (T25)	20:44	56	08:03 (T25)	19:56	25	08:01 (T26)	19:05	17:21	17:03
8	06:06		06:37 (T75)	06:33		07:07 (T25)	07:04		07:35 (T26)	07:35	07:11	07:44
	21:07	70	07:57 (T25)	20:42	56	08:03 (T25)	19:54	27	08:02 (T26)	19:03	17:20	17:03
9	06:07		06:36 (T75)	06:34		07:07 (T25)	07:05		07:34 (T26)	07:36	07:12	07:45
	21:07	72	07:57 (T25)	20:41	56	08:03 (T25)	19:52	28	08:02 (T26)	19:02	17:19	17:03
10	06:07		06:37 (T75)	06:35		07:08 (T25)	07:06		07:33 (T26)	07:37	07:13	07:46
	21:07	73	07:58 (T25)	20:40	54	08:02 (T25)	19:51	29	08:02 (T26)	19:00	17:18	17:03
11	06:08		06:37 (T75)	06:36		07:08 (T25)	07:07		07:33 (T26)	07:38	07:14	07:47
	21:06	74	07:59 (T25)	20:39	53	08:01 (T25)	19:49	29	08:02 (T26)	18:58	17:17	17:03
12	06:09		06:36 (T75)	06:37		07:09 (T25)	07:08		07:32 (T26)	07:39	07:15	07:48
	21:06	75	07:59 (T25)	20:37	52	08:01 (T25)	19:47	30	08:02 (T26)	18:57	17:16	17:03
13	06:10		06:36 (T75)	06:38		07:10 (T25)	07:09		07:32 (T26)	07:41	07:17	07:48
	21:05	76	07:59 (T25)	20:36	50	08:00 (T25)	19:46	30	08:02 (T26)	18:55	17:15	17:03
14	06:10		06:36 (T75)	06:39		07:10 (T25)	07:10		07:31 (T26)	07:42	07:18	07:49
	21:05	78	08:00 (T25)	20:35	49	07:59 (T25)	19:44	30	08:01 (T26)	18:54	17:14	17:03
15	06:11		06:37 (T75)	06:40		07:11 (T25)	07:11		07:31 (T26)	07:43	07:19	07:50
	21:04	78	08:01 (T25)	20:33	47	07:58 (T25)	19:42	29	08:00 (T26)	18:52	17:13	17:03
16	06:12		06:36 (T75)	06:41		07:12 (T25)	07:12		07:32 (T26)	07:44	07:20	07:51
	21:04	80	08:01 (T25)	20:32	44	07:56 (T25)	19:41	27	07:59 (T26)	18:51	17:12	17:04
17	06:13		06:36 (T75)	06:42		07:13 (T25)	07:13		07:33 (T26)	07:45	07:21	07:51
	21:03	80	08:01 (T25)	20:30	42	07:55 (T25)	19:39	25	07:58 (T26)	18:49	17:11	17:04
18	06:14		06:36 (T75)	06:43		07:15 (T25)	07:14		07:34 (T26)	07:46	07:23	07:52
	21:03	81	08:02 (T25)	20:29	38	07:53 (T25)	19:37	23	07:57 (T26)	18:48	17:11	17:04
19	06:14		06:37 (T75)	06:44		07:16 (T25)	07:15		07:35 (T26)	07:47	07:24	07:53
	21:02	82	08:03 (T25)	20:27	35	07:51 (T25)	19:35	20	07:55 (T26)	18:46	17:10	17:05
20	06:15		06:38 (T75)	06:45		07:17 (T25)	07:16		07:36 (T26)	07:48	07:25	07:53
	21:01	81	08:03 (T25)	20:26	31	07:48 (T25)	19:34	17	07:53 (T26)	18:45	17:09	17:05
21	06:16		06:38 (T75)	06:46		07:19 (T25)	07:17		07:37 (T26)	07:49	07:26	07:54
	21:00	81	08:03 (T25)	20:25	27	07:46 (T25)	19:32	14	07:51 (T26)	18:43	17:09	17:06
22	06:17		06:39 (T75)	06:47		07:22 (T25)	07:18		07:38 (T26)	07:51	07:27	07:54
	21:00	80	08:03 (T25)	20:23	20	07:42 (T25)	19:30	9	07:47 (T26)	18:42	17:08	17:06
23	06:18		06:40 (T75)	06:48		07:27 (T25)	07:19			07:52	07:28	07:55
	20:59	80	08:04 (T25)	20:22	9	07:36 (T25)	19:29			18:40	17:07	17:07
24	06:19		06:41 (T75)	06:49			07:20			07:53	07:30	07:55
	20:58	79	08:04 (T25)	20:20			19:27			18:39	17:07	17:07
25	06:20		06:42 (T75)	06:50			07:22			07:54	07:31	07:56
	20:57	78	08:04 (T25)	20:18			19:25			18:37	17:06	17:08
26	06:21		06:43 (T75)	06:51			07:23			07:55	07:32	07:56
	20:56	78	08:05 (T25)	20:17			19:23			18:36	17:06	17:08
27	06:22		06:44 (T75)	06:52			07:24			07:56	07:33	07:56
	20:55	77	08:05 (T25)	20:15			19:22			18:35	17:05	17:09
28	06:23		06:45 (T75)	06:53			07:25			07:58	07:34	07:57
	20:54	75	08:05 (T25)	20:14			19:20			18:33	17:05	17:10
29	06:23		06:45 (T75)	06:54			07:26			07:59	07:35	07:57
	20:53	73	08:04 (T25)	20:12			19:18			18:32	17:04	17:10
30	06:24		06:46 (T75)	06:55			07:27			08:00	07:36	07:57
	20:52	71	08:04 (T25)	20:11			19:17			18:31	17:04	17:11
31	06:25		06:47 (T75)	06:56						08:01		07:57
	20:51	70	08:05 (T25)	20:09						18:29		17:12
Potential sun hours	460			429			375			345	297	287
Total, worst case		2293			1082			456				
Sun reduction		0.66			0.61			0.59				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.69			0.68			0.63				
Total reduction		0.45			0.41			0.37				
Total, real		1039			447			169				

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

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

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1549 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May	June
1	07:57		07:43		15:47 (T69)	07:07	07:42 (T68)	07:16	07:35 (T67)	06:30	06:02
	17:13		17:48	71	16:58 (T69)	18:22	76	16:56 (T69)	19:56	51	08:52 (T68)	20:27	20:57
2	07:57		07:42		15:47 (T69)	07:06		07:37 (T68)	07:15		07:34 (T67)	06:29	06:01
	17:14		17:49	71	16:58 (T69)	18:23	83	16:55 (T69)	19:57	48	08:50 (T68)	20:28	20:57
3	07:57		07:41		15:46 (T69)	07:04		07:33 (T68)	07:13		07:32 (T67)	06:28	06:01
	17:15		17:50	73	16:59 (T69)	18:24	87	16:53 (T69)	19:58	42	08:45 (T68)	20:29	20:58
4	07:57		07:40		15:45 (T69)	07:02		07:31 (T68)	07:11		07:30 (T67)	06:27	06:01
	17:16		17:51	74	16:59 (T69)	18:25	89	16:52 (T69)	19:59	27	07:57 (T67)	20:30	20:59
5	07:57		07:39		15:45 (T69)	07:01		07:29 (T68)	07:10		07:29 (T67)	06:25	06:00
	17:17		17:53	75	17:00 (T69)	18:26	89	16:50 (T69)	20:00	28	07:57 (T67)	20:31	20:59
6	07:57		07:38		15:45 (T69)	06:59		07:28 (T68)	07:08		07:29 (T67)	06:24	06:00
	17:18		17:54	75	17:00 (T69)	18:28	89	16:49 (T69)	20:00	27	07:56 (T67)	20:32	21:00
7	07:57		07:37		15:45 (T69)	06:58		07:26 (T68)	07:06		07:29 (T67)	06:23	06:00
	17:19		17:55	76	17:01 (T69)	18:29	88	16:47 (T69)	20:01	25	07:54 (T67)	20:33	21:01
8	07:57		07:36		15:45 (T69)	07:56		08:24 (T68)	07:05		07:30 (T67)	06:22	05:59
	17:20		17:57	77	17:02 (T69)	19:30	86	17:44 (T69)	20:02	24	07:54 (T67)	20:34	21:01
9	07:57	16:10 (T69)	07:35		15:45 (T69)	07:54		08:23 (T68)	07:03		07:31 (T67)	06:21	05:59
	17:21	10	16:20 (T69)	17:58	77	17:02 (T69)	19:31	84	17:43 (T69)	20:03	21	07:52 (T67)	20:35	21:02
10	07:57	16:06 (T69)	07:33		15:44 (T69)	07:53		08:22 (T68)	07:02		07:32 (T67)	06:20	05:59
	17:22	18	16:24 (T69)	17:59	78	17:02 (T69)	19:32	80	17:39 (T69)	20:04	17	07:49 (T67)	20:36	21:03
11	07:56	16:05 (T69)	07:32		15:44 (T69)	07:51		08:20 (T68)	07:00		07:35 (T67)	06:18	05:59
	17:23	22	16:27 (T69)	18:00	78	17:02 (T69)	19:33	74	17:35 (T69)	20:06	12	07:47 (T67)	20:37	21:03
12	07:56	16:03 (T69)	07:31		15:44 (T69)	07:50		08:20 (T68)	06:58				06:17	05:59
	17:24	27	16:30 (T69)	18:01	79	17:03 (T69)	19:34	64	17:30 (T69)	20:07			20:38	21:04
13	07:56	16:01 (T69)	07:30		15:44 (T69)	07:48		08:19 (T68)	06:57				06:16	05:59
	17:25	30	16:31 (T69)	18:03	79	17:03 (T69)	19:35	52	09:11 (T68)	20:08			20:39	21:04
14	07:55	16:00 (T69)	07:28		15:44 (T69)	07:46		08:18 (T68)	06:55				06:15	05:59
	17:26	34	16:34 (T69)	18:04	78	17:02 (T69)	19:37	52	09:10 (T68)	20:09			20:40	21:05
15	07:55	15:58 (T69)	07:27		15:44 (T69)	07:45		08:18 (T68)	06:54				06:14	05:59
	17:27	37	16:35 (T69)	18:05	79	17:03 (T69)	19:38	53	09:11 (T68)	20:10			20:41	21:05
16	07:55	15:58 (T69)	07:26		15:45 (T69)	07:43		08:17 (T68)	06:52				06:13	05:59
	17:28	40	16:38 (T69)	18:06	78	17:03 (T69)	19:39	53	09:10 (T68)	20:11			20:42	21:06
17	07:54	15:56 (T69)	07:25		15:44 (T69)	07:41		08:17 (T68)	06:51				06:12	05:59
	17:30	43	16:39 (T69)	18:08	78	17:02 (T69)	19:40	53	09:10 (T68)	20:12			20:43	21:06
18	07:54	15:56 (T69)	07:23		15:45 (T69)	07:40		08:17 (T68)	06:49				06:11	05:59
	17:31	45	16:41 (T69)	18:09	78	17:03 (T69)	19:41	53	09:10 (T68)	20:13			20:44	21:06
19	07:53	15:55 (T69)	07:22		15:45 (T69)	07:38		08:16 (T68)	06:47				06:11	05:59
	17:32	47	16:42 (T69)	18:10	77	17:02 (T69)	19:42	53	09:09 (T68)	20:14			20:45	21:07
20	07:53	15:54 (T69)	07:20		15:45 (T69)	07:36		08:16 (T68)	06:46				06:10	05:59
	17:33	50	16:44 (T69)	18:11	77	17:02 (T69)	19:43	53	09:09 (T68)	20:15			20:46	21:07
21	07:52	15:53 (T69)	07:19		15:46 (T69)	07:35		08:16 (T68)	06:44				06:09	05:59
	17:34	52	16:45 (T69)	18:12	76	17:02 (T69)	19:44	53	09:09 (T68)	20:16			20:47	21:07
22	07:51	15:52 (T69)	07:18		15:46 (T69)	07:33		08:16 (T68)	06:43				06:08	05:59
	17:35	54	16:46 (T69)	18:14	75	17:01 (T69)	19:45	52	09:08 (T68)	20:17			20:48	21:07
23	07:51	15:52 (T69)	07:16		15:47 (T69)	07:31		08:16 (T68)	06:42				06:07	06:00
	17:37	56	16:48 (T69)	18:15	74	17:01 (T69)	19:46	50	09:06 (T68)	20:18			20:49	21:08
24	07:50	15:51 (T69)	07:15		15:47 (T69)	07:30		08:17 (T68)	06:40				06:07	06:00
	17:38	58	16:49 (T69)	18:16	73	17:00 (T69)	19:47	49	09:06 (T68)	20:19			20:50	21:08
25	07:49	15:50 (T69)	07:13		15:48 (T69)	07:28		07:47 (T67)	06:39				06:06	06:00
	17:39	60	16:50 (T69)	18:17	72	17:00 (T69)	19:48	54	09:05 (T68)	20:20			20:51	21:08
26	07:48	15:50 (T69)	07:12		15:49 (T69)	07:26		07:45 (T67)	06:37				06:05	06:00
	17:40	61	16:51 (T69)	18:18	69	16:58 (T69)	19:50	56	09:03 (T68)	20:21			20:52	21:08
27	07:48	15:49 (T69)	07:10		15:50 (T69)	07:25		07:44 (T67)	06:36				06:05	06:01
	17:42	63	16:52 (T69)	18:20	68	16:58 (T69)	19:51	57	09:02 (T68)	20:23			20:52	21:08
28	07:47	15:48 (T69)	07:09		15:51 (T69)	07:23		07:42 (T67)	06:35				06:04	06:01
	17:43	65	16:53 (T69)	18:21	66	16:57 (T69)	19:52	58	09:01 (T68)	20:24			20:53	21:08
29	07:46	15:49 (T69)					07:21		07:40 (T67)	06:33			06:03	06:02
	17:44	66	16:55 (T69)				19:53	58	08:59 (T68)	20:25			20:54	21:08
30	07:45	15:48 (T69)					07:20		07:39 (T67)	06:32			06:03	06:02
	17:45	68	16:56 (T69)				19:54	56	08:57 (T68)	20:26			20:55	21:08
31	07:44	15:47 (T69)					07:18		07:37 (T67)				06:02	
	17:46	70	16:57 (T69)				19:55	55	08:55 (T68)				20:56	
Potential sun hours	297		297		370		399		448	452	
Total, worst case		1076		2101		2009		322			
Sun reduction		0.31		0.40		0.44		0.52			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.73		0.73		0.62		0.63			
Total reduction		0.23		0.30		0.28		0.33			
Total, real		246		620		554		106			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1549 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December		
1	06:03		06:27		06:57		07:34 (T67)		07:28		07:58 (T68)	07:02	
	21:08		20:50		20:07	12	07:46 (T67)		19:15	51	08:49 (T68)	17:28	77
2	06:03		06:28		06:58		07:31 (T67)		07:29		07:59 (T68)	07:03	
	21:08		20:49		20:05	17	07:48 (T67)		19:13	71	17:12 (T69)	17:27	78
3	06:04		06:29		06:59		07:29 (T67)		07:30		07:59 (T68)	07:04	
	21:08		20:48		20:04	21	07:50 (T67)		19:11	78	17:16 (T69)	17:26	77
4	06:04		06:30		07:00		07:27 (T67)		07:31		07:59 (T68)	07:05	
	21:08		20:47		20:02	24	07:51 (T67)		19:10	82	17:18 (T69)	17:25	77
5	06:05		06:31		07:01		07:26 (T67)		07:32		08:01 (T68)	07:07	
	21:08		20:45		20:01	25	07:51 (T67)		19:08	85	17:21 (T69)	17:23	75
6	06:05		06:31		07:02		07:25 (T67)		07:33		08:02 (T68)	07:08	
	21:07		20:44		19:57	27	07:52 (T67)		19:07	88	17:23 (T69)	17:22	74
7	06:06		06:32		07:03		07:24 (T67)		07:34		08:03 (T68)	07:09	
	21:07		20:43		19:56	28	07:52 (T67)		19:05	89	17:24 (T69)	17:21	74
8	06:07		06:33		07:04		07:25 (T67)		07:35		08:04 (T68)	07:10	
	21:07		20:42		19:54	27	07:52 (T67)		19:03	89	17:25 (T69)	17:20	73
9	06:07		06:34		07:05		07:26 (T67)		07:36		08:05 (T68)	07:11	
	21:06		20:41		19:52	41	08:39 (T68)		19:02	89	17:26 (T69)	17:19	71
10	06:08		06:35		07:06		07:27 (T67)		07:37		08:07 (T68)	07:13	
	21:06		20:39		19:51	48	08:43 (T68)		19:00	88	17:27 (T69)	17:18	70
11	06:09		06:36		07:07		07:28 (T67)		07:38		08:09 (T68)	07:14	
	21:06		20:38		19:49	51	08:45 (T68)		18:58	86	17:28 (T69)	17:17	70
12	06:09		06:37		07:08		07:28 (T67)		07:39		08:12 (T68)	07:15	
	21:05		20:37		19:47	54	08:46 (T68)		18:57	81	17:29 (T69)	17:16	68
13	06:10		06:38		07:09		07:29 (T67)		07:40		08:20 (T68)	07:16	
	21:05		20:35		19:45	55	08:47 (T68)		18:55	67	17:29 (T69)	17:15	67
14	06:11		06:39		07:10		07:30 (T67)		07:41		16:23 (T69)	07:17	
	21:04		20:34		19:44	57	08:49 (T68)		18:54	67	17:30 (T69)	17:14	65
15	06:12		06:40		07:11		07:31 (T67)		07:42		16:22 (T69)	07:19	
	21:04		20:33		19:42	58	08:50 (T68)		18:52	69	17:31 (T69)	17:13	63
16	06:12		06:41		07:12		07:32 (T67)		07:44		16:21 (T69)	07:20	
	21:03		20:31		19:40	57	08:51 (T68)		18:51	70	17:31 (T69)	17:13	61
17	06:13		06:42		07:13		07:33 (T67)		07:45		16:20 (T69)	07:21	
	21:03		20:30		19:39	56	08:51 (T68)		18:49	71	17:31 (T69)	17:12	60
18	06:14		06:43		07:14		07:34 (T67)		07:46		16:19 (T69)	07:22	
	21:02		20:28		19:37	55	08:52 (T68)		18:48	73	17:32 (T69)	17:11	58
19	06:15		06:44		07:15		07:35 (T67)		07:47		16:18 (T69)	07:23	
	21:01		20:27		19:35	51	08:52 (T68)		18:46	74	17:32 (T69)	17:10	56
20	06:16		06:45		07:16		08:02 (T68)		07:48		16:17 (T69)	07:24	
	21:01		20:26		19:34	51	08:53 (T68)		18:45	75	17:32 (T69)	17:10	54
21	06:16		06:46		07:17		08:02 (T68)		07:49		16:17 (T69)	07:26	
	21:00		20:24		19:32	51	08:53 (T68)		18:43	76	17:33 (T69)	17:09	52
22	06:17		06:47		07:18		08:01 (T68)		07:50		16:16 (T69)	07:27	
	20:59		20:23		19:30	52	08:53 (T68)		18:42	77	17:33 (T69)	17:08	50
23	06:18		06:48		07:19		08:00 (T68)		07:51		16:15 (T69)	07:28	
	20:58		20:21		19:28	53	08:53 (T68)		18:40	77	17:32 (T69)	17:08	47
24	06:19		06:49		07:20		08:00 (T68)		07:53		16:14 (T69)	07:29	
	20:57		20:20		19:27	53	08:53 (T68)		18:39	78	17:32 (T69)	17:07	45
25	06:20		06:50		07:21		07:59 (T68)		07:54		16:14 (T69)	07:30	
	20:57		20:18		19:25	54	08:53 (T68)		18:37	78	17:32 (T69)	17:06	43
26	06:21		06:51		07:22		07:59 (T68)		07:55		16:14 (T69)	07:31	
	20:56		20:17		19:23	53	08:52 (T68)		18:36	79	17:33 (T69)	17:06	40
27	06:22		06:52		07:23		07:59 (T68)		07:56		16:14 (T69)	07:32	
	20:55		20:15		19:22	53	08:52 (T68)		18:35	78	17:32 (T69)	17:06	37
28	06:23		06:53		07:24		07:58 (T68)		07:57		16:14 (T69)	07:34	
	20:54		20:13		19:20	53	08:51 (T68)		18:33	78	17:32 (T69)	17:05	34
29	06:24		06:54		07:25		07:58 (T68)		07:58		16:13 (T69)	07:35	
	20:53		20:12		19:18	53	08:51 (T68)		18:32	79	17:32 (T69)	17:05	31
30	06:25		06:55		07:26		07:58 (T68)		07:59		16:14 (T69)	07:36	
	20:52		20:10		19:17	52	08:50 (T68)		18:31	78	17:32 (T69)	17:04	27
31	06:26		06:56						08:01		16:14 (T69)		
	20:51		20:09						18:29	78	17:32 (T69)		
Potential sun hours	459		428		375				345			298	
Total, worst case						1342				2399			1774
Sun reduction						0.59				0.48			0.30
Oper. time red.						1.00				1.00			1.00
Wind dir. red.						0.59				0.70			0.73
Total reduction						0.35				0.34			0.22
Total, real						474				814			393

	December	
1	15:46 (T69)	
	16:09 (T69)	23
2	15:49 (T69)	
	16:07 (T69)	18
3	15:53 (T69)	
	16:04 (T69)	11
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
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15		
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17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
Potential sun hours	288	
Total, worst case		52
Sun reduction		0.22
Oper. time red.		1.00
Wind dir. red.		0.73
Total reduction		0.16
Total, real		8

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1551 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7436)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	15:48 (T77)	07:43		08:13 (T76)	07:07		17:04 (T42)	07:16	19:12 (T41)	06:30	
	17:13	35 16:23 (T77)	17:47	28	08:41 (T76)	18:22	29	17:33 (T42)	19:56	22 19:34 (T41)	20:27	
2	07:57	15:49 (T77)	07:42		08:14 (T76)	07:06		17:05 (T42)	07:14	19:11 (T41)	06:29	
	17:14	34 16:23 (T77)	17:49	27	08:41 (T76)	18:23	26	17:31 (T42)	19:57	24 19:35 (T41)	20:28	
3	07:57	15:49 (T77)	07:41		08:14 (T76)	07:04		17:06 (T42)	07:13	19:10 (T41)	06:28	
	17:15	34 16:23 (T77)	17:50	27	08:41 (T76)	18:24	23	17:29 (T42)	19:58	27 19:37 (T41)	20:29	
4	07:57	15:50 (T77)	07:40		08:15 (T76)	07:02		17:09 (T42)	07:11	19:09 (T41)	06:26	
	17:16	33 16:23 (T77)	17:51	25	08:40 (T76)	18:25	17	17:26 (T42)	19:59	28 19:37 (T41)	20:30	
5	07:57	15:51 (T77)	07:39		08:17 (T76)	07:01		17:13 (T42)	07:09	19:08 (T41)	06:25	
	17:16	32 16:23 (T77)	17:52	30	17:23 (T42)	18:26	8	17:21 (T42)	20:00	30 19:38 (T41)	20:31	
6	07:57	15:52 (T77)	07:38		08:17 (T76)	06:59			07:08	19:08 (T41)	06:24	
	17:17	32 16:24 (T77)	17:54	36	17:26 (T42)	18:27			20:00	31 19:39 (T41)	20:32	
7	07:57	15:52 (T77)	07:37		08:19 (T76)	06:58			07:06	19:08 (T41)	06:23	
	17:18	31 16:23 (T77)	17:55	38	17:29 (T42)	18:29			20:01	30 19:38 (T41)	20:33	
8	07:57	15:53 (T77)	07:36		08:21 (T76)	07:56			07:05	19:08 (T41)	06:22	20:09 (T40)
	17:19	30 16:23 (T77)	17:56	38	17:31 (T42)	19:30			20:02	30 19:38 (T41)	20:34	2 20:11 (T40)
9	07:57	15:54 (T77)	07:35		08:27 (T76)	07:54			07:03	19:08 (T41)	06:20	20:03 (T40)
	17:20	29 16:23 (T77)	17:57	30	17:33 (T42)	19:31			20:03	29 19:37 (T41)	20:35	9 20:12 (T40)
10	07:57	15:56 (T77)	07:34		17:04 (T42)	07:53			07:01	19:08 (T41)	06:19	20:01 (T40)
	17:21	27 16:23 (T77)	17:59	31	17:35 (T42)	19:32			20:05	28 19:36 (T41)	20:36	12 20:13 (T40)
11	07:57	08:18 (T76)	07:32		17:02 (T42)	07:51			07:00	19:09 (T41)	06:18	20:00 (T40)
	17:23	32 16:22 (T77)	18:00	33	17:35 (T42)	19:33			20:06	27 19:36 (T41)	20:37	14 20:14 (T40)
12	07:56	08:18 (T76)	07:31		17:02 (T42)	07:50			06:58	19:09 (T41)	06:17	19:59 (T40)
	17:24	33 16:22 (T77)	18:01	34	17:36 (T42)	19:34			20:07	25 19:34 (T41)	20:38	16 20:15 (T40)
13	07:56	08:18 (T76)	07:30		17:01 (T42)	07:48			06:57	19:10 (T41)	06:16	19:58 (T40)
	17:25	34 16:22 (T77)	18:02	36	17:37 (T42)	19:35			20:08	23 19:33 (T41)	20:39	18 20:16 (T40)
14	07:56	08:17 (T76)	07:29		17:00 (T42)	07:46			06:55	19:11 (T41)	06:15	19:57 (T40)
	17:26	33 16:20 (T77)	18:04	37	17:37 (T42)	19:36			20:09	20 19:31 (T41)	20:41	20 20:17 (T40)
15	07:55	08:17 (T76)	07:27		17:00 (T42)	07:45			06:53	19:12 (T41)	06:14	19:56 (T40)
	17:27	32 16:20 (T77)	18:05	38	17:38 (T42)	19:38			20:10	17 19:29 (T41)	20:42	22 20:18 (T40)
16	07:55	08:16 (T76)	07:26		16:59 (T42)	07:43			06:52	19:15 (T41)	06:13	19:56 (T40)
	17:28	31 16:18 (T77)	18:06	40	17:39 (T42)	19:39			20:11	11 19:26 (T41)	20:42	24 20:20 (T40)
17	07:54	08:16 (T76)	07:25		16:58 (T42)	07:41			06:50		06:12	19:56 (T40)
	17:29	27 16:16 (T77)	18:07	41	17:39 (T42)	19:40			20:12		20:43	24 20:20 (T40)
18	07:54	08:15 (T76)	07:23		16:59 (T42)	07:40			06:49		06:11	19:55 (T40)
	17:30	20 08:35 (T76)	18:09	40	17:39 (T42)	19:41			20:13		20:44	26 20:21 (T40)
19	07:53	08:15 (T76)	07:22		16:59 (T42)	07:38			06:47		06:10	19:55 (T40)
	17:31	22 08:37 (T76)	18:10	41	17:40 (T42)	19:42			20:14		20:45	27 20:22 (T40)
20	07:53	08:14 (T76)	07:20		16:58 (T42)	07:36			06:46		06:09	19:55 (T40)
	17:33	23 08:37 (T76)	18:11	41	17:39 (T42)	19:43			20:15		20:46	28 20:23 (T40)
21	07:52	08:13 (T76)	07:19		16:59 (T42)	07:35			06:44		06:09	19:54 (T40)
	17:34	25 08:38 (T76)	18:12	41	17:40 (T42)	19:44			20:16		20:47	29 20:23 (T40)
22	07:52	08:13 (T76)	07:18		16:58 (T42)	07:33			06:43		06:08	19:55 (T40)
	17:35	26 08:39 (T76)	18:13	41	17:39 (T42)	19:45			20:17		20:48	30 20:25 (T40)
23	07:51	08:12 (T76)	07:16		16:59 (T42)	07:31			06:41		06:07	19:55 (T40)
	17:36	28 08:40 (T76)	18:15	40	17:39 (T42)	19:46			20:18		20:49	30 20:25 (T40)
24	07:50	08:11 (T76)	07:15		16:59 (T42)	07:30			06:40		06:06	19:55 (T40)
	17:37	29 08:40 (T76)	18:16	39	17:38 (T42)	19:47			20:19		20:50	29 20:24 (T40)
25	07:49	08:10 (T76)	07:13		17:00 (T42)	07:28			06:38		06:06	19:56 (T40)
	17:39	30 08:40 (T76)	18:17	38	17:38 (T42)	19:48			20:21		20:51	29 20:25 (T40)
26	07:49	08:10 (T76)	07:12		17:00 (T42)	07:26			06:37		06:05	19:55 (T40)
	17:40	30 08:40 (T76)	18:18	36	17:36 (T42)	19:50			20:22		20:52	30 20:25 (T40)
27	07:48	08:11 (T76)	07:10		17:01 (T42)	07:24			06:36		06:04	19:55 (T40)
	17:41	31 08:42 (T76)	18:19	35	17:36 (T42)	19:51			20:23		20:53	29 20:24 (T40)
28	07:47	08:11 (T76)	07:09		17:02 (T42)	07:23		19:22 (T41)	06:34		06:04	19:56 (T40)
	17:42	31 08:42 (T76)	18:21	32	17:34 (T42)	19:52	8	19:30 (T41)	20:24		20:54	29 20:25 (T40)
29	07:46	08:12 (T76)				07:21		19:18 (T41)	06:33		06:03	19:56 (T40)
	17:44	30 08:42 (T76)				19:53	13	19:31 (T41)	20:25		20:54	28 20:24 (T40)
30	07:45	08:12 (T76)				07:19		19:15 (T41)	06:32		06:02	19:57 (T40)
	17:45	30 08:42 (T76)				19:54	17	19:32 (T41)	20:26		20:55	27 20:24 (T40)
31	07:44	08:12 (T76)				07:18		19:14 (T41)			06:02	19:57 (T40)
	17:46	30 08:42 (T76)				19:55	20	19:34 (T41)			20:56	27 20:24 (T40)
Potential sun hours	297		297			370			399		449		453	
Total, worst case		924		993			161			402		559		589
Sun reduction		0.31		0.40			0.44			0.52		0.57		0.64
Oper. time red.		1.00		1.00			1.00			1.00		1.00		1.00
Wind dir. red.		0.63		0.68			0.67			0.61		0.55		0.55
Total reduction		0.20		0.28			0.30			0.33		0.32		0.36
Total, real		185		275			49			131		180		213

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1551 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7436)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02		20:07 (T40)	06:26		20:10 (T40)	06:57		19:08 (T41)	07:27			07:02		16:33 (T42)	07:37		08:00 (T76)
	21:08	20	20:27 (T40)	20:50	15	20:25 (T40)	20:07	27	19:35 (T41)	19:15			17:28	30	17:03 (T42)	17:04	32	16:04 (T77)
2	06:03		20:07 (T40)	06:27		20:11 (T40)	06:58		19:07 (T41)	07:29			07:03		07:55 (T76)	07:38		15:38 (T77)
	21:08	20	20:27 (T40)	20:49	13	20:24 (T40)	20:06	28	19:35 (T41)	19:13			17:27	33	17:03 (T42)	17:03	27	16:05 (T77)
3	06:03		20:07 (T40)	06:28		20:13 (T40)	06:59		19:06 (T41)	07:30			07:04		07:51 (T76)	07:39		15:38 (T77)
	21:08	21	20:28 (T40)	20:48	10	20:23 (T40)	20:04	29	19:35 (T41)	19:11			17:26	38	17:01 (T42)	17:03	29	16:07 (T77)
4	06:04		20:06 (T40)	06:29		20:15 (T40)	07:00		19:05 (T41)	07:31			07:06		07:48 (T76)	07:40		15:38 (T77)
	21:08	22	20:28 (T40)	20:47	7	20:22 (T40)	20:02	30	19:35 (T41)	19:10			17:24	39	16:59 (T42)	17:03	30	16:08 (T77)
5	06:04		20:07 (T40)	06:30			07:01		19:05 (T41)	07:32			07:07		07:47 (T76)	07:41		15:38 (T77)
	21:08	22	20:29 (T40)	20:46			20:01	30	19:35 (T41)	19:08			17:23	36	16:56 (T42)	17:03	31	16:09 (T77)
6	06:05		20:06 (T40)	06:31			07:02		19:04 (T41)	07:33			07:08		07:46 (T76)	07:42		15:38 (T77)
	21:08	23	20:29 (T40)	20:44			19:57	31	19:35 (T41)	19:06			17:22	29	16:52 (T42)	17:03	32	16:10 (T77)
7	06:05		20:06 (T40)	06:32			07:03		19:04 (T41)	07:34			07:09		07:45 (T76)	07:43		15:37 (T77)
	21:07	24	20:30 (T40)	20:43			19:56	30	19:34 (T41)	19:05			17:21	25	08:10 (T76)	17:03	32	16:09 (T77)
8	06:06		20:06 (T40)	06:33			07:04		19:04 (T41)	07:35			07:10		07:44 (T76)	07:44		15:37 (T77)
	21:07	25	20:31 (T40)	20:42			19:54	29	19:33 (T41)	19:03			17:20	27	08:11 (T76)	17:03	33	16:10 (T77)
9	06:07		20:06 (T40)	06:34			07:05		19:04 (T41)	07:36		17:46 (T42)	07:12		07:44 (T76)	07:45		15:37 (T77)
	21:07	25	20:31 (T40)	20:41			19:52	27	19:31 (T41)	19:01	13	17:59 (T42)	17:19	28	08:12 (T76)	17:03	34	16:11 (T77)
10	06:07		20:06 (T40)	06:35			07:06		19:04 (T41)	07:37		17:42 (T42)	07:13		07:44 (T76)	07:46		15:38 (T77)
	21:06	26	20:32 (T40)	20:39			19:51	24	19:28 (T41)	19:00	20	18:02 (T42)	17:18	28	08:12 (T76)	17:03	34	16:12 (T77)
11	06:08		20:06 (T40)	06:36			07:07		19:04 (T41)	07:38		17:39 (T42)	07:14		07:43 (T76)	07:46		15:38 (T77)
	21:06	26	20:32 (T40)	20:38			19:49	23	19:27 (T41)	18:58	25	18:04 (T42)	17:17	30	08:13 (T76)	17:03	35	16:13 (T77)
12	06:09		20:05 (T40)	06:37			07:08		19:05 (T41)	07:39		17:37 (T42)	07:15		07:43 (T76)	07:47		15:38 (T77)
	21:06	27	20:32 (T40)	20:37			19:47	20	19:25 (T41)	18:57	28	18:05 (T42)	17:16	30	08:13 (T76)	17:03	35	16:13 (T77)
13	06:10		20:05 (T40)	06:38			07:09		19:06 (T41)	07:40		17:35 (T42)	07:16		07:43 (T76)	07:48		15:39 (T77)
	21:05	28	20:33 (T40)	20:36			19:45	17	19:23 (T41)	18:55	31	18:06 (T42)	17:15	31	08:14 (T76)	17:03	35	16:14 (T77)
14	06:10		20:05 (T40)	06:39			07:10		19:08 (T41)	07:41		17:34 (T42)	07:18		07:43 (T76)	07:49		15:39 (T77)
	21:05	28	20:33 (T40)	20:34			19:44	14	19:22 (T41)	18:54	33	18:07 (T42)	17:14	31	08:14 (T76)	17:03	35	16:14 (T77)
15	06:11		20:05 (T40)	06:40			07:11		19:11 (T41)	07:42		17:33 (T42)	07:19		07:43 (T76)	07:50		15:39 (T77)
	21:04	29	20:34 (T40)	20:33			19:42	9	19:20 (T41)	18:52	36	18:09 (T42)	17:13	31	08:14 (T76)	17:03	36	16:15 (T77)
16	06:12		20:05 (T40)	06:41			07:12			07:44		17:32 (T42)	07:20		07:43 (T76)	07:50		15:40 (T77)
	21:03	28	20:33 (T40)	20:31			19:40			18:50	37	18:09 (T42)	17:12	30	08:13 (T76)	17:04	36	16:16 (T77)
17	06:13		20:05 (T40)	06:42			07:13			07:45		17:31 (T42)	07:21		07:44 (T76)	07:51		15:39 (T77)
	21:03	29	20:34 (T40)	20:30			19:39			18:49	38	18:09 (T42)	17:11	30	08:14 (T76)	17:04	37	16:16 (T77)
18	06:14		20:05 (T40)	06:43			07:14			07:46		17:30 (T42)	07:22		07:45 (T76)	07:52		15:40 (T77)
	21:02	29	20:34 (T40)	20:29			19:37			18:47	39	18:09 (T42)	17:11	29	08:14 (T76)	17:04	37	16:17 (T77)
19	06:14		20:05 (T40)	06:44			07:15			07:47		17:29 (T42)	07:23		07:46 (T76)	07:52		15:41 (T77)
	21:02	30	20:35 (T40)	20:27			19:35			18:46	40	18:09 (T42)	17:10	28	08:14 (T76)	17:05	36	16:17 (T77)
20	06:15		20:05 (T40)	06:45			07:16			07:48		17:29 (T42)	07:25		07:48 (T76)	07:53		15:41 (T77)
	21:01	30	20:35 (T40)	20:26			19:33			18:44	40	18:09 (T42)	17:09	26	08:14 (T76)	17:05	36	16:17 (T77)
21	06:16		20:05 (T40)	06:46			07:17			07:49		17:29 (T42)	07:26		07:49 (T76)	07:53		15:42 (T77)
	21:00	29	20:34 (T40)	20:24			19:32			18:43	41	18:10 (T42)	17:08	25	08:14 (T76)	17:05	36	16:18 (T77)
22	06:17		20:05 (T40)	06:47			07:18			07:50		17:29 (T42)	07:27		07:50 (T76)	07:54		15:42 (T77)
	20:59	29	20:34 (T40)	20:23			19:30			18:41	41	18:10 (T42)	17:08	23	08:13 (T76)	17:06	36	16:18 (T77)
23	06:18		20:05 (T40)	06:48			07:19			07:51		17:29 (T42)	07:28		07:51 (T76)	07:54		15:43 (T77)
	20:59	28	20:33 (T40)	20:21			19:28			18:40	40	18:09 (T42)	17:07	22	08:13 (T76)	17:07	36	16:19 (T77)
24	06:19		20:05 (T40)	06:49			07:20			07:53		17:28 (T42)	07:29		07:52 (T76)	07:55		15:43 (T77)
	20:58	28	20:33 (T40)	20:20			19:27			18:39	41	18:09 (T42)	17:07	20	08:12 (T76)	17:07	36	16:19 (T77)
25	06:20		20:06 (T40)	06:50			07:21			07:54		17:29 (T42)	07:30		07:54 (T76)	07:55		15:43 (T77)
	20:57	26	20:32 (T40)	20:18			19:25			18:37	40	18:09 (T42)	17:06	27	15:54 (T77)	17:08	37	16:20 (T77)
26	06:21		20:06 (T40)	06:51			07:22			07:55		17:29 (T42)	07:32		07:55 (T76)	07:56		15:44 (T77)
	20:56	25	20:31 (T40)	20:17			19:23			18:36	40	18:09 (T42)	17:06	30	15:57 (T77)	17:08	37	16:21 (T77)
27	06:22		20:07 (T40)	06:52		19:17 (T41)	07:23			07:56		17:29 (T42)	07:33		07:56 (T76)	07:56		15:45 (T77)
	20:55	24	20:31 (T40)	20:15	11	19:28 (T41)	19:21			18:34	39	18:08 (T42)	17:05	32	15:59 (T77)	17:09	36	16:21 (T77)
28	06:22		20:06 (T40)	06:53		19:14 (T41)	07:24			07:57		17:30 (T42)	07:34		07:57 (T76)	07:56		15:45 (T77)
	20:54	23	20:29 (T40)	20:14	17	19:31 (T41)	19:20			18:33	37	18:07 (T42)	17:05	33	16:00 (T77)	17:10	36	16:21 (T77)
29	06:23		20:07 (T40)	06:54		19:12 (T41)	07:25			07:58		17:30 (T42)	07:35		07:58 (T76)	07:57		15:45 (T77)
	20:53	21	20:28 (T40)	20:12	20	19:32 (T41)	19:18			18:32	36	18:06 (T42)	17:04	34	16:02 (T77)	17:10	36	16:21 (T77)
30	06:24		20:08 (T40)	06:55		19:10 (T41)	07:26			08:00		17:31 (T42)	07:36		07:59 (T76)	07:57		15:47 (T77)
	20:52	19	20:27 (T40)	20:10	23	19:33 (T41)	19:16			18:30	35	18:06 (T42)	17:04	33	16:03 (T77)	17:11	35	16:22 (T77)
31	06:25		20:09 (T40)	06:56		19:09 (T41)				08:01		17:32 (T42)				07:57		15:47 (T77)
	20:51	17	20:26 (T40)	20:09	25	19:34 (T41)				18:29	33	18:05 (T42)				17:12	35	16:22 (T77)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		781			141			368			803			888			1068	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.55			0.59			0.61			0.71			0.58			0.74	
Total reduction		0.37			0.37			0.37			0.35			0.18			0.17	
Total, real		292			52			136			280			157			179	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1552 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7437)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58		07:44		07:07		07:16		07:52 (T25)		06:30	
	17:13		17:48		18:22		19:56	67	08:59 (T25)	66	20:27	66
2	07:58		07:43		07:06		07:15		07:52 (T25)		06:29	
	17:14		17:49		18:23		19:57	68	09:00 (T25)	65	20:28	65
3	07:58		07:42		07:04		07:13		07:51 (T25)		06:28	
	17:15		17:50		18:24		19:58	69	09:00 (T25)	64	20:29	64
4	07:58		07:41		07:03		07:11		07:49 (T25)		06:26	
	17:16		17:51		18:25	11	07:34 (T26)	71	09:00 (T25)	64	20:30	64
5	07:58		07:40		07:01		07:20 (T26)		07:10		07:49 (T25)	
	17:17		17:53		18:26	16	07:36 (T26)	71	09:00 (T25)	62	20:32	62
6	07:58		07:39		07:00		07:19 (T26)		07:08		07:48 (T25)	
	17:17		17:54		18:28	20	07:39 (T26)	72	09:00 (T25)	60	20:33	60
7	07:58		07:37		06:58		07:17 (T26)		07:06		07:47 (T25)	
	17:18		17:55		18:29	23	07:40 (T26)	73	09:00 (T25)	57	20:34	57
8	07:58		07:36		07:56		08:16 (T26)		07:05		07:47 (T25)	
	17:19		17:56		19:30	26	08:42 (T26)	73	09:00 (T25)	54	20:35	54
9	07:57		07:35		07:55		08:14 (T26)		07:03		07:46 (T25)	
	17:20		17:58		19:31	28	08:42 (T26)	73	08:59 (T25)	50	20:36	50
10	07:57		07:34		07:53		08:12 (T26)		07:01		07:45 (T25)	
	17:21		17:59		19:32	30	08:42 (T26)	74	08:59 (T25)	43	20:37	43
11	07:57		07:33		07:51		08:11 (T26)		07:00		07:45 (T25)	
	17:23		18:00		19:33	32	08:43 (T26)	74	08:59 (T25)	30	20:38	30
12	07:57		07:31		07:50		08:10 (T26)		06:58		07:45 (T25)	
	17:24		18:01		19:34	33	08:43 (T26)	73	08:58 (T25)	30	20:39	30
13	07:56		07:30		07:48		08:09 (T26)		06:57		07:45 (T25)	
	17:25		18:03		19:36	33	08:42 (T26)	73	08:58 (T25)	29	20:40	29
14	07:56		07:29		07:46		08:09 (T26)		06:55		07:44 (T25)	
	17:26		18:04		19:37	34	08:43 (T26)	74	08:58 (T25)	29	20:41	29
15	07:56		07:28		07:45		08:09 (T26)		06:54		07:45 (T25)	
	17:27		18:05		19:38	33	08:42 (T26)	73	08:58 (T25)	28	20:42	28
16	07:55		07:26		07:43		08:08 (T26)		06:52		07:44 (T25)	
	17:28		18:06		19:39	33	08:41 (T26)	72	08:56 (T25)	27	20:43	27
17	07:55		07:25		07:41		08:09 (T26)		06:50		07:45 (T25)	
	17:29		18:07		19:40	32	08:41 (T26)	71	08:56 (T25)	27	20:44	27
18	07:54		07:24		07:40		08:09 (T26)		06:49		07:44 (T25)	
	17:30		18:09		19:41	31	08:40 (T26)	71	08:55 (T25)	25	20:45	25
19	07:54		07:22		07:38		08:09 (T26)		06:47		07:45 (T25)	
	17:32		18:10		19:42	30	08:39 (T26)	70	08:55 (T25)	24	20:46	24
20	07:53		07:21		07:36		08:11 (T26)		06:46		07:45 (T25)	
	17:33		18:11		19:43	30	08:41 (T25)	69	08:54 (T25)	23	20:47	23
21	07:53		07:19		07:35		08:11 (T26)		06:44		07:45 (T25)	
	17:34		18:12		19:44	34	08:45 (T25)	68	08:53 (T25)	22	20:48	22
22	07:52		07:18		07:33		08:11 (T25)		06:43		07:45 (T25)	
	17:35		18:14		19:45	36	08:47 (T25)	67	08:52 (T25)	20	20:49	20
23	07:51		07:16		07:31		08:07 (T25)		06:41		07:46 (T25)	
	17:36		18:15		19:46	42	08:49 (T25)	65	08:51 (T25)	18	20:50	18
24	07:51		07:15		07:30		08:06 (T25)		06:40		07:46 (T25)	
	17:38		18:16		19:48	46	08:52 (T25)	64	08:50 (T25)	16	20:50	16
25	07:50		07:13		07:28		08:03 (T25)		06:39		07:46 (T25)	
	17:39		18:17		19:49	50	08:53 (T25)	63	08:49 (T25)	13	20:51	13
26	07:49		07:12		07:26		08:01 (T25)		06:37		07:47 (T25)	
	17:40		18:18		19:50	53	08:54 (T25)	61	08:48 (T25)	9	20:52	9
27	07:48		07:10		07:25		08:00 (T25)		06:36		07:47 (T25)	
	17:41		18:19		19:51	56	08:56 (T25)	59	08:46 (T25)	2	20:53	2
28	07:47		07:09		07:23		07:58 (T25)		06:34		07:48 (T25)	
	17:43		18:21		19:52	59	08:57 (T25)	58	08:46 (T25)		20:54	
29	07:47				07:21		07:56 (T25)		06:33		06:53 (T75)	
	17:44				19:53	61	08:57 (T25)	64	08:45 (T25)		20:55	
30	07:46				07:20		07:55 (T25)		06:32		06:51 (T75)	
	17:45				19:54	64	08:59 (T25)	65	08:43 (T25)		20:56	
31	07:45				07:18		07:54 (T25)				06:02	
	17:46				19:55	65	08:59 (T25)				20:56	
Potential sun hours	297		297		370		399		449		453	
Total, worst case						1041		2065		957		
Sun reduction						0.44		0.52		0.57		
Oper. time red.						1.00		1.00		1.00		
Wind dir. red.						0.60		0.62		0.67		
Total reduction						0.26		0.32		0.38		
Total, real						274		666		364		

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

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

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1552 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7437)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02		06:26		06:50 (T75)	06:57	07:44 (T25)	07:28	07:49 (T26)	07:02	07:37
	21:09		20:50	29	07:19 (T75)	20:07 74	08:58 (T25)	19:15 34	08:23 (T26)	17:28	17:04
2	06:03		06:27		06:50 (T75)	06:58	07:44 (T25)	07:29	07:49 (T26)	07:03	07:38
	21:09		20:49	29	07:19 (T75)	20:06 74	08:58 (T25)	19:13 33	08:22 (T26)	17:27	17:03
3	06:03		06:28		06:50 (T75)	06:59	07:44 (T25)	07:30	07:50 (T26)	07:05	07:39
	21:09		20:48	45	08:33 (T25)	20:04 73	08:57 (T25)	19:12 31	08:21 (T26)	17:26	17:03
4	06:04		06:29		06:51 (T75)	07:00	07:44 (T25)	07:31	07:51 (T26)	07:06	07:40
	21:08		20:47	52	08:37 (T25)	20:03 73	08:57 (T25)	19:10 29	08:20 (T26)	17:24	17:03
5	06:04		06:30		06:52 (T75)	07:01	07:44 (T25)	07:32	07:52 (T26)	07:07	07:41
	21:08		20:46	55	08:39 (T25)	20:01 73	08:57 (T25)	19:08 27	08:19 (T26)	17:23	17:03
6	06:05		06:31		06:53 (T75)	07:02	07:44 (T25)	07:33	07:53 (T26)	07:08	07:42
	21:08		20:45	59	08:42 (T25)	19:58 72	08:56 (T25)	19:07 24	08:17 (T26)	17:22	17:03
7	06:05		06:32		06:54 (T75)	07:03	07:44 (T25)	07:34	07:54 (T26)	07:09	07:43
	21:08		20:44	60	08:43 (T25)	19:56 71	08:55 (T25)	19:05 21	08:15 (T26)	17:21	17:03
8	06:06		06:33		06:55 (T75)	07:04	07:44 (T25)	07:35	07:55 (T26)	07:11	07:44
	21:07		20:42	63	08:45 (T25)	19:54 71	08:55 (T25)	19:03 18	08:13 (T26)	17:20	17:03
9	06:07		06:34		06:56 (T75)	07:05	07:45 (T25)	07:36	07:56 (T26)	07:12	07:45
	21:07		20:41	65	08:47 (T25)	19:52 69	08:54 (T25)	19:02 14	08:10 (T26)	17:19	17:03
10	06:07		06:35		06:57 (T75)	07:06	07:45 (T25)	07:37	08:00 (T26)	07:13	07:46
	21:07		20:40	65	08:48 (T25)	19:51 68	08:53 (T25)	19:00 5	08:05 (T26)	17:18	17:03
11	06:08		06:36		06:58 (T75)	07:07	07:45 (T25)	07:38		07:14	07:47
	21:06		20:39	65	08:49 (T25)	19:49 67	08:52 (T25)	18:58		17:17	17:03
12	06:09		06:37		06:59 (T75)	07:08	07:46 (T25)	07:39		07:15	07:48
	21:06		20:37	66	08:51 (T25)	19:47 65	08:51 (T25)	18:57		17:16	17:03
13	06:10		06:38		07:00 (T75)	07:09	07:46 (T25)	07:40		07:17	07:48
	21:05		20:36	65	08:52 (T25)	19:46 64	08:50 (T25)	18:55		17:15	17:03
14	06:10		06:39		07:01 (T75)	07:10	07:47 (T25)	07:42		07:18	07:49
	21:05		20:35	63	08:53 (T25)	19:44 62	08:49 (T25)	18:54		17:14	17:03
15	06:11		06:40		07:56 (T25)	07:11	07:47 (T25)	07:43		07:19	07:50
	21:04		20:33	58	08:54 (T25)	19:42 59	08:46 (T25)	18:52		17:13	17:03
16	06:12		06:41		07:55 (T25)	07:12	07:48 (T25)	07:44		07:20	07:51
	21:04		20:32	59	08:54 (T25)	19:41 57	08:45 (T25)	18:51		17:12	17:04
17	06:13	07:01 (T75)	06:42		07:54 (T25)	07:13	07:49 (T25)	07:45		07:21	07:51
	21:03	6 07:07 (T75)	20:30	61	08:55 (T25)	19:39 54	08:43 (T25)	18:49		17:11	17:04
18	06:14	06:59 (T75)	06:43		07:53 (T25)	07:14	07:50 (T25)	07:46		07:23	07:52
	21:03	11 07:10 (T75)	20:29	63	08:56 (T25)	19:37 51	08:41 (T25)	18:47		17:11	17:04
19	06:14	06:57 (T75)	06:44		07:51 (T25)	07:15	07:52 (T25)	07:47		07:24	07:53
	21:02	15 07:12 (T75)	20:27	65	08:56 (T25)	19:35 47	08:39 (T25)	18:46		17:10	17:05
20	06:15	06:56 (T75)	06:45		07:50 (T25)	07:16	07:53 (T25)	07:48		07:25	07:53
	21:01	17 07:13 (T75)	20:26	66	08:56 (T25)	19:34 43	08:36 (T25)	18:45		17:09	17:05
21	06:16	06:55 (T75)	06:46		07:50 (T25)	07:17	07:55 (T25)	07:49		07:26	07:54
	21:00	19 07:14 (T75)	20:25	67	08:57 (T25)	19:32 39	08:34 (T25)	18:43		17:09	17:06
22	06:17	06:54 (T75)	06:47		07:49 (T25)	07:18	07:56 (T26)	07:51		07:27	07:54
	21:00	21 07:15 (T75)	20:23	68	08:57 (T25)	19:30 34	08:30 (T25)	18:42		17:08	17:06
23	06:18	06:53 (T75)	06:48		07:48 (T25)	07:19	07:54 (T26)	07:52		07:28	07:55
	20:59	23 07:16 (T75)	20:22	69	08:57 (T25)	19:29 32	08:26 (T25)	18:40		17:07	17:07
24	06:19	06:53 (T75)	06:49		07:48 (T25)	07:20	07:53 (T26)	07:53		07:30	07:55
	20:58	24 07:17 (T75)	20:20	70	08:58 (T25)	19:27 29	08:22 (T26)	18:39		17:07	17:07
25	06:20	06:52 (T75)	06:50		07:47 (T25)	07:22	07:52 (T26)	07:54		07:31	07:56
	20:57	25 07:17 (T75)	20:18	71	08:58 (T25)	19:25 30	08:22 (T26)	18:37		17:06	17:08
26	06:21	06:52 (T75)	06:51		07:47 (T25)	07:23	07:51 (T26)	07:55		07:32	07:56
	20:56	26 07:18 (T75)	20:17	71	08:58 (T25)	19:23 32	08:23 (T26)	18:36		17:06	17:08
27	06:22	06:52 (T75)	06:52		07:46 (T25)	07:24	07:50 (T26)	07:56		07:33	07:56
	20:55	27 07:19 (T75)	20:15	72	08:58 (T25)	19:22 33	08:23 (T26)	18:35		17:05	17:09
28	06:22	06:51 (T75)	06:53		07:46 (T25)	07:25	07:49 (T26)	07:58		07:34	07:57
	20:54	28 07:19 (T75)	20:14	72	08:58 (T25)	19:20 34	08:23 (T26)	18:33		17:05	17:10
29	06:23	06:50 (T75)	06:54		07:45 (T25)	07:26	07:49 (T26)	07:59		07:35	07:57
	20:53	29 07:19 (T75)	20:12	73	08:58 (T25)	19:18 33	08:22 (T26)	18:32		17:04	17:10
30	06:24	06:50 (T75)	06:55		07:45 (T25)	07:27	07:49 (T26)	08:00		07:36	07:57
	20:52	29 07:19 (T75)	20:11	73	08:58 (T25)	19:17 33	08:22 (T26)	18:31		17:04	17:11
31	06:25	06:50 (T75)	06:56		07:45 (T25)			08:01			07:57
	20:51	29 07:19 (T75)	20:09	73	08:58 (T25)			18:29			17:12
Potential sun hours	460		429		375		345		297	287	
Total, worst case		329		1932		1616		236			
Sun reduction		0.66		0.61		0.59		0.48			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.70		0.63		0.61		0.58			
Total reduction		0.46		0.38		0.36		0.28			
Total, real		151		744		584		66			

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1568 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7445)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April	May	June
1	07:57	15:49 (T30)	07:44		08:04 (T31)		07:07	07:29 (T28)	07:16	06:30	06:01
	17:13	46	16:35 (T30)	17:47	47	16:32 (T30)	18:22	35	08:04 (T28)	19:56	20:27	20:57
2	07:57	15:49 (T30)	07:43		08:03 (T31)		07:06	07:27 (T28)	07:14	06:29	06:01
	17:14	47	16:36 (T30)	17:49	42	16:29 (T30)	18:23	37	08:04 (T28)	19:57	20:28	20:58
3	07:58	15:50 (T30)	07:42		08:03 (T31)		07:04	07:26 (T28)	07:13	06:28	06:00
	17:15	46	16:36 (T30)	17:50	31	08:34 (T31)	18:24	39	08:05 (T28)	19:58	20:29	20:58
4	07:58	15:50 (T30)	07:40		08:03 (T31)		07:02	07:25 (T28)	07:11	06:26	06:00
	17:15	47	16:37 (T30)	17:51	31	08:34 (T31)	18:25	41	08:06 (T28)	19:59	20:30	20:59
5	07:58	15:51 (T30)	07:39		08:03 (T31)		07:01	07:24 (T28)	07:09	06:25	06:00
	17:16	46	16:37 (T30)	17:52	32	08:35 (T31)	18:26	42	08:06 (T28)	20:00	20:31	21:00
6	07:58	15:51 (T30)	07:38		08:03 (T31)		06:59	07:24 (T28)	07:08	06:24	05:59
	17:17	47	16:38 (T30)	17:54	31	08:34 (T31)	18:27	54	18:04 (T27)	20:00	20:32	21:01
7	07:57	15:52 (T30)	07:37		08:03 (T31)		06:58	07:23 (T28)	07:06	06:23	05:59
	17:18	46	16:38 (T30)	17:55	31	08:34 (T31)	18:29	62	18:07 (T27)	20:01	20:33	21:01
8	07:57	15:51 (T30)	07:36		08:04 (T31)		07:56	08:22 (T28)	07:05	06:21	05:59
	17:19	47	16:38 (T30)	17:56	29	08:33 (T31)	19:30	66	19:08 (T27)	20:02	20:34	21:02
9	07:57	15:52 (T30)	07:35		08:05 (T31)		07:54	08:22 (T28)	07:03	06:20	05:59
	17:20	47	16:39 (T30)	17:57	28	08:33 (T31)	19:31	70	19:10 (T27)	20:03	20:35	21:03
10	07:57	15:53 (T30)	07:34		08:06 (T31)		07:53	08:21 (T28)	07:01	06:19	05:58
	17:21	46	16:39 (T30)	17:59	27	08:33 (T31)	19:32	72	19:10 (T27)	20:05	20:37	21:03
11	07:57	15:53 (T30)	07:32		08:06 (T31)		07:51	08:21 (T28)	07:00	06:18	05:58
	17:22	47	16:40 (T30)	18:00	25	08:31 (T31)	19:33	74	19:11 (T27)	20:06	20:38	21:04
12	07:56	15:53 (T30)	07:31		08:07 (T31)		07:50	08:21 (T28)	06:58	06:17	05:58
	17:23	47	16:40 (T30)	18:01	23	08:30 (T31)	19:34	77	19:13 (T27)	20:07	20:39	21:04
13	07:56	15:54 (T30)	07:30		08:09 (T31)		07:48	08:21 (T28)	06:56	06:16	05:58
	17:25	46	16:40 (T30)	18:02	20	08:29 (T31)	19:35	77	19:13 (T27)	20:08	20:40	21:05
14	07:56	15:54 (T30)	07:29		08:11 (T31)		07:46	08:21 (T28)	06:55	06:15	05:58
	17:26	46	16:40 (T30)	18:04	17	08:28 (T31)	19:36	77	19:13 (T27)	20:09	20:41	21:05
15	07:55	15:55 (T30)	07:27		08:13 (T31)		07:45	08:22 (T28)	06:53	06:14	05:58
	17:27	46	16:41 (T30)	18:05	11	08:24 (T31)	19:38	77	19:14 (T27)	20:10	20:42	21:06
16	07:55	15:55 (T30)	07:26				07:43	08:22 (T28)	06:52	06:13	05:58
	17:28	46	16:41 (T30)	18:06			19:39	75	19:13 (T27)	20:11	20:43	21:06
17	07:55	15:56 (T30)	07:25				07:41	08:22 (T28)	06:50	06:12	05:58
	17:29	45	16:41 (T30)	18:07			19:40	74	19:13 (T27)	20:12	20:44	21:06
18	07:54	15:56 (T30)	07:23				07:40	08:23 (T28)	06:49	06:11	05:58
	17:30	45	16:41 (T30)	18:09			19:41	72	19:13 (T27)	20:13	20:45	21:07
19	07:53	15:58 (T30)	07:22				07:38	08:24 (T28)	06:47	06:10	05:58
	17:31	44	16:42 (T30)	18:10			19:42	68	19:12 (T27)	20:14	20:46	21:07
20	07:53	15:58 (T30)	07:21				07:36	08:25 (T28)	06:46	06:09	05:58
	17:33	43	16:41 (T30)	18:11			19:43	64	19:11 (T27)	20:15	20:46	21:07
21	07:52	08:13 (T31)	07:19				07:35	08:27 (T28)	06:44	06:08	05:59
	17:34	49	16:41 (T30)	18:12			19:44	60	19:11 (T27)	20:16	20:47	21:08
22	07:52	08:13 (T31)	07:18				07:33	08:28 (T28)	06:43	06:08	05:59
	17:35	51	16:41 (T30)	18:13			19:45	54	19:09 (T27)	20:17	20:48	21:08
23	07:51	08:12 (T31)	07:16				07:31	08:30 (T28)	06:41	06:07	05:59
	17:36	53	16:41 (T30)	18:15			19:46	47	19:08 (T27)	20:18	20:49	21:08
24	07:50	08:11 (T31)	07:15		07:41 (T28)		07:30	08:35 (T28)	06:40	06:06	05:59
	17:37	54	16:40 (T30)	18:16	11	07:52 (T28)	19:47	36	19:07 (T27)	20:20	20:50	21:08
25	07:50	08:10 (T31)	07:13		07:37 (T28)		07:28	18:42 (T27)	06:38	06:05	06:00
	17:39	55	16:40 (T30)	18:17	20	07:57 (T28)	19:48	23	19:05 (T27)	20:21	20:51	21:08
26	07:49	08:10 (T31)	07:12		07:34 (T28)		07:26	18:44 (T27)	06:37	06:05	06:00
	17:40	55	16:40 (T30)	18:18	25	07:59 (T28)	19:50	18	19:02 (T27)	20:22	20:52	21:09
27	07:48	08:09 (T31)	07:10		07:32 (T28)		07:24	18:46 (T27)	06:36	06:04	06:00
	17:41	55	16:39 (T30)	18:19	29	08:01 (T28)	19:51	12	18:58 (T27)	20:23	20:53	21:09
28	07:47	08:08 (T31)	07:09		07:30 (T28)		07:23		06:34	06:03	06:01
	17:42	55	16:38 (T30)	18:20	32	08:02 (T28)	19:52			20:24	20:54	21:09
29	07:46	08:07 (T31)					07:21			06:33	06:03	06:01
	17:44	54	16:37 (T30)				19:53			20:25	20:55	21:09
30	07:45	08:06 (T31)					07:19			06:31	06:02	06:01
	17:45	53	16:36 (T30)				19:54			20:26	20:55	21:09
31	07:44	08:05 (T31)					07:18				06:02	
	17:46	51	16:34 (T30)				19:55				20:56	
Potential sun hours	297		297			370			399	449	453	
Total, worst case		1505		542			1503					
Sun reduction		0.31		0.40			0.44					
Oper. time red.		1.00		1.00			1.00					
Wind dir. red.		0.71		0.55			0.61					
Total reduction		0.23		0.23			0.27					
Total, real		340		123			411					

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

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

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1568 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7445)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September			October			November			December		
1	06:02		06:26		06:57			07:27		08:00 (T28)	07:02		07:34 (T31)	07:37		15:36 (T30)
	21:09		20:50		20:07			19:15	77	18:52 (T27)	17:28	28	08:02 (T31)	17:04	46	16:22 (T30)
2	06:02		06:27		06:58			07:29		08:00 (T28)	07:03		07:34 (T31)	07:38		15:36 (T30)
	21:08		20:49		20:06			19:13	74	18:50 (T27)	17:27	29	08:03 (T31)	17:03	46	16:22 (T30)
3	06:03		06:28		06:59			07:30		07:59 (T28)	07:04		07:33 (T31)	07:39		15:36 (T30)
	21:08		20:48		20:04			19:11	74	18:49 (T27)	17:25	30	08:03 (T31)	17:03	47	16:23 (T30)
4	06:03		06:29		07:00			07:31		07:59 (T28)	07:06		07:33 (T31)	07:40		15:36 (T30)
	21:08		20:47		20:02			19:10	71	18:47 (T27)	17:24	31	08:04 (T31)	17:03	47	16:23 (T30)
5	06:04		06:30		07:01			07:32		07:59 (T28)	07:07		07:32 (T31)	07:41		15:37 (T30)
	21:08		20:46		20:01			19:08	68	18:46 (T27)	17:23	32	08:04 (T31)	17:03	47	16:24 (T30)
6	06:05		06:31		07:02			07:33		07:59 (T28)	07:08		07:33 (T31)	07:42		15:37 (T30)
	21:08		20:45		19:57			19:06	63	18:44 (T27)	17:22	31	08:04 (T31)	17:03	47	16:24 (T30)
7	06:05		06:32		07:03			07:34		07:59 (T28)	07:09		07:33 (T31)	07:43		15:38 (T30)
	21:08		20:43		19:56			19:05	59	18:42 (T27)	17:21	31	08:04 (T31)	17:02	46	16:24 (T30)
8	06:06		06:33		07:04			07:35		07:59 (T28)	07:10		07:33 (T31)	07:44		15:38 (T30)
	21:07		20:42		19:54			19:03	47	18:36 (T27)	17:20	31	08:04 (T31)	17:02	47	16:25 (T30)
9	06:07		06:34		07:05			07:36		08:00 (T28)	07:12		07:34 (T31)	07:45		15:38 (T30)
	21:07		20:41		19:52			19:01	41	08:41 (T28)	17:19	43	16:00 (T30)	17:02	46	16:24 (T30)
10	06:07		06:35		07:06			07:37		08:00 (T28)	07:13		07:35 (T31)	07:46		15:38 (T30)
	21:06		20:40		19:51			19:00	40	08:40 (T28)	17:18	47	16:03 (T30)	17:02	47	16:25 (T30)
11	06:08		06:36		07:07			07:38		08:00 (T28)	07:14		07:36 (T31)	07:47		15:39 (T30)
	21:06		20:38		19:49			18:58	39	08:39 (T28)	17:17	51	16:05 (T30)	17:02	46	16:25 (T30)
12	06:09		06:37		07:08			07:39		08:01 (T28)	07:15		07:37 (T31)	07:47		15:40 (T30)
	21:06		20:37		19:47			18:57	36	08:37 (T28)	17:16	53	16:07 (T30)	17:03	46	16:26 (T30)
13	06:09		06:38		07:09			07:40		08:02 (T28)	07:16		07:39 (T31)	07:48		15:40 (T30)
	21:05		20:36		19:45			18:55	34	08:36 (T28)	17:15	54	16:09 (T30)	17:03	46	16:26 (T30)
14	06:10		06:39		07:10			07:41		08:04 (T28)	07:18		07:40 (T31)	07:49		15:41 (T30)
	21:05		20:34		19:44			18:53	31	08:35 (T28)	17:14	55	16:10 (T30)	17:03	46	16:27 (T30)
15	06:11		06:40		07:11			07:42		08:05 (T28)	07:19		07:41 (T31)	07:50		15:41 (T30)
	21:04		20:33		19:42			18:52	28	08:33 (T28)	17:13	55	16:11 (T30)	17:03	46	16:27 (T30)
16	06:12		06:41		07:12		18:37 (T27)	07:44		08:07 (T28)	07:20		07:43 (T31)	07:50		15:42 (T30)
	21:04		20:32		19:40	10	18:47 (T27)	18:50	23	08:30 (T28)	17:12	55	16:13 (T30)	17:03	45	16:27 (T30)
17	06:13		06:42		07:13		18:33 (T27)	07:45		08:10 (T28)	07:21		07:44 (T31)	07:51		15:43 (T30)
	21:03		20:30		19:39	17	18:50 (T27)	18:49	17	08:27 (T28)	17:11	55	16:14 (T30)	17:04	45	16:28 (T30)
18	06:13		06:43		07:14		18:30 (T27)	07:46		08:15 (T28)	07:22		07:45 (T31)	07:52		15:42 (T30)
	21:02		20:29		19:37	22	18:52 (T27)	18:47	6	08:21 (T28)	17:10	54	16:14 (T30)	17:04	46	16:28 (T30)
19	06:14		06:44		07:15		08:24 (T28)	07:47			07:24		07:46 (T31)	07:52		15:43 (T30)
	21:02		20:27		19:35	30	18:53 (T27)	18:46			17:10	53	16:15 (T30)	17:04	46	16:29 (T30)
20	06:15		06:45		07:16		08:17 (T28)	07:48			07:25		07:48 (T31)	07:53		15:43 (T30)
	21:01		20:26		19:33	45	18:54 (T27)	18:44			17:09	51	16:16 (T30)	17:05	46	16:29 (T30)
21	06:16		06:46		07:17		08:14 (T28)	07:49			07:26		07:49 (T31)	07:53		15:44 (T30)
	21:00		20:24		19:32	53	18:55 (T27)	18:43			17:08	49	16:17 (T30)	17:05	46	16:30 (T30)
22	06:17		06:47		07:18		08:12 (T28)	07:50			07:27		15:34 (T30)	07:54		15:44 (T30)
	20:59		20:23		19:30	58	18:55 (T27)	18:41			17:08	43	16:17 (T30)	17:06	46	16:30 (T30)
23	06:18		06:48		07:19		08:09 (T28)	07:51			07:28		15:34 (T30)	07:54		15:45 (T30)
	20:59		20:21		19:28	64	18:55 (T27)	18:40			17:07	44	16:18 (T30)	17:06	46	16:31 (T30)
24	06:19		06:49		07:20		08:08 (T28)	07:53			07:29		15:34 (T30)	07:55		15:45 (T30)
	20:58		20:20		19:27	66	18:55 (T27)	18:39			17:07	45	16:19 (T30)	17:07	46	16:31 (T30)
25	06:20		06:50		07:21		08:06 (T28)	07:54			07:31		15:34 (T30)	07:55		15:45 (T30)
	20:57		20:18		19:25	70	18:55 (T27)	18:37			17:06	45	16:19 (T30)	17:07	46	16:31 (T30)
26	06:20		06:51		07:22		08:05 (T28)	07:55			07:32		15:34 (T30)	07:56		15:47 (T30)
	20:56		20:17		19:23	73	18:55 (T27)	18:36			17:05	46	16:20 (T30)	17:08	45	16:32 (T30)
27	06:21		06:52		07:23		08:04 (T28)	07:56		08:42 (T31)	07:33		15:34 (T30)	07:56		15:47 (T30)
	20:55		20:15		19:21	75	18:55 (T27)	18:34	13	08:55 (T31)	17:05	46	16:20 (T30)	17:09	45	16:32 (T30)
28	06:22		06:53		07:24		08:02 (T28)	07:57		08:39 (T31)	07:34		15:34 (T30)	07:56		15:47 (T30)
	20:54		20:14		19:20	77	18:54 (T27)	18:33	18	08:57 (T31)	17:05	46	16:20 (T30)	17:09	46	16:33 (T30)
29	06:23		06:54		07:25		08:02 (T28)	07:58		08:38 (T31)	07:35		15:34 (T30)	07:57		15:48 (T30)
	20:53		20:12		19:18	77	18:54 (T27)	18:32	21	08:59 (T31)	17:04	47	16:21 (T30)	17:10	46	16:34 (T30)
30	06:24		06:55		07:26		08:01 (T28)	08:00		08:37 (T31)	07:36		15:34 (T30)	07:57		15:48 (T30)
	20:52		20:10		19:16	77	18:53 (T27)	18:30	23	09:00 (T31)	17:04	47	16:21 (T30)	17:11	46	16:34 (T30)
31	06:25		06:56					08:01		08:35 (T31)				07:57		15:49 (T30)
	20:51		20:09					18:29	26	09:01 (T31)				17:12	46	16:35 (T30)
Potential sun hours	460		429		375			345			297			287		
Total, worst case						814			929			1327			1428	
Sun reduction						0.59			0.48			0.30			0.22	
Oper. time red.						1.00			1.00			1.00			1.00	
Wind dir. red.						0.62			0.58			0.66			0.74	
Total reduction						0.37			0.29			0.20			0.17	
Total, real						304			267			270			238	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1583 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7458)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58	09:12 (T11)	07:44	16:52 (T74)	07:07		07:16	07:35 (T9)	06:30		06:01	06:44 (T72)
	17:13 64	10:16 (T11)	17:47 16	17:08 (T74)	18:22		19:56 21	07:56 (T9)	20:27		20:57 14	06:58 (T72)
2	07:58	09:13 (T11)	07:43	16:54 (T74)	07:06		07:15	07:34 (T9)	06:29		06:01	06:45 (T72)
	17:14 63	10:16 (T11)	17:49 13	17:07 (T74)	18:23		19:57 23	07:57 (T9)	20:28		20:58 11	06:56 (T72)
3	07:58	09:13 (T11)	07:42	16:57 (T74)	07:04		07:13	07:32 (T9)	06:28	06:47 (T72)	06:00	06:47 (T72)
	17:14 64	10:17 (T11)	17:50 7	17:04 (T74)	18:24		19:58 24	07:56 (T9)	20:29 8	06:55 (T72)	20:59 8	06:55 (T72)
4	07:58	09:14 (T11)	07:41		07:03		07:11	07:30 (T9)	06:26	06:46 (T72)	06:00	06:49 (T72)
	17:15 63	10:17 (T11)	17:51		18:25		19:59 26	07:56 (T9)	20:31 11	06:57 (T72)	21:00 4	06:53 (T72)
5	07:58	09:15 (T11)	07:40	17:24 (T73)	07:01		07:10	07:30 (T9)	06:25	06:45 (T72)	06:00	
	17:16 62	10:17 (T11)	17:52 2	17:26 (T73)	18:26		20:00 26	07:56 (T9)	20:32 14	06:59 (T72)	21:00	
6	07:58	09:15 (T11)	07:39	17:19 (T73)	07:00		07:08	07:30 (T9)	06:24	06:44 (T72)	05:59	
	17:17 64	16:51 (T74)	17:54 11	17:30 (T73)	18:28		20:00 25	07:55 (T9)	20:33 17	07:01 (T72)	21:01	
7	07:58	09:16 (T11)	07:37	17:17 (T73)	06:58		07:06	07:30 (T9)	06:23	06:43 (T72)	05:59	
	17:18 66	16:52 (T74)	17:55 15	17:32 (T73)	18:29		20:02 23	07:53 (T9)	20:34 19	07:02 (T72)	21:02	
8	07:58	09:17 (T11)	07:36	17:14 (T73)	07:56		07:05	07:31 (T9)	06:21	06:42 (T72)	05:59	
	17:19 67	16:53 (T74)	17:56 18	17:32 (T73)	19:30		20:03 22	07:53 (T9)	20:35 21	07:03 (T72)	21:02	
9	07:58	09:17 (T11)	07:35	17:13 (T73)	07:55		07:03	07:31 (T9)	06:20	06:40 (T72)	05:58	
	17:20 68	16:54 (T74)	17:57 21	17:34 (T73)	19:31		20:04 20	07:51 (T9)	20:36 22	07:02 (T72)	21:03	
10	07:57	09:18 (T11)	07:34	17:13 (T73)	07:53		07:01	07:32 (T9)	06:19	06:39 (T72)	05:58	
	17:21 69	16:55 (T74)	17:59 22	17:35 (T73)	19:32		20:05 17	07:49 (T9)	20:37 24	07:03 (T72)	21:03	
11	07:57	09:19 (T11)	07:33	17:12 (T73)	07:51		07:00	07:34 (T9)	06:18	06:38 (T72)	05:58	
	17:22 69	16:56 (T74)	18:00 25	17:37 (T73)	19:33		20:06 13	07:47 (T9)	20:38 25	07:03 (T72)	21:04	
12	07:57	09:20 (T11)	07:31	17:11 (T73)	07:50		06:58	07:37 (T9)	06:17	06:37 (T72)	05:58	
	17:23 70	16:58 (T74)	18:01 27	17:38 (T73)	19:34		20:07 6	07:43 (T9)	20:39 27	07:04 (T72)	21:05	
13	07:56	09:20 (T11)	07:30	17:10 (T73)	07:48		06:57		06:16	06:36 (T72)	05:58	
	17:24 70	16:58 (T74)	18:02 29	17:39 (T73)	19:35		20:08		20:40 28	07:04 (T72)	21:05	
14	07:56	09:21 (T11)	07:29	17:10 (T73)	07:46		06:55		06:15	06:35 (T72)	05:58	
	17:26 72	17:00 (T74)	18:04 31	17:41 (T73)	19:37		20:09		20:41 29	07:04 (T72)	21:06	
15	07:56	09:22 (T11)	07:28	17:09 (T73)	07:45		06:53		06:14	06:34 (T72)	05:58	
	17:27 72	17:01 (T74)	18:05 32	17:41 (T73)	19:38		20:10		20:42 30	07:04 (T72)	21:06	
16	07:55	09:23 (T11)	07:26	17:10 (T73)	07:43		06:52		06:13	06:34 (T72)	05:58	
	17:28 71	17:02 (T74)	18:06 31	17:41 (T73)	19:39		20:11		20:43 30	07:04 (T72)	21:06	
17	07:55	09:24 (T11)	07:25	17:10 (T73)	07:41		06:50		06:12	06:35 (T72)	05:58	
	17:29 71	17:03 (T74)	18:07 32	17:42 (T73)	19:40		20:12		20:44 30	07:05 (T72)	21:07	
18	07:54	09:25 (T11)	07:24	17:09 (T73)	07:40		06:49		06:11	06:35 (T72)	05:58	
	17:30 71	17:05 (T74)	18:09 32	17:41 (T73)	19:41		20:13		20:45 29	07:04 (T72)	21:07	
19	07:54	09:26 (T11)	07:22	17:10 (T73)	07:38		06:47		06:10	06:35 (T72)	05:58	
	17:31 71	17:06 (T74)	18:10 31	17:41 (T73)	19:42		20:14		20:46 29	07:04 (T72)	21:07	
20	07:53	09:27 (T11)	07:21	17:10 (T73)	07:36		06:46		06:09	06:35 (T72)	05:58	
	17:33 70	17:07 (T74)	18:11 30	17:40 (T73)	19:43		20:16		20:47 29	07:04 (T72)	21:08	
21	07:53	09:29 (T11)	07:19	17:11 (T73)	07:35		06:44		06:08	06:35 (T72)	05:58	
	17:34 69	17:09 (T74)	18:12 29	17:40 (T73)	19:44		20:17		20:48 28	07:03 (T72)	21:08	
22	07:52	09:30 (T11)	07:18	17:12 (T73)	07:33		06:43		06:08	06:37 (T72)	05:59	
	17:35 68	17:10 (T74)	18:13 28	17:40 (T73)	19:45		20:18		20:49 27	07:04 (T72)	21:08	
23	07:51	09:31 (T11)	07:16	17:12 (T73)	07:31		06:41		06:07	06:37 (T72)	05:59	
	17:36 67	17:11 (T74)	18:15 26	17:38 (T73)	19:46		20:19		20:50 26	07:03 (T72)	21:09	
24	07:51	09:33 (T11)	07:15	17:14 (T73)	07:30		06:40		06:06	06:37 (T72)	05:59	
	17:37 64	17:12 (T74)	18:16 23	17:37 (T73)	19:48		20:20		20:51 25	07:02 (T72)	21:09	
25	07:50	09:35 (T11)	07:13	17:15 (T73)	07:28		06:38		06:05	06:38 (T72)	05:59	
	17:39 61	17:12 (T74)	18:17 20	17:35 (T73)	19:49		20:21		20:51 25	07:03 (T72)	21:09	
26	07:49	09:36 (T11)	07:12	17:17 (T73)	07:26		06:37		06:05	06:38 (T72)	06:00	
	17:40 57	17:12 (T74)	18:18 16	17:33 (T73)	19:50		20:22		20:52 24	07:02 (T72)	21:09	
27	07:48	09:39 (T11)	07:10	17:20 (T73)	07:25	07:44 (T9)	06:36		06:04	06:39 (T72)	06:00	
	17:41 51	17:12 (T74)	18:19 9	17:29 (T73)	19:51 7	07:51 (T9)	20:23		20:53 22	07:01 (T72)	21:09	
28	07:47	09:42 (T11)	07:09		07:23	07:42 (T9)	06:34		06:03	06:40 (T72)	06:01	
	17:42 44	17:11 (T74)	18:21		19:52 11	07:53 (T9)	20:24		20:54 21	07:01 (T72)	21:09	
29	07:47	09:46 (T11)			07:21	07:40 (T9)	06:33		06:03	06:40 (T72)	06:01	
	17:44 35	17:11 (T74)			19:53 14	07:54 (T9)	20:25		20:55 20	07:00 (T72)	21:09	
30	07:46	16:49 (T74)			07:20	07:39 (T9)	06:31		06:02	06:42 (T72)	06:01	
	17:45 21	17:10 (T74)			19:54 17	07:56 (T9)	20:26		20:56 18	07:00 (T72)	21:09	
31	07:45	16:50 (T74)			07:18	07:37 (T9)			06:02	06:42 (T72)		
	17:46 19	17:09 (T74)			19:55 19	07:56 (T9)			20:57 16	06:58 (T72)		
Potential sun hours	297		297		370		399		449		453	
Total, worst case	1913		576		68		246		674		37	
Sun reduction	0.31		0.40		0.44		0.52		0.57		0.64	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.57		0.71		0.64		0.64		0.70		0.70	
Total reduction	0.17		0.27		0.27		0.32		0.39		0.43	
Total, real	329		158		18		79		260		16	

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

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

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1583 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7458)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September			October			November			December		
1	06:02			06:26		06:48 (T72)	06:57		07:33 (T9)	07:28			07:02		16:43 (T73)	07:37		09:01 (T11)
	21:09			20:50	26	07:14 (T72)	20:07	13	07:46 (T9)	19:15			17:28	22	17:05 (T73)	17:03	70	16:39 (T74)
2	06:02			06:27		06:49 (T72)	06:58		07:31 (T9)	07:29			07:04		16:43 (T73)	07:38		09:01 (T11)
	21:09			20:49	25	07:14 (T72)	20:06	17	07:48 (T9)	19:13			17:27	20	17:03 (T73)	17:03	69	16:38 (T74)
3	06:03			06:28		06:50 (T72)	06:59		07:29 (T9)	07:30			07:05		16:45 (T73)	07:40		09:01 (T11)
	21:09			20:48	23	07:13 (T72)	20:04	20	07:49 (T9)	19:11			17:25	17	17:02 (T73)	17:03	68	16:38 (T74)
4	06:03			06:29		06:51 (T72)	07:00		07:28 (T9)	07:31			07:06		16:46 (T73)	07:41		09:01 (T11)
	21:09			20:47	22	07:13 (T72)	20:03	22	07:50 (T9)	19:10			17:24	14	17:00 (T73)	17:03	67	16:37 (T74)
5	06:04			06:30		06:52 (T72)	07:01		07:27 (T9)	07:32			07:07		16:49 (T73)	07:41		09:01 (T11)
	21:08			20:46	20	07:12 (T72)	20:01	24	07:51 (T9)	19:08			17:23	11	17:00 (T73)	17:03	66	16:37 (T74)
6	06:05			06:31		06:53 (T72)	07:02		07:26 (T9)	07:33			07:08			07:42		09:01 (T11)
	21:08			20:45	18	07:11 (T72)	19:58	25	07:51 (T9)	19:06			17:22			17:02	64	16:37 (T74)
7	06:05			06:32		06:54 (T72)	07:03		07:25 (T9)	07:34			07:10			07:43		09:02 (T11)
	21:08			20:44	16	07:10 (T72)	19:56	26	07:51 (T9)	19:05			17:21			17:02	62	10:04 (T11)
8	06:06			06:33		06:55 (T72)	07:04		07:25 (T9)	07:35			07:11		16:27 (T74)	07:44		09:02 (T11)
	21:08			20:42	13	07:08 (T72)	19:54	26	07:51 (T9)	19:03			17:20	8	16:35 (T74)	17:02	63	10:05 (T11)
9	06:07		06:55 (T72)	06:34		06:56 (T72)	07:05		07:26 (T9)	07:36			07:12		16:25 (T74)	07:45		09:02 (T11)
	21:07	7	07:02 (T72)	20:41	10	07:06 (T72)	19:52	24	07:50 (T9)	19:02			17:19	13	16:38 (T74)	17:02	64	10:06 (T11)
10	06:07		06:53 (T72)	06:35		06:57 (T72)	07:06		07:27 (T9)	07:37			07:13		16:23 (T74)	07:46		09:03 (T11)
	21:07	11	07:04 (T72)	20:40	6	07:03 (T72)	19:51	23	07:50 (T9)	19:00			17:18	16	16:39 (T74)	17:02	63	10:06 (T11)
11	06:08		06:52 (T72)	06:36			07:07		07:28 (T9)	07:38			07:14		16:22 (T74)	07:47		09:03 (T11)
	21:06	13	07:05 (T72)	20:39			19:49	21	07:49 (T9)	18:58			17:17	19	16:41 (T74)	17:02	64	10:07 (T11)
12	06:09		06:51 (T72)	06:37			07:08		07:29 (T9)	07:39			07:16		16:21 (T74)	07:48		09:03 (T11)
	21:06	15	07:06 (T72)	20:37			19:47	19	07:48 (T9)	18:57			17:16	21	16:42 (T74)	17:03	64	10:07 (T11)
13	06:09		06:51 (T72)	06:38			07:09		07:29 (T9)	07:40			07:17		09:17 (T11)	07:49		09:03 (T11)
	21:06	16	07:07 (T72)	20:36			19:46	17	07:46 (T9)	18:55			17:15	36	16:43 (T74)	17:03	65	10:08 (T11)
14	06:10		06:50 (T72)	06:39			07:10		07:30 (T9)	07:42			07:18		09:13 (T11)	07:49		09:04 (T11)
	21:05	19	07:09 (T72)	20:35			19:44	15	07:45 (T9)	18:54			17:14	46	16:43 (T74)	17:03	64	10:08 (T11)
15	06:11		06:49 (T72)	06:40			07:11		07:31 (T9)	07:43		17:51 (T73)	07:19		09:12 (T11)	07:50		09:04 (T11)
	21:04	20	07:09 (T72)	20:33			19:42	12	07:43 (T9)	18:52	12	18:03 (T73)	17:13	51	16:45 (T74)	17:03	65	10:09 (T11)
16	06:12		06:48 (T72)	06:41			07:12		07:32 (T9)	07:44		17:48 (T73)	07:20		09:09 (T11)	07:51		09:04 (T11)
	21:04	22	07:10 (T72)	20:32			19:41	8	07:40 (T9)	18:50	18	18:06 (T73)	17:12	58	16:45 (T74)	17:03	65	10:09 (T11)
17	06:13		06:48 (T72)	06:42			07:13			07:45		17:46 (T73)	07:22		09:08 (T11)	07:51		09:05 (T11)
	21:03	23	07:11 (T72)	20:30			19:39			18:49	21	18:07 (T73)	17:11	61	16:45 (T74)	17:04	65	10:10 (T11)
18	06:13		06:48 (T72)	06:43			07:14			07:46		17:44 (T73)	07:23		09:06 (T11)	07:52		09:06 (T11)
	21:03	24	07:12 (T72)	20:29			19:37			18:47	24	18:08 (T73)	17:10	64	16:45 (T74)	17:04	65	10:11 (T11)
19	06:14		06:48 (T72)	06:44			07:15			07:47		17:43 (T73)	07:24		09:06 (T11)	07:53		09:06 (T11)
	21:02	24	07:12 (T72)	20:28			19:35			18:46	27	18:10 (T73)	17:10	67	16:46 (T74)	17:04	65	10:11 (T11)
20	06:15		06:46 (T72)	06:45			07:16			07:48		17:42 (T73)	07:25		09:05 (T11)	07:53		09:06 (T11)
	21:01	26	07:12 (T72)	20:26			19:34			18:44	28	18:10 (T73)	17:09	68	16:45 (T74)	17:05	66	10:12 (T11)
21	06:16		06:46 (T72)	06:46			07:17			07:49		17:41 (T73)	07:26		09:04 (T11)	07:54		09:06 (T11)
	21:01	27	07:13 (T72)	20:25			19:32			18:43	30	18:11 (T73)	17:08	69	16:44 (T74)	17:05	66	10:12 (T11)
22	06:17		06:46 (T72)	06:47			07:18			07:51		17:40 (T73)	07:27		09:03 (T11)	07:54		09:07 (T11)
	21:00	27	07:13 (T72)	20:23			19:30			18:41	31	18:11 (T73)	17:08	70	16:43 (T74)	17:06	66	10:13 (T11)
23	06:18		06:46 (T72)	06:48			07:19			07:52		17:40 (T73)	07:29		09:03 (T11)	07:55		09:07 (T11)
	20:59	28	07:14 (T72)	20:22			19:28			18:40	31	18:11 (T73)	17:07	71	16:43 (T74)	17:06	66	10:13 (T11)
24	06:19		06:46 (T72)	06:49			07:20			07:53		17:40 (T73)	07:30		09:02 (T11)	07:55		09:09 (T11)
	20:58	28	07:14 (T72)	20:20			19:27			18:39	32	18:12 (T73)	17:07	71	16:42 (T74)	17:07	65	10:14 (T11)
25	06:19		06:46 (T72)	06:50			07:21			07:54		17:40 (T73)	07:31		09:02 (T11)	07:56		09:09 (T11)
	20:57	29	07:15 (T72)	20:19			19:25			18:37	31	18:11 (T73)	17:06	71	16:41 (T74)	17:07	65	10:14 (T11)
26	06:20		06:46 (T72)	06:51			07:22			07:55		17:39 (T73)	07:32		09:01 (T11)	07:56		09:09 (T11)
	20:56	29	07:15 (T72)	20:17			19:23			18:36	32	18:11 (T73)	17:05	71	16:40 (T74)	17:08	65	10:14 (T11)
27	06:21		06:45 (T72)	06:52			07:24			07:56		17:39 (T73)	07:33		09:01 (T11)	07:56		09:09 (T11)
	20:55	29	07:14 (T72)	20:15			19:22			18:34	31	18:10 (T73)	17:05	72	16:40 (T74)	17:09	65	10:14 (T11)
28	06:22		06:45 (T72)	06:53			07:25			07:58		17:40 (T73)	07:34		09:02 (T11)	07:57		09:10 (T11)
	20:55	29	07:14 (T72)	20:14			19:20			18:33	30	18:10 (T73)	17:05	71	16:40 (T74)	17:09	65	10:15 (T11)
29	06:23		06:45 (T72)	06:54			07:26			07:59		17:40 (T73)	07:35		09:01 (T11)	07:57		09:11 (T11)
	20:54	29	07:14 (T72)	20:12			19:18			18:32	29	18:09 (T73)	17:04	71	16:40 (T74)	17:10	64	10:15 (T11)
30	06:24		06:46 (T72)	06:55			07:27			08:00		17:40 (T73)	07:36		09:01 (T11)	07:57		09:11 (T11)
	20:53	28	07:14 (T72)	20:11			19:17			18:30	27	18:07 (T73)	17:04	70	16:39 (T74)	17:11	64	10:15 (T11)
31	06:25		06:47 (T72)	06:56		07:37 (T9)				08:01		17:41 (T73)				07:57		09:11 (T11)
	20:52	27	07:14 (T72)	20:09	6	07:43 (T9)				18:29	24	18:05 (T73)				17:12	65	10:16 (T11)
Potential sun hours	460			429			375			345			297			287		
Total, worst case		530			185			312			458			1319			2020	
Sun reduction		0.66			0.61			0.59			0.48			0.30			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.70			0.70			0.64			0.71			0.61			0.53	
Total reduction		0.45			0.41			0.36			0.33			0.18			0.11	
Total, real		237			76			114			150			232			227	

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1603 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7476)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March		April			May			June		
1	07:58		15:38 (T13)	07:44		17:11 (T12)	07:07		07:16			06:30		19:12 (T10)	06:01		19:57 (T9)
	17:13	45	16:23 (T13)	17:47	12	17:23 (T12)	18:22		19:56			20:27	30	19:42 (T10)	20:57	26	20:23 (T9)
2	07:58		15:39 (T13)	07:43		17:10 (T12)	07:06		07:14			06:29		19:12 (T10)	06:01		19:57 (T9)
	17:13	44	16:23 (T13)	17:48	14	17:24 (T12)	18:23		19:57			20:28	28	19:40 (T10)	20:58	25	20:22 (T9)
3	07:58		15:39 (T13)	07:42		17:09 (T12)	07:04		07:13			06:27		19:13 (T10)	06:00		19:58 (T9)
	17:14	45	16:24 (T13)	17:50	17	17:26 (T12)	18:24		19:58			20:29	26	19:39 (T10)	20:59	25	20:23 (T9)
4	07:58		15:40 (T13)	07:41		17:08 (T12)	07:03		07:11			06:26		19:15 (T10)	06:00		19:58 (T9)
	17:15	44	16:24 (T13)	17:51	19	17:27 (T12)	18:25		19:59			20:30	22	19:37 (T10)	20:59	25	20:23 (T9)
5	07:58		15:41 (T13)	07:40		17:07 (T12)	07:01		07:09			06:25		19:17 (T10)	05:59		19:58 (T9)
	17:16	43	16:24 (T13)	17:52	22	17:29 (T12)	18:26		20:00			20:31	18	19:35 (T10)	21:00	24	20:22 (T9)
6	07:58		15:41 (T13)	07:38		17:07 (T12)	06:59		07:08			06:24		19:20 (T10)	05:59		19:59 (T9)
	17:17	44	16:25 (T13)	17:54	23	17:30 (T12)	18:27		20:00			20:33	13	19:33 (T10)	21:01	23	20:22 (T9)
7	07:58		15:42 (T13)	07:37		17:06 (T12)	06:58		07:06			06:22		20:06 (T9)	05:59		20:00 (T9)
	17:18	43	16:25 (T13)	17:55	25	17:31 (T12)	18:29		20:01			20:34	5	20:11 (T9)	21:01	22	20:22 (T9)
8	07:58		15:43 (T13)	07:36		17:05 (T12)	07:56		07:05		19:26 (T10)	06:21		20:02 (T9)	05:59		20:01 (T9)
	17:19	42	16:25 (T13)	17:56	27	17:32 (T12)	19:30		20:03	11	19:37 (T10)	20:35	9	20:11 (T9)	21:02	21	20:22 (T9)
9	07:57		15:43 (T13)	07:35		17:05 (T12)	07:55		07:03		19:22 (T10)	06:20		20:00 (T9)	05:58		20:01 (T9)
	17:20	42	16:25 (T13)	17:57	29	17:34 (T12)	19:31		20:04	18	19:40 (T10)	20:36	13	20:13 (T9)	21:03	20	20:21 (T9)
10	07:57		15:44 (T13)	07:34		17:06 (T12)	07:53		07:01		19:19 (T10)	06:19		19:58 (T9)	05:58		20:01 (T9)
	17:21	41	16:25 (T13)	17:59	29	17:35 (T12)	19:32		20:05	23	19:42 (T10)	20:37	16	20:14 (T9)	21:03	20	20:21 (T9)
11	07:57		15:45 (T13)	07:33		17:06 (T12)	07:51		07:00		19:17 (T10)	06:18		19:57 (T9)	05:58		20:02 (T9)
	17:22	41	16:26 (T13)	18:00	29	17:35 (T12)	19:33		20:06	27	19:44 (T10)	20:38	18	20:15 (T9)	21:04	19	20:21 (T9)
12	07:57		15:45 (T13)	07:31		17:05 (T12)	07:50		06:58		19:15 (T10)	06:17		19:56 (T9)	05:58		20:03 (T9)
	17:23	40	16:25 (T13)	18:01	29	17:34 (T12)	19:34		20:07	30	19:45 (T10)	20:39	20	20:16 (T9)	21:04	18	20:21 (T9)
13	07:56		15:47 (T13)	07:30		17:06 (T12)	07:48		06:56		19:14 (T10)	06:16		19:55 (T9)	05:58		20:03 (T9)
	17:24	38	16:25 (T13)	18:02	29	17:35 (T12)	19:35		20:08	33	19:47 (T10)	20:40	21	20:16 (T9)	21:05	17	20:20 (T9)
14	07:56		15:48 (T13)	07:29		17:07 (T12)	07:46		06:55		19:13 (T10)	06:15		19:55 (T9)	05:58		20:04 (T9)
	17:25	38	16:26 (T13)	18:04	28	17:35 (T12)	19:36		20:09	34	19:47 (T10)	20:41	22	20:17 (T9)	21:05	16	20:20 (T9)
15	07:56		15:48 (T13)	07:27		17:06 (T12)	07:45		06:53		19:11 (T10)	06:14		19:54 (T9)	05:58		20:04 (T9)
	17:27	37	16:25 (T13)	18:05	27	17:33 (T12)	19:38		20:10	36	19:47 (T10)	20:42	24	20:18 (T9)	21:06	16	20:20 (T9)
16	07:55		15:50 (T13)	07:26		17:08 (T12)	07:43		06:52		19:11 (T10)	06:13		19:54 (T9)	05:58		20:05 (T9)
	17:28	35	16:25 (T13)	18:06	25	17:33 (T12)	19:39		20:11	37	19:48 (T10)	20:43	25	20:19 (T9)	21:06	15	20:20 (T9)
17	07:55		15:51 (T13)	07:25		17:09 (T12)	07:41		06:50		19:09 (T10)	06:12		19:53 (T9)	05:58		20:05 (T9)
	17:29	33	16:24 (T13)	18:07	23	17:32 (T12)	19:40		20:12	39	19:48 (T10)	20:44	27	20:20 (T9)	21:07	15	20:20 (T9)
18	07:54		15:52 (T13)	07:23		17:09 (T12)	07:40		06:49		19:09 (T10)	06:11		19:54 (T9)	05:58		20:05 (T9)
	17:30	32	16:24 (T13)	18:08	22	17:31 (T12)	19:41		20:13	39	19:48 (T10)	20:45	28	20:22 (T9)	21:07	15	20:20 (T9)
19	07:54		15:53 (T13)	07:22		17:11 (T12)	07:38		06:47		19:08 (T10)	06:10		19:54 (T9)	05:58		20:06 (T9)
	17:31	30	16:23 (T13)	18:10	18	17:29 (T12)	19:42		20:14	40	19:48 (T10)	20:46	28	20:22 (T9)	21:07	14	20:20 (T9)
20	07:53		15:55 (T13)	07:21		17:13 (T12)	07:36		06:46		19:08 (T10)	06:09		19:53 (T9)	05:58		20:07 (T9)
	17:32	27	16:22 (T13)	18:11	14	17:27 (T12)	19:43		20:15	40	19:48 (T10)	20:47	30	20:23 (T9)	21:08	14	20:21 (T9)
21	07:53		15:57 (T13)	07:19		17:18 (T12)	07:35		06:44		19:08 (T10)	06:08		19:53 (T9)	05:58		20:07 (T9)
	17:34	25	16:22 (T13)	18:12	5	17:23 (T12)	19:44		20:16	40	19:48 (T10)	20:48	30	20:23 (T9)	21:08	14	20:21 (T9)
22	07:52		15:59 (T13)	07:18			07:33		06:43		19:08 (T10)	06:07		19:53 (T9)	05:59		20:07 (T9)
	17:35	21	16:20 (T13)	18:13			19:45		20:18	40	19:48 (T10)	20:49	30	20:23 (T9)	21:08	14	20:21 (T9)
23	07:51		16:01 (T13)	07:16			07:31		06:41		19:08 (T10)	06:07		19:54 (T9)	05:59		20:07 (T9)
	17:36	17	16:18 (T13)	18:15			19:46		20:19	40	19:48 (T10)	20:50	30	20:24 (T9)	21:08	14	20:21 (T9)
24	07:50		16:04 (T13)	07:15			07:30		06:40		19:08 (T10)	06:06		19:54 (T9)	05:59		20:08 (T9)
	17:37	11	16:15 (T13)	18:16			19:47		20:20	39	19:47 (T10)	20:50	30	20:24 (T9)	21:09	14	20:22 (T9)
25	07:50			07:13			07:28		06:38		19:08 (T10)	06:05		19:53 (T9)	05:59		20:07 (T9)
	17:38			18:17			19:48		20:21	39	19:47 (T10)	20:51	30	20:23 (T9)	21:09	15	20:22 (T9)
26	07:49			07:12			07:26		06:37		19:08 (T10)	06:05		19:54 (T9)	06:00		20:07 (T9)
	17:40			18:18			19:50		20:22	38	19:46 (T10)	20:52	30	20:24 (T9)	21:09	15	20:22 (T9)
27	07:48			07:10			07:24		06:35		19:09 (T10)	06:04		19:54 (T9)	06:00		20:08 (T9)
	17:41			18:19			19:51		20:23	36	19:45 (T10)	20:53	29	20:23 (T9)	21:09	15	20:23 (T9)
28	07:47			07:09			07:23		06:34		19:10 (T10)	06:03		19:55 (T9)	06:00		20:07 (T9)
	17:42			18:20			19:52		20:24	35	19:45 (T10)	20:54	29	20:24 (T9)	21:09	16	20:23 (T9)
29	07:46						07:21		06:33		19:09 (T10)	06:03		19:55 (T9)	06:01		20:07 (T9)
	17:43						19:53		20:25	34	19:43 (T10)	20:55	28	20:23 (T9)	21:09	16	20:23 (T9)
30	07:46						07:19		06:31		19:10 (T10)	06:02		19:56 (T9)	06:01		20:07 (T9)
	17:45						19:54		20:26	33	19:43 (T10)	20:56	28	20:24 (T9)	21:09	17	20:24 (T9)
31	07:45		17:13 (T12)				07:18					06:02		19:56 (T9)			
	17:46	8	17:21 (T12)				19:55					20:56	27	20:23 (T9)			
Potential sun hours	297			297			370		399			449			453		
Total, worst case		866			466					781			744			540	
Sun reduction		0.31			0.40					0.52			0.57			0.64	
Oper. time red.		1.00			1.00					1.00			1.00			1.00	
Wind dir. red.		0.74			0.71					0.58			0.56			0.55	
Total reduction		0.24			0.30					0.32			0.33			0.37	
Total, real		209			139					248			248			200	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1603 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7476)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02	20:06 (T9)	06:26	20:07 (T9)	06:57	19:16 (T10)	07:28		07:02	16:35 (T12)	07:37	15:27 (T13)
	21:09	19 20:25 (T9)	20:50	19 20:26 (T9)	20:07	27 19:43 (T10)	19:15		17:28	30 17:05 (T12)	17:03	41 16:08 (T13)
2	06:02	20:07 (T9)	06:27	20:08 (T9)	06:58	19:18 (T10)	07:29		07:03	16:35 (T12)	07:38	15:27 (T13)
	21:09	19 20:26 (T9)	20:49	17 20:25 (T9)	20:06	23 19:41 (T10)	19:13		17:27	28 17:03 (T12)	17:03	41 16:08 (T13)
3	06:03	20:06 (T9)	06:28	20:09 (T9)	06:59	19:20 (T10)	07:30		07:05	16:35 (T12)	07:39	15:27 (T13)
	21:09	20 20:26 (T9)	20:48	15 20:24 (T9)	20:04	18 19:38 (T10)	19:11		17:25	27 17:02 (T12)	17:03	42 16:09 (T13)
4	06:03	20:06 (T9)	06:29	20:11 (T9)	07:00	19:23 (T10)	07:31		07:06	16:35 (T12)	07:40	15:27 (T13)
	21:08	21 20:27 (T9)	20:47	12 20:23 (T9)	20:02	12 19:35 (T10)	19:10		17:24	25 17:00 (T12)	17:03	42 16:09 (T13)
5	06:04	20:05 (T9)	06:30	20:13 (T9)	07:01		07:32		07:07	16:37 (T12)	07:41	15:27 (T13)
	21:08	22 20:27 (T9)	20:46	9 20:22 (T9)	20:01		19:08		17:23	23 17:00 (T12)	17:03	43 16:10 (T13)
6	06:05	20:06 (T9)	06:31	19:32 (T10)	07:02		07:33		07:08	16:37 (T12)	07:42	15:28 (T13)
	21:08	22 20:28 (T9)	20:45	8 19:40 (T10)	19:57		19:06		17:22	21 16:58 (T12)	17:02	43 16:11 (T13)
7	06:05	20:06 (T9)	06:32	19:29 (T10)	07:03		07:34		07:09	16:38 (T12)	07:43	15:28 (T13)
	21:08	23 20:29 (T9)	20:44	14 19:43 (T10)	19:56		19:05		17:21	19 16:57 (T12)	17:02	43 16:11 (T13)
8	06:06	20:05 (T9)	06:33	19:26 (T10)	07:04		07:35		07:11	16:40 (T12)	07:44	15:28 (T13)
	21:07	24 20:29 (T9)	20:42	20 19:46 (T10)	19:54		19:03		17:20	16 16:56 (T12)	17:02	44 16:12 (T13)
9	06:06	20:05 (T9)	06:34	19:24 (T10)	07:05		07:36		07:12	16:41 (T12)	07:45	15:28 (T13)
	21:07	25 20:30 (T9)	20:41	23 19:47 (T10)	19:52		19:01		17:19	14 16:55 (T12)	17:02	45 16:13 (T13)
10	06:07	20:05 (T9)	06:35	19:23 (T10)	07:06		07:37		07:13	16:42 (T12)	07:46	15:29 (T13)
	21:07	25 20:30 (T9)	20:40	26 19:49 (T10)	19:51		19:00		17:18	12 16:54 (T12)	17:02	44 16:13 (T13)
11	06:08	20:04 (T9)	06:36	19:21 (T10)	07:07		07:38		07:14	16:45 (T12)	07:47	15:28 (T13)
	21:06	26 20:30 (T9)	20:38	29 19:50 (T10)	19:49		18:58		17:17	7 16:52 (T12)	17:02	45 16:13 (T13)
12	06:09	20:04 (T9)	06:37	19:19 (T10)	07:08		07:39		07:15		07:48	15:29 (T13)
	21:06	27 20:31 (T9)	20:37	31 19:50 (T10)	19:47		18:57		17:16		17:02	45 16:14 (T13)
13	06:09	20:04 (T9)	06:38	19:18 (T10)	07:09		07:40		07:17		07:48	15:29 (T13)
	21:05	28 20:32 (T9)	20:36	33 19:51 (T10)	19:46		18:55		17:15		17:03	45 16:14 (T13)
14	06:10	20:05 (T9)	06:39	19:17 (T10)	07:10		07:41		07:18		07:49	15:30 (T13)
	21:05	27 20:32 (T9)	20:34	34 19:51 (T10)	19:44		18:53		17:14		17:03	45 16:15 (T13)
15	06:11	20:04 (T9)	06:40	19:16 (T10)	07:11		07:43		07:19		07:50	15:30 (T13)
	21:04	28 20:32 (T9)	20:33	36 19:52 (T10)	19:42		18:52		17:13		17:03	45 16:15 (T13)
16	06:12	20:04 (T9)	06:41	19:15 (T10)	07:12		07:44		07:20		07:51	15:30 (T13)
	21:04	29 20:33 (T9)	20:32	37 19:52 (T10)	19:40		18:50		17:12		17:03	46 16:16 (T13)
17	06:12	20:04 (T9)	06:42	19:15 (T10)	07:13		07:45		07:21		07:51	15:31 (T13)
	21:03	29 20:33 (T9)	20:30	37 19:52 (T10)	19:39		18:49		17:11		17:04	46 16:17 (T13)
18	06:13	20:04 (T9)	06:43	19:14 (T10)	07:14		07:46		07:23	15:38 (T13)	07:52	15:31 (T13)
	21:03	30 20:34 (T9)	20:29	39 19:53 (T10)	19:37		18:47		17:10	12 15:50 (T13)	17:04	46 16:17 (T13)
19	06:14	20:03 (T9)	06:44	19:14 (T10)	07:15		07:47		07:24	15:36 (T13)	07:53	15:32 (T13)
	21:02	30 20:33 (T9)	20:27	39 19:53 (T10)	19:35		18:46		17:10	17 15:53 (T13)	17:04	45 16:17 (T13)
20	06:15	20:03 (T9)	06:45	19:13 (T10)	07:16		07:48		07:25	15:34 (T13)	07:53	15:33 (T13)
	21:01	30 20:33 (T9)	20:26	40 19:53 (T10)	19:34		18:44		17:09	21 15:55 (T13)	17:05	45 16:18 (T13)
21	06:16	20:03 (T9)	06:46	19:13 (T10)	07:17		07:49	17:46 (T12)	07:26	15:32 (T13)	07:54	15:33 (T13)
	21:00	31 20:34 (T9)	20:24	40 19:53 (T10)	19:32		18:43	9 17:55 (T12)	17:08	25 15:57 (T13)	17:05	45 16:18 (T13)
22	06:17	20:04 (T9)	06:47	19:12 (T10)	07:18		07:50	17:43 (T12)	07:27	15:31 (T13)	07:54	15:34 (T13)
	21:00	30 20:34 (T9)	20:23	40 19:52 (T10)	19:30		18:41	15 17:58 (T12)	17:08	27 15:58 (T13)	17:06	45 16:19 (T13)
23	06:18	20:04 (T9)	06:48	19:12 (T10)	07:19		07:52	17:40 (T12)	07:28	15:30 (T13)	07:55	15:34 (T13)
	20:59	30 20:34 (T9)	20:21	40 19:52 (T10)	19:28		18:40	20 18:00 (T12)	17:07	30 16:00 (T13)	17:06	45 16:19 (T13)
24	06:18	20:04 (T9)	06:49	19:12 (T10)	07:20		07:53	17:40 (T12)	07:30	15:29 (T13)	07:55	15:34 (T13)
	20:58	29 20:33 (T9)	20:20	40 19:52 (T10)	19:27		18:38	22 18:02 (T12)	17:06	32 16:01 (T13)	17:07	45 16:19 (T13)
25	06:19	20:04 (T9)	06:50	19:12 (T10)	07:21		07:54	17:38 (T12)	07:31	15:29 (T13)	07:56	15:35 (T13)
	20:57	29 20:33 (T9)	20:18	39 19:51 (T10)	19:25		18:37	24 18:02 (T12)	17:06	33 16:02 (T13)	17:07	45 16:20 (T13)
26	06:20	20:04 (T9)	06:51	19:12 (T10)	07:22		07:55	17:37 (T12)	07:32	15:28 (T13)	07:56	15:35 (T13)
	20:56	27 20:31 (T9)	20:17	39 19:51 (T10)	19:23		18:36	26 18:03 (T12)	17:05	35 16:03 (T13)	17:08	46 16:21 (T13)
27	06:21	20:04 (T9)	06:52	19:13 (T10)	07:23		07:56	17:36 (T12)	07:33	15:27 (T13)	07:56	15:35 (T13)
	20:55	26 20:30 (T9)	20:15	37 19:50 (T10)	19:22		18:34	27 18:03 (T12)	17:05	37 16:04 (T13)	17:09	46 16:21 (T13)
28	06:22	20:04 (T9)	06:53	19:13 (T10)	07:24		07:57	17:35 (T12)	07:34	15:27 (T13)	07:57	15:37 (T13)
	20:54	25 20:29 (T9)	20:14	36 19:49 (T10)	19:20		18:33	28 18:03 (T12)	17:04	38 16:05 (T13)	17:09	45 16:22 (T13)
29	06:23	20:05 (T9)	06:54	19:14 (T10)	07:25		07:59	17:35 (T12)	07:35	15:28 (T13)	07:57	15:37 (T13)
	20:53	23 20:28 (T9)	20:12	34 19:48 (T10)	19:18		18:32	29 18:04 (T12)	17:04	38 16:06 (T13)	17:10	45 16:22 (T13)
30	06:24	20:06 (T9)	06:55	19:14 (T10)	07:27		08:00	17:35 (T12)	07:36	15:27 (T13)	07:57	15:37 (T13)
	20:52	22 20:28 (T9)	20:11	32 19:46 (T10)	19:16		18:30	29 18:04 (T12)	17:04	40 16:07 (T13)	17:11	45 16:22 (T13)
31	06:25	20:06 (T9)	06:56	19:15 (T10)			08:01	17:35 (T12)			07:57	15:38 (T13)
	20:51	21 20:27 (T9)	20:09	30 19:45 (T10)			18:29	29 18:04 (T12)			17:12	45 16:23 (T13)
Potential sun hours	460		429		375		345		297		287	
Total, worst case		797		925		80		258		607		1378
Sun reduction		0.66		0.61		0.59		0.48		0.30		0.22
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.55		0.58		0.58		0.71		0.73		0.74
Total reduction		0.38		0.37		0.36		0.36		0.23		0.17
Total, real		305		343		29		93		140		236

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA**Shadow receptor:** 1620 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7491)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		08:04 (T44)	07:07			07:16		07:35 (T77)	06:30			06:02		06:29 (T42)
	17:13	17:48	8	08:12 (T44)	18:22			19:56	29	08:04 (T77)	20:27			20:57	38	07:07 (T42)
2	07:57	07:42		08:03 (T44)	07:06			07:15		07:33 (T77)	06:29			06:01		06:29 (T42)
	17:14	17:49	12	08:15 (T44)	18:23			19:57	31	08:04 (T77)	20:28			20:58	39	07:08 (T42)
3	07:57	07:41		08:02 (T44)	07:04			07:13		07:32 (T77)	06:28			06:01		06:29 (T42)
	17:15	17:50	15	08:17 (T44)	18:24			19:58	33	08:05 (T77)	20:29			20:58	38	07:07 (T42)
4	07:58	07:40		08:01 (T44)	07:03			07:11		07:31 (T77)	06:26			06:00		06:29 (T42)
	17:16	17:51	17	08:18 (T44)	18:25			19:59	34	08:05 (T77)	20:30			20:59	39	07:08 (T42)
5	07:57	07:39		08:00 (T44)	07:01			07:10		07:31 (T77)	06:25			06:00		06:30 (T42)
	17:17	17:53	19	08:19 (T44)	18:26			20:00	35	08:06 (T77)	20:31			21:00	38	07:08 (T42)
6	07:57	07:38		07:58 (T44)	06:59			07:08		07:30 (T77)	06:24			06:00		06:29 (T42)
	17:18	17:54	22	08:20 (T44)	18:28			20:00	35	08:05 (T77)	20:32			21:01	38	07:07 (T42)
7	07:57	07:37		07:57 (T44)	06:58			07:06		07:29 (T77)	06:23			05:59		06:30 (T42)
	17:19	17:55	24	08:21 (T44)	18:29			20:01	35	08:04 (T77)	20:33			21:01	38	07:08 (T42)
8	07:57	07:36		07:56 (T44)	07:56			07:05		07:30 (T77)	06:22			05:59		06:30 (T42)
	17:20	17:56	25	08:21 (T44)	19:30			20:02	35	08:05 (T77)	20:34			21:02	38	07:08 (T42)
9	07:57	07:35		07:55 (T44)	07:55			07:03		07:29 (T77)	06:20			05:59		06:31 (T42)
	17:21	17:58	27	08:22 (T44)	19:31			20:04	35	08:04 (T77)	20:35			21:02	37	07:08 (T42)
10	07:57	07:34		07:54 (T44)	07:53			07:01		07:29 (T77)	06:19		06:43 (T42)	05:59		06:31 (T42)
	17:22	17:59	29	08:23 (T44)	19:32			20:05	34	08:03 (T77)	20:36	9	06:52 (T42)	21:03	37	07:08 (T42)
11	07:57	07:32		07:53 (T44)	07:51			07:00		07:29 (T77)	06:18		06:39 (T42)	05:58		06:32 (T42)
	17:23	18:00	29	08:22 (T44)	19:33			20:06	34	08:03 (T77)	20:38	15	06:54 (T42)	21:04	37	07:09 (T42)
12	07:56	07:31		07:53 (T44)	07:50			06:58		07:29 (T77)	06:17		06:37 (T42)	05:58		06:32 (T42)
	17:24	18:01	29	08:22 (T44)	19:34			20:07	32	08:01 (T77)	20:39	19	06:56 (T42)	21:04	37	07:09 (T42)
13	07:56	07:30		07:53 (T44)	07:48			06:57		07:30 (T77)	06:16		06:36 (T42)	05:58		06:31 (T42)
	17:25	18:03	29	08:22 (T44)	19:35			20:08	31	08:01 (T77)	20:40	22	06:58 (T42)	21:05	37	07:08 (T42)
14	07:56	07:29		07:54 (T44)	07:46			06:55		07:30 (T77)	06:15		06:36 (T42)	05:58		06:32 (T42)
	17:26	18:04	29	08:23 (T44)	19:37			20:09	29	07:59 (T77)	20:41	24	07:00 (T42)	21:05	36	07:08 (T42)
15	07:55	07:27		07:54 (T44)	07:45			06:53		07:32 (T77)	06:14		06:35 (T42)	05:58		06:32 (T42)
	17:27	18:05	27	08:21 (T44)	19:38			20:10	26	07:58 (T77)	20:42	26	07:01 (T42)	21:06	36	07:08 (T42)
16	07:55	07:26		07:55 (T44)	07:43			06:52		07:33 (T77)	06:13		06:34 (T42)	05:58		06:33 (T42)
	17:28	18:06	26	08:21 (T44)	19:39			20:11	23	07:56 (T77)	20:43	28	07:02 (T42)	21:06	36	07:09 (T42)
17	07:54	07:25		07:55 (T44)	07:41			06:50		07:34 (T77)	06:12		06:33 (T42)	05:58		06:33 (T42)
	17:29	18:07	25	08:20 (T44)	19:40			20:12	21	07:55 (T77)	20:44	29	07:02 (T42)	21:06	37	07:10 (T42)
18	07:54	07:23		07:56 (T44)	07:40			06:49		07:36 (T77)	06:11		06:32 (T42)	05:58		06:33 (T42)
	17:30	18:09	23	08:19 (T44)	19:41			20:13	16	07:52 (T77)	20:45	31	07:03 (T42)	21:07	37	07:10 (T42)
19	07:53	07:22		07:58 (T44)	07:38			06:47		07:40 (T77)	06:10		06:31 (T42)	05:58		06:34 (T42)
	17:32	18:10	20	08:18 (T44)	19:42			20:14	8	07:48 (T77)	20:45	32	07:03 (T42)	21:07	36	07:10 (T42)
20	07:53	07:21		07:59 (T44)	07:36			06:46			06:09		06:30 (T42)	05:59		06:34 (T42)
	17:33	18:11	17	08:16 (T44)	19:43			20:15			20:46	34	07:04 (T42)	21:07	36	07:10 (T42)
21	07:52	07:19		08:01 (T44)	07:35			06:44			06:09		06:30 (T42)	05:59		06:34 (T42)
	17:34	18:12	13	08:14 (T44)	19:44			20:16			20:47	35	07:05 (T42)	21:08	36	07:10 (T42)
22	07:52	07:18			07:33			06:43			06:08		06:29 (T42)	05:59		06:34 (T42)
	17:35	18:14			19:45			20:17			20:48	36	07:05 (T42)	21:08	36	07:10 (T42)
23	07:51	07:16			07:31			06:41			06:07		06:29 (T42)	05:59		06:35 (T42)
	17:36	18:15			19:46			20:18			20:49	36	07:05 (T42)	21:08	36	07:11 (T42)
24	07:50	07:15			07:30			06:40			06:06		06:28 (T42)	05:59		06:34 (T42)
	17:38	18:16			19:47			20:20			20:50	37	07:05 (T42)	21:08	37	07:11 (T42)
25	07:50	07:13			07:28			06:39			06:06		06:29 (T42)	06:00		06:34 (T42)
	17:39	18:17			19:49			20:21			20:51	37	07:06 (T42)	21:08	37	07:11 (T42)
26	07:49	07:12			07:26			06:37			06:05		06:28 (T42)	06:00		06:35 (T42)
	17:40	18:18			19:50			20:22			20:52	38	07:06 (T42)	21:08	36	07:11 (T42)
27	07:48	07:10			07:25		07:49 (T77)	06:36			06:04		06:29 (T42)	06:00		06:35 (T42)
	17:41	18:19			19:51	5	07:54 (T77)	20:23			20:53	38	07:07 (T42)	21:09	36	07:11 (T42)
28	07:47	07:09			07:23		07:43 (T77)	06:34			06:04		06:28 (T42)	06:01		06:35 (T42)
	17:43	18:21			19:52	15	07:58 (T77)	20:24			20:54	39	07:07 (T42)	21:09	36	07:11 (T42)
29	07:46				07:21		07:40 (T77)	06:33			06:03		06:29 (T42)	06:01		06:35 (T42)
	17:44				19:53	20	08:00 (T77)	20:25			20:54	38	07:07 (T42)	21:09	37	07:12 (T42)
30	07:45				07:20		07:39 (T77)	06:32			06:03		06:29 (T42)	06:02		06:35 (T42)
	17:45				19:54	23	08:02 (T77)	20:26			20:55	38	07:07 (T42)	21:09	37	07:12 (T42)
31	07:44				07:18		07:37 (T77)				06:02		06:29 (T42)			
	17:46				19:55	26	08:03 (T77)				20:56	39	07:08 (T42)			
Potential sun hours	297	297			370			399			448			453		
Total, worst case			465			89			556			680			1109	
Sun reduction			0.40			0.44			0.52			0.57			0.64	
Oper. time red.			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.			0.55			0.64			0.64			0.71			0.71	
Total reduction			0.22			0.28			0.33			0.40			0.45	
Total, real			100			25			183			272			497	

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

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

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1620 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7491)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December
1	06:02		06:36 (T42)	06:26		06:48 (T42)	06:57		07:28 (T77)	07:28			07:02		07:23 (T44)	07:37
	21:09	37	07:13 (T42)	20:50	18	07:06 (T42)	20:07	34	08:02 (T77)	19:15			17:28	28	07:51 (T44)	17:04
2	06:03		06:35 (T42)	06:27		06:50 (T42)	06:58		07:28 (T77)	07:29			07:03		07:25 (T44)	07:38
	21:08	38	07:13 (T42)	20:49	14	07:04 (T42)	20:06	34	08:02 (T77)	19:13			17:27	27	07:52 (T44)	17:03
3	06:03		06:36 (T42)	06:28		06:55 (T42)	06:59		07:27 (T77)	07:30			07:04		07:26 (T44)	07:39
	21:08	37	07:13 (T42)	20:48	4	06:59 (T42)	20:04	35	08:02 (T77)	19:11			17:26	25	07:51 (T44)	17:03
4	06:04		06:36 (T42)	06:29			07:00		07:27 (T77)	07:31			07:06		07:27 (T44)	07:40
	21:08	37	07:13 (T42)	20:47			20:02	35	08:02 (T77)	19:10			17:24	23	07:50 (T44)	17:03
5	06:04		06:36 (T42)	06:30			07:01		07:26 (T77)	07:32			07:07		07:28 (T44)	07:41
	21:08	38	07:14 (T42)	20:46			20:01	36	08:02 (T77)	19:08			17:23	21	07:49 (T44)	17:03
6	06:05		06:36 (T42)	06:31			07:02		07:26 (T77)	07:33			07:08		07:30 (T44)	07:42
	21:08	37	07:13 (T42)	20:44			19:57	35	08:01 (T77)	19:06			17:22	19	07:49 (T44)	17:03
7	06:06		06:36 (T42)	06:32			07:03		07:26 (T77)	07:34			07:09		07:31 (T44)	07:43
	21:07	38	07:14 (T42)	20:43			19:56	35	08:01 (T77)	19:05			17:21	17	07:48 (T44)	17:03
8	06:06		06:37 (T42)	06:33			07:04		07:26 (T77)	07:35			07:10		07:32 (T44)	07:44
	21:07	38	07:15 (T42)	20:42			19:54	34	08:00 (T77)	19:03			17:20	14	07:46 (T44)	17:03
9	06:07		06:36 (T42)	06:34			07:05		07:26 (T77)	07:36			07:12		07:34 (T44)	07:45
	21:07	38	07:14 (T42)	20:41			19:52	33	07:59 (T77)	19:02			17:19	11	07:45 (T44)	17:03
10	06:08		06:37 (T42)	06:35			07:06		07:27 (T77)	07:37			07:13		07:35 (T44)	07:46
	21:06	38	07:15 (T42)	20:40			19:51	31	07:58 (T77)	19:00			17:18	8	07:43 (T44)	17:03
11	06:08		06:37 (T42)	06:36			07:07		07:28 (T77)	07:38			07:14			07:47
	21:06	38	07:15 (T42)	20:38			19:49	29	07:57 (T77)	18:58			17:17			17:03
12	06:09		06:36 (T42)	06:37			07:08		07:28 (T77)	07:39			07:15			07:47
	21:06	39	07:15 (T42)	20:37			19:47	27	07:55 (T77)	18:57			17:16			17:03
13	06:10		06:37 (T42)	06:38			07:09		07:29 (T77)	07:40			07:16			07:48
	21:05	38	07:15 (T42)	20:36			19:46	24	07:53 (T77)	18:55			17:15			17:03
14	06:10		06:37 (T42)	06:39			07:10		07:30 (T77)	07:41			07:18			07:49
	21:05	39	07:16 (T42)	20:34			19:44	21	07:51 (T77)	18:54			17:14			17:03
15	06:11		06:38 (T42)	06:40			07:11		07:32 (T77)	07:43			07:19			07:50
	21:04	38	07:16 (T42)	20:33			19:42	16	07:48 (T77)	18:52			17:13			17:03
16	06:12		06:37 (T42)	06:41			07:12		07:35 (T77)	07:44			07:20			07:50
	21:03	38	07:15 (T42)	20:32			19:40	8	07:43 (T77)	18:50			17:12			17:04
17	06:13		06:38 (T42)	06:42			07:13			07:45			07:21			07:51
	21:03	37	07:15 (T42)	20:30			19:39			18:49			17:12			17:04
18	06:14		06:38 (T42)	06:43			07:14			07:46			07:22			07:52
	21:02	38	07:16 (T42)	20:29			19:37			18:47			17:11			17:04
19	06:14		06:39 (T42)	06:44			07:15			07:47			07:24			07:52
	21:02	37	07:16 (T42)	20:27			19:35			18:46			17:10			17:05
20	06:15		06:39 (T42)	06:45			07:16			07:48		08:35 (T44)	07:25			07:53
	21:01	37	07:16 (T42)	20:26			19:34			18:44	7	08:42 (T44)	17:09			17:05
21	06:16		06:39 (T42)	06:46			07:17			07:49		08:31 (T44)	07:26			07:53
	21:00	36	07:15 (T42)	20:24			19:32			18:43	14	08:45 (T44)	17:09			17:06
22	06:17		06:39 (T42)	06:47			07:18			07:50		08:29 (T44)	07:27			07:54
	20:59	36	07:15 (T42)	20:23			19:30			18:42	18	08:47 (T44)	17:08			17:06
23	06:18		06:40 (T42)	06:48			07:19			07:52		08:27 (T44)	07:28			07:54
	20:59	34	07:14 (T42)	20:21			19:28			18:40	21	08:48 (T44)	17:07			17:07
24	06:19		06:41 (T42)	06:49		07:42 (T77)	07:20			07:53		08:25 (T44)	07:29			07:55
	20:58	33	07:14 (T42)	20:20	10	07:52 (T77)	19:27			18:39	24	08:49 (T44)	17:07			17:07
25	06:20		06:42 (T42)	06:50		07:39 (T77)	07:21			07:54		08:25 (T44)	07:30			07:55
	20:57	32	07:14 (T42)	20:18	16	07:55 (T77)	19:25			18:37	26	08:51 (T44)	17:06			17:08
26	06:21		06:43 (T42)	06:51		07:36 (T77)	07:22			07:55		08:24 (T44)	07:32			07:56
	20:56	30	07:13 (T42)	20:17	21	07:57 (T77)	19:23			18:36	27	08:51 (T44)	17:06			17:08
27	06:22		06:44 (T42)	06:52		07:34 (T77)	07:23			07:56		08:23 (T44)	07:33			07:56
	20:55	29	07:13 (T42)	20:15	24	07:58 (T77)	19:22			18:35	28	08:51 (T44)	17:05			17:09
28	06:23		06:45 (T42)	06:53		07:33 (T77)	07:24			07:57		08:23 (T44)	07:34			07:56
	20:54	27	07:12 (T42)	20:14	26	07:59 (T77)	19:20			18:33	28	08:51 (T44)	17:05			17:10
29	06:23		06:45 (T42)	06:54		07:31 (T77)	07:25			07:58		08:23 (T44)	07:35			07:57
	20:53	25	07:10 (T42)	20:12	29	08:00 (T77)	19:18			18:32	29	08:52 (T44)	17:04			17:10
30	06:24		06:46 (T42)	06:55		07:30 (T77)	07:27			08:00		08:23 (T44)	07:36			07:57
	20:52	23	07:09 (T42)	20:10	31	08:01 (T77)	19:16			18:31	29	08:52 (T44)	17:04			17:11
31	06:25		06:47 (T42)	06:56		07:29 (T77)				08:01		08:22 (T44)				07:57
	20:51	21	07:08 (T42)	20:09	32	08:01 (T77)				18:29	30	08:52 (T44)				17:12
Potential sun hours	460			429			375			345			297			287
Total, worst case		1081			225			467			281			193		
Sun reduction		0.66			0.61			0.59			0.48			0.30		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.71			0.65			0.64			0.55			0.55		
Total reduction		0.46			0.39			0.37			0.26			0.16		
Total, real		500			88			174			73			31		

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

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

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1666 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7530)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January			February			March	April			May			June		
1	07:57			07:43		16:30 (T45)	07:07	07:16			06:30		19:15 (T44)	06:01		19:11 (T44)
	17:13			17:47	45	17:15 (T45)	18:22	19:56			20:27	42	19:57 (T44)	20:57	52	20:03 (T44)
2	07:57			07:42		16:30 (T45)	07:06	07:14			06:29		19:14 (T44)	06:01		19:12 (T44)
	17:14			17:49	46	17:16 (T45)	18:23	19:57			20:28	45	19:59 (T44)	20:58	51	20:03 (T44)
3	07:57			07:41		16:30 (T45)	07:04	07:13			06:28		19:12 (T44)	06:01		19:12 (T44)
	17:15			17:50	46	17:16 (T45)	18:24	19:58			20:29	47	19:59 (T44)	20:58	51	20:03 (T44)
4	07:57			07:40		16:30 (T45)	07:02	07:11			06:26		19:12 (T44)	06:00		19:13 (T44)
	17:16			17:51	47	17:17 (T45)	18:25	19:59			20:30	48	20:00 (T44)	20:59	50	20:03 (T44)
5	07:57			07:39		16:29 (T45)	07:01	07:09			06:25		19:11 (T44)	06:00		19:13 (T44)
	17:17			17:52	47	17:16 (T45)	18:26	20:00			20:31	49	20:00 (T44)	21:00	50	20:03 (T44)
6	07:57			07:38		16:29 (T45)	06:59	07:08			06:24		19:10 (T44)	06:00		19:13 (T44)
	17:17			17:54	48	17:17 (T45)	18:27	20:00			20:32	51	20:01 (T44)	21:00	49	20:02 (T44)
7	07:57			07:37		16:29 (T45)	06:58	07:06			06:23		19:10 (T44)	05:59		19:14 (T44)
	17:18			17:55	48	17:17 (T45)	18:29	20:01			20:33	52	20:02 (T44)	21:01	49	20:03 (T44)
8	07:57			07:36		16:29 (T45)	07:56	07:05			06:22		19:10 (T44)	05:59		19:14 (T44)
	17:19			17:56	48	17:17 (T45)	19:30	20:02			20:34	52	20:02 (T44)	21:02	49	20:03 (T44)
9	07:57			07:35		16:30 (T45)	07:54	07:03			06:20		19:09 (T44)	05:59		19:15 (T44)
	17:20			17:58	48	17:18 (T45)	19:31	20:03			20:35	54	20:03 (T44)	21:02	48	20:03 (T44)
10	07:57			07:34		16:30 (T45)	07:53	07:01			06:19		19:08 (T44)	05:59		19:16 (T44)
	17:21			17:59	48	17:18 (T45)	19:32	20:05			20:36	54	20:02 (T44)	21:03	47	20:03 (T44)
11	07:57			07:32		16:30 (T45)	07:51	07:00			06:18		19:08 (T44)	05:58		19:16 (T44)
	17:23			18:00	47	17:17 (T45)	19:33	20:06			20:37	54	20:02 (T44)	21:03	47	20:03 (T44)
12	07:56			07:31		16:30 (T45)	07:50	06:58			06:17		19:07 (T44)	05:58		19:16 (T44)
	17:24			18:01	47	17:17 (T45)	19:34	20:07			20:38	56	20:03 (T44)	21:04	46	20:02 (T44)
13	07:56			07:30		16:31 (T45)	07:48	06:57			06:16		19:07 (T44)	05:58		19:16 (T44)
	17:25			18:02	46	17:17 (T45)	19:35	20:08			20:39	56	20:03 (T44)	21:05	46	20:02 (T44)
14	07:56			07:29		16:31 (T45)	07:46	06:55			06:15		19:07 (T44)	05:58		19:16 (T44)
	17:26			18:04	45	17:16 (T45)	19:36	20:09			20:40	56	20:03 (T44)	21:05	46	20:02 (T44)
15	07:55			07:27		16:32 (T45)	07:45	06:53			06:14		19:08 (T44)	05:58		19:17 (T44)
	17:27			18:05	43	17:15 (T45)	19:38	20:10			20:41	56	20:04 (T44)	21:05	45	20:02 (T44)
16	07:55			07:26		16:33 (T45)	07:43	06:52			06:13		19:08 (T44)	05:58		19:17 (T44)
	17:28			18:06	42	17:15 (T45)	19:39	20:11			20:42	56	20:04 (T44)	21:06	46	20:03 (T44)
17	07:54		16:43 (T45)	07:25		16:34 (T45)	07:41	06:50			06:12		19:08 (T44)	05:58		19:18 (T44)
	17:29	11	16:54 (T45)	18:07	39	17:13 (T45)	19:40	20:12			20:43	56	20:04 (T44)	21:06	46	20:04 (T44)
18	07:54		16:40 (T45)	07:23		16:35 (T45)	07:40	06:49			06:11		19:08 (T44)	05:58		19:18 (T44)
	17:30	17	16:57 (T45)	18:09	38	17:13 (T45)	19:41	20:13			20:44	56	20:04 (T44)	21:07	46	20:04 (T44)
19	07:53		16:39 (T45)	07:22		16:37 (T45)	07:38	06:47			06:10		19:07 (T44)	05:58		19:19 (T44)
	17:32	21	17:00 (T45)	18:10	35	17:12 (T45)	19:42	20:14			20:45	57	20:04 (T44)	21:07	45	20:04 (T44)
20	07:53		16:37 (T45)	07:20		16:37 (T45)	07:36	06:46			06:09		19:07 (T44)	05:59		19:19 (T44)
	17:33	25	17:02 (T45)	18:11	33	17:10 (T45)	19:43	20:15			20:46	57	20:04 (T44)	21:07	45	20:04 (T44)
21	07:52		16:36 (T45)	07:19		16:40 (T45)	07:35	06:44			06:09		19:07 (T44)	05:59		19:19 (T44)
	17:34	27	17:03 (T45)	18:12	29	17:09 (T45)	19:44	20:16			20:47	56	20:03 (T44)	21:07	45	20:04 (T44)
22	07:52		16:36 (T45)	07:18		16:41 (T45)	07:33	06:43			06:08		19:08 (T44)	05:59		19:19 (T44)
	17:35	29	17:05 (T45)	18:13	25	17:06 (T45)	19:45	20:17			20:48	56	20:04 (T44)	21:08	45	20:04 (T44)
23	07:51		16:34 (T45)	07:16		16:44 (T45)	07:31	06:41			06:07		19:08 (T44)	05:59		19:20 (T44)
	17:36	33	17:07 (T45)	18:15	20	17:04 (T45)	19:46	20:18			20:49	56	20:04 (T44)	21:08	45	20:05 (T44)
24	07:50		16:33 (T45)	07:15		16:48 (T45)	07:30	06:40		19:32 (T44)	06:06		19:08 (T44)	05:59		19:20 (T44)
	17:38	35	17:08 (T45)	18:16	11	16:59 (T45)	19:47	20:19	10	19:42 (T44)	20:50	55	20:03 (T44)	21:08	45	20:05 (T44)
25	07:49		16:33 (T45)	07:13			07:28	06:38		19:27 (T44)	06:06		19:09 (T44)	06:00		19:19 (T44)
	17:39	36	17:09 (T45)	18:17			19:48	20:21	20	19:47 (T44)	20:51	55	20:04 (T44)	21:08	46	20:05 (T44)
26	07:49		16:32 (T45)	07:12			07:26	06:37		19:23 (T44)	06:05		19:09 (T44)	06:00		19:20 (T44)
	17:40	38	17:10 (T45)	18:18			19:50	20:22	26	19:49 (T44)	20:52	55	20:04 (T44)	21:08	46	20:06 (T44)
27	07:48		16:32 (T45)	07:10			07:24	06:36		19:21 (T44)	06:04		19:10 (T44)	06:00		19:20 (T44)
	17:41	40	17:12 (T45)	18:19			19:51	20:23	31	19:52 (T44)	20:53	54	20:04 (T44)	21:08	45	20:05 (T44)
28	07:47		16:31 (T45)	07:09			07:23	06:34		19:20 (T44)	06:04		19:10 (T44)	06:01		19:20 (T44)
	17:42	41	17:12 (T45)	18:21			19:52	20:24	34	19:54 (T44)	20:54	53	20:03 (T44)	21:08	45	20:05 (T44)
29	07:46		16:31 (T45)				07:21	06:33		19:17 (T44)	06:03		19:10 (T44)	06:01		19:20 (T44)
	17:44	42	17:13 (T45)				19:53	20:25	38	19:55 (T44)	20:54	53	20:03 (T44)	21:08	46	20:06 (T44)
30	07:45		16:30 (T45)				07:19	06:32		19:16 (T44)	06:02		19:11 (T44)	06:02		19:20 (T44)
	17:45	44	17:14 (T45)				19:54	20:26	40	19:56 (T44)	20:55	52	20:03 (T44)	21:08	46	20:06 (T44)
31	07:44		16:30 (T45)				07:18				06:02		19:10 (T44)			
	17:46	45	17:15 (T45)				19:55				20:56	53	20:03 (T44)			
Potential sun hours	297			297			370	399			448			453		
Total, worst case		484			971				199			1652			1408	
Sun reduction		0.31			0.40				0.52			0.57			0.64	
Oper. time red.		1.00			1.00				1.00			1.00			1.00	
Wind dir. red.		0.73			0.73				0.57			0.57			0.57	
Total reduction		0.23			0.30				0.30			0.33			0.37	
Total, real		112			289				60			549			525	

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

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

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar

Calculation: 2019-01-07_Emerson SFA **Shadow receptor:** 1666 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7530)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July			August			September	October			November			December
1	06:02		19:20 (T44)	06:26		19:18 (T44)	06:57	07:27			07:02		15:59 (T45)	07:37
	21:08	47	20:07 (T44)	20:50	55	20:13 (T44)	20:07	19:15			17:28	47	16:46 (T45)	17:04
2	06:03		19:20 (T44)	06:27		19:18 (T44)	06:58	07:29			07:03		15:59 (T45)	07:38
	21:08	47	20:07 (T44)	20:49	55	20:13 (T44)	20:06	19:13			17:27	48	16:47 (T45)	17:03
3	06:03		19:20 (T44)	06:28		19:19 (T44)	06:59	07:30			07:04		15:59 (T45)	07:39
	21:08	48	20:08 (T44)	20:48	54	20:13 (T44)	20:04	19:11			17:26	48	16:47 (T45)	17:03
4	06:04		19:20 (T44)	06:29		19:19 (T44)	07:00	07:31			07:06		15:59 (T45)	07:40
	21:08	48	20:08 (T44)	20:47	53	20:12 (T44)	20:02	19:10			17:24	48	16:47 (T45)	17:03
5	06:04		19:20 (T44)	06:30		19:19 (T44)	07:01	07:32			07:07		15:59 (T45)	07:41
	21:08	49	20:09 (T44)	20:46	53	20:12 (T44)	20:01	19:08			17:23	48	16:47 (T45)	17:03
6	06:05		19:19 (T44)	06:31		19:20 (T44)	07:02	07:33			07:08		15:59 (T45)	07:42
	21:08	49	20:08 (T44)	20:44	51	20:11 (T44)	19:57	19:06			17:22	48	16:47 (T45)	17:03
7	06:05		19:20 (T44)	06:32		19:20 (T44)	07:03	07:34			07:09		15:59 (T45)	07:43
	21:07	49	20:09 (T44)	20:43	51	20:11 (T44)	19:56	19:05			17:21	48	16:47 (T45)	17:03
8	06:06		19:20 (T44)	06:33		19:21 (T44)	07:04	07:35			07:10		15:59 (T45)	07:44
	21:07	50	20:10 (T44)	20:42	49	20:10 (T44)	19:54	19:03			17:20	47	16:46 (T45)	17:03
9	06:07		19:19 (T44)	06:34		19:21 (T44)	07:05	07:36			07:12		16:00 (T45)	07:45
	21:07	51	20:10 (T44)	20:41	48	20:09 (T44)	19:52	19:01			17:19	46	16:46 (T45)	17:03
10	06:07		19:19 (T44)	06:35		19:22 (T44)	07:06	07:37			07:13		16:01 (T45)	07:46
	21:06	52	20:11 (T44)	20:39	46	20:08 (T44)	19:51	19:00			17:18	45	16:46 (T45)	17:03
11	06:08		19:20 (T44)	06:36		19:23 (T44)	07:07	07:38			07:14		16:01 (T45)	07:46
	21:06	51	20:11 (T44)	20:38	44	20:07 (T44)	19:49	18:58			17:17	44	16:45 (T45)	17:03
12	06:09		19:19 (T44)	06:37		19:24 (T44)	07:08	07:39			07:15		16:01 (T45)	07:47
	21:05	52	20:11 (T44)	20:37	42	20:06 (T44)	19:47	18:57			17:16	44	16:45 (T45)	17:03
13	06:10		19:19 (T44)	06:38		19:25 (T44)	07:09	07:40			07:16		16:03 (T45)	07:48
	21:05	53	20:12 (T44)	20:36	40	20:05 (T44)	19:45	18:55			17:15	42	16:45 (T45)	17:03
14	06:10		19:19 (T44)	06:39		19:26 (T44)	07:10	07:41			07:18		16:03 (T45)	07:49
	21:04	53	20:12 (T44)	20:34	37	20:03 (T44)	19:44	18:54			17:14	41	16:44 (T45)	17:03
15	06:11		19:19 (T44)	06:40		19:28 (T44)	07:11	07:42			07:19		16:04 (T45)	07:50
	21:04	54	20:13 (T44)	20:33	33	20:01 (T44)	19:42	18:52			17:13	39	16:43 (T45)	17:03
16	06:12		19:18 (T44)	06:41		19:30 (T44)	07:12	07:44			07:20		16:05 (T45)	07:50
	21:03	54	20:12 (T44)	20:31	29	19:59 (T44)	19:40	18:50			17:12	38	16:43 (T45)	17:04
17	06:13		19:18 (T44)	06:42		19:31 (T44)	07:13	07:45			07:21		16:07 (T45)	07:51
	21:03	55	20:13 (T44)	20:30	25	19:56 (T44)	19:39	18:49			17:11	36	16:43 (T45)	17:04
18	06:14		19:19 (T44)	06:43		19:34 (T44)	07:14	07:46		17:18 (T45)	07:22		16:07 (T45)	07:52
	21:02	54	20:13 (T44)	20:29	18	19:52 (T44)	19:37	18:47	14	17:32 (T45)	17:11	35	16:42 (T45)	17:04
19	06:14		19:19 (T44)	06:44		19:39 (T44)	07:15	07:47		17:14 (T45)	07:23		16:08 (T45)	07:52
	21:01	55	20:14 (T44)	20:27	7	19:46 (T44)	19:35	18:46	21	17:35 (T45)	17:10	33	16:41 (T45)	17:05
20	06:15		19:19 (T44)	06:45			07:16	07:48		17:11 (T45)	07:25		16:10 (T45)	07:53
	21:01	55	20:14 (T44)	20:26			19:33	18:44	26	17:37 (T45)	17:09	29	16:39 (T45)	17:05
21	06:16		19:18 (T44)	06:46			07:17	07:49		17:10 (T45)	07:26		16:12 (T45)	07:53
	21:00	55	20:13 (T44)	20:24			19:32	18:43	30	17:40 (T45)	17:09	27	16:39 (T45)	17:06
22	06:17		19:18 (T44)	06:47			07:18	07:50		17:08 (T45)	07:27		16:13 (T45)	07:54
	20:59	56	20:14 (T44)	20:23			19:30	18:41	33	17:41 (T45)	17:08	25	16:38 (T45)	17:06
23	06:18		19:18 (T44)	06:48			07:19	07:51		17:06 (T45)	07:28		16:15 (T45)	07:54
	20:58	56	20:14 (T44)	20:21			19:28	18:40	36	17:42 (T45)	17:07	21	16:36 (T45)	17:07
24	06:19		19:18 (T44)	06:49			07:20	07:53		17:04 (T45)	07:29		16:17 (T45)	07:55
	20:58	56	20:14 (T44)	20:20			19:27	18:39	39	17:43 (T45)	17:07	17	16:34 (T45)	17:07
25	06:20		19:18 (T44)	06:50			07:21	07:54		17:03 (T45)	07:30		16:21 (T45)	07:55
	20:57	56	20:14 (T44)	20:18			19:25	18:37	40	17:43 (T45)	17:06	11	16:32 (T45)	17:08
26	06:21		19:18 (T44)	06:51			07:22	07:55		17:03 (T45)	07:32			07:56
	20:56	57	20:15 (T44)	20:17			19:23	18:36	42	17:45 (T45)	17:06			17:08
27	06:22		19:18 (T44)	06:52			07:23	07:56		17:02 (T45)	07:33			07:56
	20:55	57	20:15 (T44)	20:15			19:21	18:34	43	17:45 (T45)	17:05			17:09
28	06:22		19:18 (T44)	06:53			07:24	07:57		17:01 (T45)	07:34			07:56
	20:54	57	20:15 (T44)	20:14			19:20	18:33	44	17:45 (T45)	17:05			17:10
29	06:23		19:18 (T44)	06:54			07:25	07:58		17:00 (T45)	07:35			07:57
	20:53	56	20:14 (T44)	20:12			19:18	18:32	45	17:45 (T45)	17:04			17:10
30	06:24		19:18 (T44)	06:55			07:26	08:00		17:00 (T45)	07:36			07:57
	20:52	56	20:14 (T44)	20:10			19:16	18:31	47	17:47 (T45)	17:04			17:11
31	06:25		19:18 (T44)	06:56				08:01		16:59 (T45)				07:57
	20:51	55	20:13 (T44)	20:09				18:29	48	17:47 (T45)				17:12
Potential sun hours	460			429			375	345			297			287
Total, worst case		1643			790				508			955		
Sun reduction		0.66			0.61				0.48			0.30		
Oper. time red.		1.00			1.00				1.00			1.00		
Wind dir. red.		0.57			0.57				0.73			0.73		
Total reduction		0.38			0.36				0.36			0.22		
Total, real		632			281				182			213		

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

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

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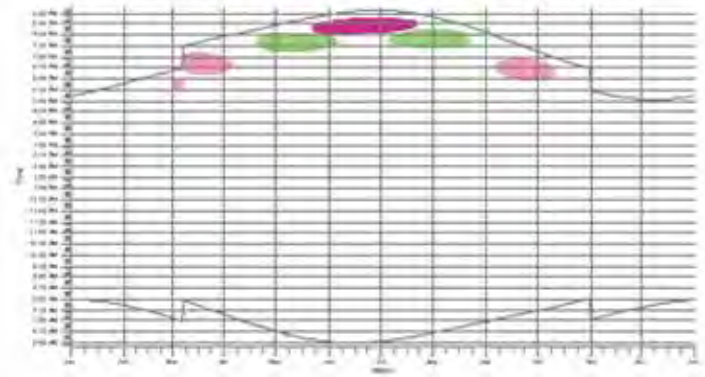
Calculated:
1/7/2019 5:03 PM/3.2.737

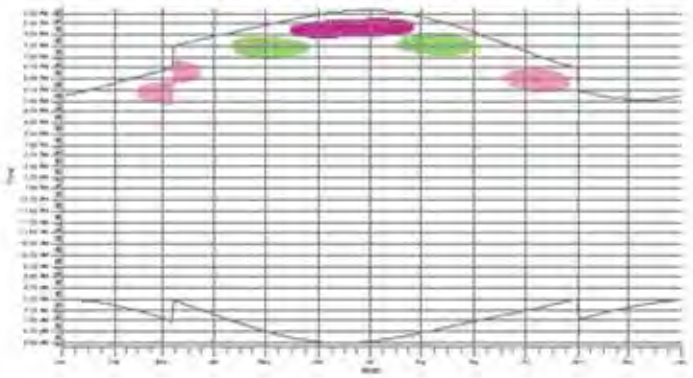
SHADOW - Calendar, graphical

Calculation: 2019-01-07_Emerson SFA

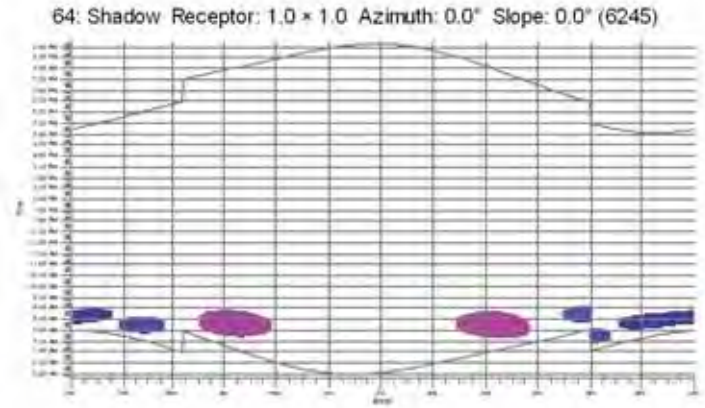
7: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6198)



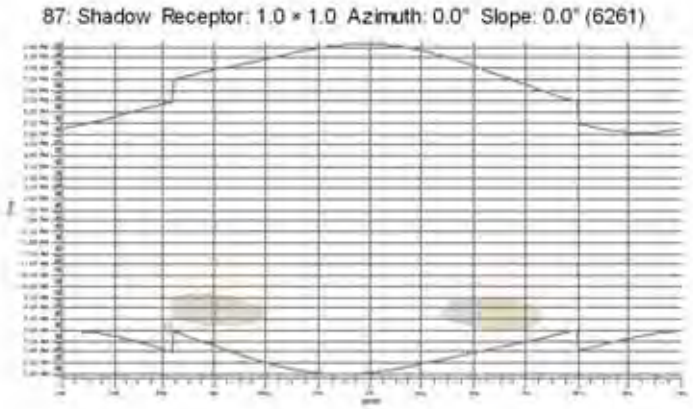
54: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6238)



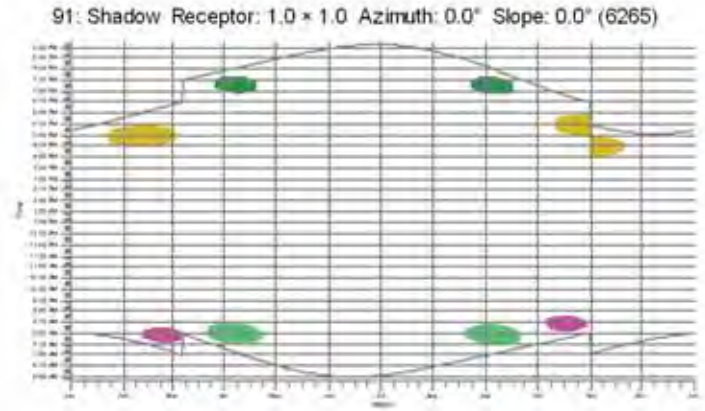
64: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6245)



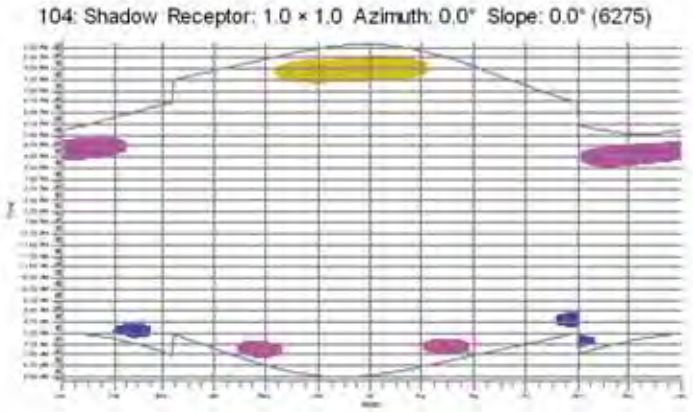
87: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6261)



91: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6265)



104: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6275)



WTGs

T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T49: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (468)
T57: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (476)
T59: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (478)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T78: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (495)

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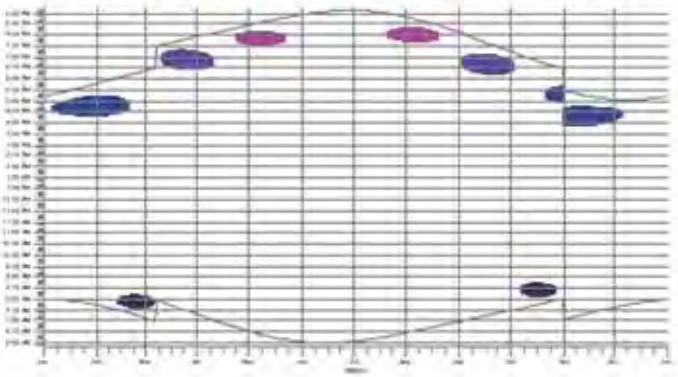
Calculated:
1/7/2019 5:03 PM/3.2.737

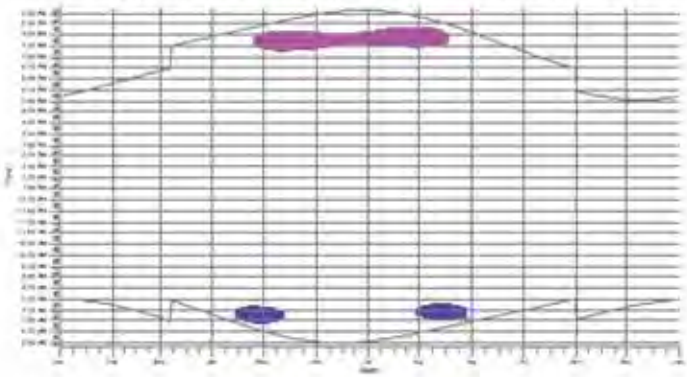
SHADOW - Calendar, graphical

Calculation: 2019-01-07_Emerson SFA

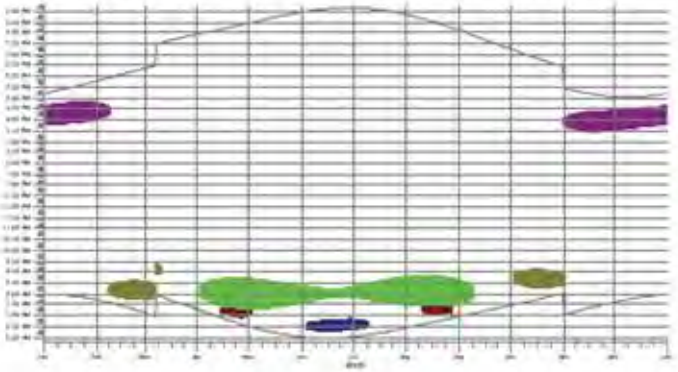
137: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6297)



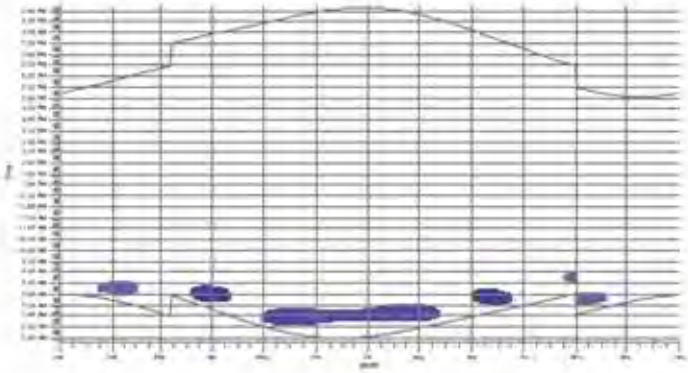
145: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6304)



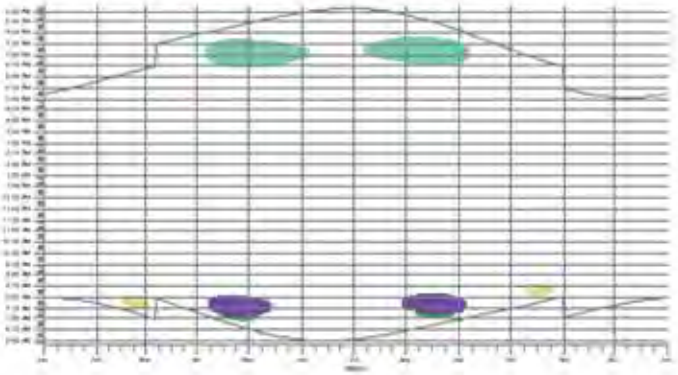
197: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6346)



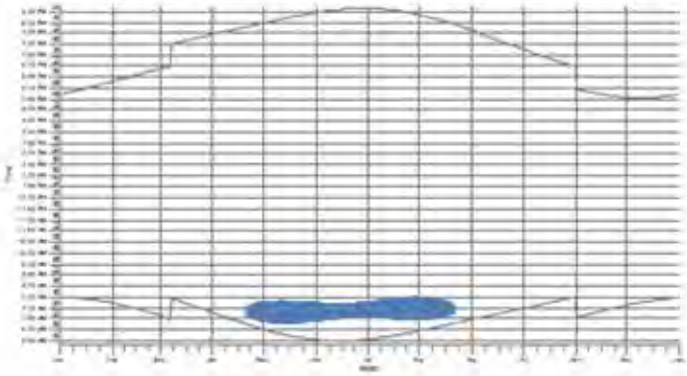
228: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6374)



232: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6378)



255: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6398)



WTGs

T7: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (426)
T8: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (427)
T9: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (428)
T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T11: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (430)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T39: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (458)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T54: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (473)
T55: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (474)
T56: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (475)
T58: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (477)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)

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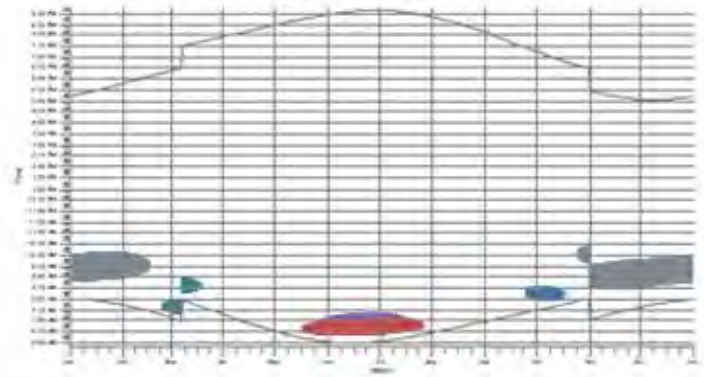
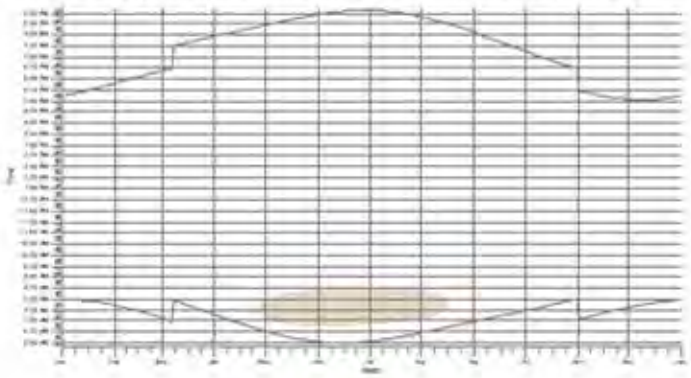
Calculation: 2019-01-07_Emerson SFA

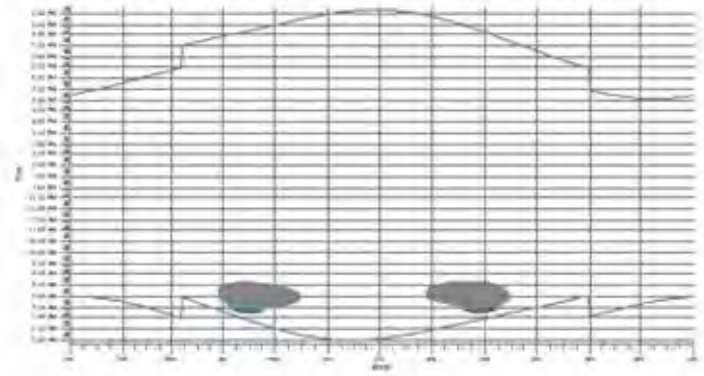
275: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6413)



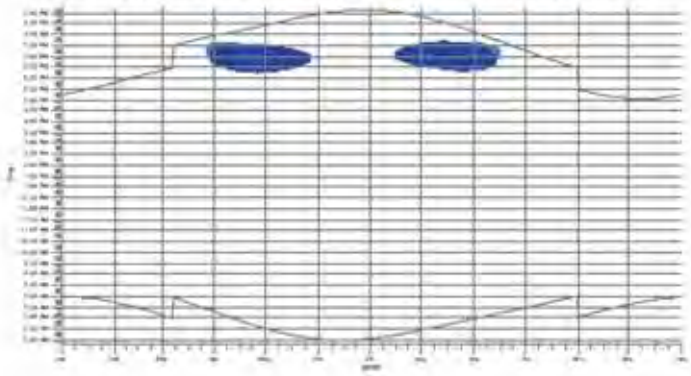
277: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6414)



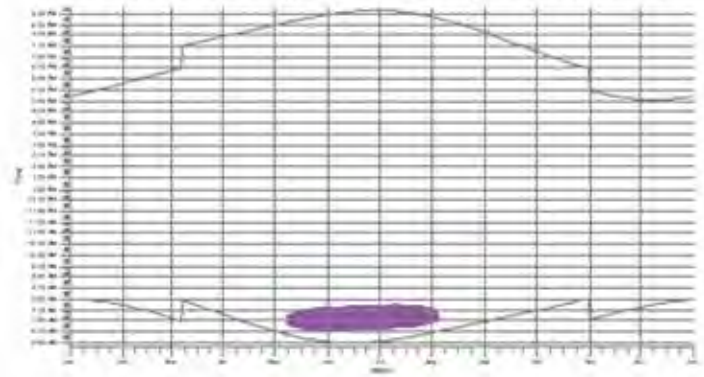
304: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6434)



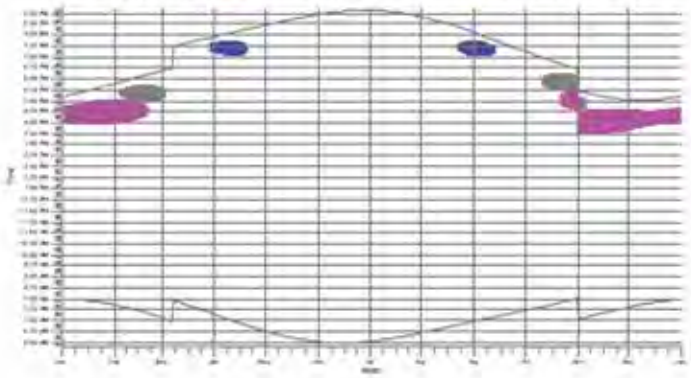
319: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6442)



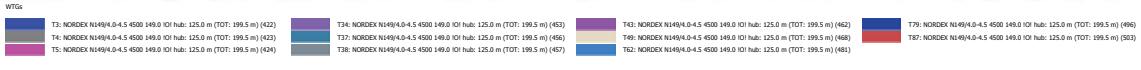
328: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6450)



332: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6454)



WTGs



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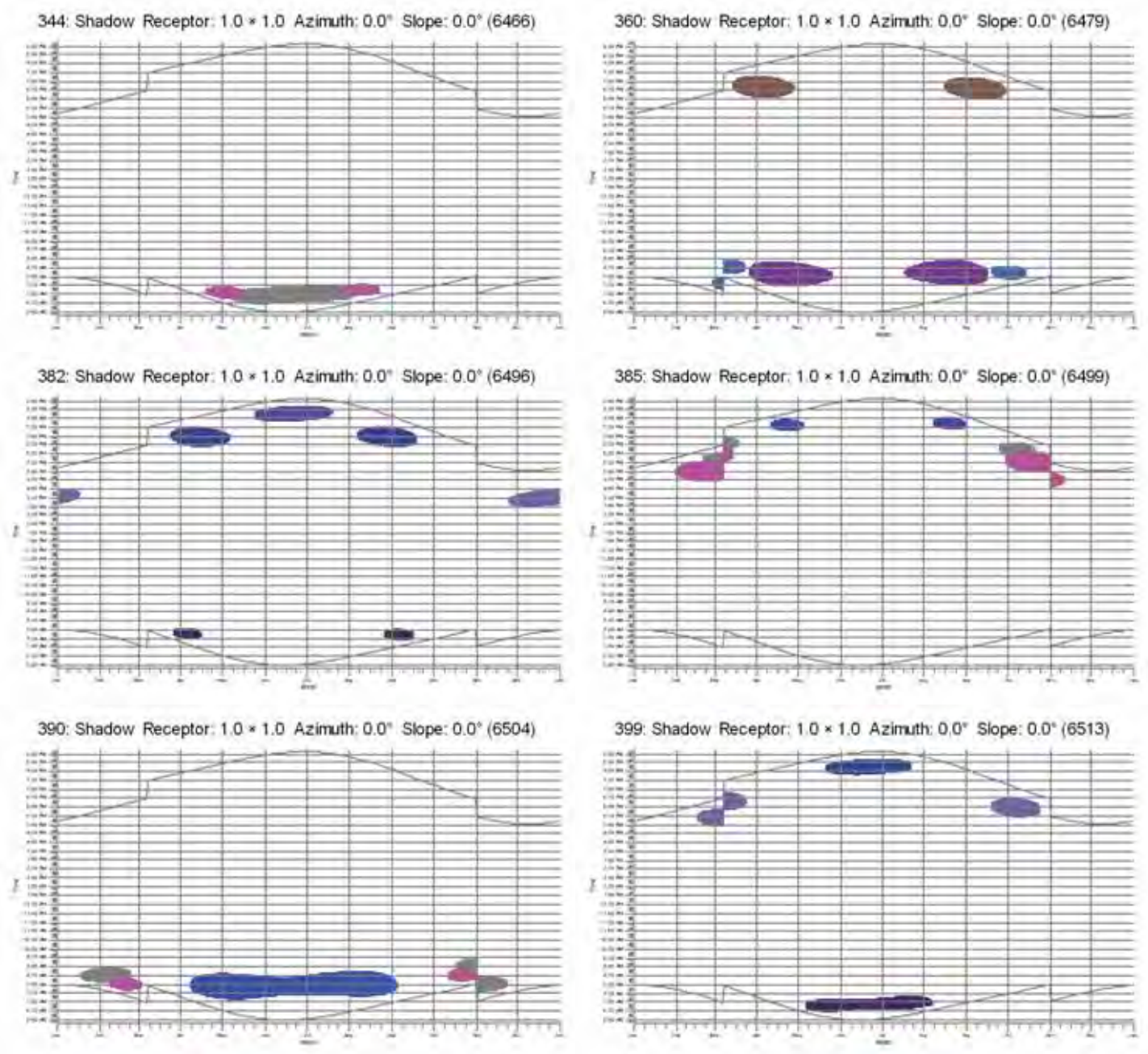

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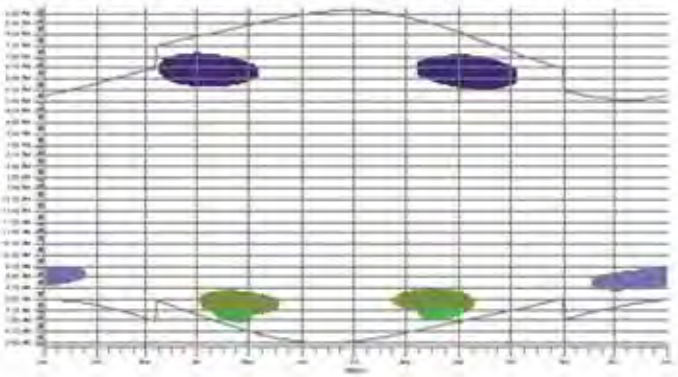
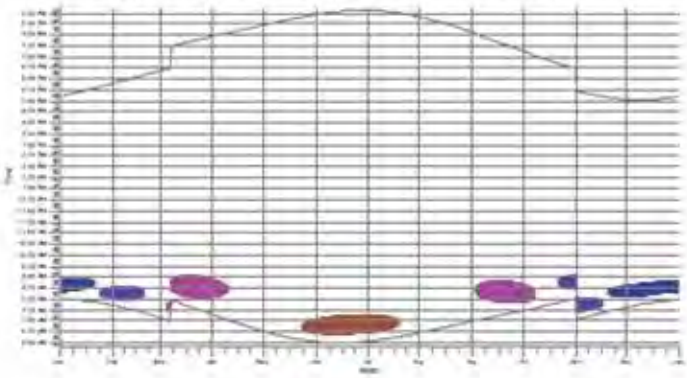
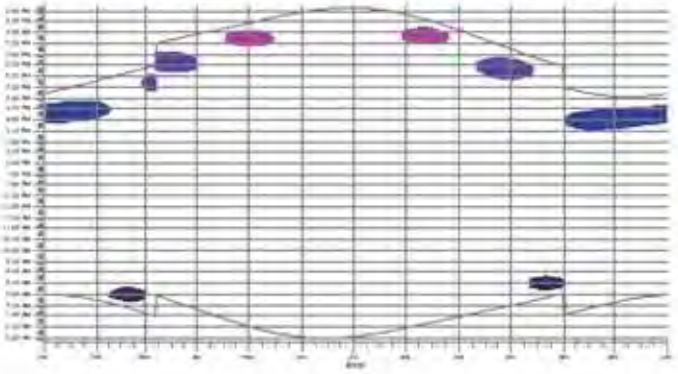
404: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6518)



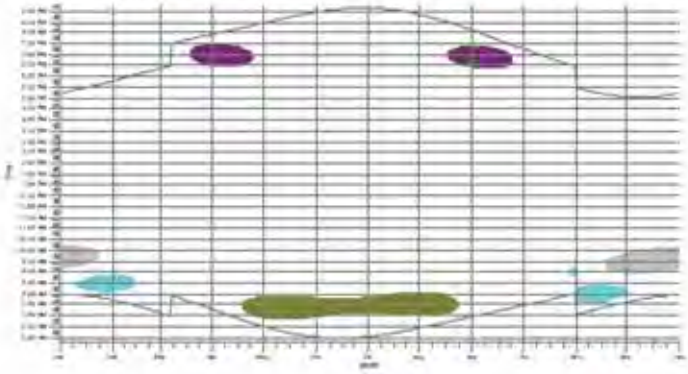
422: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6530)



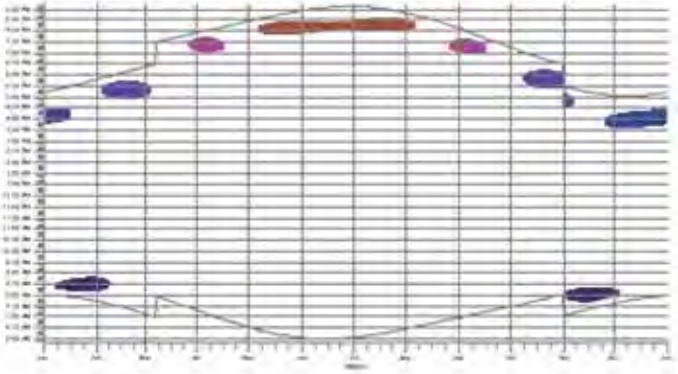
423: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6531)



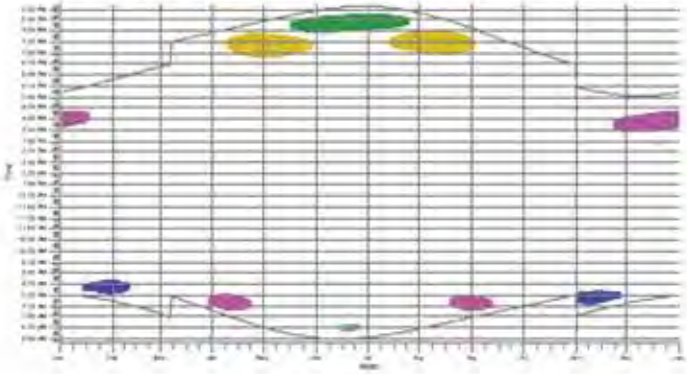
427: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6534)



477: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6572)



500: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6592)



WTGs

T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T11: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (430)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T40: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (459)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T71: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (488)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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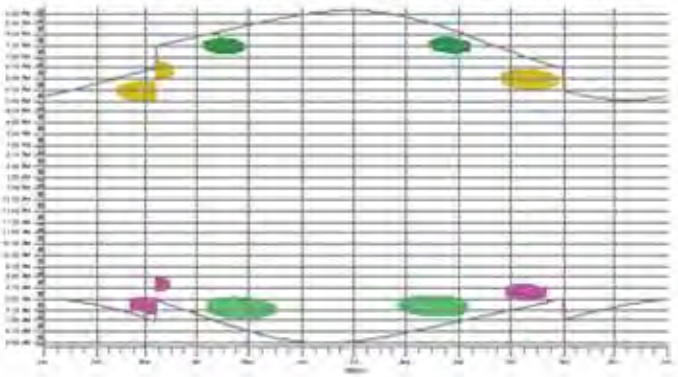
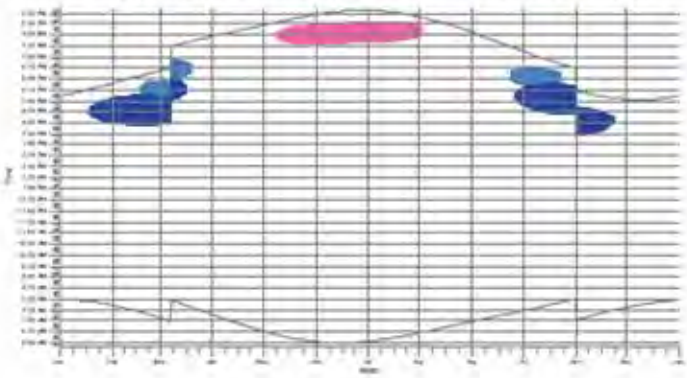
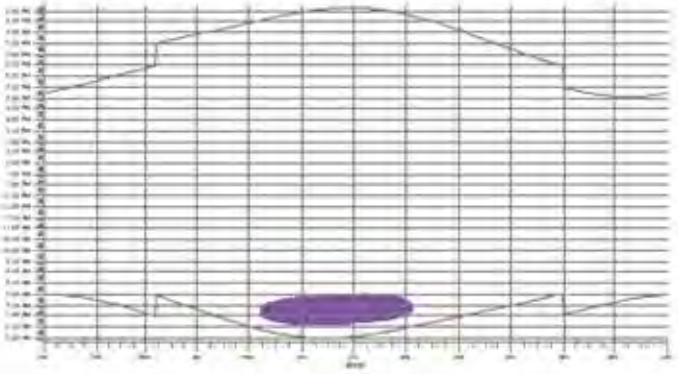
501: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6593)



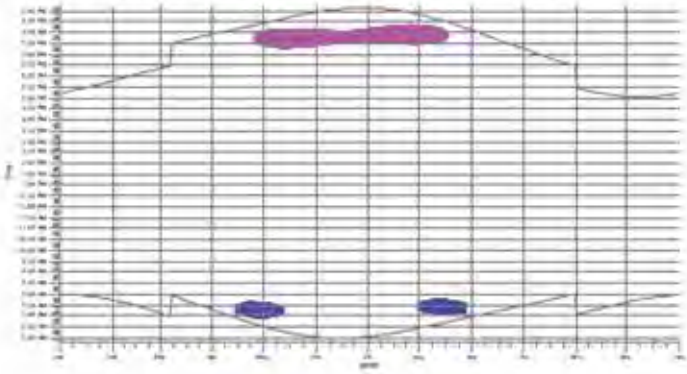
510: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6600)



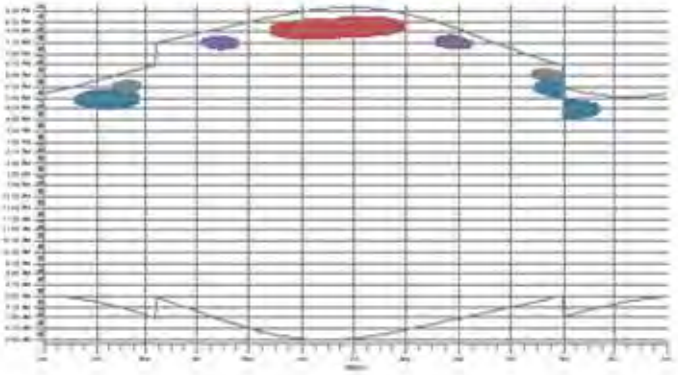
518: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6605)



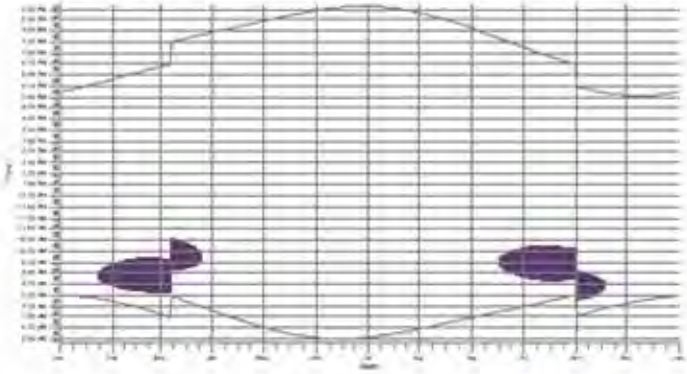
569: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6649)



570: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6650)



580: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6660)



WTGs

T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T34: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (453)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T46: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (465)
T60: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (479)
T62: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (481)
T63: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (482)
T79: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (496)
T87: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (503)

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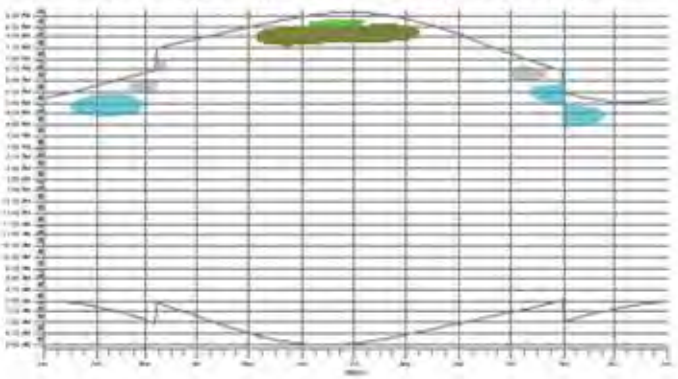
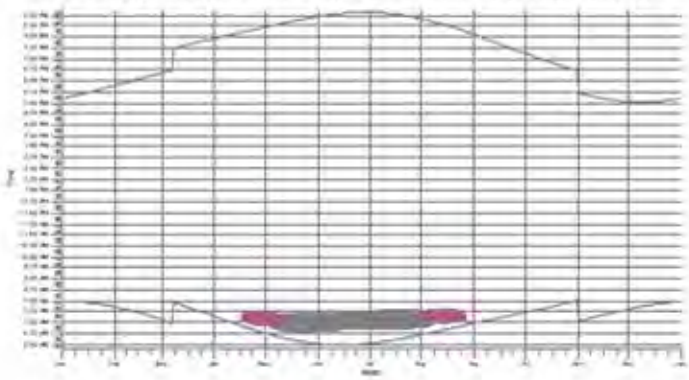
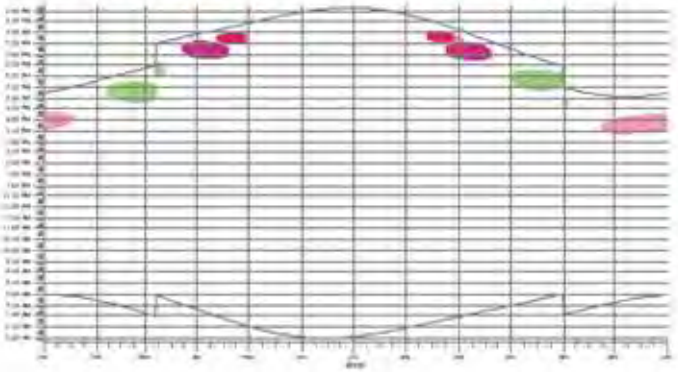
596: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6673)



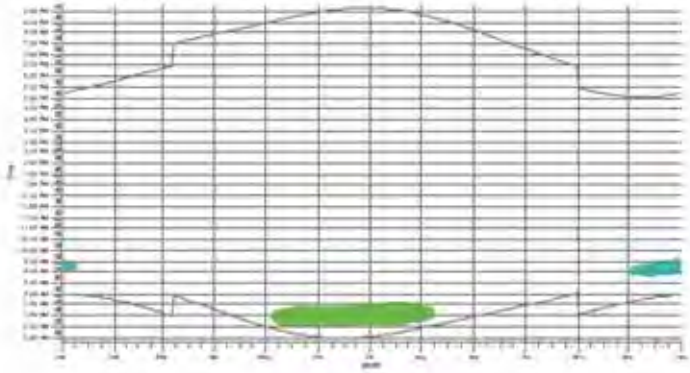
611: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6686)



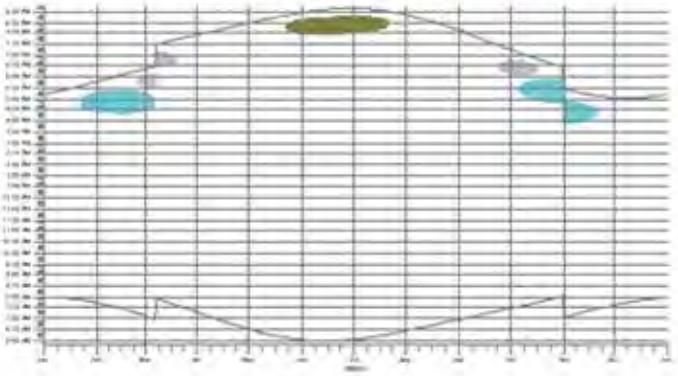
614: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6689)



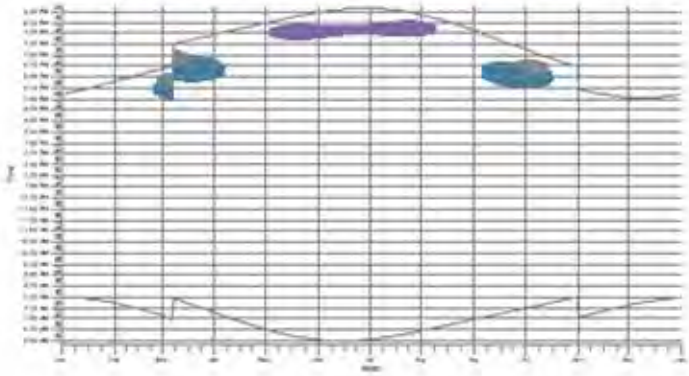
653: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6714)



688: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6741)



693: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6746)



WTGs

T4: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (423)
T5: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (424)
T9: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (428)
T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T18: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (437)
T21: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (440)
T34: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (453)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T53: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (472)
T57: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (476)
T59: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (478)
T78: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (495)

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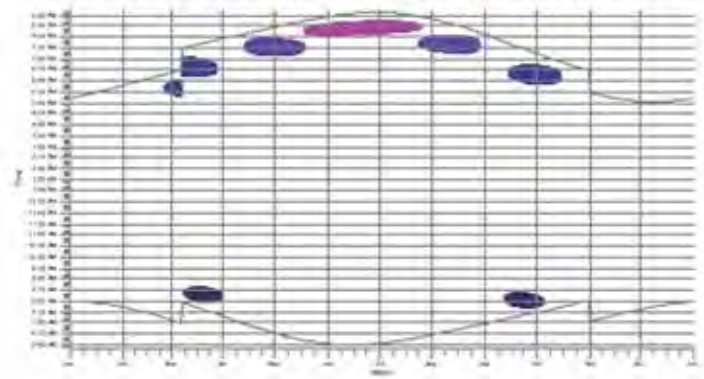
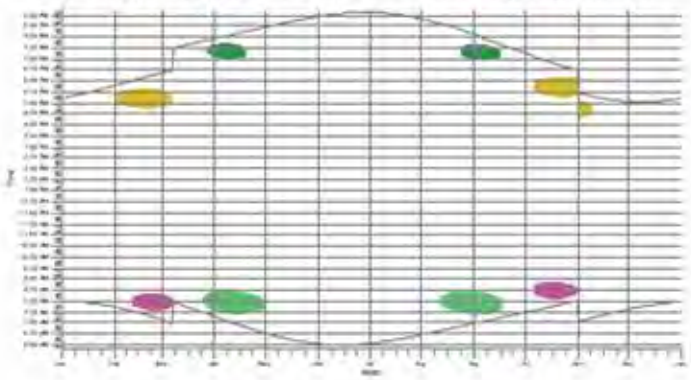
SHADOW - Calendar, graphical

Calculation: 2019-01-07_Emerson SFA

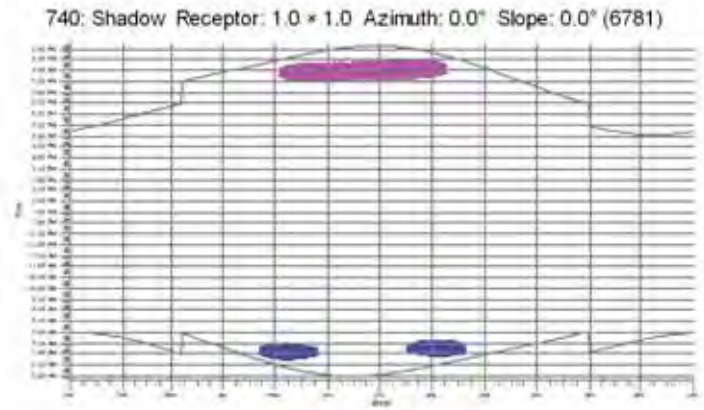
718: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6764)



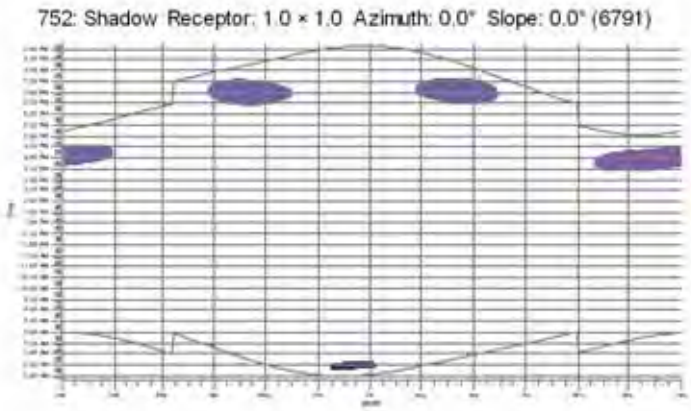
728: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6771)



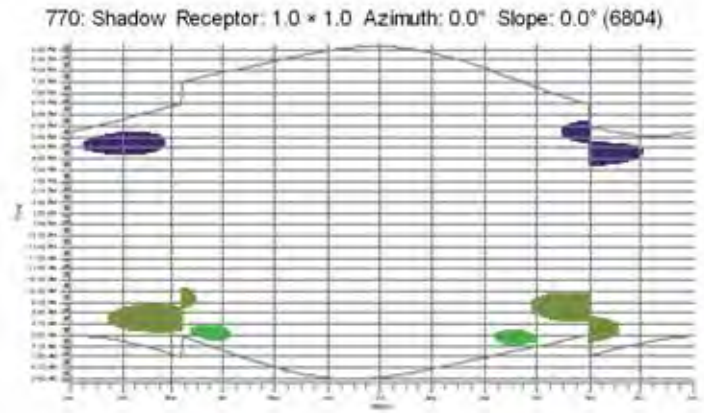
740: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6781)



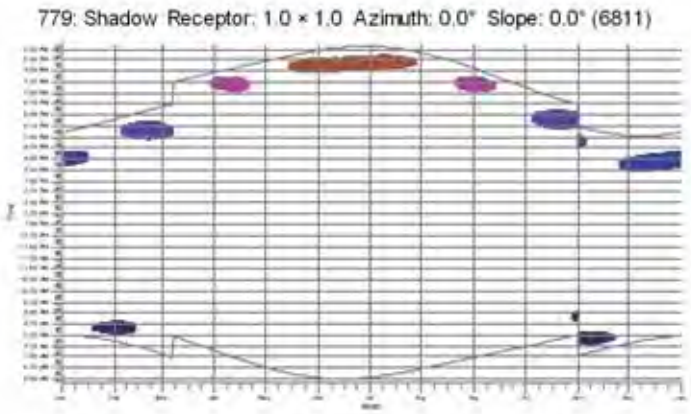
752: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6791)



770: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6804)



779: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6811)



WTGs

T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T40: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (459)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T45: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (464)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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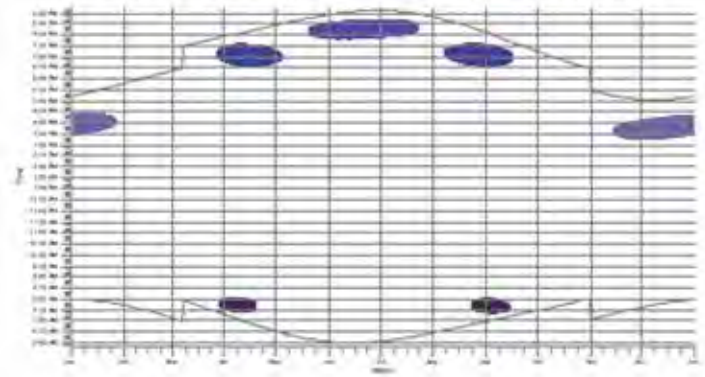
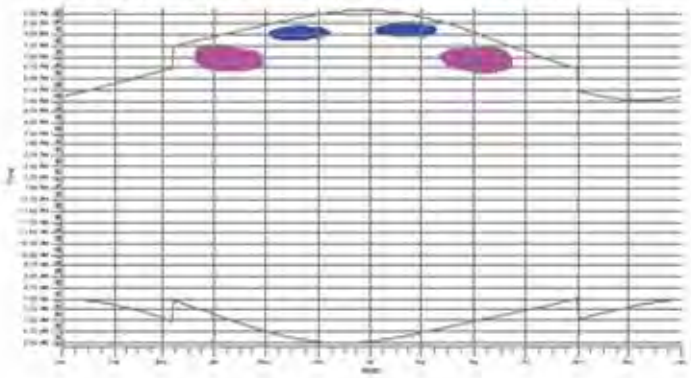
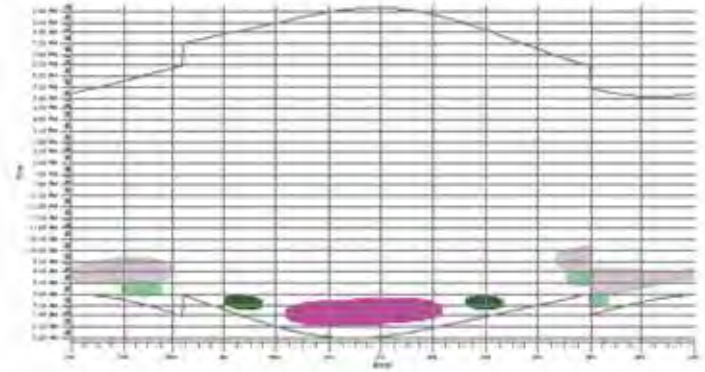
785: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6817)



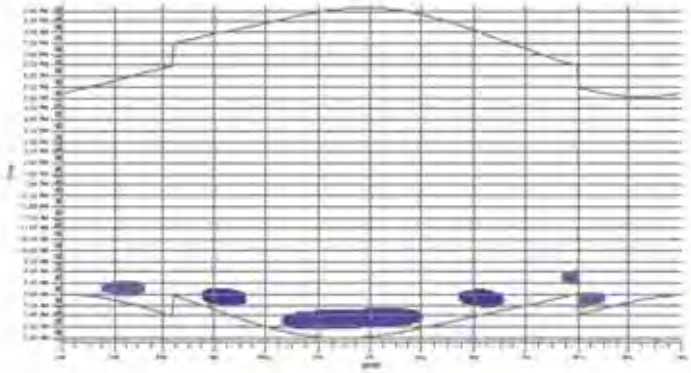
824: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6849)



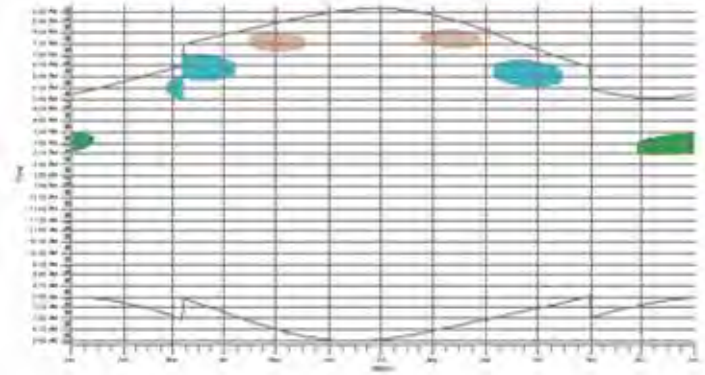
827: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6852)



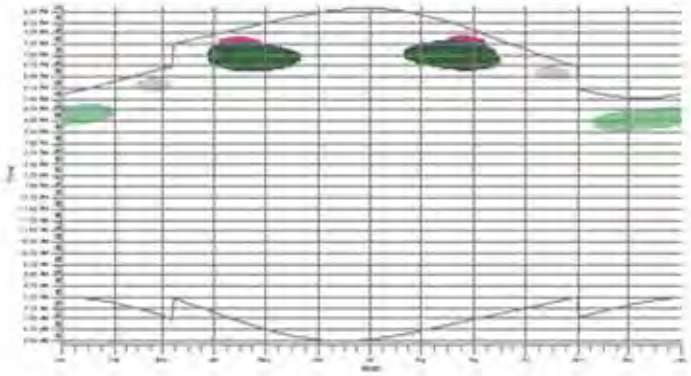
834: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6858)



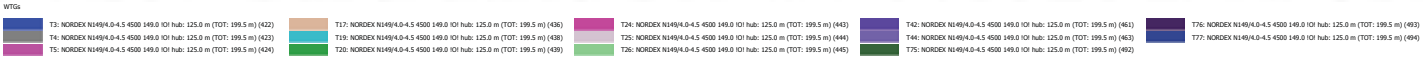
855: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6876)



857: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6877)



WTGs



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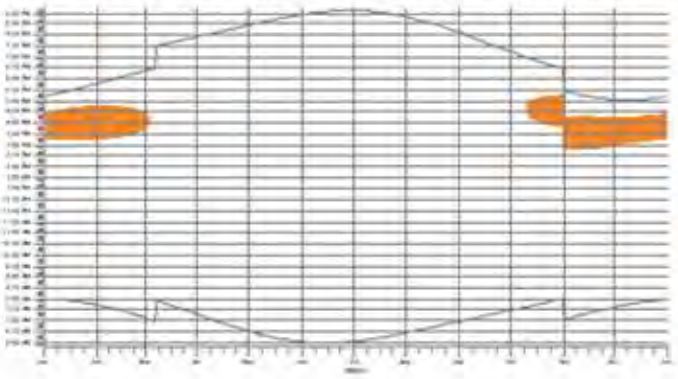
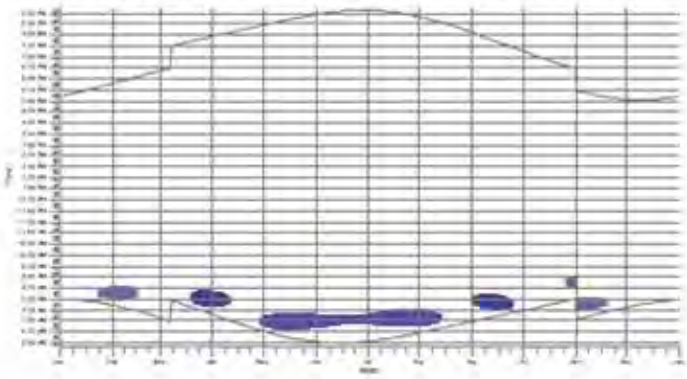
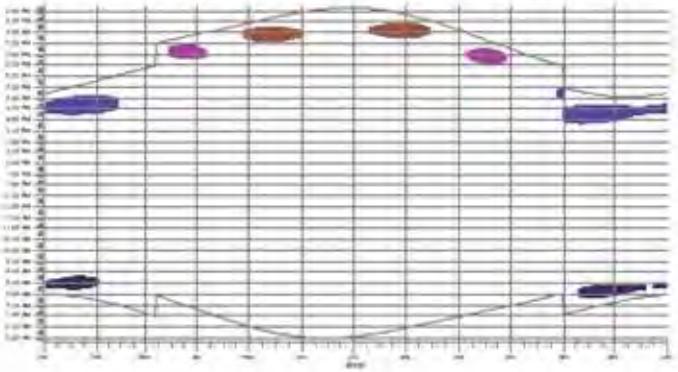
860: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6878)



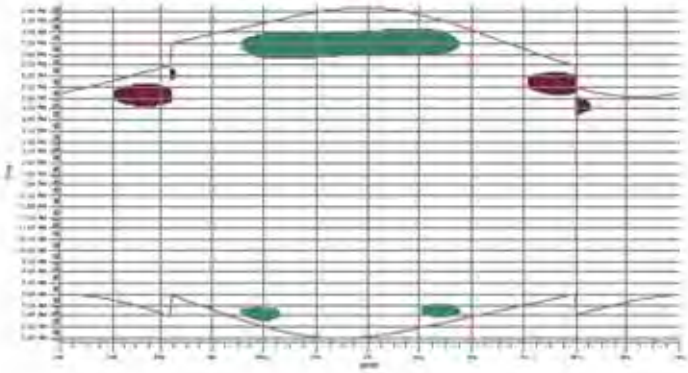
861: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6879)



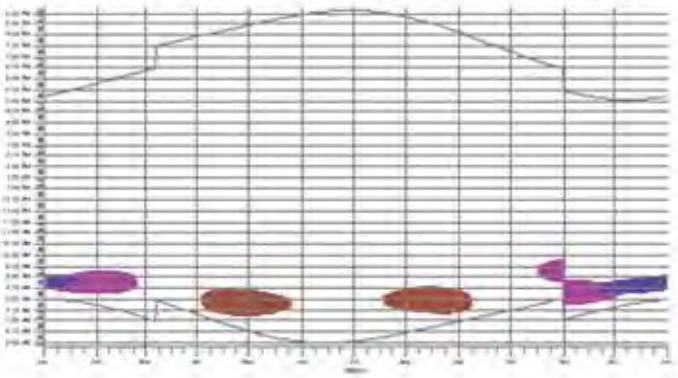
869: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6886)



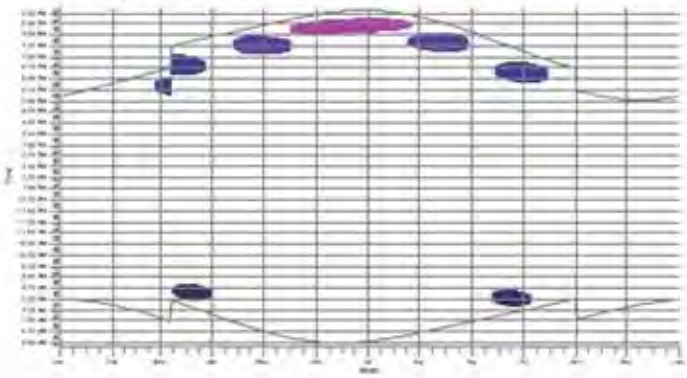
870: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6887)



879: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6895)



880: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6896)



WTGs

T23: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (442)
T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T29: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (448)
T32: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (451)
T40: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (459)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)

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SHADOW - Calendar, graphical

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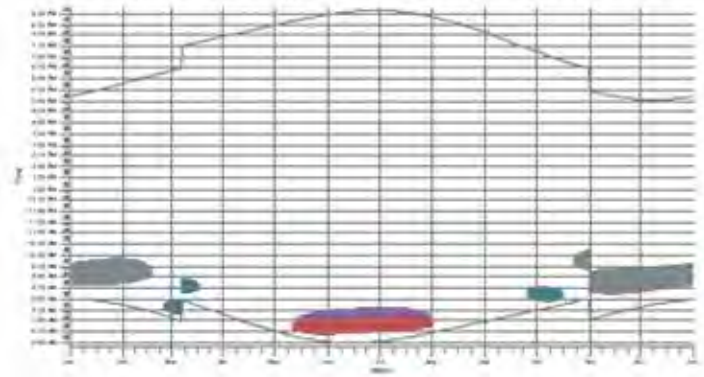
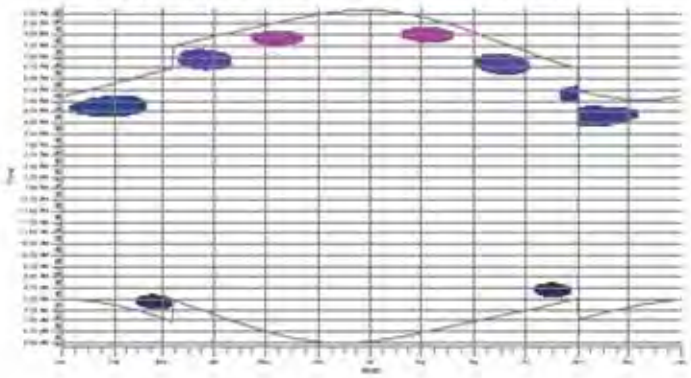
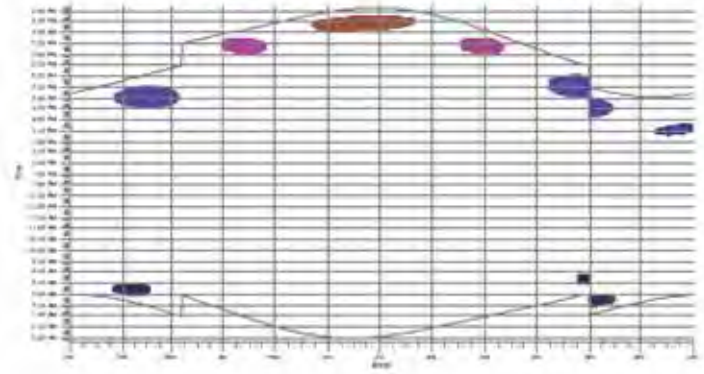
923: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6930)



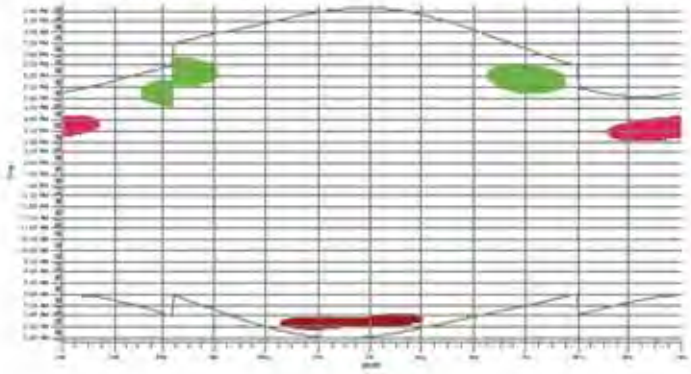
932: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6939)



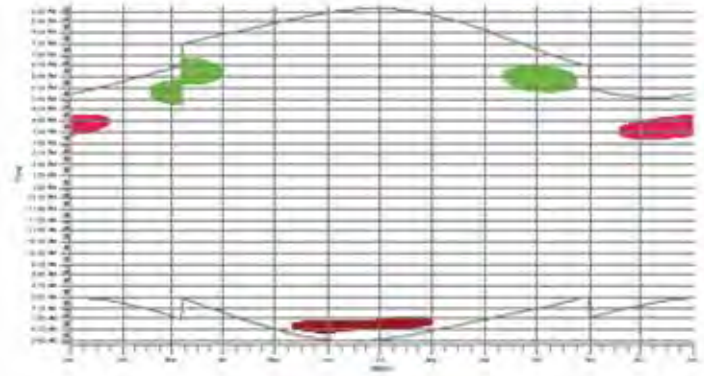
938: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6944)



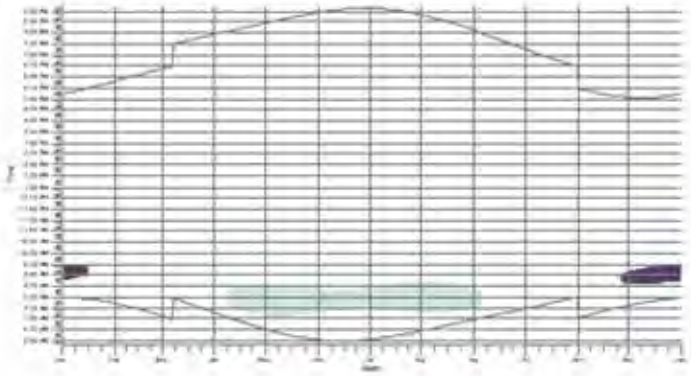
940: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6945)



941: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6946)



948: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6952)



WTGs

T34: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (453)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T40: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (459)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
TS1: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (470)
TS2: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (471)
TS3: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (472)
T61: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (480)
T63: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (482)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T87: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (503)

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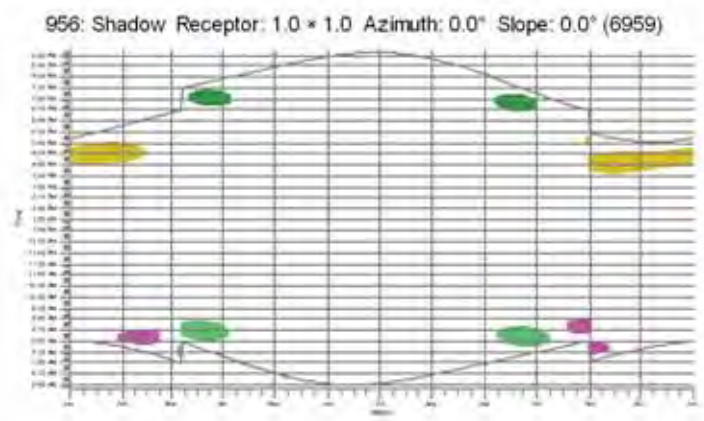

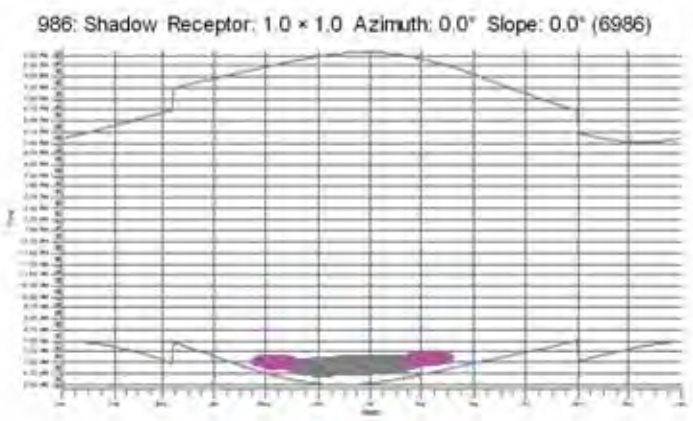

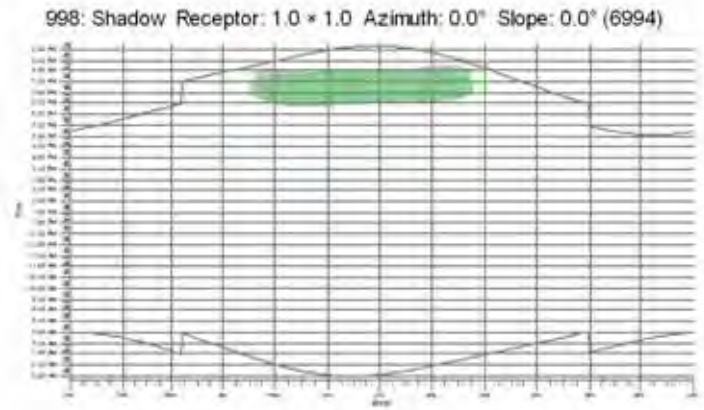

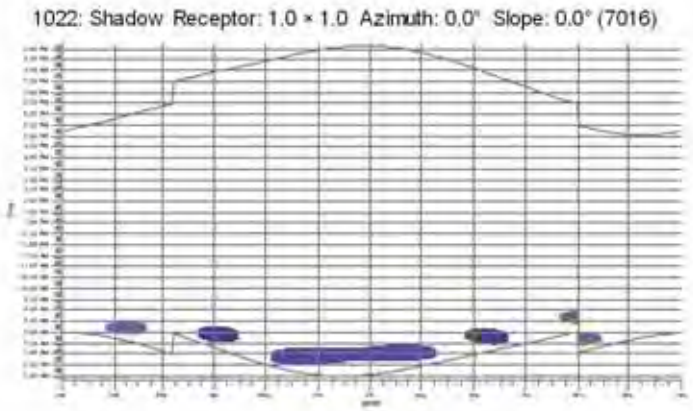

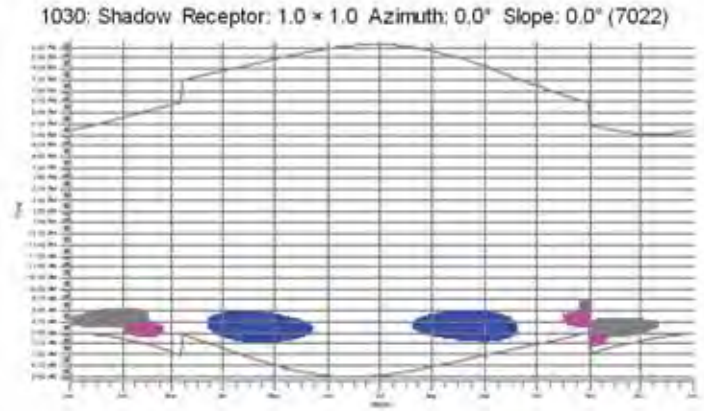

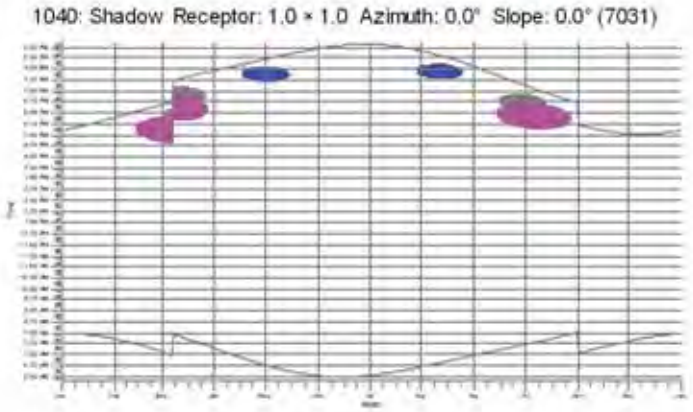

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SHADOW - Calendar, graphical

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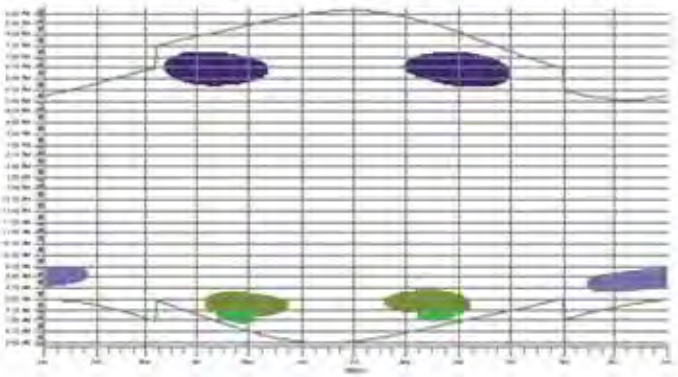
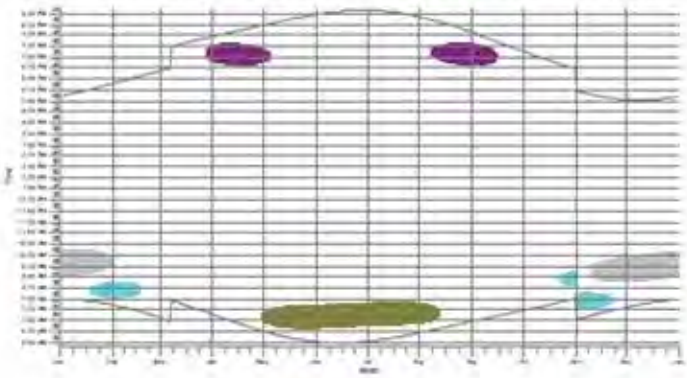
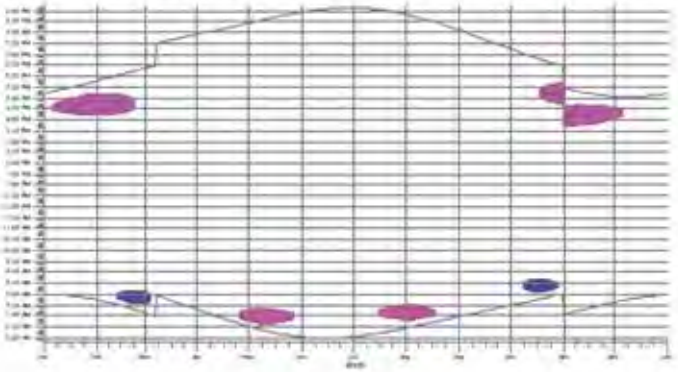
1043: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7033)



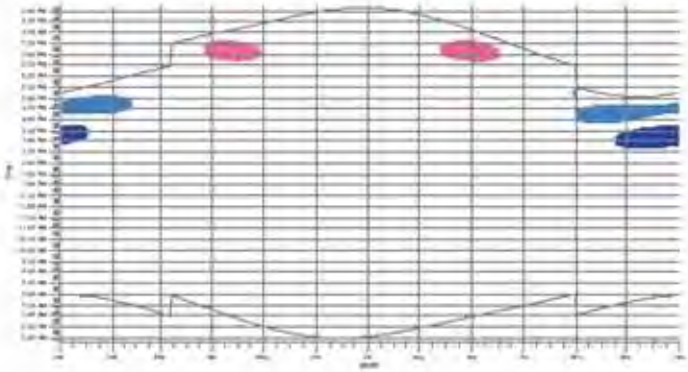
1056: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7044)



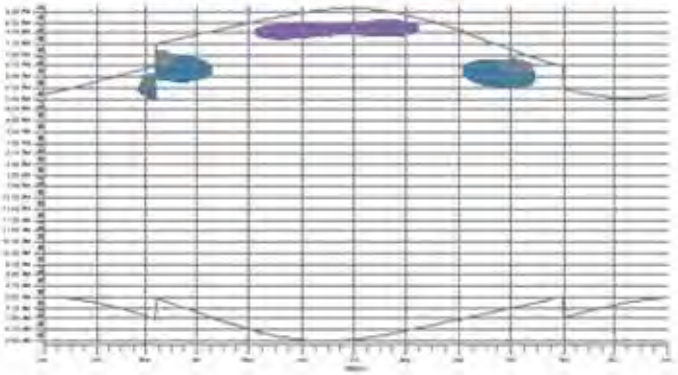
1067: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7053)



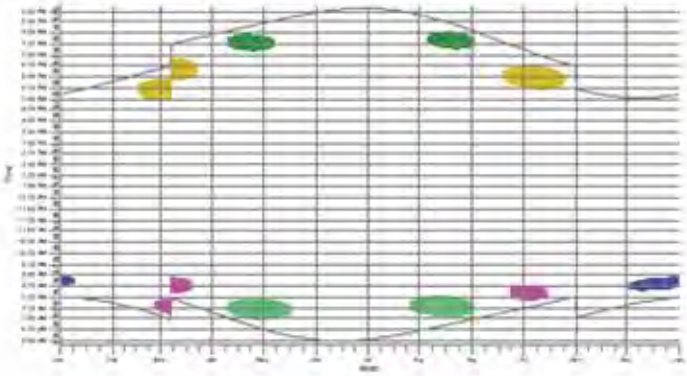
1085: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7068)



1106: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7088)



1136: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7113)



WTGs

T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T11: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (430)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T34: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (453)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T60: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (479)
T62: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (481)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T71: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (488)
T79: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (496)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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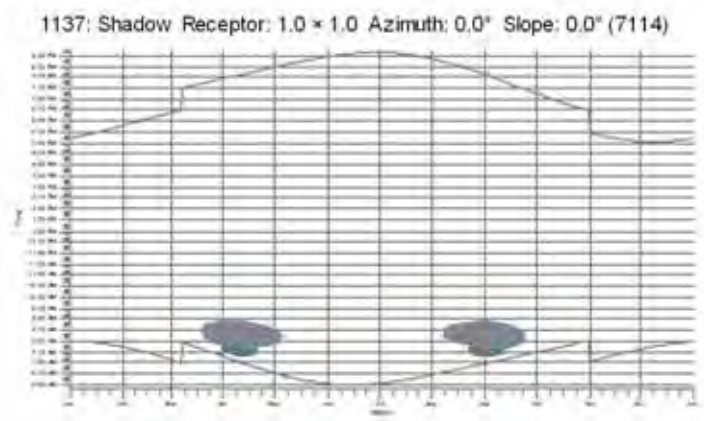
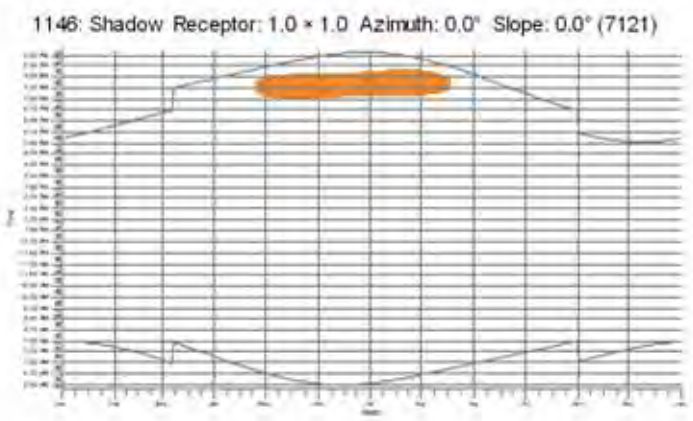
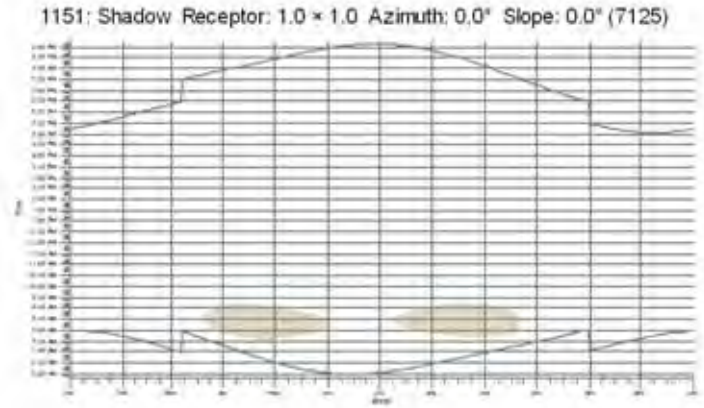
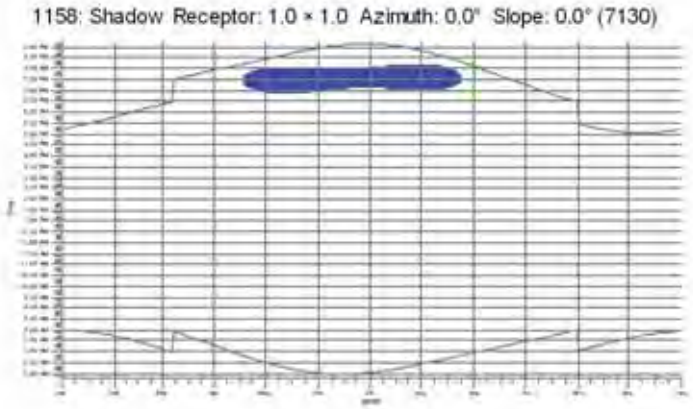
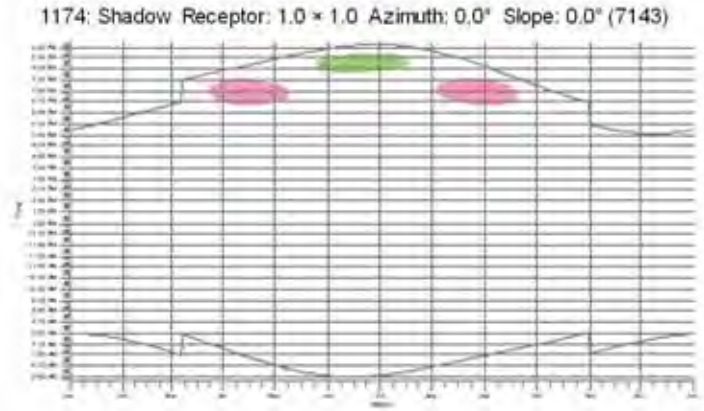
Calculation: 2019-01-07_Emerson SFA

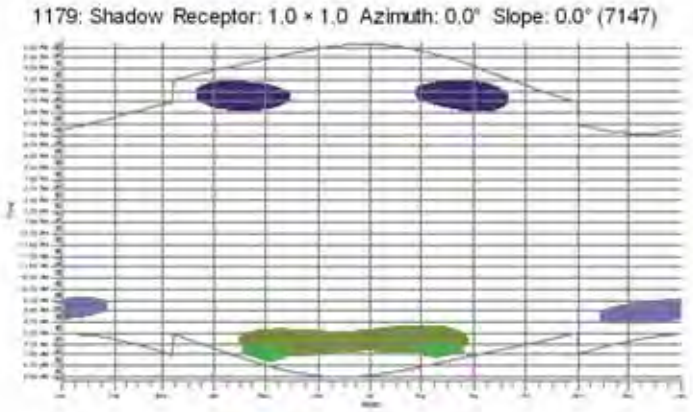












WTGs

T23: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (442)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T49: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (468)
T59: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (478)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T71: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (488)
T78: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (495)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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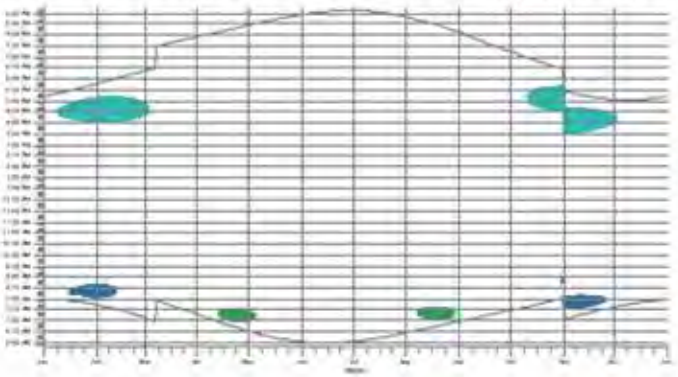
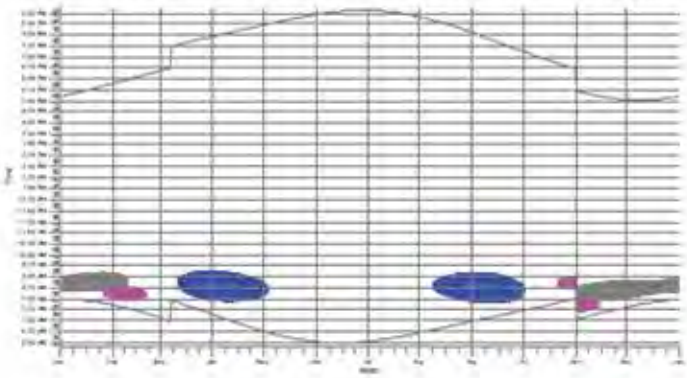
SHADOW - Calendar, graphical

Calculation: 2019-01-07_Emerson SFA

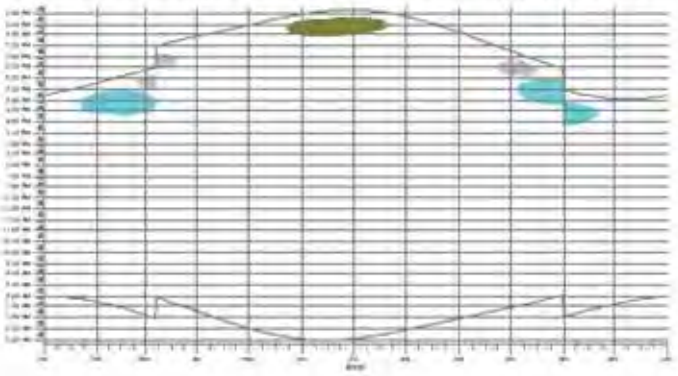
1204: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7169)



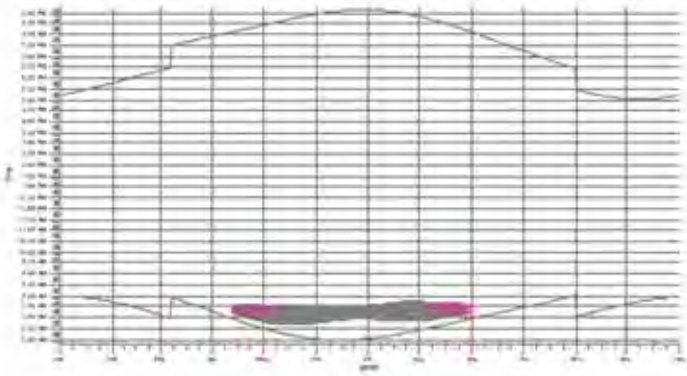
1236: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7193)



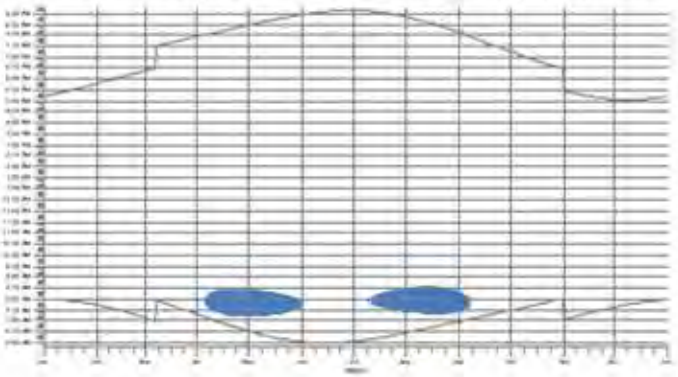
1237: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7194)



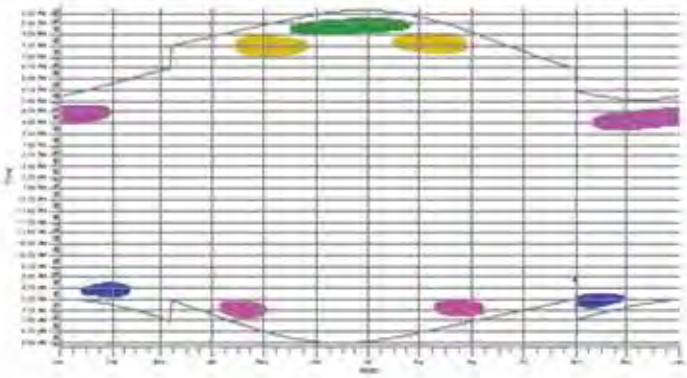
1253: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7208)



1264: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7214)



1269: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7219)



WTGs

T3: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (422)
T4: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (423)
T5: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (424)
T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T20: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (439)
T21: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (440)
T22: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (441)
T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T35: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (454)
T36: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (455)
T39: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (458)

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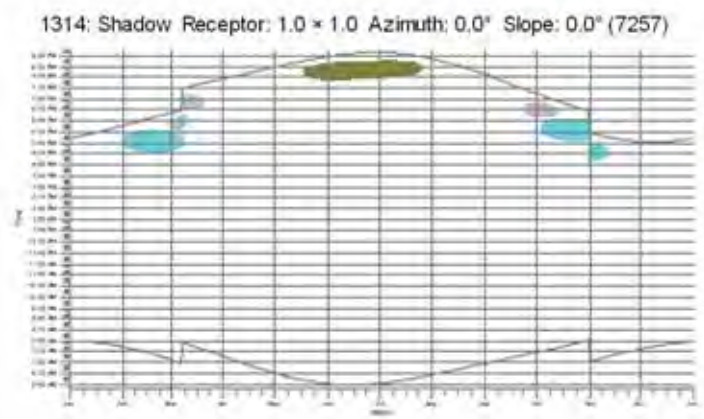
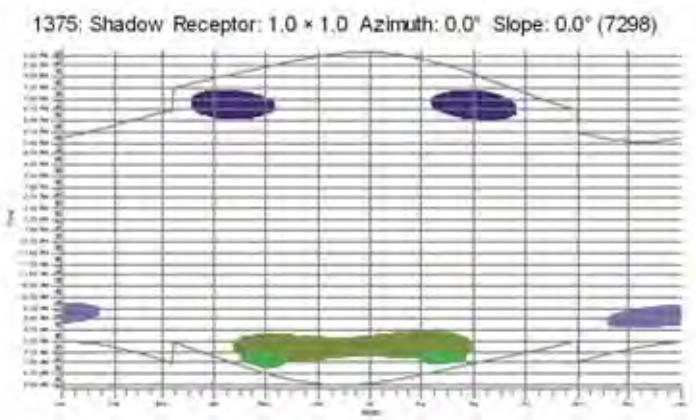
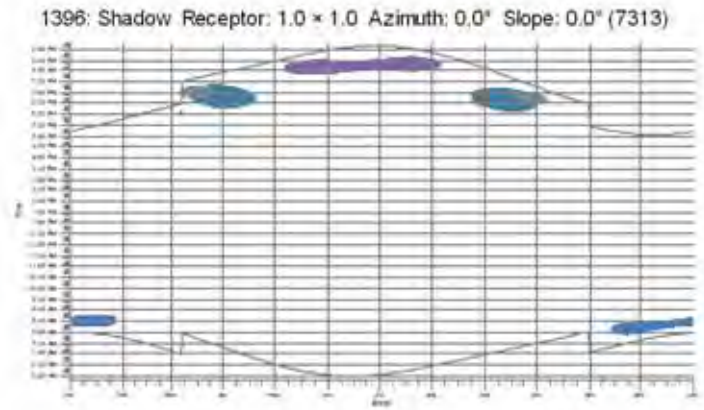
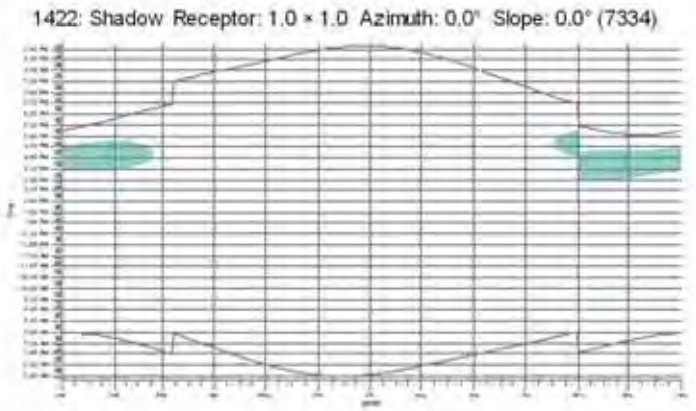
SHADOW - Calendar, graphical

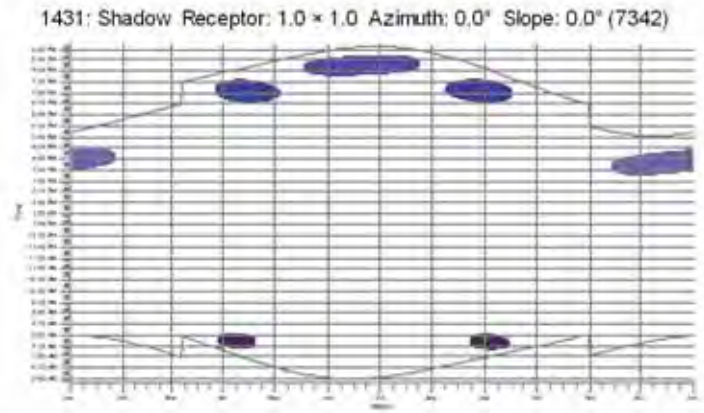
Calculation: 2019-01-07_Emerson SFA

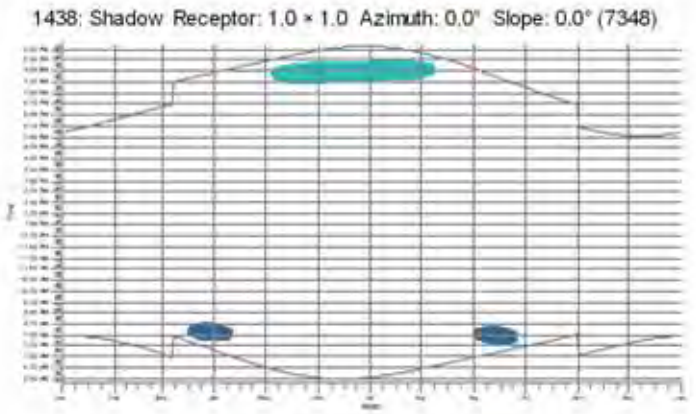












WTGs

T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T21: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (440)
T22: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (441)
T34: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (453)
T37: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (456)
T38: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (457)
T39: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (458)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T48: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (467)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T71: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (488)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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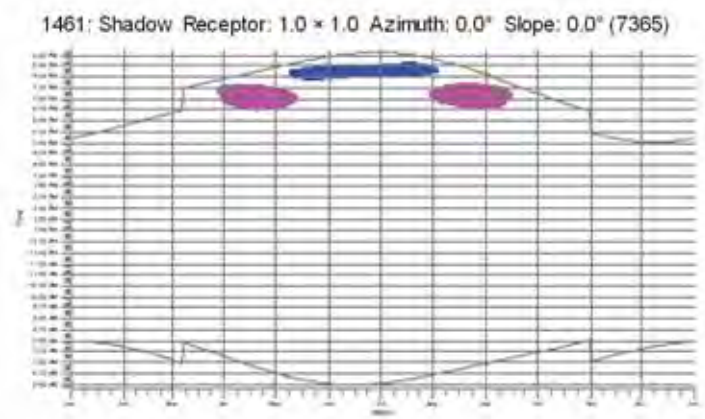
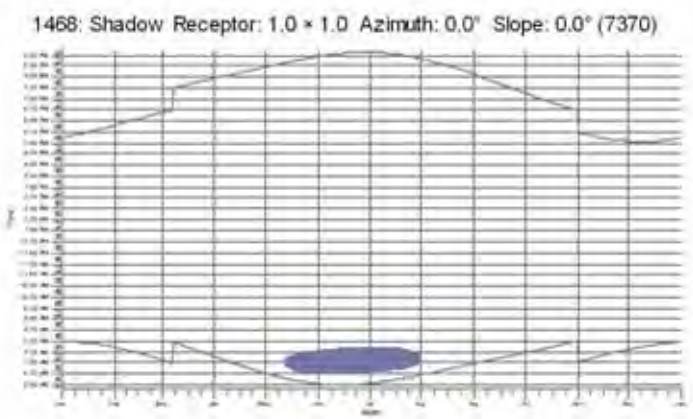
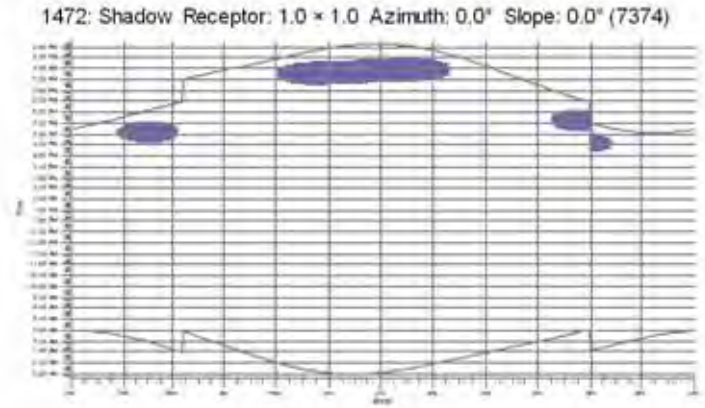
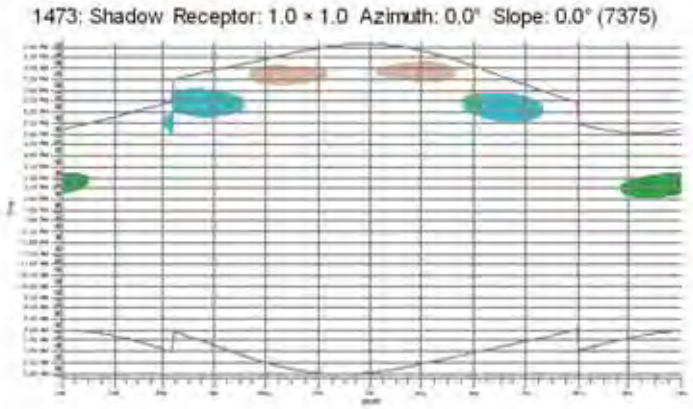
SHADOW - Calendar, graphical

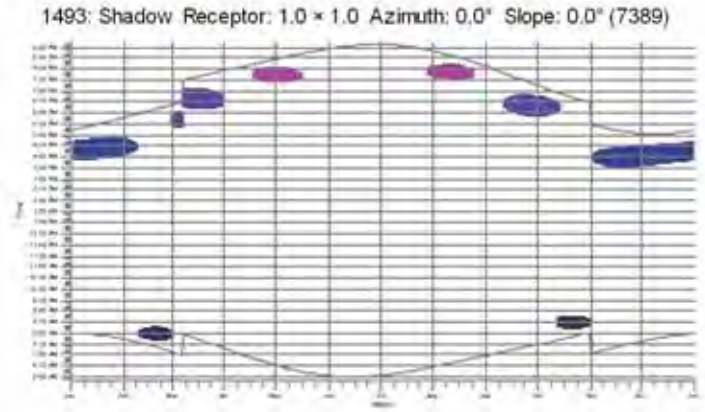
Calculation: 2019-01-07_Emerson SFA

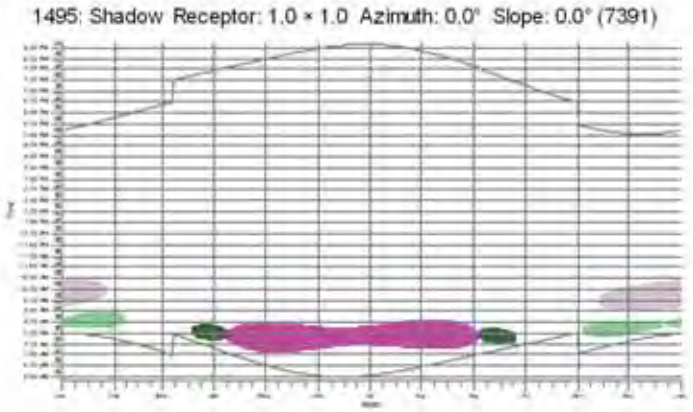












WTGs

T3: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (422)
T4: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (423)
T5: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (424)
T17: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (436)
T19: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (438)
T20: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (439)
T24: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (443)
T25: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (444)
T26: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (445)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T45: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (464)
T71: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (488)
T75: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (492)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)

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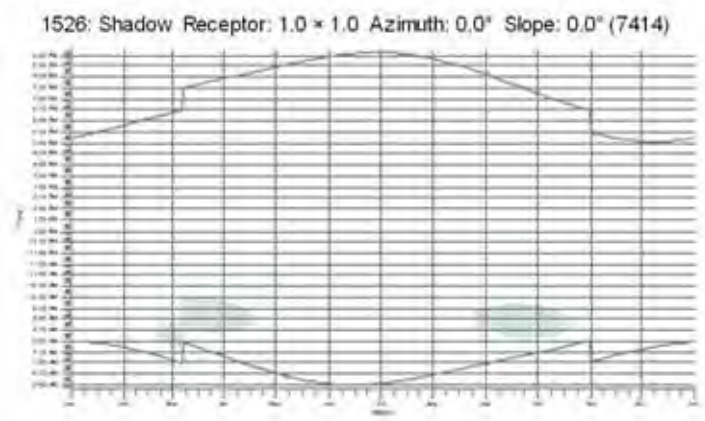
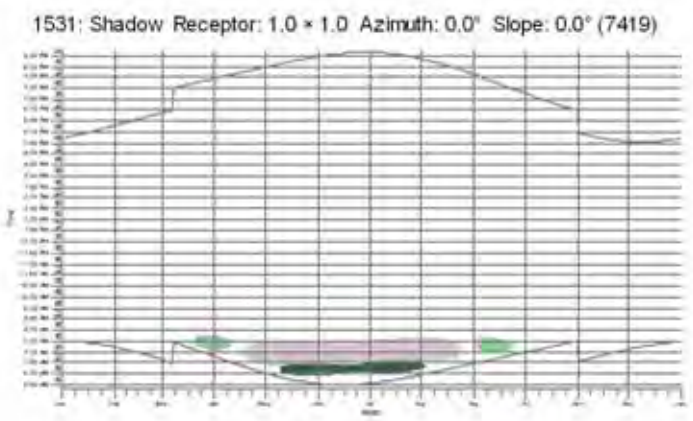
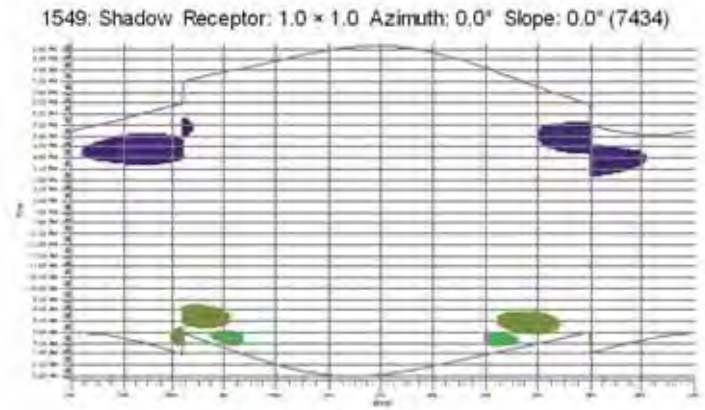
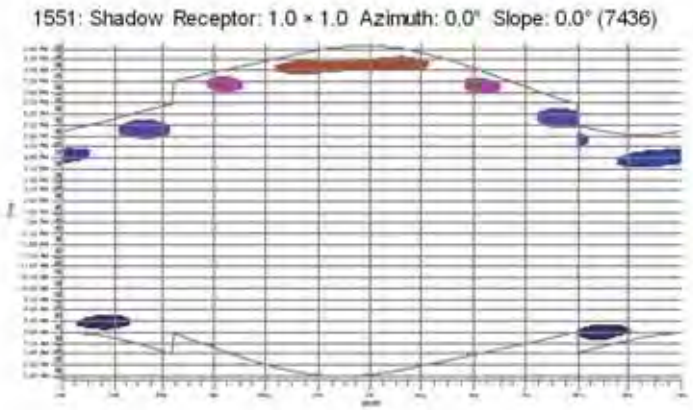
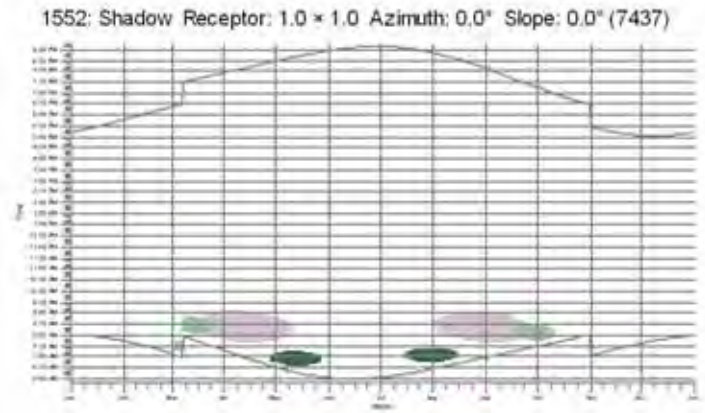
Calculation: 2019-01-07_Emerson SFA

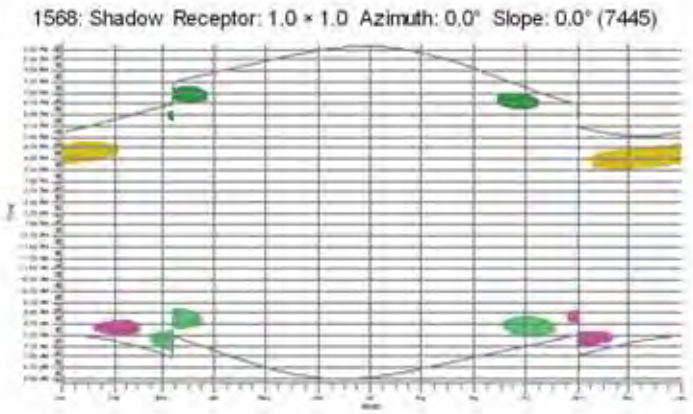












WTGs

T25: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (444)
T26: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (445)
T27: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (446)
T28: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (447)
T30: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (449)
T31: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (450)
T40: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (459)
T41: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (460)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T61: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (480)
T68: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (486)
T69: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (487)
T75: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (492)
T76: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (493)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)
T67: VESTAS V150-4.2 4200 150.0 IOI hub: 105.0 m (TOT: 180.0 m) (504)

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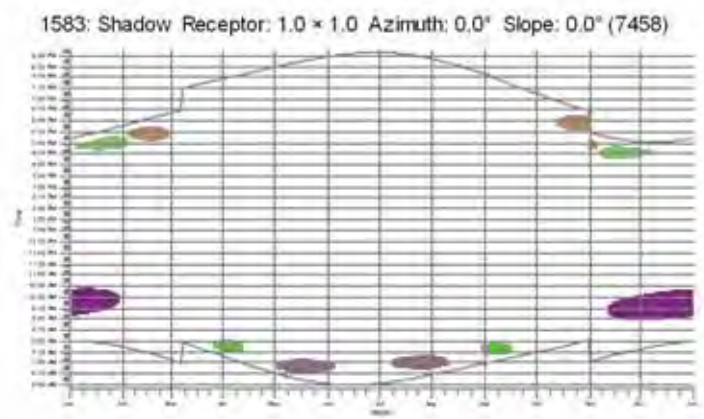
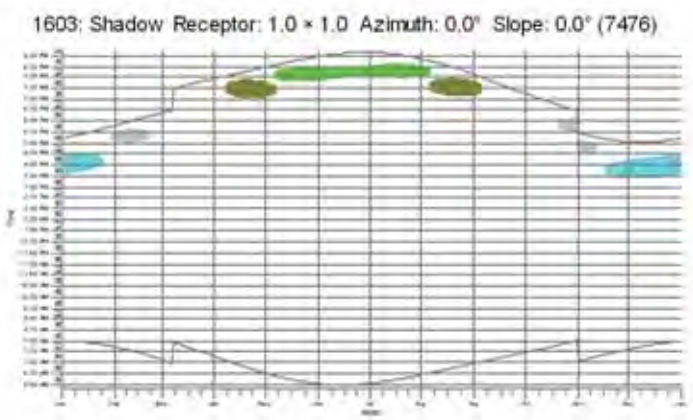
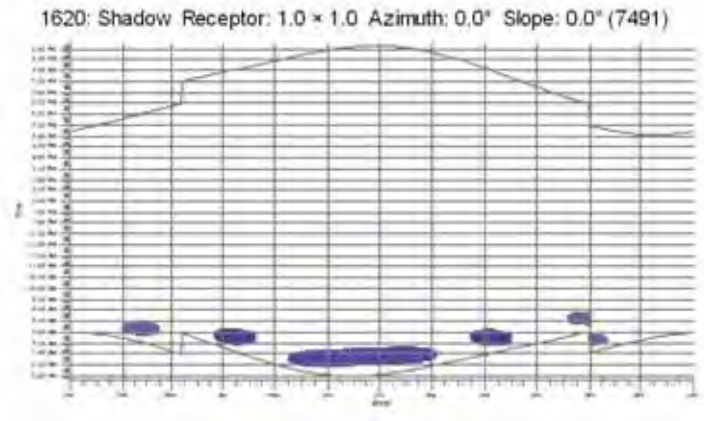
Calculated:
1/7/2019 5:03 PM/3.2.737

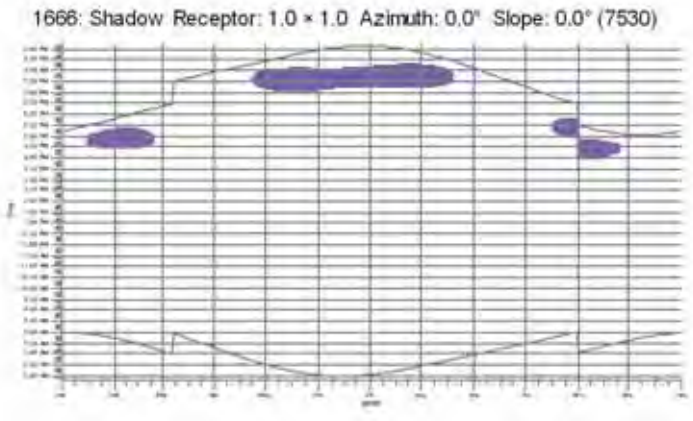
SHADOW - Calendar, graphical

Calculation: 2019-01-07_Emerson SFA









WTGs

T9: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (428)
T10: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (429)
T11: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (430)
T12: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (431)
T13: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (432)
T42: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (461)
T44: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (463)
T45: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (464)
T72: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (489)
T73: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (490)
T74: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (491)
T77: NORDEX N149/4.0-4.5 4500 149.0 IOI hub: 125.0 m (TOT: 199.5 m) (494)

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T1 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (420)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 15:40-16:44/64	07:44 08:21-08:59/38	07:07	07:16	06:30	06:01
	17:13 08:20-09:15/55	17:47 08:04-08:12/8	18:22	19:56	20:27	20:57
2	07:58 15:40-16:44/64	07:43 08:21-08:57/36	07:06	07:14	06:29	06:01
	17:14 08:20-09:15/55	17:49 08:03-08:14/11	18:23	19:57	20:28	20:58
3	07:58 15:41-16:45/64	07:42 08:22-08:55/33	07:04	07:13	06:27	06:00
	17:14 08:20-09:15/55	17:50 08:02-08:16/14	18:24	19:58	20:29	20:59
4	07:58 15:41-16:45/64	07:41 08:24-08:53/29	07:03	07:11	06:26	06:00
	17:15 08:20-09:16/56	17:51 08:01-08:17/16	18:25	19:59	20:31	21:00
5	07:58 15:42-16:46/64	07:40 08:25-08:51/26	07:01	07:09	06:25	05:59
	17:16 08:20-09:16/56	17:52 08:00-08:18/18	18:26	20:00	20:32	21:00
6	07:58 15:43-16:46/63	07:39 08:27-08:48/21	07:00	07:08	06:24	05:59
	17:17 08:20-09:17/57	17:54 07:59-08:19/20	18:27	20:00	20:33	21:01
7	07:58 15:44-16:47/63	07:37 07:58-08:20/22	06:58	07:06	06:23	05:59
	17:18 08:20-09:17/57	17:55 08:29-08:46/17	18:29	20:02	20:34	21:02
8	07:58 15:45-16:48/63	07:36 07:57-08:21/24	07:56	07:05	06:21	05:59
	17:19 08:20-09:18/58	17:56 08:31-08:42/11	19:30	20:03	20:35	21:02
9	07:58 15:46-16:48/62	07:35 07:55-08:20/25	07:55	07:03	06:20	05:58
	17:20 08:20-09:18/58	17:57	19:31	20:04	20:36	21:03
10	07:57 15:46-16:48/62	07:34 07:54-08:21/27	07:53	07:01	06:19	05:58
	17:21 08:19-09:18/59	17:59	19:32	20:05	20:37	21:04
11	07:57 15:47-16:48/61	07:33 07:53-08:21/28	07:51	07:00	06:18	05:58
	17:22 08:19-09:19/60	18:00	19:33	20:06	20:38	21:04
12	07:57 15:48-16:49/61	07:31 07:52-08:21/29	07:50	06:58	06:17	05:58
	17:23 08:19-09:19/60	18:01	19:34	20:07	20:39	21:05
13	07:57 15:49-16:49/60	07:30 07:50-08:20/30	07:48	06:57	06:16	05:58
	17:24 08:18-09:19/61	18:02	19:35	20:08	20:40	21:05
14	07:56 15:50-16:49/59	07:29 07:49-08:20/31	07:46	06:55	06:15	05:58
	17:26 08:18-09:19/61	18:04	19:37	20:09	20:41	21:06
15	07:56 15:51-16:49/58	07:28 07:48-08:20/32	07:45	06:53	06:14	05:58
	17:27 08:17-09:19/62	18:05	19:38	20:10	20:42	21:06
16	07:55 15:52-16:49/57	07:26 07:46-08:19/33	07:43	06:52	06:13	05:58
	17:28 08:17-09:19/62	18:06	19:39	20:11	20:43	21:06
17	07:55 15:53-16:49/56	07:25 07:45-08:18/33	07:41	06:50	06:12	05:58
	17:29 08:17-09:18/61	18:07	19:40	20:12	20:44	21:07
18	07:54 15:55-16:49/54	07:24 07:43-08:16/33	07:40	06:49	06:11	05:58
	17:30 08:17-09:19/62	18:09	19:41	20:13	20:45	21:07
19	07:54 15:56-16:49/53	07:22 07:42-08:14/32	07:38	06:47	06:10	05:58
	17:31 08:17-09:18/61	18:10	19:42	20:14	20:46	21:08
20	07:53 16:21-16:48/27 15:58-16:19/21	07:21 07:41-08:10/29	07:36	06:46	06:09	05:58
	17:32 08:18-09:18/60	18:11	19:43	20:16	20:47	21:08
21	07:53 16:23-16:48/25 16:01-16:18/17	07:19 07:40-08:03/23	07:35	06:44	06:08	05:58
	17:34 08:17-09:18/61	18:12	19:44	20:17	20:48	21:08
22	07:52 16:23-16:47/24 16:04-16:16/12	07:18 07:41-08:03/22	07:33	06:43	06:07	05:59
	17:35 08:17-09:17/60	18:13	19:45	20:18	20:49	21:08
23	07:51 16:25-16:46/21	07:16 07:41-08:02/21	07:31	06:41	06:07	05:59
	17:36 08:17-09:16/59	18:15	19:46	20:19	20:50	21:09
24	07:51 16:27-16:46/19	07:15 07:42-08:02/20	07:30	06:40	06:06	05:59
	17:37 08:18-09:15/57	18:16	19:48	20:20	20:51	21:09
25	07:50 16:29-16:45/16	07:13 07:43-08:00/17	07:28	06:38	06:05	05:59
	17:39 08:18-09:14/56	18:17	19:49	20:21	20:52	21:09
26	07:49 16:31-16:42/11	07:12 07:45-07:58/13	07:26	06:37	06:05	06:00
	17:40 08:18-09:12/54	18:18	19:50	20:22	20:52	21:09
27	07:48 08:18-09:10/52	07:10 07:48-07:54/6	07:25	06:35	06:04	06:00
	17:41	18:19	19:51	20:23	20:53	21:09
28	07:47 08:18-09:05/47	07:09	07:23	06:34	06:03	06:00
	17:42	18:21	19:52	20:24	20:54	21:09
29	07:47 08:19-09:02/43		07:21	06:33	06:03	06:01
	17:43		19:53	20:25	20:55	21:09
30	07:46 08:19-09:01/42		07:20	06:31	06:02	06:01
	17:45		19:54	20:26	20:56	21:09
31	07:45 08:20-09:00/40		07:18		06:02	
	17:46		19:55		20:57	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3092	828	0	0	0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T1 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (420)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October		November			December	
1	06:02	06:26	06:57	07:28		07:02	07:24-07:51/27		07:37	15:29-16:30/61
	21:09	20:51	20:07	19:15		17:28			17:03	08:01-09:01/60
2	06:02	06:27	06:58	07:29		07:04	07:25-07:50/25		07:39	15:29-16:31/62
	21:09	20:49	20:06	19:13		17:27			17:03	08:02-09:01/59
3	06:03	06:28	06:59	07:30		07:05	07:26-07:50/24		07:40	15:29-16:31/62
	21:09	20:48	20:04	19:11		17:25	08:00-08:13/13		17:03	08:03-09:01/58
4	06:03	06:29	07:00	07:31		07:06	07:28-07:50/22		07:41	15:29-16:32/63
	21:09	20:47	20:03	19:10		17:24	07:58-08:16/18		17:03	08:04-09:02/58
5	06:04	06:30	07:01	07:32		07:07	07:56-08:19/23		07:42	15:29-16:32/63
	21:08	20:46	20:01	19:08		17:23	07:29-07:49/20		17:03	08:05-09:02/57
6	06:05	06:31	07:02	07:33		07:08	07:55-08:21/26		07:43	15:29-16:32/63
	21:08	20:45	19:58	19:06		17:22	07:30-07:48/18		17:02	08:06-09:03/57
7	06:05	06:32	07:03	07:34		07:10	07:53-08:23/30		07:43	15:29-16:33/64
	21:08	20:44	19:56	19:05		17:21	07:31-07:47/16		17:02	08:07-09:03/56
8	06:06	06:33	07:04	07:35		07:11	07:53-08:26/33		07:44	15:30-16:33/63
	21:08	20:42	19:54	19:03		17:20	07:33-07:46/13		17:02	08:08-09:04/56
9	06:06	06:34	07:05	07:36		07:12	07:52-08:28/36		07:45	15:30-16:34/64
	21:07	20:41	19:52	19:02		17:19	07:34-07:45/11		17:02	08:09-09:05/56
10	06:07	06:35	07:06	07:37		07:13	07:51-08:30/39		07:46	15:30-16:34/64
	21:07	20:40	19:51	19:00		17:18	07:35-07:42/7		17:02	08:10-09:05/55
11	06:08	06:36	07:07	07:38		07:14	07:52-08:32/40		07:47	15:31-16:35/64
	21:07	20:39	19:49	18:58		17:17			17:02	08:11-09:06/55
12	06:09	06:37	07:08	07:39		07:16	07:51-08:33/42		07:48	15:30-16:34/64
	21:06	20:37	19:47	18:57		17:16			17:02	08:11-09:05/54
13	06:09	06:38	07:09	07:40		07:17	07:51-08:34/43		07:49	15:31-16:35/64
	21:06	20:36	19:46	18:55		17:15			17:03	08:12-09:06/54
14	06:10	06:39	07:10	07:42		07:18	07:50-08:38/48		07:49	15:31-16:36/65
	21:05	20:35	19:44	18:54		17:14			17:03	08:13-09:07/54
15	06:11	06:40	07:11	07:43	08:19-08:28/9	07:19	07:51-08:43/52		07:50	15:32-16:36/64
	21:05	20:33	19:42	18:52		17:13			17:03	08:14-09:07/53
16	06:12	06:41	07:12	07:44	08:16-08:30/14	07:20	16:04-16:15/11		07:51	15:32-16:36/64
	21:04	20:32	19:40	18:50		17:12	07:51-08:45/54		17:03	08:14-09:07/53
17	06:12	06:42	07:13	07:45	08:14-08:32/18	07:22	16:02-16:18/16		07:51	15:32-16:37/65
	21:03	20:30	19:39	18:49		17:11	07:51-08:47/56		17:04	08:15-09:08/53
18	06:13	06:43	07:14	07:46	08:14-08:33/19	07:23	16:01-16:20/19		07:52	15:33-16:38/65
	21:03	20:29	19:37	18:47		17:10	07:52-08:49/57		17:04	08:16-09:09/53
19	06:14	06:44	07:15	07:47	08:12-08:34/22	07:24	16:00-16:21/21		07:53	15:33-16:38/65
	21:02	20:28	19:35	18:46		17:10	07:52-08:51/59		17:04	08:16-09:09/53
20	06:15	06:45	07:16	07:48	08:11-08:34/23	07:25	15:58-16:22/24	15:39-15:51/12	07:53	15:34-16:38/64
	21:01	20:26	19:34	18:44		17:09	07:52-08:52/60		17:05	08:17-09:10/53
21	06:16	06:46	07:17	07:49	08:11-08:34/23	07:26	15:58-16:23/25	15:36-15:53/17	07:54	15:34-16:38/64
	21:01	20:25	19:32	18:43		17:08	07:52-08:53/61		17:05	08:17-09:09/52
22	06:17	06:47	07:18	07:51	08:11-08:42/31	07:27	15:57-16:24/27	15:34-15:55/21	07:54	15:35-16:39/64
	21:00	20:23	19:30	18:41		17:08	07:54-08:54/60		17:06	08:18-09:10/52
23	06:18	06:48	07:19	07:52	08:13-08:44/31	07:29	15:34-16:26/52		07:55	15:35-16:39/64
	20:59	20:22	19:28	18:40		17:07	07:54-08:55/61		17:06	08:18-09:11/53
24	06:18	06:49	07:20	07:53	08:14-08:47/33	07:30	15:32-16:26/54		07:55	15:36-16:40/64
	20:58	20:20	19:27	18:39		17:06	07:54-08:56/62		17:07	08:19-09:12/53
25	06:19	06:50	07:21	07:54	08:15-08:48/33	07:31	15:31-16:27/56		07:56	15:36-16:41/65
	20:57	20:19	19:25	18:37		17:06	07:55-08:56/61		17:07	08:19-09:12/53
26	06:20	06:51	07:22	07:55	08:16-08:48/32	07:32	15:30-16:27/57		07:56	15:36-16:41/65
	20:56	20:17	19:23	18:36		17:05	07:55-08:57/62		17:08	08:19-09:12/53
27	06:21	06:52	07:23	07:56	08:17-08:49/32	07:33	15:30-16:28/58		07:57	15:38-16:42/64
	20:56	20:15	19:22	18:34		17:05	07:57-08:59/62		17:09	08:20-09:13/53
28	06:22	06:53	07:25	07:58	08:19-08:50/31	07:34	15:30-16:29/59		07:57	15:38-16:42/64
	20:55	20:14	19:20	18:33		17:04	07:58-08:59/61		17:09	08:20-09:13/53
29	06:23	06:54	07:26	07:59	08:20-08:50/30	07:35	15:30-16:30/60		07:57	15:38-16:43/65
	20:54	20:12	19:18	18:32		17:04	07:59-09:00/61		17:10	08:20-09:14/54
30	06:24	06:55	07:27	08:00	08:21-08:50/29	07:36	15:29-16:30/61		07:57	15:39-16:43/64
	20:53	20:11	19:16	18:30		17:04	08:00-09:00/60		17:11	08:20-09:14/54
31	06:25	06:56		08:01	08:22-08:50/28				07:58	15:39-16:43/64
	20:52	20:09		18:29					17:12	08:20-09:14/54
Potential sun hours	460	429	375	345		297			287	
Sum of minutes with flicker	0	0	0	438		2173			3671	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T10 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (429)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:58	07:44		07:07	07:48-08:31/43	07:16		06:30	19:12-19:42/30	06:01	19:44-20:33/49
	17:13	17:47		18:22		19:56		20:27	06:59-07:48/49	20:57	06:43-07:45/62
2	07:58	07:43		07:06	07:48-08:30/42	07:14		06:29	19:12-19:40/28	06:01	19:44-20:33/49
	17:14	17:49		18:23		19:57		20:28	06:58-07:49/51	20:58	06:42-07:44/62
3	07:58	07:42		07:04	07:49-08:29/40	07:13		06:27	19:13-19:39/26	06:00	19:45-20:34/49
	17:14	17:50		18:24		19:58		20:29	06:57-07:49/52	20:59	06:43-07:44/61
4	07:58	07:41		07:03	07:49-08:28/39	07:11		06:26	19:15-19:37/22	06:00	19:45-20:35/50
	17:15	17:51		18:25		19:59		20:30	06:55-07:49/54	20:59	06:43-07:44/61
5	07:58	07:40		07:01	07:50-08:26/36	07:09		06:25	19:17-19:35/18	06:00	19:45-20:35/50
	17:16	17:52		18:26		20:00		20:31	06:53-07:50/57	21:00	06:43-07:43/60
6	07:58	07:39		06:59	07:51-08:25/34	07:08		06:24	19:20-19:33/13 19:57-20:07/10	05:59	19:46-20:36/50
	17:17	17:54		18:27		20:00		20:33	06:52-07:50/58	21:01	06:43-07:43/60
7	07:58	07:37		06:58	07:52-08:23/31	07:06		06:23	06:51-07:50/59	05:59	19:46-20:36/50
	17:18	17:55		18:29		20:01		20:34	19:54-20:10/16	21:02	06:44-07:43/59
8	07:58	07:36	08:07-08:13/6	07:56	08:54-09:21/27	07:05	19:26-19:37/11	06:21	06:49-07:49/60	05:59	19:47-20:37/50
	17:19	17:56		19:30		20:03		20:35	19:51-20:11/20	21:02	06:44-07:43/59
9	07:57	07:35	08:02-08:19/17	07:55	08:56-09:18/22	07:03	19:22-19:40/18	06:20	06:48-07:50/62	05:58	19:46-20:37/51
	17:20	17:57		19:31		20:04		20:36	19:49-20:13/24	21:03	06:45-07:43/58
10	07:57	07:34	08:00-08:22/22	07:53	08:59-09:14/15	07:01	19:19-19:42/23	06:19	06:47-07:50/63	05:58	19:47-20:37/50
	17:21	17:59		19:32		20:05		20:37	19:48-20:14/26	21:03	06:44-07:42/58
11	07:57	07:33	07:58-08:24/26	07:51		07:00	19:17-19:44/27	06:18	06:46-07:50/64	05:58	19:47-20:38/51
	17:22	18:00		19:33		20:06		20:38	19:47-20:15/28	21:04	06:45-07:42/57
12	07:57	07:31	07:56-08:25/29	07:50		06:58	19:15-19:45/30	06:17	06:45-07:50/65	05:58	19:48-20:38/50
	17:23	18:01		19:34		20:07		20:39	19:46-20:16/30	21:04	06:45-07:42/57
13	07:56	07:30	07:54-08:27/33	07:48		06:56	19:14-19:47/33	06:16	06:45-07:50/65	05:58	19:48-20:39/51
	17:24	18:02		19:35		20:08		20:40	19:45-20:16/31	21:05	06:45-07:42/57
14	07:56	07:29	07:53-08:29/36	07:46		06:55	19:13-19:47/34	06:15	06:44-07:49/65	05:58	19:49-20:39/50
	17:26	18:04		19:36		20:09		20:41	19:44-20:17/33	21:05	06:46-07:42/56
15	07:56	07:28	07:52-08:29/37	07:45		06:53	19:11-19:47/36	06:14	06:44-07:49/65	05:58	19:49-20:39/50
	17:27	18:05		19:38		20:10		20:42	19:44-20:18/34	21:06	06:46-07:42/56
16	07:55	07:26	07:51-08:30/39	07:43		06:52	19:11-19:48/37	06:13	06:43-07:49/66	05:58	19:49-20:39/50
	17:28	18:06		19:39		20:11		20:43	19:43-20:19/36	21:06	06:46-07:42/56
17	07:55	07:25	07:51-08:32/41	07:41		06:50	19:09-19:48/39	06:12	06:44-07:50/66	05:58	19:50-20:40/50
	17:29	18:07		19:40		20:12		20:44	19:43-20:19/36	21:07	06:46-07:42/56
18	07:54	07:23	07:49-08:32/43	07:40		06:49	19:09-19:48/39	06:11	06:43-07:49/66	05:58	19:50-20:40/50
	17:30	18:09		19:41		20:13		20:45	19:43-20:20/37	21:07	06:46-07:42/56
19	07:54	07:22	07:49-08:32/43	07:38		06:47	19:08-19:48/40	06:10	19:43-20:20/37	05:58	19:50-20:40/50
	17:31	18:10		19:42		20:14		20:46	06:43-07:49/66	21:07	06:47-07:43/56
20	07:53	07:21	07:48-08:32/44	07:36		06:46	19:08-19:48/40	06:09	19:43-20:22/39	05:58	19:51-20:41/50
	17:32	18:11		19:43		20:15	07:21-07:30/9	20:47	06:42-07:48/66	21:08	06:47-07:43/56
21	07:53	07:19	07:48-08:33/45	07:35		06:44	19:08-19:48/40	06:08	19:42-20:24/42	05:58	19:51-20:41/50
	17:34	18:12		19:44		20:17	07:15-07:35/20	20:48	06:42-07:48/66	21:08	06:47-07:43/56
22	07:52	07:18	07:48-08:34/46	07:33		06:43	19:08-19:48/40	06:07	19:42-20:25/43	05:59	19:51-20:41/50
	17:35	18:13		19:45		20:18	07:12-07:38/26	20:49	06:42-07:48/66	21:08	06:47-07:43/56
23	07:51	07:16	07:47-08:33/46	07:31		06:41	19:08-19:48/40	06:07	19:43-20:26/43	05:59	19:51-20:41/50
	17:36	18:15		19:46		20:19	07:10-07:40/30	20:50	06:42-07:48/66	21:08	06:47-07:43/56
24	07:51	07:15	07:48-08:33/45	07:30		06:40	19:08-19:47/39	06:06	19:42-20:26/44	05:59	19:52-20:42/50
	17:37	18:16		19:47		20:20	07:07-07:42/35	20:50	06:42-07:47/65	21:09	06:48-07:44/56
25	07:50	07:13	07:47-08:33/46	07:28		06:38	19:08-19:47/39	06:05	19:42-20:27/45	05:59	19:52-20:42/50
	17:39	18:17		19:49		20:21	07:06-07:43/37	20:51	06:42-07:48/66	21:09	06:48-07:44/56
26	07:49	07:12	07:47-08:32/45	07:26		06:37	19:08-19:46/38	06:05	19:43-20:28/45	06:00	19:51-20:42/51
	17:40	18:18		19:50		20:22	07:04-07:44/40	20:52	06:42-07:47/65	21:09	06:48-07:44/56
27	07:48	07:10	07:47-08:32/45	07:25		06:35	19:09-19:45/36	06:04	19:43-20:29/46	06:00	19:52-20:42/50
	17:41	18:19		19:51		20:23	07:03-07:45/42	20:53	06:42-07:46/64	21:09	06:49-07:45/56
28	07:47	07:09	07:47-08:31/44	07:23		06:34	19:10-19:45/35	06:03	19:43-20:30/47	06:00	19:52-20:42/50
	17:42	18:20		19:52		20:24	07:02-07:46/44	20:54	06:42-07:46/64	21:09	06:49-07:45/56
29	07:47			07:21		06:33	19:09-19:43/34	06:03	19:43-20:30/47	06:01	19:52-20:42/50
	17:43			19:53		20:25	07:00-07:47/47	20:55	06:42-07:46/64	21:09	06:49-07:46/57
30	07:46			07:19		06:31	19:10-19:43/33	06:02	19:44-20:32/48	06:01	19:52-20:42/50
	17:45			19:54		20:26	06:59-07:47/48	20:56	06:42-07:46/64	21:09	06:49-07:46/57
31	07:45			07:18				06:02	19:44-20:32/48		
	17:46			19:55				20:56	06:42-07:45/63		
Potential sun hours	297	297		370		399		449		453	
Sum of minutes with flicker	0	778		329		1159		3004		3226	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T10 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (429)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:52-20:42/50	06:26 06:56-08:00/64	06:57 19:16-19:43/27	07:28	07:02 07:30-07:51/21	07:37
	21:09 06:49-07:46/57	20:50 19:57-20:26/29	20:07	19:15	17:28	17:03
2	06:02 19:52-20:42/50	06:27 06:57-08:00/63	06:58 19:18-19:41/23	07:29	07:03 07:33-07:48/15	07:38
	21:09 06:49-07:47/58	20:49 19:58-20:25/27	20:06	19:13	17:27	17:03
3	06:03 19:52-20:42/50	06:28 06:58-08:00/62	06:59 19:20-19:38/18	07:30 08:40-08:51/11	07:05	07:39
	21:09 06:49-07:47/58	20:48 19:59-20:24/25	20:04	19:11	17:25	17:03
4	06:03 19:52-20:42/50	06:29 06:59-08:00/61	07:00 19:23-19:35/12	07:31 08:35-08:55/20	07:06	07:40
	21:08 06:50-07:48/58	20:47 20:00-20:23/23	20:02	19:10	17:24	17:03
5	06:04 19:52-20:43/51	06:30 07:00-08:00/60	07:01	07:32 08:32-08:57/25	07:07	07:41
	21:08 06:50-07:49/59	20:46 20:02-20:21/19	20:01	19:08	17:23	17:03
6	06:05 19:52-20:42/50	06:31 19:32-19:40/8 20:04-20:19/15	07:02	07:33 08:30-08:59/29	07:08	07:42
	21:08 06:50-07:49/59	20:45 07:01-08:00/59	19:57	19:06	17:22	17:02
7	06:05 19:52-20:42/50	06:32 19:29-19:43/14 20:09-20:15/6	07:03	07:34 08:28-09:00/32	07:09	07:43
	21:08 06:50-07:50/60	20:44 07:02-07:59/57	19:56	19:05	17:21	17:02
8	06:06 19:52-20:41/49	06:33 19:26-19:46/20	07:04	07:35 08:26-09:01/35	07:11	07:44
	21:07 06:50-07:50/60	20:42 07:04-07:59/55	19:54	19:03	17:20	17:02
9	06:06 19:52-20:41/49	06:34 19:24-19:47/23	07:05	07:36 08:25-09:02/37	07:12	07:45
	21:07 06:50-07:51/61	20:41 07:05-07:59/54	19:52	19:01	17:19	17:02
10	06:07 19:52-20:41/49	06:35 19:23-19:49/26	07:06	07:37 08:23-09:02/39	07:13	07:46
	21:07 06:51-07:52/61	20:40 07:07-07:58/51	19:51	19:00	17:18	17:02
11	06:08 19:52-20:40/48	06:36 19:21-19:50/29	07:07	07:38 08:22-09:03/41	07:14	07:47
	21:06 06:50-07:52/62	20:39 07:07-07:58/51	19:49	18:58	17:17	17:02
12	06:09 19:52-20:40/48	06:37 19:19-19:50/31	07:08	07:39 08:21-09:03/42	07:15	07:48
	21:06 06:50-07:53/63	20:37 07:08-07:57/49	19:47	18:57	17:16	17:02
13	06:09 19:52-20:40/48	06:38 19:18-19:51/33	07:09	07:40 08:21-09:05/44	07:17	07:48
	21:05 06:51-07:54/63	20:36 07:08-07:56/48	19:46	18:55	17:15	17:03
14	06:10 19:52-20:40/48	06:39 19:17-19:51/34	07:10	07:42 08:20-09:05/45	07:18	07:49
	21:05 06:51-07:55/64	20:34 07:08-07:54/46	19:44	18:53	17:14	17:03
15	06:11 19:52-20:39/47	06:40 19:16-19:52/36	07:11	07:43 08:20-09:05/45	07:19	07:50
	21:04 06:51-07:54/63	20:33 07:09-07:53/44	19:42	18:52	17:13	17:03
16	06:12 19:52-20:38/46	06:41 19:15-19:52/37	07:12	07:44 08:19-09:05/46	07:20	07:51
	21:04 06:51-07:55/64	20:32 07:10-07:52/42	19:40	18:50	17:12	17:03
17	06:12 19:52-20:38/46	06:42 19:15-19:52/37	07:13	07:45 08:19-09:04/45	07:21	07:51
	21:03 06:51-07:56/65	20:30 07:11-07:50/39	19:39	18:49	17:11	17:04
18	06:13 19:52-20:38/46	06:43 19:14-19:53/39	07:14	07:46 08:18-09:04/46	07:23	07:52
	21:03 06:52-07:57/65	20:29 07:12-07:49/37	19:37	18:47	17:10	17:04
19	06:14 19:52-20:36/44	06:44 19:14-19:53/39	07:15	07:47 08:19-09:05/46	07:24	07:53
	21:02 06:52-07:57/65	20:27 07:13-07:47/34	19:35	18:46	17:10	17:04
20	06:15 19:52-20:36/44	06:45 19:13-19:53/40	07:16	07:48 08:19-09:04/45	07:25	07:53
	21:01 06:51-07:57/66	20:26 07:15-07:45/30	19:34	18:44	17:09	17:05
21	06:16 19:52-20:35/43	06:46 19:13-19:53/40	07:17	07:49 08:19-09:03/44	07:26	07:54
	21:00 06:52-07:58/66	20:25 07:17-07:42/25	19:32	18:43	17:08	17:05
22	06:17 19:53-20:35/42	06:47 19:12-19:52/40	07:18	07:51 08:19-09:03/44	07:27	07:54
	21:00 06:52-07:58/66	20:23 07:20-07:39/19	19:30	18:41	17:08	17:06
23	06:18 19:53-20:34/41	06:48 19:12-19:52/40	07:19	07:52 08:19-09:02/43	07:29	07:55
	20:59 06:53-07:59/66	20:21 07:26-07:33/7	19:28	18:40	17:07	17:06
24	06:19 19:53-20:32/39	06:49 19:12-19:52/40	07:20	07:53 08:20-09:02/42	07:30	07:55
	20:58 06:53-07:59/66	20:20	19:27	18:39	17:06	17:07
25	06:19 19:54-20:31/37	06:50 19:12-19:51/39	07:21	07:54 08:21-09:01/40	07:31	07:56
	20:57 06:53-08:00/67	20:18	19:25	18:37	17:06	17:07
26	06:20 06:54-08:00/66	06:51 19:12-19:51/39	07:22	07:55 08:21-09:00/39	07:32	07:56
	20:56 19:53-20:30/37	20:17	19:23	18:36	17:05	17:08
27	06:21 06:53-07:59/66	06:52 19:13-19:50/37	07:23	07:56 08:22-08:59/37	07:33	07:56
	20:55 19:54-20:29/35	20:15	19:22	18:34	17:05	17:09
28	06:22 06:54-08:00/66	06:53 19:13-19:49/36	07:24	07:57 08:23-08:58/35	07:34	07:57
	20:54 19:54-20:29/35	20:14	19:20	18:33	17:04	17:09
29	06:23 06:54-08:00/66	06:54 19:14-19:48/34	07:26	07:59 08:24-08:57/33	07:35	07:57
	20:53 19:55-20:28/33	20:12	19:18	18:32	17:04	17:10
30	06:24 06:55-08:00/65	06:55 19:14-19:46/32	07:27	08:00 08:26-08:55/29	07:36	07:57
	20:52 19:55-20:28/33	20:11	19:16	18:30	17:04	17:11
31	06:25 06:56-08:00/64	06:56 19:15-19:45/30		08:01 08:27-08:53/26		07:57
	20:51 19:56-20:27/31	20:09		18:29		17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	3324	2054	80	1085	36	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T11 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (430)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June
1	07:58	09:12-10:16/64	07:44	16:03-16:44/41	07:07		07:16	18:33-19:27/54	06:30	18:51-19:18/27	06:01
	17:13	15:49-16:36/47	17:47		18:22		19:56		20:27		20:57
2	07:58	09:13-10:16/63	07:43	16:05-16:43/38	07:06		07:15	18:32-19:28/56	06:29	18:53-19:16/23	06:01
	17:14	15:49-16:37/48	17:49		18:23		19:57		20:28		20:58
3	07:58	09:13-10:17/64	07:42	16:06-16:42/36	07:04		07:13	18:32-19:30/58	06:28	18:55-19:13/18	06:00
	17:14	15:49-16:37/48	17:50		18:24		19:58		20:29		20:59
4	07:58	09:14-10:17/63	07:41	16:08-16:41/33	07:03		07:11	18:31-19:31/60	06:26	18:59-19:09/10	06:00
	17:15	15:50-16:38/48	17:51		18:25		19:59		20:30		21:00
5	07:58	09:15-10:17/62	07:40	16:09-16:40/31	07:01		07:10	18:30-19:31/61	06:25		06:00
	17:16	15:50-16:39/49	17:52		18:26		20:00		20:32		21:00
6	07:58	09:15-10:17/62	07:39	16:12-16:38/26	06:59		07:08	18:31-19:33/62	06:24		05:59
	17:17	15:51-16:39/48	17:54		18:28		20:00		20:33		21:01
7	07:58	09:16-10:18/62	07:37	16:14-16:36/22	06:58		07:06	18:30-19:33/63	06:23		05:59
	17:18	15:51-16:40/49	17:55		18:29		20:02		20:34		21:02
8	07:58	09:17-10:18/61	07:36	16:17-16:32/15	07:56		07:05	18:31-19:34/63	06:21		05:59
	17:19	15:51-16:41/50	17:56		19:30		20:03		20:35		21:02
9	07:57	09:17-10:17/60	07:35		07:55		07:03	18:30-19:34/64	06:20		05:58
	17:20	15:51-16:41/50	17:57		19:31		20:04		20:36		21:03
10	07:57	09:18-10:18/60	07:34		07:53		07:01	18:30-19:33/63	06:19		05:58
	17:21	15:51-16:41/50	17:59		19:32		20:05		20:37		21:03
11	07:57	09:19-10:18/59	07:33		07:51		07:00	18:31-19:34/63	06:18		05:58
	17:22	15:52-16:42/50	18:00		19:33		20:06		20:38		21:04
12	07:57	09:20-10:18/58	07:31		07:50		06:58	18:31-19:34/63	06:17		05:58
	17:23	15:52-16:42/50	18:01		19:34		20:07		20:39		21:05
13	07:56	09:20-10:17/57	07:30		07:48		06:57	18:32-19:34/62	06:16		05:58
	17:24	15:52-16:43/51	18:02		19:35		20:08		20:40		21:05
14	07:56	09:21-10:18/57	07:29		07:46		06:55	18:32-19:33/61	06:15		05:58
	17:26	15:53-16:44/51	18:04		19:37		20:09		20:41		21:06
15	07:56	09:22-10:17/55	07:28		07:45		06:53	18:32-19:33/61	06:14		05:58
	17:27	15:53-16:44/51	18:05		19:38		20:10		20:42		21:06
16	07:55	09:23-10:17/54	07:26		07:43		06:52	18:33-19:33/60	06:13		05:58
	17:28	15:54-16:45/51	18:06		19:39		20:11		20:43		21:06
17	07:55	09:24-10:16/52	07:25		07:41		06:50	18:34-19:32/58	06:12		05:58
	17:29	15:54-16:45/51	18:07		19:40		20:12		20:44		21:07
18	07:54	09:25-10:16/51	07:24		07:40		06:49	18:35-19:32/57	06:11		05:58
	17:30	15:55-16:46/51	18:09		19:41		20:13		20:45		21:07
19	07:54	09:26-10:15/49	07:22		07:38		06:47	18:36-19:31/55	06:10		05:58
	17:31	15:55-16:45/50	18:10		19:42		20:14		20:46		21:07
20	07:53	09:27-10:14/47	07:21		07:36	18:57-19:07/10	06:46	18:38-19:31/53	06:09		05:58
	17:33	15:55-16:45/50	18:11		19:43		20:15		20:47		21:08
21	07:53	09:29-10:14/45	07:19		07:35	18:52-19:12/20	06:44	18:39-19:30/51	06:08		05:58
	17:34	15:56-16:46/50	18:12		19:44		20:17		20:48		21:08
22	07:52	09:30-10:13/43	07:18		07:33	18:48-19:15/27	06:43	18:41-19:29/48	06:08		05:59
	17:35	15:56-16:46/50	18:13		19:45		20:18		20:49		21:08
23	07:51	09:31-10:12/41	07:16		07:31	18:45-19:17/32	06:41	18:43-19:29/46	06:07		05:59
	17:36	15:56-16:46/50	18:15		19:46		20:19		20:50		21:08
24	07:51	09:33-10:11/38	07:15		07:30	18:44-19:19/35	06:40	18:43-19:28/45	06:06		05:59
	17:37	15:56-16:46/50	18:16		19:48		20:20		20:51		21:09
25	07:50	09:35-10:10/35	07:13		07:28	18:41-19:20/39	06:38	18:44-19:27/43	06:05		05:59
	17:39	15:58-16:46/48	18:17		19:49		20:21		20:51		21:09
26	07:49	09:36-10:08/32	07:12		07:26	18:39-19:21/42	06:37	18:44-19:25/41	06:05		06:00
	17:40	15:58-16:46/48	18:18		19:50		20:22		20:52		21:09
27	07:48	09:39-10:05/26	07:10		07:25	18:38-19:22/44	06:36	18:45-19:24/39	06:04		06:00
	17:41	15:59-16:46/47	18:19		19:51		20:23		20:53		21:09
28	07:47	09:42-10:03/21	07:09		07:23	18:37-19:23/46	06:34	18:47-19:23/36	06:03		06:01
	17:42	16:00-16:46/46	18:21		19:52		20:24		20:54		21:09
29	07:47	09:46-09:58/12			07:21	18:35-19:23/48	06:33	18:47-19:21/34	06:03		06:01
	17:44	16:00-16:45/45			19:53		20:25		20:55		21:09
30	07:46	16:01-16:45/44			07:20	18:34-19:23/49	06:31	18:49-19:20/31	06:02		06:01
	17:45				19:54		20:26		20:56		21:09
31	07:45	16:02-16:44/42			07:18	18:34-19:26/52			06:02		
	17:46				19:55				20:57		
Potential sun hours	297		297		370		399		449		453
Sum of minutes with flicker	2966		242		444		1611		78		0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T11 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (430)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August		September		October	November		December	
1	06:02	06:26		06:57	18:30-19:33/63	07:28	07:02		07:37	09:01-10:00/59
	21:09	20:50		20:07		19:15	17:28		17:03	15:34-16:24/50
2	06:02	06:27		06:58	18:29-19:32/63	07:29	07:03	15:52-15:58/6	07:38	09:01-10:01/60
	21:09	20:49		20:06		19:13	17:27		17:03	15:35-16:25/50
3	06:03	06:28		06:59	18:28-19:32/64	07:30	07:05	15:46-16:03/17	07:39	09:01-10:01/60
	21:09	20:48		20:04		19:11	17:25		17:03	15:35-16:25/50
4	06:03	06:29		07:00	18:28-19:31/63	07:31	07:06	15:43-16:05/22	07:40	09:01-10:02/61
	21:09	20:47		20:02		19:10	17:24		17:03	15:35-16:25/50
5	06:04	06:30		07:01	18:27-19:30/63	07:32	07:07	15:41-16:08/27	07:41	09:01-10:03/62
	21:08	20:46		20:01		19:08	17:23		17:03	15:36-16:25/49
6	06:05	06:31		07:02	18:27-19:29/62	07:33	07:08	15:39-16:10/31	07:42	09:01-10:03/62
	21:08	20:45		19:57		19:06	17:22		17:02	15:37-16:25/48
7	06:05	06:32		07:03	18:26-19:27/61	07:34	07:09	15:37-16:11/34	07:43	09:02-10:04/62
	21:08	20:44		19:56		19:05	17:21		17:02	15:37-16:26/49
8	06:06	06:33		07:04	18:26-19:26/60	07:35	07:11	15:37-16:13/36	07:44	09:02-10:05/63
	21:08	20:42		19:54		19:03	17:20		17:02	15:38-16:26/48
9	06:07	06:34	19:07-19:20/13	07:05	18:26-19:25/59	07:36	07:12	15:35-16:14/39	07:45	09:02-10:06/64
	21:07	20:41		19:52		19:02	17:19		17:02	15:39-16:26/47
10	06:07	06:35	19:04-19:23/19	07:06	18:26-19:23/57	07:37	07:13	15:34-16:14/40	07:46	09:03-10:06/63
	21:07	20:40		19:51		19:00	17:18		17:02	15:39-16:27/48
11	06:08	06:36	19:01-19:26/25	07:07	18:25-19:20/55	07:38	07:14	15:33-16:15/42	07:47	09:03-10:07/64
	21:06	20:39		19:49		18:58	17:17		17:02	15:40-16:27/47
12	06:09	06:37	18:59-19:28/29	07:08	18:25-19:17/52	07:39	07:16	15:33-16:17/44	07:48	09:03-10:07/64
	21:06	20:37		19:47		18:57	17:16		17:03	15:40-16:27/47
13	06:09	06:38	18:57-19:29/32	07:09	18:25-19:15/50	07:40	07:17	09:17-09:30/13	07:49	09:03-10:08/65
	21:06	20:36		19:46		18:55	17:15	15:32-16:17/45	17:03	15:41-16:27/46
14	06:10	06:39	18:54-19:29/35	07:10	18:25-19:14/49	07:42	07:18	09:13-09:35/22	07:49	09:04-10:08/64
	21:05	20:35		19:44		18:54	17:14	15:32-16:18/46	17:03	15:41-16:28/47
15	06:11	06:40	18:53-19:30/37	07:11	18:26-19:12/46	07:43	07:19	09:12-09:38/26	07:50	09:04-10:09/65
	21:04	20:33		19:42		18:52	17:13	15:32-16:19/47	17:03	15:42-16:28/46
16	06:12	06:41	18:52-19:31/39	07:12	18:27-19:11/44	07:44	07:20	09:09-09:41/32	07:51	09:04-10:09/65
	21:04	20:32		19:40		18:50	17:12	15:31-16:19/48	17:03	15:42-16:28/46
17	06:13	06:42	18:50-19:32/42	07:13	18:27-19:09/42	07:45	07:22	09:08-09:43/35	07:51	09:05-10:10/65
	21:03	20:30		19:39		18:49	17:11	15:31-16:19/48	17:04	15:43-16:29/46
18	06:13	06:43	18:49-19:33/44	07:14	18:28-19:08/40	07:46	07:23	09:06-09:44/38	07:52	09:06-10:11/65
	21:03	20:29		19:37		18:47	17:10	15:30-16:20/50	17:04	15:44-16:30/46
19	06:14	06:44	18:48-19:34/46	07:15	18:29-19:06/37	07:47	07:24	09:06-09:47/41	07:53	09:06-10:11/65
	21:02	20:27		19:35		18:46	17:10	15:31-16:21/50	17:04	15:44-16:29/45
20	06:15	06:45	18:47-19:34/47	07:16	18:31-19:04/33	07:48	07:25	09:05-09:48/43	07:53	09:06-10:12/66
	21:01	20:26		19:34		18:44	17:09	15:31-16:21/50	17:05	15:45-16:30/45
21	06:16	06:46	18:46-19:34/48	07:17	18:33-19:01/28	07:49	07:26	09:04-09:49/45	07:54	09:06-10:12/66
	21:01	20:25		19:32		18:43	17:08	15:31-16:21/50	17:05	15:45-16:30/45
22	06:17	06:47	18:43-19:35/52	07:18	18:35-18:58/23	07:51	07:27	09:03-09:50/47	07:54	09:07-10:13/66
	21:00	20:23		19:30		18:41	17:08	15:31-16:21/50	17:06	15:46-16:31/45
23	06:18	06:48	18:41-19:35/54	07:19	18:39-18:53/14	07:52	07:29	09:03-09:52/49	07:55	09:07-10:13/66
	20:59	20:22		19:28		18:40	17:07	15:32-16:22/50	17:06	15:46-16:31/45
24	06:19	06:49	18:39-19:35/56	07:20		07:53	07:30	09:02-09:53/51	07:55	09:09-10:14/65
	20:58	20:20		19:27		18:39	17:06	15:32-16:23/51	17:07	15:46-16:31/45
25	06:19	06:50	18:38-19:35/57	07:21		07:54	07:31	09:02-09:54/52	07:56	09:09-10:14/65
	20:57	20:18		19:25		18:37	17:06	15:32-16:23/51	17:07	15:47-16:32/45
26	06:20	06:51	18:36-19:35/59	07:22		07:55	07:32	09:01-09:55/54	07:56	09:09-10:14/65
	20:56	20:17		19:23		18:36	17:05	15:32-16:23/51	17:08	15:47-16:33/46
27	06:21	06:52	18:35-19:35/60	07:23		07:56	07:33	09:01-09:56/55	07:56	09:09-10:14/65
	20:55	20:15		19:22		18:34	17:05	15:32-16:23/51	17:09	15:47-16:33/46
28	06:22	06:53	18:34-19:35/61	07:25		07:58	07:34	09:02-09:58/56	07:57	09:10-10:15/65
	20:55	20:14		19:20		18:33	17:05	15:33-16:24/51	17:09	15:48-16:34/46
29	06:23	06:54	18:33-19:34/61	07:26		07:59	07:35	09:01-09:58/57	07:57	09:11-10:15/64
	20:54	20:12		19:18		18:32	17:04	15:33-16:24/51	17:10	15:48-16:35/47
30	06:24	06:55	18:32-19:34/62	07:27		08:00	07:36	09:01-09:59/58	07:57	09:11-10:15/64
	20:53	20:11		19:17		18:30	17:04	15:34-16:24/50	17:11	15:48-16:35/47
31	06:25	06:56	18:31-19:34/63			08:01			07:57	09:11-10:16/65
	20:52	20:09				18:29			17:12	15:49-16:35/46
Potential sun hours	460	429		375		345	297		287	
Sum of minutes with flicker	0	1041		1128		0	2002		3433	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T12 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (431)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 09:02-10:06/64 17:13	07:44 17:11-17:23/12 17:47 09:36-09:49/13	07:07 17:32-18:00/28 18:22	07:16 19:56	06:30 06:50-06:56/6 20:27	06:01 20:57
2	07:58 09:02-10:07/65 17:14	07:43 17:10-17:24/14 17:49	07:06 17:31-18:01/30 18:23	07:14 19:57	06:29 06:49-06:58/9 20:28	06:01 20:58
3	07:58 09:03-10:07/64 17:14	07:42 17:09-17:26/17 17:50	07:04 17:31-18:03/32 18:24	07:13 19:58	06:27 06:47-06:59/12 20:29	06:00 20:59
4	07:58 09:04-10:07/63 17:15	07:41 17:08-17:27/19 17:51	07:03 17:31-18:03/32 18:25	07:11 19:59	06:26 06:46-07:00/14 20:30	06:00 20:59
5	07:58 09:04-10:07/63 17:16	07:40 17:07-17:29/22 17:52	07:01 17:30-18:04/34 18:26	07:09 20:00	06:25 06:45-07:01/16 20:31	06:00 21:00
6	07:58 09:05-10:08/63 17:17	07:39 17:07-17:30/23 17:54	06:59 17:31-18:06/35 18:27	07:08 20:00	06:24 06:44-07:01/17 20:33	05:59 21:01
7	07:58 09:06-10:08/62 17:18	07:37 17:06-17:31/25 17:55	06:58 17:31-18:07/36 18:29	07:06 20:01	06:23 06:43-07:02/19 20:34	05:59 21:02
8	07:58 09:06-10:09/63 17:19	07:36 17:05-17:32/27 17:56	07:56 18:31-19:08/37 19:30	07:05 20:03	06:21 06:42-07:02/20 20:35	05:59 21:02
9	07:57 09:06-10:08/62 17:20	07:35 17:05-17:34/29 17:57	07:55 18:33-19:08/35 19:31	07:03 20:04	06:20 06:40-07:01/21 20:36	05:58 21:03
10	07:57 09:07-10:08/61 17:21	07:34 17:06-17:35/29 17:59	07:53 18:32-19:08/36 19:32	07:01 20:05	06:19 06:39-07:01/22 20:37	05:58 21:03
11	07:57 09:08-10:09/61 17:22	07:33 17:06-17:35/29 18:00	07:51 18:33-19:08/35 19:33	07:00 20:06	06:18 06:38-07:01/23 20:38	05:58 21:04
12	07:57 09:08-10:08/60 17:23	07:31 17:05-17:34/29 18:01	07:50 18:33-19:07/34 19:34	06:58 20:07	06:17 06:37-07:01/24 20:39	05:58 21:04
13	07:56 09:09-10:09/60 17:24	07:30 17:06-17:35/29 18:02	07:48 18:33-19:06/33 19:35	06:57 20:08	06:16 06:37-07:01/24 20:40	05:58 21:05
14	07:56 09:10-10:09/59 17:26	07:29 17:07-17:35/28 18:04	07:46 18:35-19:06/31 19:37	06:55 20:09	06:15 06:37-07:00/23 20:41	05:58 21:05
15	07:56 09:10-10:09/59 17:27	07:28 17:06-17:33/27 18:05	07:45 18:35-19:05/30 19:38	06:53 20:10	06:14 06:38-07:00/22 20:42	05:58 21:06
16	07:55 09:12-10:09/57 17:28	07:26 17:08-17:33/25 18:06	07:43 18:36-19:03/27 19:39	06:52 20:11	06:13 06:39-07:00/21 20:43	05:58 21:06
17	07:55 09:12-10:08/56 17:29	07:25 17:09-17:32/23 18:07	07:41 18:37-19:01/24 19:40	06:50 20:12	06:12 06:40-07:00/20 20:44	05:58 21:07
18	07:54 09:13-10:09/56 17:30	07:23 17:09-17:31/22 18:09	07:40 18:41-18:59/18 19:41	06:49 20:13	06:11 06:40-06:59/19 20:45	05:58 21:07
19	07:54 09:14-10:08/54 17:31	07:22 17:11-17:29/18 18:10	07:38 18:45-18:55/10 19:42	06:47 20:14	06:10 06:41-06:58/17 20:46	05:58 21:07
20	07:53 09:14-10:07/53 17:32	07:21 17:13-17:27/14 18:11	07:36 19:43	06:46 20:15	06:09 06:42-06:56/14 20:47	05:58 21:08
21	07:53 09:16-10:07/51 17:34	07:19 17:18-17:23/5 18:12	07:35 19:44	06:44 20:17	06:08 06:43-06:55/12 20:48	05:58 21:08
22	07:52 09:17-10:06/49 17:35	07:18 17:42-17:51/9 18:13	07:33 19:45	06:43 20:18	06:08 06:46-06:54/8 20:49	05:59 21:08
23	07:51 09:17-10:05/48 17:36	07:16 17:39-17:52/13 18:15	07:31 19:46	06:41 20:19	06:07 20:50	05:59 21:08
24	07:51 09:18-10:04/46 17:37	07:15 17:36-17:53/17 18:16	07:30 19:47	06:40 20:20	06:06 20:50	05:59 21:09
25	07:50 09:20-10:04/44 17:39	07:13 17:35-17:55/20 18:17	07:28 19:49	06:38 20:21	06:05 20:51	05:59 21:09
26	07:49 09:22-10:03/41 17:40	07:12 17:34-17:56/22 18:18	07:26 19:50	06:37 20:22	06:05 20:52	06:00 21:09
27	07:48 09:23-10:02/39 17:41	07:10 17:33-17:57/24 18:19	07:25 19:51	06:36 20:23	06:04 20:53	06:00 21:09
28	07:47 09:25-10:00/35 17:42	07:09 17:32-17:58/26 18:21	07:23 19:52	06:34 20:24	06:03 20:54	06:00 21:09
29	07:47 09:27-09:58/31 17:44		07:21 19:53	06:33 20:25	06:03 20:55	06:01 21:09
30	07:46 09:29-09:56/27 17:45		07:19 19:54	06:31 06:51-06:53/2 20:26	06:02 20:56	06:01 21:09
31	07:45 17:13-17:21/8 17:46 09:32-09:53/21		07:18 19:55		06:02 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1645	610	577	2	383	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T12 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (431)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:09	06:26 06:48-07:12/24 20:50	06:57 20:07	07:28 18:12-18:46/34 19:15	07:02 16:35-17:05/30 17:28	07:37 08:50-09:51/61 17:03
2	06:02 21:09	06:27 06:49-07:12/23 20:49	06:58 20:06	07:29 18:11-18:46/35 19:13	07:03 16:35-17:03/28 17:27	07:38 08:50-09:51/61 17:03
3	06:03 21:09	06:28 06:50-07:12/22 20:48	06:59 20:04	07:30 18:11-18:46/35 19:11	07:05 16:35-17:02/27 17:25	07:39 08:50-09:52/62 17:03
4	06:03 21:08	06:29 06:51-07:12/21 20:47	07:00 20:02	07:31 18:10-18:46/36 19:10	07:06 16:35-17:00/25 17:24	07:40 08:50-09:53/63 17:03
5	06:04 21:08	06:30 06:52-07:12/20 20:46	07:01 20:01	07:32 18:10-18:46/36 19:08	07:07 16:37-17:00/23 17:23	07:41 08:51-09:53/62 17:03
6	06:05 21:08	06:31 06:53-07:11/18 20:45	07:02 19:57	07:33 18:08-18:44/36 19:06	07:08 16:37-16:58/21 17:22	07:42 08:51-09:54/63 17:02
7	06:05 21:08	06:32 06:54-07:11/17 20:44	07:03 19:56	07:34 18:07-18:42/35 19:05	07:09 16:38-16:57/19 17:21	07:43 08:51-09:54/63 17:02
8	06:06 21:07	06:33 06:55-07:10/15 20:42	07:04 19:54	07:35 18:06-18:41/35 19:03	07:11 16:40-16:56/16 17:20	07:44 08:52-09:55/63 17:02
9	06:06 21:07	06:34 06:56-07:09/13 20:41	07:05 19:52	07:36 18:06-18:39/33 19:01	07:12 16:41-16:55/14 17:19	07:45 08:52-09:56/64 17:02
10	06:07 21:07	06:35 06:57-07:08/11 20:40	07:06 19:51	07:37 18:05-18:37/32 19:00	07:13 16:42-16:54/12 17:18 09:06-09:21/15	07:46 08:52-09:57/65 17:02
11	06:08 21:06	06:36 06:58-07:07/9 20:39	07:07 19:49	07:38 18:05-18:35/30 18:58	07:14 16:45-16:52/7 17:17 09:02-09:25/23	07:47 08:52-09:56/64 17:02
12	06:09 21:06	06:37 06:59-07:05/6 20:37	07:08 19:47	07:39 18:05-18:34/29 18:57	07:15 09:01-09:28/27 17:16	07:48 08:53-09:57/64 17:03
13	06:09 21:05	06:38 20:36	07:09 19:46	07:40 18:06-18:33/27 18:55	07:17 08:58-09:30/32 17:15	07:48 08:53-09:58/65 17:03
14	06:10 21:05	06:39 20:34	07:10 19:44	07:42 18:06-18:31/25 18:54	07:18 08:57-09:32/35 17:14	07:49 08:54-09:59/65 17:03
15	06:11 21:04	06:40 20:33	07:11 19:42	07:43 18:06-18:29/23 18:52	07:19 08:56-09:35/39 17:13	07:50 08:54-10:00/66 17:03
16	06:12 21:04	06:41 20:32	07:12 19:40	07:44 18:07-18:28/21 18:50	07:20 08:55-09:36/41 17:12	07:51 08:54-10:00/66 17:03
17	06:12 21:03	06:42 20:30	07:13 19:39	07:45 18:07-18:26/19 18:49	07:21 08:53-09:37/44 17:11	07:51 08:55-10:01/66 17:04
18	06:13 21:03	06:43 20:29	07:14 19:37	07:46 18:09-18:24/15 18:47	07:23 08:52-09:38/46 17:10	07:52 08:56-10:02/66 17:04
19	06:14 21:02	06:44 20:27	07:15 19:35	07:47 18:10-18:22/12 18:46	07:24 08:52-09:40/48 17:10	07:53 08:56-10:01/65 17:04
20	06:15 21:01	06:45 20:26	07:16 19:34	07:48 18:15-18:22/7 18:44	07:25 08:52-09:41/49 17:09	07:53 08:57-10:02/65 17:05
21	06:16 06:57-07:02/5 21:00	06:46 20:25	07:17 19:32	07:49 17:46-17:55/9 18:43	07:26 08:51-09:42/51 17:08	07:54 08:57-10:02/65 17:05
22	06:17 06:54-07:04/10 21:00	06:47 20:23	07:18 19:30	07:51 17:43-17:58/15 18:41	07:27 08:50-09:43/53 17:08	07:54 08:58-10:03/65 17:06
23	06:18 06:53-07:06/13 20:59	06:48 20:22	07:19 19:28	07:52 17:40-18:00/20 18:40	07:28 08:51-09:45/54 17:07	07:55 08:58-10:03/65 17:06
24	06:19 06:52-07:08/16 20:58	06:49 20:20	07:20 18:31-18:37/6 19:27	07:53 17:40-18:02/22 18:39	07:30 08:50-09:46/56 17:06	07:55 08:58-10:03/65 17:07
25	06:19 06:51-07:09/18 20:57	06:50 20:18	07:21 18:25-18:41/16 19:25	07:54 17:38-18:02/24 18:37	07:31 08:50-09:46/56 17:06	07:56 08:59-10:05/66 17:07
26	06:20 06:51-07:10/19 20:56	06:51 20:17	07:22 18:21-18:43/22 19:23	07:55 17:37-18:03/26 18:36	07:32 08:50-09:47/57 17:05	07:56 08:59-10:05/66 17:08
27	06:21 06:50-07:11/21 20:55	06:52 20:15	07:23 18:18-18:44/26 19:22	07:56 17:36-18:03/27 18:34	07:33 08:49-09:48/59 17:05	07:56 08:59-10:05/66 17:09
28	06:22 06:49-07:10/21 20:54	06:53 20:14	07:24 18:16-18:45/29 19:20	07:57 17:35-18:03/28 18:33	07:34 08:50-09:49/59 17:05	07:57 09:00-10:06/66 17:09
29	06:23 06:48-07:11/23 20:53	06:54 20:12	07:26 18:14-18:45/31 19:18	07:59 17:35-18:04/29 18:32	07:35 08:50-09:50/60 17:04	07:57 09:01-10:06/65 17:10
30	06:24 06:48-07:11/23 20:52	06:55 20:11	07:27 18:13-18:46/33 19:16	08:00 17:35-18:04/29 18:30	07:36 08:50-09:50/60 17:04	07:57 09:01-10:06/65 17:11
31	06:25 06:48-07:12/24 20:51	06:56 20:09		08:01 17:35-18:04/29 18:29		07:57 09:01-10:06/65 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	193	199	163	813	1186	1998

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T13 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (432)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 15:38-16:23/45 17:13	07:44 16:28-17:15/47 17:47 08:06-08:46/40	07:07 16:31-17:27/56 18:22	07:16 19:56	06:30 19:44-20:05/21 20:27 07:09-07:44/35	06:01 06:23-06:50/27 20:57
2	07:58 15:39-16:23/44 17:14	07:43 16:28-17:16/48 17:49 08:06-08:46/40	07:06 16:32-17:26/54 18:23	07:14 19:57	06:29 19:42-20:05/23 20:28 07:10-07:43/33	06:01 06:22-06:50/28 20:58
3	07:58 15:39-16:24/45 17:14	07:42 16:27-17:17/50 17:50 08:06-08:46/40	07:04 16:34-17:25/51 18:24	07:13 19:58	06:27 19:42-20:07/25 20:29 07:10-07:41/31	06:00 06:22-06:51/29 20:59
4	07:58 15:40-16:24/44 17:15	07:41 16:26-17:19/53 17:51 08:06-08:46/40	07:03 16:36-17:23/47 18:25	07:11 19:59	06:26 19:42-20:08/26 20:30 07:11-07:40/29	06:00 06:22-06:52/30 20:59
5	07:58 15:41-16:24/43 17:16	07:40 16:26-17:21/55 17:52 08:06-08:46/40	07:01 16:38-17:21/43 18:26	07:09 20:00	06:25 19:42-20:09/27 20:31 07:12-07:39/27	06:00 06:21-06:51/30 21:00
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9	07:57 15:43-16:25/42 17:20	07:35 16:24-17:26/62 17:57 08:07-08:42/35	07:55 17:57-18:10/13 19:31	07:03 20:04	06:20 19:41-20:12/31 20:36 07:19-07:31/12	05:58 06:21-06:54/33 21:03
10	07:57 15:44-16:25/41 17:21	07:34 16:24-17:27/63 17:59 08:08-08:41/33	07:53 19:32	07:01 07:25-07:36/11 20:05	06:19 19:42-20:14/32 20:37	05:58 06:20-06:53/33 21:03
11	07:57 15:45-16:26/41 17:22	07:33 16:24-17:28/64 18:00 08:09-08:41/32	07:51 19:33	07:00 07:22-07:40/18 20:06	06:18 19:42-20:14/32 20:38	05:58 06:20-06:54/34 21:04
12	07:57 15:45-16:25/40 17:23 08:22-08:25/3	07:31 16:23-17:28/65 18:01 08:09-08:39/30	07:50 19:34	06:58 07:19-07:42/23 20:07	06:17 19:43-20:13/30 20:39	05:58 06:20-06:54/34 21:04
13	07:56 15:47-16:25/38 17:24 08:19-08:29/10	07:30 16:23-17:29/66 18:02 08:10-08:38/28	07:48 19:35	06:56 07:17-07:44/27 20:08	06:16 19:43-20:13/30 20:40	05:58 06:20-06:54/34 21:05
14	07:56 15:48-16:26/38 17:26 08:18-08:32/14	07:29 16:23-17:30/67 18:04 08:12-08:37/25	07:46 19:36	06:55 07:15-07:45/30 20:09	06:15 19:44-20:12/28 20:41	05:58 06:20-06:55/35 21:05
15	07:56 15:48-16:25/37 17:27 08:17-08:33/16	07:28 16:23-17:30/67 18:05 08:13-08:35/22	07:45 19:38	06:53 07:13-07:45/32 20:10	06:14 19:45-20:12/27 20:42	05:58 06:20-06:55/35 21:06
16	07:55 15:50-16:25/35 17:28 08:17-08:35/18	07:26 16:23-17:31/68 18:06 08:15-08:34/19	07:43 19:39	06:52 07:12-07:47/35 20:11	06:13 19:46-20:11/25 20:43	05:58 06:20-06:55/35 21:06
17	07:55 15:51-16:24/33 17:29 08:16-08:36/20	07:25 16:23-17:31/68 18:07 08:18-08:31/13	07:41 19:40	06:50 07:11-07:47/36 20:12	06:12 19:47-20:10/23 20:44	05:58 06:21-06:55/34 21:07
18	07:54 15:52-16:24/32 08:16-08:38/22 17:30 16:48-16:50/2	07:23 16:23-17:31/68 18:09	07:40 19:41	06:49 07:10-07:48/38 20:13	06:11 19:49-20:10/21 20:45	05:58 06:21-06:55/34 21:07
19	07:54 15:53-16:23/30 08:15-08:39/24 17:31 16:42-16:56/14	07:22 16:24-17:32/68 18:10	07:38 19:42	06:47 07:09-07:47/38 20:14	06:10 19:51-20:09/18 20:46	05:58 06:22-06:57/35 21:07
20	07:53 15:55-16:22/27 16:39-16:58/19 17:32 08:14-08:40/26	07:21 16:23-17:31/68 18:11	07:36 19:43	06:46 07:09-07:48/39 20:15	06:09 19:54-20:08/14 20:47	05:58 06:22-06:57/35 21:08
21	07:53 15:57-16:22/25 16:38-17:01/23 17:34 08:14-08:41/27	07:19 16:24-17:31/67 18:12	07:35 19:44	06:44 07:08-07:48/40 20:16	06:08 19:55-20:06/11 20:48	05:58 06:22-06:57/35 21:08
22	07:52 15:59-16:20/21 16:37-17:03/26 17:35 08:13-08:42/29	07:18 16:24-17:31/67 18:13	07:33 19:45	06:43 07:08-07:48/40 20:18	06:07 19:58-20:03/5 20:49 06:31-06:39/8	05:59 06:22-06:57/35 21:08
23	07:51 16:01-16:18/17 08:12-08:43/31 17:36 16:35-17:05/30	07:16 16:25-17:31/66 18:15	07:31 19:46	06:41 07:08-07:48/40 20:19	06:07 06:28-06:41/13 20:50	05:59 06:22-06:57/35 21:08
24	07:51 16:04-16:15/11 08:11-08:43/32 17:37 16:34-17:06/32	07:15 16:25-17:30/65 18:16	07:30 19:47	06:40 07:07-07:47/40 20:20	06:06 06:27-06:43/16 20:50	05:59 06:23-06:58/35 21:09
25	07:50 16:34-17:08/34 17:39 08:11-08:44/33	07:13 16:26-17:30/64 18:17	07:28 19:49	06:38 07:07-07:48/41 20:21 19:54-19:59/5	06:05 06:27-06:45/18 20:51	05:59 06:23-06:57/34 21:09
26	07:49 16:33-17:09/36 17:40 08:10-08:45/35	07:12 16:27-17:29/62 18:18	07:26 19:50	06:37 07:07-07:47/40 20:22 19:50-20:00/10	06:05 06:26-06:45/19 20:52	06:00 06:23-06:57/34 21:09
27	07:48 16:32-17:10/38 17:41 08:09-08:45/36	07:10 16:28-17:29/61 18:19	07:25 19:51	06:35 07:07-07:46/39 20:23 19:48-20:01/13	06:04 06:25-06:46/21 20:53	06:00 06:23-06:58/35 21:09
28	07:47 16:31-17:11/40 17:42 08:08-08:46/38	07:09 16:29-17:27/58 18:20	07:23 19:52	06:34 19:47-20:02/15 20:24 07:08-07:46/38	06:03 06:25-06:47/22 20:54	06:00 06:23-06:58/35 21:09
29	07:46 16:31-17:12/41 17:43 08:07-08:46/39		07:21 19:53	06:33 19:45-20:03/18 20:25 07:07-07:45/38	06:03 06:24-06:48/24 20:55	06:01 06:24-06:59/35 21:09
30	07:46 16:30-17:13/43 17:45 08:07-08:46/39		07:19 19:54	06:31 19:44-20:04/20 20:26 07:08-07:44/36	06:02 06:24-06:49/25 20:56	06:01 06:24-06:58/34 21:09
31	07:45 16:29-17:14/45 17:46 08:06-08:46/40		07:18 19:55		06:02 06:23-06:49/26 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1813	2284	352	800	960	997

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T13 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (432)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:24-06:58/34 21:09	06:26 19:53-20:24/31 20:50	06:57 07:21-07:39/18 20:07	07:28 19:15	07:02 15:54-16:57/63 17:28 07:38-08:11/33	07:37 15:27-16:08/41 17:03
2	06:02 06:25-06:58/33 21:09	06:27 19:53-20:24/31 20:49	06:58 07:24-07:35/11 20:06	07:29 19:13	07:03 15:54-16:56/62 17:27 07:37-08:12/35	07:38 15:27-16:08/41 17:03
3	06:03 06:25-06:58/33 21:09	06:28 19:52-20:24/32 20:48 07:32-07:39/7	06:59 20:04	07:30 19:11	07:05 15:54-16:54/60 17:25 07:36-08:13/37	07:39 15:27-16:09/42 17:03
4	06:03 06:26-06:59/33 21:08	06:29 19:52-20:23/31 20:47 07:28-07:43/15	07:00 20:02	07:31 17:39-17:43/4 19:10	07:06 15:54-16:53/59 17:24 07:36-08:14/38	07:40 15:27-16:09/42 17:03
5	06:04 06:27-06:59/32 21:08	06:30 19:52-20:22/30 20:46 07:26-07:45/19	07:01 20:01	07:32 17:31-17:49/18 19:08	07:07 15:55-16:52/57 17:23 07:37-08:15/38	07:41 15:27-16:10/43 17:03
6	06:05 06:27-06:58/31 21:08	06:31 19:51-20:21/30 20:45 07:24-07:47/23	07:02 19:57	07:33 17:28-17:52/24 19:06	07:08 15:56-16:51/55 17:22 07:36-08:16/40	07:42 15:28-16:11/43 17:02
7	06:05 06:28-06:59/31 21:08	06:32 19:51-20:19/28 20:44 07:23-07:48/25	07:03 19:56	07:34 17:20-17:54/34 19:05	07:09 15:56-16:49/53 17:21 07:36-08:16/40	07:43 15:28-16:11/43 17:02
8	06:06 06:28-06:58/30 21:07	06:33 19:51-20:18/27 20:42 07:21-07:49/28	07:04 19:54	07:35 17:15-17:56/41 19:03	07:11 15:58-16:47/49 17:20 07:37-08:17/40	07:44 15:28-16:12/44 17:02
9	06:06 06:29-06:58/29 21:07	06:34 19:51-20:17/26 20:41 07:20-07:50/30	07:05 19:52	07:36 17:12-17:57/45 19:01	07:12 15:59-16:46/47 17:19 07:37-08:17/40	07:45 15:28-16:13/45 17:02
10	06:07 06:30-06:58/28 21:07	06:35 19:52-20:16/24 20:40 07:19-07:51/32	07:06 19:51	07:37 17:09-17:58/49 19:00	07:13 15:59-16:46/47 17:18 07:37-08:17/40	07:46 15:29-16:13/44 17:02
11	06:08 06:30-06:58/28 21:06	06:36 19:52-20:15/23 20:38 07:18-07:52/34	07:07 19:49	07:38 17:07-17:59/52 18:58	07:14 16:00-16:45/45 17:17 07:37-08:17/40	07:47 15:28-16:13/45 17:02
12	06:09 06:31-06:58/27 21:06	06:37 19:51-20:13/22 20:37 07:17-07:53/36	07:08 19:47	07:39 17:05-17:59/54 18:57	07:15 16:02-16:45/43 17:16 07:39-08:18/39	07:48 15:29-16:14/45 17:02
13	06:09 06:32-06:58/26 21:05	06:38 19:52-20:11/19 20:36 07:17-07:53/36	07:09 19:46	07:40 17:04-18:01/57 18:55	07:17 16:03-16:44/41 17:15 07:39-08:18/39	07:48 15:29-16:14/45 17:03
14	06:10 06:33-06:57/24 21:05	06:39 19:53-20:10/17 20:34 07:15-07:53/38	07:10 19:44	07:41 17:02-18:01/59 18:53	07:18 16:03-16:43/40 17:14 07:40-08:18/38	07:49 15:30-16:15/45 17:03
15	06:11 06:33-06:56/23 21:04	06:40 07:14-07:53/39 20:33 19:54-20:09/15	07:11 19:42	07:43 17:00-18:01/61 18:52	07:19 16:05-16:43/38 17:13 07:42-08:18/36	07:50 15:30-16:15/45 17:03
16	06:12 06:34-06:56/22 21:04	06:41 07:14-07:53/39 20:32 19:55-20:07/12	07:12 19:40	07:44 16:59-18:02/63 18:50	07:20 16:06-16:42/36 17:12 07:43-08:18/35	07:51 15:30-16:16/46 17:03
17	06:12 06:35-06:55/20 21:03	06:42 07:14-07:53/39 20:30 19:57-20:06/9	07:13 19:39	07:45 16:58-18:02/64 18:49	07:21 16:07-16:41/34 17:11 07:44-08:17/33	07:51 15:31-16:17/46 17:04
18	06:13 06:36-06:55/19 21:03	06:43 07:13-07:53/40 20:29 20:01-20:05/4	07:14 19:37	07:46 16:57-18:02/65 18:47	07:23 15:38-15:50/12 07:45-08:17/32 17:10 16:08-16:40/32	07:52 15:31-16:17/46 17:04
19	06:14 06:37-06:54/17 21:02	06:44 07:13-07:53/40 20:27	07:15 19:35	07:47 16:55-18:01/66 18:46	07:24 15:36-15:53/17 07:47-08:18/31 17:10 16:10-16:40/30	07:53 15:32-16:17/45 17:04
20	06:15 06:37-06:51/14 21:01	06:45 07:13-07:53/40 20:26	07:16 19:34	07:48 16:56-18:02/66 18:44	07:25 15:34-15:55/21 16:12-16:38/26 17:09 07:48-08:17/29	07:53 15:33-16:18/45 17:05
21	06:16 06:38-06:50/12 21:00	06:46 07:13-07:53/40 20:24	07:17 19:32	07:49 16:55-18:02/67 18:43	07:26 15:32-15:57/25 16:13-16:36/23 17:08 07:49-08:16/27	07:54 15:33-16:18/45 17:05
22	06:17 20:07-20:15/8 21:00 06:43-06:46/3	06:47 07:13-07:52/39 20:23	07:18 19:30	07:50 16:54-18:02/68 18:41	07:27 15:31-15:58/27 16:15-16:34/19 17:08 07:50-08:16/26	07:54 15:34-16:19/45 17:06
23	06:18 20:05-20:17/12 20:59	06:48 07:13-07:52/39 20:21	07:19 19:28	07:52 16:53-18:01/68 18:40	07:28 15:30-16:00/30 07:52-08:16/24 17:07 16:19-16:33/14	07:55 15:34-16:19/45 17:06
24	06:19 20:03-20:19/16 20:58	06:49 07:13-07:51/38 20:20	07:20 19:27	07:53 16:54-18:02/68 18:39 08:52-08:57/5	07:30 15:29-16:01/32 07:53-08:15/22 17:06 16:24-16:28/4	07:55 15:34-16:19/45 17:07
25	06:19 20:01-20:20/19 20:57	06:50 07:13-07:50/37 20:18	07:21 19:25	07:54 16:53-18:01/68 18:37 08:47-09:02/15	07:31 15:29-16:02/33 17:06 07:54-08:14/20	07:56 15:35-16:20/45 17:07
26	06:20 19:58-20:20/22 20:56	06:51 07:14-07:50/36 20:17	07:22 19:23	07:55 16:53-18:00/67 18:36 08:44-09:04/20	07:32 15:28-16:03/35 17:05 07:55-08:13/18	07:56 15:35-16:21/46 17:08
27	06:21 19:57-20:21/24 20:55	06:52 07:14-07:49/35 20:15	07:23 19:22	07:56 16:52-18:00/68 18:34 08:42-09:05/23	07:33 15:27-16:04/37 17:05 07:56-08:12/16	07:56 15:35-16:21/46 17:09
28	06:22 19:56-20:22/26 20:54	06:53 07:15-07:47/32 20:14	07:24 19:20	07:57 16:52-17:59/67 18:33 08:41-09:07/26	07:34 15:27-16:05/38 17:04 07:58-08:12/14	07:57 15:37-16:22/45 17:09
29	06:23 19:55-20:23/28 20:53	06:54 07:16-07:46/30 20:12	07:25 19:18	07:59 16:53-17:59/66 18:32 08:40-09:08/28	07:35 15:28-16:06/38 17:04 08:00-08:10/10	07:57 15:37-16:22/45 17:10
30	06:24 19:54-20:23/29 20:52	06:55 07:17-07:44/27 20:11	07:27 19:16	08:00 16:53-17:58/65 18:30 08:39-09:09/30	07:36 15:27-16:07/40 17:04 08:03-08:07/4	07:57 15:37-16:22/45 17:11
31	06:25 19:54-20:24/30 20:51	06:56 07:19-07:42/23 20:09		08:01 16:53-17:57/64 18:29 08:38-09:09/31		07:57 15:38-16:23/45 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	763	1347	29	1736	2276	1378

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T14 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (433)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 14:42-15:41/59 15:47-16:00/13	07:43 08:04-09:34/90	07:07 07:42-07:54/12	07:16	06:30 06:50-07:17/27	06:01
	17:12 08:25-10:09/104	17:47	18:21	19:56	20:27	20:57
2	07:57 14:42-15:41/59 15:49-15:59/10	07:42 08:03-09:34/91	07:05 07:47-07:49/2	07:14	06:28 06:48-07:15/27	06:00
	17:13 08:25-10:09/104	17:48	18:22 07:25-07:31/6	19:57	20:28	20:58
3	07:57 14:43-15:41/58 15:51-15:58/7	07:41 08:02-09:33/91	07:04 07:23-07:33/10	07:12	06:27 06:47-07:13/26	06:00
	17:14 08:24-10:10/106	17:49	18:24	19:58	20:29	20:58
4	07:57 14:44-15:42/58	07:40 08:01-09:32/91	07:02 07:22-07:35/13	07:11	06:26 06:47-07:12/25	06:00
	17:15 08:24-10:10/106	17:51	18:25	19:59	20:30	20:59
5	07:57 14:45-15:42/57	07:39 08:00-09:30/90	07:01 07:20-07:36/16	07:09	06:25 06:48-07:10/22	05:59
	17:16 08:24-10:10/106	17:52	18:26	20:00	20:31	21:00
6	07:57 14:46-15:42/56	07:38 07:58-09:29/91	06:59 07:19-07:37/18	07:07	06:23 06:48-07:08/20	05:59
	17:17 08:24-10:10/106	17:53 17:25-17:29/4	18:27	20:00	20:32	21:01
7	07:57 14:46-15:41/55	07:37 07:57-09:27/90	06:57 07:17-07:37/20	07:06	06:22 06:49-07:07/18	05:59
	17:18 08:24-10:10/106	17:54 17:22-17:31/9	18:28	20:01	20:33	21:01
8	07:57 14:47-15:42/55	07:36 07:56-09:25/89	07:56 08:15-08:37/22	07:04	06:21 06:50-07:06/16	05:58
	17:19 08:23-10:10/107	17:56 17:20-17:32/12	19:29	20:02	20:34	21:02
9	07:57 14:48-15:42/54	07:35 07:55-09:23/88	07:54 08:14-08:37/23	07:03 07:22-07:28/6	06:20 06:51-07:04/13	05:58
	17:20 08:23-10:10/107	17:57 17:19-17:34/15	19:31	20:03	20:35	21:02
10	07:57 14:49-15:42/53	07:33 07:54-09:21/87	07:53 08:12-08:37/25	07:01 07:20-07:30/10	06:19 06:53-07:02/9	05:58
	17:21 08:22-10:10/108	17:58 17:17-17:34/17	19:32	20:04	20:36	21:03
11	07:57 14:50-15:41/51	07:32 07:52-09:15/83	07:51 08:10-08:36/26	06:59 07:18-07:31/13	06:18	05:58
	17:22 08:21-10:10/109	18:00 17:17-17:36/19	19:33	20:05	20:37	21:04
12	07:56 14:51-15:41/50	07:31 07:51-09:08/77	07:49 08:09-08:36/27	06:58 07:17-07:32/15	06:17	05:58
	17:23 08:21-10:10/109	18:01 17:16-17:38/22	19:34	20:06	20:38	21:04
13	07:56 14:53-15:41/48	07:30 07:50-09:03/73	07:48 08:07-08:34/27	06:56 07:15-07:33/18	06:15	05:58
	17:24 08:21-10:10/109	18:02 17:16-17:39/23	19:35	20:08	20:39	21:05
14	07:56 14:53-15:40/47	07:28 07:48-08:59/71	07:46 08:05-08:33/28	06:55 07:14-07:33/19	06:14	05:57
	17:25 08:20-10:09/109	18:03 17:15-17:40/25	19:36	20:09	20:40	21:05
15	07:55 14:55-15:40/45	07:27 07:47-08:56/69	07:44 08:04-08:32/28	06:53 07:12-07:33/21	06:13	05:57
	17:26 08:20-10:09/109	18:04 17:16-17:42/26	19:37	20:10	20:41	21:06
16	07:55 14:56-15:39/43	07:26 07:46-08:52/66	07:43 08:02-08:29/27	06:51 07:11-07:34/23	06:12	05:57
	17:27 08:19-10:08/109	18:06 17:16-17:42/26	19:38	20:11	20:42	21:06
17	07:54 14:58-15:39/41	07:24 07:44-08:48/64	07:41 08:00-08:26/26	06:50 07:09-07:33/24	06:11	05:58
	17:29 08:18-10:08/110	18:07 17:15-17:41/26	19:39	20:12	20:43	21:06
18	07:54 15:00-15:38/38	07:23 07:43-08:44/61	07:39 07:59-08:23/24	06:48 07:08-07:33/25	06:11	05:58
	17:30 08:17-10:07/110	18:08 17:16-17:41/25	19:41	20:13	20:44	21:07
19	07:53 15:02-15:38/36	07:22 07:42-08:39/57	07:38 07:57-08:22/25	06:47 07:06-07:32/26	06:10	05:58
	17:31 08:16-10:07/111	18:09 17:16-17:40/24	19:42	20:14	20:45	21:07
20	07:53 15:04-15:36/32	07:20 07:40-08:34/54	07:36 07:56-08:22/26	06:45 07:05-07:32/27	06:09	05:58
	17:32 08:15-10:06/111	18:11 17:17-17:40/23	19:43	20:15	20:46	21:07
21	07:52 15:06-15:34/28	07:19 07:39-08:30/51	07:34 07:55-08:21/26	06:44 07:03-07:31/28	06:08	05:58
	17:33 08:13-10:04/111	18:12 17:18-17:39/21	19:44	20:16	20:47	21:08
22	07:52 15:09-15:33/24	07:17 07:37-08:26/49	07:33 07:56-08:20/24	06:42 07:02-07:30/28	06:07	05:58
	17:35 08:13-10:04/111	18:13 17:19-17:37/18	19:45	20:17	20:48	21:08
23	07:51 15:12-15:30/18	07:16 07:37-08:22/45	07:31 07:57-08:19/22	06:41 07:00-07:29/29	06:06	05:58
	17:36 08:12-10:02/110	18:14 17:21-17:36/15	19:46	20:18	20:49	21:08
24	07:50 15:18-15:25/7	07:15 07:36-08:15/39	07:29 07:57-08:17/20	06:39 06:59-07:29/30	06:06	05:59
	17:37 08:11-10:00/109	18:15 17:24-17:32/8	19:47	20:19	20:50	21:08
25	07:49 08:10-09:57/107	07:13 07:37-08:11/34	07:28 07:59-08:16/17	06:38 06:57-07:27/30	06:05	05:59
	17:38	18:17	19:48	20:20	20:51	21:08
26	07:49 08:09-09:36/87	07:12 07:38-08:07/29	07:26 08:01-08:13/12	06:37 06:56-07:27/31	06:04	05:59
	17:39 09:40-09:53/13	18:18	19:49	20:22	20:52	21:08
27	07:48 08:09-09:37/88	07:10 07:39-08:03/24	07:24 08:05-08:08/3	06:35 06:55-07:26/31	06:04	06:00
	17:41	18:19	19:50	20:23	20:53	21:09
28	07:47 08:08-09:36/88	07:08 07:40-07:57/17	07:22	06:34 06:53-07:23/30	06:03	06:00
	17:42	18:20	19:51	20:24	20:54	21:09
29	07:46 08:07-09:36/89		07:21	06:32 06:52-07:21/29	06:02	06:01
	17:43		19:52	20:25	20:54	21:09
30	07:45 08:06-09:35/89		07:19	06:31 06:51-07:17/26	06:02	06:01
	17:44		19:54	20:26	20:55	21:09
31	07:44 08:05-09:35/90		07:17		06:01	
	17:46		19:55		20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	4350	2219	555	519	203	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T14 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (433)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01 21:08	06:26 20:50	06:57 07:18-07:31/13 20:07	07:27 07:47-08:14/27 19:14	07:02 07:23-08:50/87 17:27 16:47-17:04/17	07:37 14:32-15:23/51 17:03 08:03-09:52/109
2	06:02 21:08	06:27 07:06-07:10/4 20:49	06:58 07:19-07:29/10 20:05	07:28 07:48-08:14/26 19:13	07:03 07:25-08:54/89 17:26 16:48-17:02/14	07:38 14:33-15:25/52 17:03 08:05-09:53/108
3	06:02 21:08	06:28 07:03-07:14/11 20:48	06:59 07:19-07:25/6 20:04	07:29 07:49-08:14/25 19:11	07:04 07:26-08:56/90 17:25 16:50-17:02/12	07:39 14:32-15:26/54 17:03 08:07-09:54/107
4	06:03 21:08	06:29 07:01-07:15/14 20:47	07:00 20:02	07:30 07:50-08:14/24 19:09	07:05 07:27-08:57/90 17:24 16:52-17:00/8	07:40 14:32-15:27/55 17:02 08:08-09:55/107
5	06:04 21:08	06:30 07:00-07:17/17 20:46	07:01 20:00	07:31 07:51-08:13/22 19:08	07:07 07:28-08:59/91 17:23 16:55-16:59/4	07:41 14:32-15:27/55 17:02 08:09-09:56/107
6	06:04 21:08	06:31 06:58-07:17/19 20:44	07:02 19:57	07:33 07:52-08:13/21 19:06	07:08 07:30-09:01/91 17:22	07:42 14:32-15:28/56 17:02 08:10-09:56/106
7	06:05 21:07	06:32 06:57-07:18/21 20:43	07:03 19:55	07:34 07:54-08:13/19 19:04	07:09 07:31-09:02/91 17:20	07:43 14:32-15:29/57 17:02 08:11-09:57/106
8	06:05 21:07	06:33 06:56-07:19/23 20:42	07:04 19:54	07:35 07:55-08:12/17 19:03	07:10 07:32-09:03/91 17:19	07:44 14:31-15:29/58 17:02 08:12-09:58/106
9	06:06 21:07	06:34 06:56-07:21/25 20:41	07:05 19:52	07:36 07:56-08:10/14 19:01	07:11 07:34-09:05/91 17:18	07:45 14:31-15:29/58 15:39-15:46/7 17:02 08:12-09:58/106
10	06:07 21:06	06:35 06:56-07:23/27 20:39	07:06 19:50	07:37 07:57-08:09/12 19:00	07:13 07:35-09:05/90 17:17	07:46 14:32-15:30/58 15:38-15:48/10 17:02 08:14-09:58/104
11	06:08 21:06	06:36 06:57-07:24/27 20:38	07:07 19:49	07:38 07:58-08:06/8 18:58	07:14 07:36-09:06/90 17:16	07:46 14:32-15:31/59 15:37-15:50/13 17:02 08:15-09:59/104
12	06:08 21:06	06:37 06:58-07:24/26 20:37	07:08 19:47	07:39 08:17-08:26/9 18:56 07:59-08:03/4	07:15 07:37-09:06/89 17:15	07:47 14:32-15:32/60 15:37-15:51/14 17:02 08:16-10:00/104
13	06:09 21:05	06:38 06:59-07:26/27 20:35	07:09 19:45	07:40 08:14-08:28/14 18:55	07:16 07:39-09:08/89 17:14	07:48 14:33-15:33/60 15:37-15:53/16 17:02 08:17-10:01/104
14	06:10 21:05	06:39 07:00-07:30/30 20:34	07:10 19:44	07:41 08:12-08:30/18 18:53	07:18 07:40-09:08/88 17:13	07:49 14:32-15:33/61 15:36-15:53/17 17:02 08:17-10:01/104
15	06:11 21:04	06:40 07:01-07:31/30 20:33	07:11 19:42	07:42 08:11-08:38/27 18:52	07:19 07:41-09:09/88 17:13	07:50 14:33-15:33/60 15:36-15:54/18 17:03 08:18-10:01/103
16	06:11 21:03	06:41 07:02-07:33/31 20:31	07:12 19:40	07:43 08:10-08:41/31 18:50	07:20 07:43-09:10/87 17:12 09:14-09:28/14	07:50 14:33-15:34/61 15:36-15:55/19 17:03 08:19-10:02/103
17	06:12 21:03	06:42 07:03-07:33/30 20:30	07:13 07:50-08:01/11 19:38	07:44 08:09-08:45/36 18:48	07:21 07:44-09:31/107 17:11	07:51 14:33-15:34/61 15:36-15:56/20 17:03 08:20-10:03/103
18	06:13 21:02	06:43 07:04-07:34/30 20:29	07:14 07:47-08:03/16 19:37	07:46 08:08-08:48/40 18:47 17:54-18:05/11	07:22 14:52-14:59/7 17:10 07:45-09:34/109	07:52 14:34-15:35/61 15:37-15:57/20 17:04 08:20-10:03/103
19	06:14 21:02	06:44 07:05-07:35/30 20:27	07:15 07:45-08:04/19 19:35	07:47 08:07-08:54/47 18:45 17:51-18:07/16	07:23 14:46-15:04/18 17:09 07:46-09:36/110	07:52 14:35-15:36/61 15:37-15:58/21 17:04 08:21-10:04/103
20	06:15 21:01	06:45 07:06-07:35/29 20:26	07:16 07:43-08:05/22 19:33	07:48 08:08-08:58/50 18:44 17:49-18:08/19	07:25 14:44-15:08/24 17:09 07:48-09:39/111	07:53 14:35-15:36/61 15:37-15:58/21 17:04 08:21-10:04/103
21	06:16 21:00	06:46 07:07-07:35/28 20:24	07:17 07:42-08:06/24 19:31	07:49 08:10-09:02/52 18:42 17:48-18:09/21	07:26 14:42-15:10/28 17:08 07:49-09:40/111	07:53 14:35-15:37/62 15:38-15:59/21 17:05 08:22-10:05/103
22	06:16 20:59	06:47 07:08-07:36/28 20:23	07:18 07:41-08:06/25 19:30	07:50 08:11-09:05/54 18:41 17:47-18:11/24	07:27 14:40-15:12/32 17:07 07:51-09:42/111	07:54 14:35-15:37/62 15:38-15:59/21 17:05 08:22-10:05/103
23	06:17 20:59	06:48 07:09-07:36/27 20:21	07:19 07:40-08:06/26 19:28	07:51 08:12-09:11/59 18:40 17:46-18:11/25	07:28 14:38-15:14/36 17:07 07:52-09:43/111	07:54 14:37-15:38/61 15:39-16:00/21 17:06 08:23-10:06/103
24	06:18 20:58	06:49 07:10-07:36/26 20:20	07:20 07:40-08:06/26 19:26	07:52 08:13-09:14/61 18:38 17:46-18:11/25	07:29 14:37-15:15/38 17:06 07:54-09:44/110	07:55 14:37-15:38/61 15:39-16:00/21 17:06 08:23-10:06/103
25	06:19 20:57	06:50 07:11-07:36/25 20:18	07:21 07:41-08:05/24 19:25	07:54 08:14-09:18/64 18:37 17:45-18:11/26	07:30 14:36-15:17/41 17:06 07:56-09:46/110	07:55 14:37-15:38/61 15:39-16:00/21 17:07 08:23-10:06/103
26	06:20 20:56	06:51 07:12-07:36/24 20:17	07:22 07:42-08:06/24 19:23	07:55 08:16-09:23/67 18:35 17:46-18:12/26	07:32 14:35-15:18/43 17:05 07:58-09:47/109	07:56 14:38-15:39/61 15:41-16:01/20 17:08 08:24-10:07/103
27	06:21 20:55	06:52 07:13-07:36/23 20:15	07:23 07:43-08:10/27 19:21	07:56 08:17-09:26/69 18:34 17:45-18:11/26	07:33 14:34-15:19/45 17:05 07:59-09:48/109	07:56 14:38-15:39/61 15:41-16:00/19 17:08 08:24-10:07/103
28	06:22 20:54	06:53 07:14-07:35/21 20:13	07:24 07:44-08:12/28 19:19	07:57 08:18-09:29/71 18:33 17:45-18:09/24	07:34 14:34-15:20/46 17:04 08:00-09:49/109	07:56 14:39-15:39/60 15:42-16:00/18 17:09 08:24-10:07/103
29	06:23 20:53	06:54 07:15-07:34/19 20:12	07:25 07:45-08:13/28 19:18	07:58 08:19-09:32/73 18:31 17:45-18:08/23	07:35 14:33-15:21/48 17:04 08:01-09:50/109	07:57 14:39-15:39/60 15:43-16:00/17 17:10 08:25-10:08/103
30	06:24 20:52	06:55 07:16-07:33/17 20:10	07:26 07:46-08:14/28 19:16	07:59 08:21-09:39/78 18:30 17:46-18:07/21	07:36 14:32-15:22/50 17:03 08:02-09:51/109	07:57 14:41-15:41/60 15:44-16:01/17 17:11 08:25-10:09/104
31	06:25 20:51	06:56 07:17-07:32/15 20:09		08:01 08:22-09:46/84 18:29 17:47-18:05/18		07:57 14:41-15:41/60 15:45-16:01/16 17:11 08:25-10:09/104
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	0	704	357	1528	3492	5471

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T15 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:58/38 15:25-16:00/35 17:12 09:23-10:00/37	07:43 08:04-08:38/34 17:47 17:01-17:23/22	07:07 18:21	07:16 19:56	06:30 19:34-19:51/17 20:27	06:01 20:57
2	07:57 08:20-08:58/38 15:26-16:01/35 17:13 09:24-10:00/36	07:42 08:03-08:37/34 17:48 17:01-17:24/23	07:05 18:22	07:14 19:57	06:28 19:36-19:49/13 20:28	06:00 20:58
3	07:57 08:20-08:57/37 15:27-16:01/34 17:14 09:25-10:00/35	07:41 08:02-08:36/34 17:49 17:01-17:26/25	07:04 18:24	07:12 19:58	06:27 19:38-19:47/9 20:29	06:00 20:58
4	07:57 08:20-08:47/27 15:28-16:01/33 17:15 09:26-09:59/33 08:48-08:56/8	07:40 08:01-08:35/34 17:51 17:01-17:27/26	07:02 18:25	07:11 19:59	06:26 20:30	06:00 20:59
5	07:57 08:20-08:48/28 15:29-16:01/32 17:16 09:27-09:59/32 08:52-08:54/2	07:39 07:59-08:33/34 17:52 17:00-17:27/27	07:01 18:26	07:09 20:00	06:25 20:31	05:59 21:00
6	07:57 08:20-08:48/28 15:30-16:01/31 17:17 09:28-09:59/31	07:38 07:58-08:33/35 17:53 17:01-17:27/26	06:59 18:27	07:07 20:00	06:23 20:32	05:59 21:00
7	07:57 08:20-08:49/29 15:31-15:59/28 17:18 09:28-09:58/30	07:37 07:57-08:32/35 17:54 17:01-17:27/26	06:57 18:28	07:06 20:01	06:22 20:33	05:59 21:01
8	07:57 08:19-08:48/29 15:32-15:59/27 17:19 09:30-09:57/27	07:36 07:56-08:31/35 17:56 17:02-17:27/25	07:56 19:29	07:04 20:02	06:21 20:34	05:58 21:02
9	07:57 08:19-08:49/30 15:34-15:59/25 17:20 09:32-09:57/25	07:35 07:55-08:30/35 17:57 17:03-17:26/23	07:54 19:30	07:03 20:03	06:20 20:35	05:58 21:02
10	07:57 08:19-08:49/30 15:35-15:59/24 17:21 09:34-09:56/22	07:33 07:54-08:29/35 17:58 17:03-17:25/22	07:53 19:32	07:01 20:04	06:19 20:36	05:58 21:03
11	07:57 08:18-08:49/31 15:36-15:57/21 17:22 09:35-09:54/19	07:32 07:52-08:26/34 17:59 17:04-17:24/20	07:51 19:33	06:59 20:05	06:18 20:37	05:58 21:04
12	07:56 08:18-08:49/31 15:39-15:56/17 17:23 09:38-09:52/14	07:31 07:51-08:26/35 18:01 17:06-17:23/17	07:49 19:34	06:58 20:06	06:16 20:38	05:58 21:04
13	07:56 08:18-08:50/32 15:42-15:55/13 17:24 09:43-09:49/6	07:30 07:50-08:25/35 18:02 17:09-17:21/12	07:48 19:35	06:56 20:08	06:15 20:39	05:58 21:05
14	07:56 08:17-08:49/32 17:25 15:45-15:51/6	07:28 07:48-08:24/36 18:03 17:11-17:17/6	07:46 19:36	06:55 19:45-19:47/2 20:09	06:14 20:40	05:57 21:05
15	07:55 08:17-08:50/33 17:26	07:27 07:47-08:23/36 18:04	07:44 19:37	06:53 19:40-19:48/8 20:10	06:13 20:41	05:57 21:05
16	07:55 08:16-08:49/33 17:27	07:26 07:46-08:21/35 18:06	07:43 19:38	06:51 19:37-19:49/12 20:11	06:12 20:42	05:57 21:06
17	07:54 08:16-08:49/33 17:29	07:24 07:44-08:18/34 18:07	07:41 19:39	06:50 19:35-19:50/15 20:12	06:11 20:43	05:58 21:06
18	07:54 08:15-08:49/34 17:30	07:23 07:43-08:13/30 18:08	07:39 19:41	06:48 19:34-19:51/17 20:13	06:11 20:44	05:58 21:07
19	07:53 08:15-08:49/34 17:31	07:22 07:41-08:12/31 18:09	07:38 19:42	06:47 19:33-19:52/19 20:14	06:10 20:45	05:58 21:07
20	07:53 08:14-08:47/33 17:32	07:20 07:40-08:11/31 18:11	07:36 19:43	06:45 19:32-19:53/21 20:15	06:09 20:46	05:58 21:07
21	07:52 08:13-08:46/33 17:33	07:19 07:39-08:10/31 18:12	07:34 19:44	06:44 19:31-19:54/23 20:16	06:08 20:47	05:58 21:08
22	07:52 08:13-08:45/32 17:34	07:17 07:39-08:08/29 18:13	07:33 19:45	06:42 19:31-19:56/25 20:17	06:07 20:48	05:58 21:08
23	07:51 08:12-08:43/31 17:36	07:16 07:40-08:06/26 18:14	07:31 19:46	06:41 19:31-19:56/25 20:18	06:06 20:49	05:58 21:08
24	07:50 08:11-08:42/31 17:37 17:10-17:12/2	07:14 07:40-08:01/21 18:15	07:29 19:47	06:39 19:31-19:57/26 20:19	06:06 20:50	05:59 21:08
25	07:49 08:10-08:41/31 17:38 17:06-17:13/7	07:13 07:42-07:58/16 18:17	07:28 19:48	06:38 19:30-19:56/26 20:20	06:05 20:51	05:59 21:08
26	07:49 08:09-08:40/31 17:39 17:04-17:14/10	07:12 07:44-07:55/11 18:18	07:26 19:49	06:37 19:31-19:56/25 20:21	06:04 20:52	05:59 21:08
27	07:48 08:09-08:41/32 17:41 17:03-17:15/12	07:10 18:19	07:24 19:50	06:35 19:31-19:56/25 20:23	06:04 20:53	06:00 21:09
28	07:47 08:08-08:41/33 17:42 17:03-17:18/15	07:08 18:20	07:22 19:51	06:34 19:31-19:54/23 20:24	06:03 20:54	06:00 21:09
29	07:46 08:07-08:41/34 17:43 17:02-17:19/17		07:21 19:52	06:32 19:32-19:54/22 20:25	06:02 20:54	06:01 21:09
30	07:45 08:06-08:40/34 17:44 17:02-17:20/18		07:19 19:54	06:31 19:33-19:53/20 20:26	06:02 20:55	06:01 21:09
31	07:44 08:05-08:39/34 17:46 17:01-17:21/20		07:17 19:55		06:01 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1815	1116	0	334	39	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T15 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (434)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01	06:26	06:57	07:27	07:02 07:23-07:58/35	07:37 08:00-08:31/31 15:19-15:39/20
	21:08	20:50	20:07	19:14	17:27 16:33-16:55/22	17:03 09:17-09:36/19
2	06:02	06:27	06:58	07:28	07:03 07:25-08:00/35	07:38 08:02-08:32/30 15:18-15:41/23
	21:08	20:49	20:05	19:13	17:26 16:32-16:55/23	17:03 09:17-09:39/22
3	06:02	06:28	06:59	07:29	07:04 07:26-08:01/35	07:39 08:03-08:33/30 15:18-15:43/25
	21:08	20:48	20:04	19:11	17:25 16:32-16:56/24	17:03 09:16-09:41/25
4	06:03	06:29	07:00	07:30	07:05 07:27-08:02/35	07:40 08:04-08:33/29 15:17-15:44/27
	21:08	20:47	20:02	19:09	17:24 16:31-16:57/26	17:02 09:15-09:42/27
5	06:04	06:30	07:01	07:31	07:07 07:28-08:03/35	07:41 08:05-08:34/29 15:17-15:45/28
	21:08	20:46	20:00	19:08	17:23 16:31-16:57/26	17:02 09:15-09:44/29
6	06:04	06:31	07:02	07:32	07:08 07:30-08:04/34	07:42 08:06-08:34/28 15:16-15:47/31
	21:08	20:44	19:57	19:06	17:22 16:31-16:57/26	17:02 09:14-09:45/31
7	06:05	06:32	07:03	07:34	07:09 07:31-08:05/34	07:43 08:07-08:35/28 15:15-15:47/32
	21:07	20:43	19:55	19:04	17:20 16:31-16:57/26	17:02 09:14-09:46/32
8	06:05	06:33	07:04	07:35	07:10 07:32-08:06/34	07:44 08:08-08:35/27 15:15-15:48/33
	21:07	20:42	19:54	19:03	17:19 16:31-16:55/24	17:02 09:13-09:46/33 08:37-08:44/7
9	06:06	06:34	07:05	07:36	07:11 07:34-08:08/34	07:45 08:08-08:45/37 15:15-15:49/34
	21:07	20:41	19:52	19:01	17:18 16:31-16:54/23	17:02 09:13-09:48/35
10	06:07	06:35 19:46-19:56/10	07:06	07:37	07:13 07:35-08:09/34	07:46 08:09-08:46/37 15:15-15:50/35
	21:06	20:39	19:50	18:59	17:17 16:32-16:54/22	17:02 09:13-09:49/36
11	06:07	06:36 19:44-19:58/14	07:07	07:38	07:14 07:36-08:10/34	07:46 08:10-08:48/38 15:15-15:50/35
	21:06	20:38	19:49	18:58	17:16 16:32-16:52/20	17:02 09:13-09:50/37
12	06:08	06:37 19:42-20:00/18	07:08	07:39	07:15 07:37-08:11/34	07:47 08:11-08:49/38 15:16-15:51/35
	21:06	20:37	19:47	18:56	17:15 16:33-16:51/18	17:02 09:13-09:51/38
13	06:09	06:38 19:41-20:01/20	07:09	07:40	07:16 07:39-08:13/34	07:48 08:12-08:50/38 15:16-15:52/36
	21:05	20:35	19:45	18:55	17:14 16:34-16:51/17	17:02 09:13-09:52/39
14	06:10	06:39 19:40-20:02/22	07:10	07:41	07:17 07:40-08:13/33	07:49 08:12-08:50/38 15:15-15:52/37
	21:05	20:34	19:43	18:53	17:13 16:35-16:49/14	17:02 09:13-09:52/39
15	06:10	06:40 19:39-20:02/23	07:11	07:42 08:19-08:25/6	07:19 07:41-08:13/32	07:50 08:13-08:51/38 15:16-15:53/37
	21:04	20:33	19:42	18:52	17:13 16:36-16:48/12	17:03 09:13-09:53/40
16	06:11	06:41 19:38-20:03/25	07:12	07:43 08:15-08:28/13	07:20 07:43-08:14/31	07:50 08:14-08:53/39 15:17-15:54/37
	21:03	20:31	19:40	18:50	17:12 16:37-16:47/10	17:03 09:14-09:54/40
17	06:12	06:42 19:37-20:03/26	07:13	07:44 08:13-08:31/18	07:21 07:44-08:15/31	07:51 08:15-08:55/40 15:16-15:54/38
	21:03	20:30	19:38	18:48	17:11 16:40-16:47/7	17:03 09:14-09:54/40
18	06:13	06:43 19:37-20:03/26	07:14	07:46 08:11-08:34/23	07:22 07:45-08:16/31	07:52 08:15-08:55/40 15:17-15:55/38
	21:02	20:28	19:37	18:47	17:10 16:44-16:46/2	17:04 09:14-09:55/41
19	06:14	06:44 19:37-20:03/26	07:15	07:47 08:10-08:38/28	07:23 07:46-08:17/31	07:52 08:16-08:56/40 15:18-15:56/38
	21:01	20:27	19:35	18:45	17:09	17:04 09:15-09:56/41
20	06:15	06:45 19:36-20:02/26	07:16	07:48 08:09-08:39/30	07:25 07:48-08:20/32	07:53 08:16-08:56/40 15:18-15:56/38
	21:01	20:26	19:33	18:44	17:09	17:04 09:15-09:56/41
21	06:15	06:46 19:36-20:01/25	07:17	07:49 08:10-08:41/31	07:26 07:49-08:22/33	07:53 08:17-08:57/40 15:19-15:57/38
	21:00	20:24	19:31	18:42	17:08	17:05 09:16-09:57/41
22	06:16	06:47 19:36-19:59/23	07:18	07:50 08:11-08:42/31	07:27 07:50-08:23/33	07:54 08:17-08:57/40 15:18-15:57/39
	20:59	20:23	19:30	18:41	17:07	17:05 09:16-09:57/41
23	06:17	06:48 19:37-19:58/21	07:19	07:51 08:12-08:43/31	07:28 07:51-08:25/34	07:54 08:18-08:58/40 15:20-15:58/38
	20:58	20:21	19:28	18:40	17:07	17:06 09:17-09:58/41
24	06:18	06:49 19:37-19:56/19	07:20	07:52 08:13-08:45/32	07:29 07:52-08:26/34	07:55 08:18-08:58/40 15:20-15:58/38
	20:58	20:20	19:26	18:38	17:06	17:06 09:17-09:58/41
25	06:19	06:50 19:38-19:55/17	07:21	07:54 08:14-08:49/35	07:30 07:54-08:27/33	07:55 08:18-08:58/40 15:20-15:58/38
	20:57	20:18	19:25	18:37	17:06	17:07 09:17-09:58/41
26	06:20	06:51 19:38-19:53/15	07:22	07:55 08:16-08:52/36	07:32 07:55-08:28/33	07:56 08:19-08:59/40 15:21-15:59/38
	20:56	20:16	19:23	18:35	17:05	17:08 09:18-09:59/41
27	06:21	06:52 19:40-19:52/12	07:23	07:56 08:17-08:53/36	07:33 07:56-08:29/33	07:56 08:19-08:58/39 15:21-15:59/38
	20:55	20:15	19:21	18:34	17:05	17:08 09:19-09:59/40
28	06:22	06:53 19:42-19:50/8	07:24	07:57 08:18-08:54/36	07:34 07:57-08:29/32	07:56 08:19-08:58/39 15:22-15:59/37
	20:54	20:13	19:19	18:33 17:40-17:48/8	17:04 15:25-15:31/6	17:09 09:19-09:59/40
29	06:23	06:54	07:25	07:58 08:19-08:54/35	07:35 07:58-08:30/32 15:22-15:35/13	07:57 08:19-08:57/38 15:22-15:59/37
	20:53	20:12	19:18	18:31 17:37-17:51/14	17:04 09:23-09:29/6	17:10 09:20-09:59/39
30	06:24	06:55	07:26	07:59 08:21-08:56/35	07:36 07:59-08:30/31 15:20-15:37/17	07:57 08:20-08:58/38 15:24-16:00/36
	20:52	20:10	19:16	18:30 17:36-17:53/17	17:03 09:19-09:33/14	17:10 09:21-10:00/39
31	06:25	06:56		08:01 08:22-08:56/34		07:57 08:20-08:58/38 15:24-16:00/36
	20:51	20:09		18:29 17:34-17:54/20		17:11 09:22-10:00/38
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	0	376	0	549	1394	3331

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T16 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (435)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:31-09:07/36	07:43 16:50-17:22/32	07:07 17:31-17:59/28	07:16	06:30 19:15-19:39/24	06:01 06:29-07:14/45
	17:12 15:59-16:27/28	17:47	18:21	19:56	20:27	20:57
2	07:57 08:31-09:07/36	07:42 16:51-17:22/31	07:05 17:31-18:00/29	07:14	06:28 19:17-19:38/21	06:00 06:29-07:15/46
	17:13 16:00-16:27/27	17:48	18:22	19:57	20:28	20:58
3	07:57 08:32-09:07/35	07:41 16:54-17:22/28	07:04 17:30-17:59/29	07:12	06:27 19:19-19:36/17	06:00 06:30-07:15/45
	17:14 16:01-16:27/26	17:49	18:24	19:58	20:29	20:58
4	07:57 08:32-09:08/36	07:40 16:56-17:21/25	07:02 17:31-17:59/28	07:11	06:26 19:22-19:33/11	05:59 06:29-07:15/46
	17:15 16:01-16:27/26	17:51	18:25	19:59	20:30	20:59
5	07:57 08:33-09:08/35	07:39 16:59-17:20/21	07:01 17:30-17:59/29	07:09	06:25	05:59 06:30-07:15/45
	17:16 16:02-16:27/25	17:52	18:26	20:00	20:31	21:00
6	07:57 08:34-09:09/35	07:38 17:00-17:20/20	06:59 17:30-17:58/28	07:07	06:23	05:59 06:30-07:16/46
	17:17 16:03-16:27/24	17:53	18:27	20:00	20:32	21:00
7	07:57 08:34-09:08/34 16:03-16:26/23	07:37 17:02-17:19/17	06:57 17:31-17:57/26	07:06	06:22	05:59 06:31-07:16/45
	17:18 16:47-16:51/4	17:54	18:28	20:01	20:33	21:01
8	07:57 08:34-09:08/34 16:05-16:26/21	07:36 17:04-17:17/13	07:56 18:32-18:56/24	07:04 19:28-19:36/8	06:21	05:58 06:30-07:16/46
	17:19 16:46-16:52/6	17:56	19:29	20:02	20:34	21:02 20:32-20:36/4
9	07:57 08:35-09:09/34 16:06-16:26/20	07:35 17:07-17:15/8	07:54 18:32-18:54/22	07:03 19:23-19:40/17	06:20	05:58 06:30-07:16/46
	17:20 16:46-16:54/8	17:57	19:30	20:03	20:35	21:02 20:30-20:37/7
10	07:57 08:36-09:09/33 16:08-16:26/18	07:33	07:53 18:34-18:53/19	07:01 19:21-19:43/22	06:19 06:44-06:58/14	05:58 06:31-07:16/45
	17:21 16:45-16:55/10	17:58	19:32	20:04	20:36	21:03 20:30-20:38/8
11	07:57 08:36-09:08/32 16:09-16:25/16	07:32	07:51 18:36-18:50/14	06:59 19:19-19:44/25	06:18 06:41-07:01/20	05:58 06:31-07:17/46
	17:22 16:44-16:55/11	17:59	19:33	20:05	20:37	21:04 20:29-20:39/10
12	07:56 08:37-09:09/32 16:11-16:24/13	07:31	07:49 18:41-18:44/3	06:58 19:17-19:45/28	06:16 06:39-07:03/24	05:58 06:31-07:17/46
	17:23 16:44-16:57/13	18:01	19:34	20:06	20:38	21:04 20:29-20:39/10
13	07:56 08:39-09:09/30 16:13-16:23/10	07:30	07:48	06:56 19:16-19:46/30	06:15 06:38-07:04/26	05:58 06:32-07:17/45
	17:24 16:44-16:58/14	18:02	19:35	20:08	20:39	21:05 20:28-20:40/12
14	07:56 08:39-09:08/29	07:28	07:46	06:55 19:15-19:47/32	06:14 06:36-07:05/29	05:57 06:32-07:17/45
	17:25 16:43-16:59/16	18:03	19:36	20:09	20:40	21:05 20:28-20:40/12
15	07:55 08:40-09:08/28	07:27	07:44	06:53 19:14-19:47/33	06:13 06:35-07:07/32	05:57 06:32-07:17/45
	17:26 16:43-17:01/18	18:04	19:37	20:10	20:41	21:05 20:28-20:40/12
16	07:55 08:41-09:08/27	07:26	07:43	06:51 19:12-19:47/35	06:12 06:34-07:07/33	05:57 06:32-07:18/46
	17:27 16:43-17:01/18	18:06	19:38	20:11	20:42	21:06 20:28-20:41/13
17	07:54 08:43-09:08/25	07:24	07:41	06:50 19:12-19:48/36	06:11 06:33-07:08/35	05:57 06:32-07:18/46
	17:29 16:43-17:03/20	18:07	19:39	20:12	20:43	21:06 20:28-20:41/13
18	07:54 08:44-09:06/22	07:23	07:39	06:48 19:11-19:47/36	06:11 06:32-07:09/37	05:58 06:33-07:18/45
	17:30 16:43-17:04/21	18:08	19:41	20:13	20:44	21:07 20:28-20:41/13
19	07:53 08:46-09:06/20	07:22	07:38	06:47 19:11-19:48/37	06:10 06:32-07:10/38	05:58 06:33-07:18/45
	17:31 16:42-17:05/23	18:09	19:42	20:14	20:45	21:07 20:28-20:41/13
20	07:53 08:47-09:05/18	07:20	07:36	06:45 19:10-19:47/37	06:09 06:32-07:11/39	05:58 06:33-07:18/45
	17:32 16:43-17:07/24	18:11	19:43	20:15	20:46	21:07 20:28-20:42/14
21	07:52 08:49-09:03/14	07:19	07:34	06:44 19:11-19:48/37	06:08 06:31-07:11/40	05:58 06:34-07:19/45
	17:33 16:43-17:08/25	18:12	19:44	20:16	20:47	21:08 20:28-20:42/14
22	07:51 08:53-09:00/7	07:17 17:40-17:51/11	07:33	06:42 19:11-19:48/37	06:07 06:30-07:11/41	05:58 06:34-07:19/45
	17:34 16:43-17:09/26	18:13	19:45	20:17	20:48	21:08 20:29-20:43/14
23	07:51 16:44-17:11/27	07:16 17:38-17:52/14	07:31	06:41 19:10-19:47/37	06:06 06:30-07:12/42	05:58 06:34-07:19/45
	17:36	18:14	19:46	20:18	20:49	21:08 20:29-20:42/13
24	07:50 16:44-17:12/28	07:14 17:36-17:53/17	07:29	06:39 19:11-19:47/36	06:06 06:30-07:13/43	05:59 06:34-07:19/45
	17:37	18:15	19:47	20:19	20:50	21:08 20:29-20:42/13
25	07:49 16:44-17:13/29	07:13 17:35-17:55/20	07:27	06:38 19:11-19:45/34	06:05 06:30-07:13/43	05:59 06:34-07:20/46
	17:38	18:17	19:48	20:20	20:51	21:08 20:30-20:43/13
26	07:49 16:44-17:14/30	07:11 17:33-17:56/23	07:26	06:36 19:11-19:45/34	06:04 06:30-07:14/44	05:59 06:34-07:20/46
	17:39	18:18	19:49	20:21	20:52	21:08 20:30-20:43/13
27	07:48 16:45-17:15/30	07:10 17:32-17:56/24	07:24	06:35 19:12-19:45/33	06:04 06:30-07:14/44	06:00 06:34-07:19/45
	17:41	18:19	19:50	20:23	20:53	21:08 20:30-20:43/13
28	07:47 16:46-17:18/32	07:08 17:31-17:58/27	07:22	06:34 19:12-19:43/31	06:03 06:29-07:13/44	06:00 06:35-07:20/45
	17:42	18:20	19:51	20:24	20:54	21:09 20:31-20:43/12
29	07:46 16:47-17:19/32		07:21	06:32 19:13-19:42/29	06:02 06:29-07:14/45	06:01 06:35-07:20/45
	17:43		19:52	20:25	20:54	21:09 20:31-20:43/12
30	07:45 16:48-17:20/32		07:19	06:31 19:15-19:41/26	06:02 06:29-07:14/45	06:01 06:35-07:21/46
	17:44		19:54	20:26	20:55	21:09 20:33-20:43/10
31	07:44 16:49-17:21/32		07:17		06:01 06:29-07:15/46	
	17:46		19:55		20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1438	331	279	710	877	1630

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T16 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (435)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01 06:35-07:21/46 21:08 20:33-20:43/10	06:26 06:51-07:12/21 20:50	06:57 19:18-19:43/25 20:07	07:27 19:14	07:02 17:27	07:37 08:18-08:50/32 15:51-16:07/16 17:03 16:26-16:38/12
2	06:02 06:36-07:21/45 21:08 20:33-20:42/9	06:27 06:53-07:10/17 20:49	06:58 19:19-19:41/22 20:05	07:28 18:16-18:27/11 19:13	07:03 16:35-16:45/10 17:26	07:38 08:19-08:52/33 15:50-16:08/18 17:03 16:27-16:37/10
3	06:02 06:36-07:21/45 21:08 20:35-20:43/8	06:28 06:57-07:07/10 20:48	06:59 19:21-19:38/17 20:04	07:29 18:13-18:29/16 19:11	07:04 16:33-16:48/15 17:25	07:39 08:19-08:53/34 15:49-16:09/20 17:03 16:28-16:37/9
4	06:03 06:36-07:22/46 21:08 20:37-20:43/6	06:29 20:47	07:00 19:25-19:33/8 20:02	07:30 18:11-18:31/20 19:09	07:05 16:31-16:49/18 17:24	07:40 08:19-08:53/34 15:50-16:11/21 17:02 16:31-16:37/6
5	06:04 06:36-07:21/45 21:08	06:30 20:46	07:01 20:00	07:31 18:09-18:32/23 19:08	07:07 16:30-16:50/20 17:23	07:41 08:20-08:54/34 15:50-16:12/22 17:02 16:33-16:37/4
6	06:04 06:36-07:22/46 21:08	06:31 20:44	07:02 19:57	07:32 18:07-18:33/26 19:06	07:08 16:30-16:51/21 17:22	07:42 08:20-08:55/35 15:49-16:13/24 17:02 16:35-16:36/1
7	06:05 06:36-07:22/46 21:07	06:32 20:43	07:03 19:55	07:34 18:06-18:33/27 19:04	07:09 16:27-16:52/25 17:20	07:43 08:20-08:55/35 17:02 15:48-16:13/25
8	06:05 06:37-07:22/45 21:07	06:33 19:35-19:38/3 20:42	07:04 19:54	07:35 18:05-18:33/28 19:03	07:10 16:23-16:52/29 17:19	07:44 08:20-08:55/35 17:02 15:48-16:14/26
9	06:06 06:37-07:23/46 21:07	06:34 19:30-19:43/13 20:41	07:05 19:52	07:36 18:06-18:34/28 19:01	07:11 16:21-16:52/31 17:18	07:45 08:20-08:55/35 17:02 15:49-16:15/26
10	06:07 06:37-07:22/45 21:06	06:35 19:27-19:45/18 20:39	07:06 19:50	07:37 18:05-18:34/29 18:59	07:13 16:21-16:53/32 17:17	07:46 08:20-08:56/36 17:02 15:49-16:16/27
11	06:07 06:37-07:23/46 21:06	06:36 19:25-19:47/22 20:38	07:07 19:49	07:38 18:04-18:34/30 18:58	07:14 16:19-16:52/33 17:16	07:46 08:21-08:57/36 17:02 15:49-16:17/28
12	06:08 06:38-07:23/45 21:05	06:37 19:23-19:48/25 20:37	07:08 19:47	07:39 18:04-18:33/29 18:56	07:15 16:18-16:51/33 17:15	07:47 08:21-08:57/36 17:02 15:50-16:18/28
13	06:09 06:37-07:22/45 21:05	06:38 19:22-19:49/27 20:35	07:09 19:45	07:40 18:04-18:32/28 18:55	07:16 16:19-16:51/32 17:14	07:48 08:22-08:58/36 17:02 15:50-16:18/28
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15	06:10 06:38-07:23/45 21:04	06:40 19:20-19:51/31 20:33	07:11 19:42	07:42 18:04-18:28/24 18:52	07:19 16:17-16:48/31 17:12	07:50 08:22-08:59/37 17:03 15:50-16:19/29
16	06:11 06:39-07:23/44 21:03	06:41 19:19-19:51/32 20:31	07:12 19:40	07:43 18:06-18:28/22 18:50	07:20 16:17-16:47/30 17:12	07:50 08:23-09:00/37 17:03 15:51-16:20/29
17	06:12 06:39-07:23/44 21:03	06:42 19:18-19:52/34 20:30	07:13 19:38	07:44 18:07-18:26/19 18:48	07:21 16:18-16:47/29 17:11	07:51 08:23-08:59/36 17:03 15:50-16:20/30
18	06:13 06:39-07:22/43 21:02	06:43 19:17-19:52/35 20:28	07:14 19:37	07:46 18:08-18:24/16 18:47	07:22 16:18-16:46/28 17:10	07:52 08:24-09:00/36 17:04 15:51-16:21/30
19	06:14 06:39-07:22/43 21:01	06:44 19:17-19:52/35 20:27	07:15 19:35	07:47 18:09-18:22/13 18:45	07:23 16:18-16:45/27 17:09	07:52 08:25-09:01/36 17:04 15:52-16:22/30
20	06:15 06:40-07:22/42 21:01	06:45 19:16-19:52/36 20:26	07:16 19:33	07:48 18:12-18:21/9 18:44	07:25 08:28-08:35/7 17:09 16:18-16:44/26	07:53 08:25-09:01/36 17:04 15:52-16:22/30
21	06:15 06:41-07:22/41 21:00	06:46 19:16-19:52/36 20:24	07:17 19:31	07:49 18:42	07:26 08:25-08:39/14 17:08 16:19-16:44/25	07:53 08:25-09:02/37 17:05 15:53-16:23/30
22	06:16 06:41-07:22/41 20:59	06:47 19:15-19:52/37 20:23	07:18 19:30	07:50 18:41	07:27 08:23-08:41/18 17:07 16:19-16:43/24	07:54 08:25-09:02/37 17:05 15:53-16:23/30
23	06:17 06:42-07:22/40 20:58	06:48 19:15-19:52/37 20:21	07:19 19:28	07:51 18:40	07:28 08:22-08:42/20 17:07 16:19-16:42/23	07:54 08:26-09:03/37 17:06 15:54-16:24/30
24	06:18 06:42-07:20/38 20:58	06:49 19:15-19:52/37 20:20	07:20 19:26	07:52 18:38	07:29 08:21-08:43/22 17:06 16:20-16:41/21	07:55 08:27-09:03/36 17:06 15:54-16:24/30
25	06:19 06:42-07:20/38 20:57	06:50 19:15-19:51/36 20:18	07:21 19:25	07:54 18:37	07:30 08:21-08:46/25 17:06 16:21-16:41/20	07:55 08:27-09:03/36 17:07 15:54-16:24/30
26	06:20 06:43-07:19/36 20:56	06:51 19:15-19:51/36 20:16	07:22 19:23	07:55 18:35	07:31 08:20-08:47/27 17:05 16:22-16:40/18	07:56 08:28-09:04/36 17:08 15:55-16:25/30
27	06:21 06:44-07:18/34 20:55	06:52 19:15-19:50/35 20:15	07:23 19:21	07:56 18:34	07:33 08:20-08:47/27 17:05 16:22-16:40/18	07:56 08:28-09:04/36 17:08 15:56-16:25/29
28	06:22 06:45-07:18/33 20:54	06:53 19:15-19:49/34 20:13	07:24 19:19	07:57 18:33	07:34 08:19-08:48/29 17:04 16:23-16:39/16	07:56 08:28-09:05/37 17:09 15:56-16:25/29
29	06:23 06:46-07:17/31 20:53	06:54 19:16-19:48/32 20:12	07:25 19:18	07:58 18:31	07:35 08:19-08:49/30 15:54-16:03/9 17:04 16:24-16:39/15	07:57 08:29-09:05/36 17:10 15:56-16:25/29
30	06:24 06:48-07:16/28 20:52	06:55 19:16-19:46/30 20:10	07:26 19:16	07:59 18:30	07:36 08:19-08:50/31 15:52-16:05/13 17:03 16:25-16:38/13	07:57 08:30-09:06/36 17:10 15:58-16:26/28
31	06:25 06:49-07:14/25 20:51	06:56 19:16-19:44/28 20:09		08:01 18:29		07:57 08:30-09:06/36 17:11 15:58-16:26/28
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1315	766	72	424	966	1986

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T17 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (436)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57 15:13-15:36/23 17:13	07:44 17:47	07:07 18:22	07:16 19:56	06:30 19:16-20:03/47 20:27	06:01 19:33-19:55/22 20:57 06:36-06:47/11	06:02 21:09	06:26 19:30-20:14/44 20:50 06:48-07:01/13	06:57 20:07	07:27 19:15	07:02 17:28	07:37 17:03
2	07:58 15:14-15:36/22 17:13	07:43 17:48	07:06 18:23	07:14 19:57	06:29 19:15-20:02/47 20:28	06:01 19:34-19:53/19 20:58 06:36-06:46/10	06:02 21:09	06:27 19:30-20:15/45 20:49 06:49-07:00/11	06:58 20:06	07:28 19:13	07:03 17:26	07:38 17:03
3	07:58 15:15-15:35/20 17:14	07:42 17:50	07:04 18:24	07:13 19:58	06:27 19:15-20:03/48 20:29	06:00 19:36-19:53/17 20:59 06:39-06:45/6	06:03 21:08	06:28 19:29-20:15/46 20:48 06:50-06:59/9	06:59 20:04	07:30 19:11	07:04 17:25	07:39 17:03
4	07:58 15:17-15:35/18 17:15	07:40 17:51	07:02 18:25	07:11 19:59	06:26 19:16-20:04/48 20:30	06:00 19:38-19:52/14 20:59	06:03 21:08	06:29 19:28-20:14/46 20:47 06:51-06:58/7	07:00 20:02	07:31 19:10	07:06 17:24	07:40 17:03
5	07:58 15:19-15:34/15 17:16	07:39 17:52	07:01 18:26	07:09 20:00	06:25 19:16-20:04/48 20:31	05:59 19:39-19:50/11 21:00	06:04 21:08	06:30 19:27-20:14/47 20:46 06:52-06:56/4	07:01 20:01	07:32 19:08	07:07 17:23	07:41 17:02
6	07:58 15:22-15:32/10 17:17	07:38 17:53	06:59 18:27	07:08 20:00	06:24 19:17-20:04/47 20:32	05:59 19:41-19:48/7 21:01	06:04 19:49-19:53/4 21:08	06:31 19:27-20:14/47 20:45	07:02 19:57	07:33 19:06	07:08 17:22	07:42 15:08-15:18/10 17:02
7	07:57 17:18	07:37 17:55	06:58 18:28	07:06 20:01	06:22 19:16-20:04/48 20:33 06:42-06:44/2	05:59 21:01	06:05 19:47-19:56/9 21:08	06:32 19:26-20:14/48 20:43	07:03 19:56	07:34 19:05	07:09 17:21	07:43 15:07-15:21/14 17:02
8	07:57 17:19	07:36 17:56	07:56 19:30	07:04 20:02	06:21 19:17-20:04/47 20:34 06:41-06:46/5	05:59 21:02	06:06 19:44-19:57/13 21:07	06:33 19:25-20:13/48 20:42	07:04 19:54	07:35 19:03	07:10 17:20	07:44 15:05-15:23/18 17:02
9	07:57 17:20	07:35 17:57	07:54 19:31	07:03 20:03	06:20 19:18-20:04/46 20:35 06:40-06:48/8	05:58 21:03	06:06 19:44-19:59/15 21:07 06:47-06:51/4	06:34 19:24-20:12/48 20:41	07:05 19:52	07:36 19:01	07:12 17:18	07:45 15:05-15:24/19 17:02
10	07:57 17:21	07:34 17:58	07:53 19:32	07:01 20:05	06:19 19:18-20:04/46 20:37 06:39-06:49/10	05:58 21:03	06:07 19:43-20:01/18 21:07 06:45-06:53/8	06:35 19:24-20:12/48 20:40	07:06 19:51	07:37 19:00	07:13 17:17	07:46 15:03-15:25/22 17:02
11	07:57 17:22	07:32 18:00	07:51 19:33	07:00 20:06	06:18 19:19-20:04/45 20:38 06:38-06:50/12	05:58 21:04	06:08 19:41-20:01/20 21:06 06:43-06:54/11	06:36 19:24-20:11/47 20:38	07:07 19:49	07:38 18:58	07:14 17:16	07:47 15:03-15:26/23 17:02
12	07:57 17:23	07:31 18:01	07:49 19:34	06:58 20:07	06:17 19:20-20:04/44 20:39 06:37-06:51/14	05:58 21:04	06:08 19:41-20:03/22 21:06 06:43-06:56/13	06:37 19:23-20:10/47 20:37	07:08 19:47	07:39 18:56	07:15 17:15	07:47 15:03-15:27/24 17:02
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Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Sum of minutes with flicker	108	0	0	519	1651	117	1185	1115	0	0	0	669

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T18 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (437)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:53/33 17:13	07:44 08:43-08:50/7 17:47	07:07 18:22	07:16 19:56	06:30 06:50-07:09/19 20:27	06:01 06:23-07:22/59 20:57
2	07:58 08:20-08:54/34 17:13	07:43 17:48	07:06 18:23	07:14 19:57	06:29 06:48-07:09/21 20:28	06:01 06:22-07:21/59 20:58
3	07:58 08:20-08:54/34 17:14	07:42 17:50	07:04 18:24	07:13 19:58	06:27 06:47-07:10/23 20:29	06:00 06:23-07:22/59 20:59
4	07:58 08:20-08:55/35 17:15	07:41 17:51	07:02 18:25	07:11 19:59	06:26 06:46-07:10/24 20:30	06:00 06:23-07:22/59 20:59
5	07:58 08:20-08:56/36 17:16	07:39 17:52	07:01 18:26	07:09 20:00	06:25 06:45-07:11/26 20:31	05:59 06:22-07:22/60 21:00
6	07:58 08:20-08:56/36 17:17	07:38 17:53	06:59 18:27	07:08 20:00	06:24 06:44-07:11/27 20:32	05:59 06:22-07:22/60 21:01
7	07:58 08:20-08:57/37 17:18	07:37 17:55	06:58 18:28	07:06 20:01	06:22 06:43-07:11/28 20:33	05:59 06:23-07:22/59 21:01
8	07:57 08:20-08:58/38 17:19	07:36 17:56	07:56 19:30	07:04 20:02	06:21 06:41-07:10/29 20:34	05:59 06:23-07:23/60 21:02
9	07:57 08:19-08:58/39 17:20	07:35 17:57	07:54 19:31	07:03 20:03	06:20 06:40-07:11/31 20:36	05:58 06:22-07:22/60 21:03
10	07:57 08:19-08:59/40 17:21	07:34 17:59	07:53 19:32	07:01 20:05	06:19 06:40-07:12/32 20:37	05:58 06:22-07:22/60 21:03
11	07:57 08:19-08:59/40 17:22	07:32 18:00	07:51 19:33	07:00 20:06	06:18 06:39-07:13/34 20:38	05:58 06:23-07:22/59 21:04
12	07:57 08:18-08:59/41 17:23	07:31 18:01	07:50 19:34	06:58 20:07	06:17 06:38-07:14/36 20:39	05:58 06:23-07:23/60 21:04
13	07:56 08:18-09:00/42 17:24	07:30 18:02	07:48 19:35	06:56 20:08	06:16 06:37-07:15/38 20:40	05:58 06:23-07:23/60 21:05
14	07:56 08:18-09:01/43 17:25	07:29 18:03	07:46 19:36	06:55 20:09	06:15 06:36-07:16/40 20:41	05:58 06:23-07:23/60 21:05
15	07:56 08:18-09:01/43 17:27	07:27 18:05	07:45 19:37	06:53 20:10	06:14 06:35-07:16/41 20:42	05:58 06:23-07:23/60 21:06
16	07:55 08:19-09:01/42 17:28	07:26 18:06	07:43 19:39	06:52 20:11	06:13 06:34-07:17/43 20:43	05:58 06:23-07:23/60 21:06
17	07:55 08:19-09:01/42 17:29	07:25 18:07	07:41 19:40	06:50 20:12	06:12 06:34-07:17/43 20:44	05:58 06:23-07:23/60 21:07
18	07:54 08:19-09:01/42 17:30	07:23 18:08	07:40 19:41	06:49 20:13	06:11 06:34-07:19/45 20:45	05:58 06:24-07:23/59 21:07
19	07:54 08:20-09:02/42 17:31	07:22 18:10	07:38 19:42	06:47 20:14	06:10 06:32-07:19/47 20:46	05:58 06:24-07:23/59 21:07
20	07:53 08:21-09:01/40 17:32	07:21 18:11	07:36 19:43	06:46 20:15	06:09 06:30-07:19/49 20:47	05:58 06:25-07:25/60 21:08
21	07:52 08:22-09:02/40 17:34	07:19 18:12	07:35 19:44	06:44 20:16	06:08 06:29-07:19/50 20:48	05:58 06:25-07:25/60 21:08
22	07:52 08:22-09:02/40 17:35	07:18 18:13	07:33 19:45	06:43 20:17	06:07 06:28-07:19/51 20:48	05:59 06:25-07:25/60 21:08
23	07:51 08:23-09:01/38 17:36	07:16 18:14	07:31 19:46	06:41 20:19	06:07 06:28-07:20/52 20:49	05:59 06:25-07:24/59 21:08
24	07:50 08:23-09:01/38 17:37	07:15 18:16	07:29 19:47	06:40 20:20	06:06 06:27-07:20/53 20:50	05:59 06:26-07:25/59 21:08
25	07:50 08:25-09:01/36 17:38	07:13 18:17	07:28 19:48	06:38 20:21	06:05 06:26-07:20/54 20:51	05:59 06:25-07:25/60 21:09
26	07:49 08:26-09:00/34 17:40	07:12 18:18	07:26 19:49	06:37 20:22	06:04 06:26-07:21/55 20:52	06:00 06:25-07:25/60 21:09
27	07:48 08:27-08:59/32 17:41	07:10 18:19	07:24 19:51	06:35 06:55-07:02/7 20:23	06:04 06:25-07:21/56 20:53	06:00 06:26-07:26/60 21:09
28	07:47 08:29-08:59/30 17:42	07:09 18:20	07:23 19:52	06:34 06:54-07:05/11 20:24	06:03 06:25-07:21/56 20:54	06:00 06:26-07:26/60 21:09
29	07:46 08:31-08:57/26 17:43		07:21 19:53	06:33 06:52-07:06/14 20:25	06:03 06:24-07:21/57 20:55	06:01 06:26-07:26/60 21:09
30	07:45 08:36-08:56/20 17:45		07:19 19:54	06:31 06:51-07:07/16 20:26	06:02 06:24-07:22/58 20:55	06:01 06:27-07:27/60 21:09
31	07:45 08:39-08:54/15 17:46		07:18 19:55		06:02 06:23-07:21/58 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1128	7	0	48	1276	1790

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T18 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (437)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:27-07:27/60 21:09	06:26 06:49-07:24/35 20:50	06:57 20:07	07:27 19:15	07:02 17:28	07:37 08:01-08:41/40 17:03
2	06:02 06:27-07:27/60 21:09	06:27 06:50-07:23/33 20:49	06:58 20:06	07:29 19:13	07:03 17:26	07:38 08:02-08:42/40 17:03
3	06:03 06:27-07:27/60 21:08	06:28 06:50-07:22/32 20:48	06:59 20:04	07:30 19:11	07:04 17:25	07:39 08:03-08:42/39 17:03
4	06:03 06:28-07:28/60 21:08	06:29 06:51-07:21/30 20:47	07:00 20:02	07:31 19:10	07:06 17:24	07:40 08:04-08:42/38 17:03
5	06:04 06:28-07:27/59 21:08	06:30 06:52-07:21/29 20:46	07:01 20:01	07:32 19:08	07:07 17:23	07:41 08:05-08:42/37 17:02
6	06:04 06:29-07:28/59 21:08	06:31 06:53-07:21/28 20:45	07:02 19:57	07:33 19:06	07:08 17:22	07:42 08:06-08:43/37 17:02
7	06:05 06:29-07:29/60 21:08	06:32 06:54-07:21/27 20:43	07:03 19:56	07:34 19:05	07:09 17:21	07:43 08:07-08:43/36 17:02
8	06:06 06:29-07:28/59 21:07	06:33 06:55-07:20/25 20:42	07:04 19:54	07:35 19:03	07:10 17:20	07:44 08:08-08:43/35 17:02
9	06:06 06:30-07:29/59 21:07	06:34 06:56-07:20/24 20:41	07:05 19:52	07:36 19:01	07:12 17:19	07:45 08:09-08:43/34 17:02
10	06:07 06:30-07:29/59 21:07	06:35 06:57-07:19/22 20:40	07:06 19:51	07:37 19:00	07:13 08:13-08:22/9 17:18	07:46 08:09-08:43/34 17:02
11	06:08 06:30-07:29/59 21:06	06:36 06:58-07:18/20 20:38	07:07 19:49	07:38 18:58	07:14 08:10-08:25/15 17:17	07:47 08:10-08:43/33 17:02
12	06:09 06:31-07:29/58 21:06	06:37 06:58-07:16/18 20:37	07:08 19:47	07:39 18:57	07:15 08:07-08:28/21 17:16	07:47 08:11-08:44/33 17:02
13	06:09 06:32-07:30/58 21:05	06:38 06:59-07:15/16 20:36	07:09 19:45	07:40 18:55	07:17 08:03-08:29/26 17:15	07:48 08:12-08:44/32 17:03
14	06:10 06:33-07:30/57 21:05	06:39 07:00-07:13/13 20:34	07:10 19:44	07:41 18:53	07:18 08:01-08:31/30 17:14	07:49 08:13-08:45/32 17:03
15	06:11 06:33-07:30/57 21:04	06:40 07:01-07:11/10 20:33	07:11 19:42	07:42 18:52	07:19 07:59-08:31/32 17:13	07:50 08:13-08:44/31 17:03
16	06:12 06:34-07:30/56 21:04	06:41 07:02-07:08/6 20:32	07:12 19:40	07:44 18:50	07:20 07:59-08:33/34 17:12	07:51 08:14-08:45/31 17:03
17	06:12 06:35-07:30/55 21:03	06:42 20:30	07:13 19:39	07:45 18:49	07:21 07:58-08:34/36 17:11	07:51 08:15-08:46/31 17:04
18	06:13 06:36-07:30/54 21:02	06:43 20:29	07:14 19:37	07:46 18:47	07:22 07:57-08:35/38 17:10	07:52 08:15-08:46/31 17:04
19	06:14 06:36-07:30/54 21:02	06:44 20:27	07:15 19:35	07:47 18:46	07:24 07:58-08:36/38 17:10	07:52 08:16-08:46/30 17:04
20	06:15 06:37-07:30/53 21:01	06:45 20:26	07:16 19:33	07:48 18:44	07:25 07:57-08:37/40 17:09	07:53 08:16-08:46/30 17:05
21	06:16 06:38-07:30/52 21:00	06:46 20:24	07:17 19:32	07:49 18:43	07:26 07:57-08:37/40 17:08	07:54 08:17-08:47/30 17:05
22	06:17 06:39-07:30/51 21:00	06:47 20:23	07:18 19:30	07:50 18:41	07:27 07:57-08:37/40 17:08	07:54 08:17-08:47/30 17:06
23	06:18 06:40-07:30/50 20:59	06:48 20:21	07:19 19:28	07:52 18:40	07:28 07:56-08:38/42 17:07	07:55 08:18-08:48/30 17:06
24	06:18 06:42-07:29/47 20:58	06:49 20:20	07:20 19:27	07:53 18:38	07:29 07:57-08:39/42 17:06	07:55 08:18-08:48/30 17:07
25	06:19 06:43-07:29/46 20:57	06:50 20:18	07:21 19:25	07:54 18:37	07:31 07:57-08:39/42 17:06	07:55 08:19-08:49/30 17:07
26	06:20 06:44-07:28/44 20:56	06:51 20:17	07:22 19:23	07:55 18:36	07:32 07:57-08:39/42 17:05	07:56 08:19-08:50/31 17:08
27	06:21 06:45-07:28/43 20:55	06:52 20:15	07:23 19:21	07:56 18:34	07:33 07:57-08:40/43 17:05	07:56 08:19-08:50/31 17:09
28	06:22 06:45-07:27/42 20:54	06:53 20:14	07:24 19:20	07:57 18:33	07:34 07:58-08:40/42 17:04	07:57 08:20-08:51/31 17:09
29	06:23 06:46-07:27/41 20:53	06:54 20:12	07:25 19:18	07:59 18:32	07:35 07:59-08:40/41 17:04	07:57 08:20-08:52/32 17:10
30	06:24 06:47-07:26/39 20:52	06:55 20:10	07:26 19:16	08:00 18:30	07:36 08:00-08:41/41 17:04	07:57 08:20-08:52/32 17:11
31	06:25 06:48-07:25/37 20:51	06:56 20:09		08:01 18:29		07:57 08:20-08:53/33 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1648	368	0	0	734	1024

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T19 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (438)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		07:07	17:15-17:47/32	07:16	17:52-18:57/65	06:30	06:50-07:08/18	06:01	20:02-20:33/31
	17:13	17:47		18:21		19:56	19:22-19:34/12	20:27	19:37-20:05/28	20:57	
2	07:57	07:43		07:06	17:12-17:49/37	07:14	17:52-18:56/64	06:29	06:48-07:07/19	06:01	20:02-20:33/31
	17:13	17:48		18:23		19:57	19:20-19:35/15	20:28	19:37-20:05/28	20:58	
3	07:58	07:41		07:04	17:09-17:50/41	07:13	17:53-18:56/63	06:27	06:47-07:08/21	06:00	20:03-20:34/31
	17:14	17:50		18:24		19:58	19:20-19:37/17	20:29	19:39-20:07/28	20:59	
4	07:58	07:40		07:02	17:08-17:52/44	07:11	17:53-18:54/61	06:26	06:46-07:08/22	06:00	20:05-20:35/30
	17:15	17:51		18:25		19:59	19:19-19:37/18	20:30	19:41-20:08/27	20:59	
5	07:58	07:39		07:01	17:06-17:53/47	07:09	17:53-18:53/60	06:25	06:45-07:08/23	05:59	20:05-20:35/30
	17:16	17:52		18:26		20:00	19:18-19:38/20	20:31	19:45-20:09/24	21:00	
6	07:58	07:38		06:59	17:05-17:55/50	07:08	17:55-18:53/58	06:24	06:44-07:08/24	05:59	20:05-20:36/31
	17:17	17:53		18:27		20:00	19:19-19:40/21	20:32	19:45-20:10/25	21:01	
7	07:57	07:37		06:58	17:03-17:55/52	07:06	17:55-18:51/56	06:22	06:42-07:07/25	05:59	20:06-20:37/31
	17:18	17:55		18:28		20:01	19:18-19:40/22	20:33	19:45-20:10/25	21:01	
8	07:57	07:36		07:56	18:02-18:56/54	07:04	17:56-18:49/53	06:21	06:42-07:07/25	05:59	20:06-20:37/31
	17:19	17:56		19:30		20:02	19:18-19:41/23	20:34	19:45-20:11/26	21:02	
9	07:57	07:35		07:54	18:01-18:57/56	07:03	17:58-18:48/50	06:20	06:42-07:07/25	05:58	20:06-20:37/31
	17:20	17:57		19:31		20:03	19:19-19:43/24	20:35	19:45-20:12/27	21:03	
10	07:57	07:34		07:53	18:00-18:57/57	07:01	17:58-18:46/48	06:19	06:43-07:06/23	05:58	20:06-20:38/32
	17:21	17:58		19:32		20:04	19:20-19:43/23	20:37	19:45-20:13/28	21:03	
11	07:57	07:32		07:51	17:59-18:57/58	07:00	18:00-18:45/45	06:18	06:43-07:06/23	05:58	20:07-20:38/31
	17:22	18:00		19:33		20:06	19:20-19:44/24	20:38	19:46-20:14/28	21:04	
12	07:56	07:31		07:49	17:59-18:58/59	06:58	18:01-18:43/42	06:17	06:44-07:05/21	05:58	20:07-20:39/32
	17:23	18:01		19:34		20:07	19:23-19:46/23	20:39	19:46-20:15/29	21:04	
13	07:56	07:30		07:48	17:58-18:58/60	06:56	18:03-18:40/37	06:16	06:45-07:04/19	05:58	20:07-20:40/33
	17:24	18:02		19:35		20:08	19:25-19:46/21	20:40	19:46-20:16/30	21:05	
14	07:56	07:29		07:46	17:57-18:59/62	06:55	18:05-18:39/34	06:15	06:46-07:03/17	05:58	20:08-20:40/32
	17:25	18:03		19:36		20:09	19:26-19:48/22	20:41	19:47-20:17/30	21:05	
15	07:55	07:27		07:45	17:57-19:00/63	06:53	18:07-18:35/28	06:14	06:47-07:01/14	05:58	20:08-20:40/32
	17:27	18:05		19:37		20:10	19:25-19:48/23	20:42	19:48-20:18/30	21:06	
16	07:55	07:26		07:43	17:56-19:00/64	06:52	18:11-18:32/21	06:13	06:48-07:00/12	05:58	20:08-20:41/33
	17:28	18:06		19:39		20:11	19:26-19:50/24	20:43	19:48-20:19/31	21:06	
17	07:55	07:25		07:41	17:55-19:00/65	06:50	18:16-18:26/10	06:12	06:51-06:57/6	05:58	20:08-20:41/33
	17:29	18:07		19:40		20:12	19:25-19:50/25	20:44	19:49-20:20/31	21:06	
18	07:54	07:23		07:39	17:55-19:01/66	06:49	19:26-19:52/26	06:11	19:51-20:21/30	05:58	20:09-20:41/32
	17:30	18:08		19:41		20:13		20:45		21:07	
19	07:54	07:22		07:38	17:54-19:01/67	06:47	19:27-19:52/25	06:10	19:53-20:22/29	05:58	20:09-20:41/32
	17:31	18:10		19:42		20:14		20:46		21:07	
20	07:53	07:20		07:36	17:53-19:01/68	06:45	19:28-19:54/26	06:09	19:54-20:23/29	05:58	20:09-20:41/32
	17:32	18:11		19:43		20:15		20:47		21:07	
21	07:52	07:19		07:34	17:53-19:02/69	06:44	19:29-19:54/25	06:08	19:54-20:24/30	05:58	20:10-20:43/33
	17:34	18:12		19:44		20:16		20:47		21:08	
22	07:52	07:18		07:33	17:53-19:01/68	06:43	19:30-19:56/26	06:07	19:54-20:24/30	05:58	20:10-20:42/32
	17:35	18:13		19:45		20:17		20:48		21:08	
23	07:51	07:16		07:31	17:52-19:01/69	06:41	19:30-19:56/26	06:07	19:55-20:26/31	05:59	20:10-20:42/32
	17:36	18:14		19:46		20:18		20:49		21:08	
24	07:50	07:15		07:29	17:51-19:01/70	06:40	19:31-19:58/27	06:06	19:56-20:26/30	05:59	20:10-20:42/32
	17:37	18:16		19:47		20:20		20:50		21:08	
25	07:50	07:13		07:28	17:52-19:01/69	06:38	06:58-06:59/1	06:05	19:56-20:27/31	05:59	20:11-20:43/32
	17:38	18:17		19:48		20:21	19:32-19:59/27	20:51		21:08	
26	07:49	07:12		07:26	17:51-19:00/69	06:37	06:56-07:02/6	06:04	19:57-20:28/31	06:00	20:10-20:43/33
	17:40	18:18		19:49		20:22	19:33-20:00/27	20:52		21:09	
27	07:48	07:10	17:22-17:41/19	07:24	17:51-19:00/69	06:35	06:55-07:04/9	06:04	19:57-20:29/32	06:00	20:10-20:43/33
	17:41	18:19		19:51		20:23	19:35-20:01/26	20:53		21:09	
28	07:47	07:09	17:17-17:44/27	07:23	17:51-19:00/69	06:34	06:54-07:06/12	06:03	19:58-20:30/32	06:00	20:11-20:43/32
	17:42	18:20		19:52		20:24	19:34-20:01/27	20:54		21:09	
29	07:46			07:21	17:51-18:59/68	06:33	06:52-07:06/14	06:03	19:59-20:30/31	06:01	20:11-20:43/32
	17:43			19:53	19:29-19:31/2	20:25	19:35-20:03/28	20:55		21:09	
30	07:45			07:19	17:51-18:58/67	06:31	06:51-07:07/16	06:02	20:00-20:32/32	06:01	20:11-20:43/32
	17:45			19:54	19:25-19:32/7	20:26	19:36-20:04/28	20:55		21:09	
31	07:44			07:18	17:52-18:58/66			06:01	20:00-20:32/32		
	17:46			19:55	19:24-19:34/10			20:56			
Potential sun hours	297	297		370		399		449		453	
Sum of minutes with flicker	0	46		1874		1554		1242		954	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T19 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (438)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02	20:11-20:43/32	06:26	06:54-07:16/22	06:57	17:59-18:44/45	07:27	17:37-18:37/60	07:02	07:37
	21:09		20:50	19:56-20:26/30	20:07	19:20-19:44/24	19:15		17:28	17:03
2	06:02	20:11-20:43/32	06:27	06:54-07:16/22	06:58	17:57-18:45/48	07:28	17:37-18:36/59	07:03	07:38
	21:09		20:49	19:56-20:25/29	20:06	19:19-19:42/23	19:13		17:26	17:03
3	06:03	20:11-20:42/31	06:28	06:53-07:17/24	06:59	17:56-18:46/50	07:29	17:37-18:35/58	07:04	07:39
	21:08		20:48	19:56-20:24/28	20:04	19:17-19:41/24	19:11		17:25	17:03
4	06:03	20:11-20:43/32	06:29	06:53-07:17/24	07:00	17:54-18:47/53	07:31	17:38-18:34/56	07:06	07:40
	21:08		20:47	19:56-20:23/27	20:02	19:15-19:38/23	19:10		17:24	17:03
5	06:04	20:11-20:42/31	06:30	06:52-07:18/26	07:01	17:51-18:47/56	07:32	17:38-18:33/55	07:07	07:41
	21:08		20:46	19:55-20:22/27	20:01	19:14-19:37/23	19:08		17:23	17:02
6	06:04	20:11-20:42/31	06:31	06:53-07:18/25	07:02	17:50-18:48/58	07:33	17:40-18:32/52	07:08	07:42
	21:08		20:45	19:55-20:21/26	19:57	19:14-19:35/21	19:06		17:22	17:02
7	06:05	20:12-20:42/30	06:32	06:54-07:18/24	07:03	17:49-18:48/59	07:34	17:40-18:31/51	07:09	07:43
	21:08		20:43	19:54-20:18/24	19:56	19:13-19:33/20	19:05		17:21	17:02
8	06:06	20:11-20:41/30	06:33	06:55-07:18/23	07:04	17:47-18:49/62	07:35	17:41-18:29/48	07:10	07:44
	21:07		20:42	19:52-20:17/25	19:54	19:13-19:32/19	19:03		17:20	17:02
9	06:06	20:11-20:41/30	06:34	06:56-07:18/22	07:05	17:46-18:49/63	07:36	17:42-18:28/46	07:12	07:45
	21:07		20:41	19:49-20:16/27	19:52	19:13-19:30/17	19:01		17:18	17:02
10	06:07	20:10-20:41/31	06:35	06:56-07:16/20	07:06	17:45-18:49/64	07:37	17:43-18:26/43	07:13	07:46
	21:07		20:40	19:47-20:15/28	19:50	19:13-19:28/15	19:00		17:17	17:02
11	06:08	20:09-20:40/31	06:36	06:57-07:16/19	07:07	17:44-18:49/65	07:38	17:44-18:24/40	07:14	07:47
	21:06		20:38	19:46-20:14/28	19:49	19:14-19:27/13	18:58		17:16	17:02
12	06:08	20:09-20:40/31	06:37	06:58-07:15/17	07:08	17:43-18:49/66	07:39	17:46-18:21/35	07:15	07:47
	21:06		20:37	19:44-20:13/29	19:47	19:15-19:25/10	18:56		17:15	17:02
13	06:09	20:08-20:40/32	06:38	06:59-07:14/15	07:09	17:42-18:49/67	07:40	17:48-18:18/30	07:16	07:48
	21:05		20:36	19:43-20:11/28	19:45	19:16-19:23/7	18:55		17:15	17:03
14	06:10	20:07-20:39/32	06:39	07:00-07:13/13	07:10	17:41-18:49/68	07:41	17:51-18:15/24	07:18	07:49
	21:05		20:34	19:43-20:10/27	19:44	19:18-19:22/4	18:53		17:14	17:03
15	06:11	20:07-20:39/32	06:40	07:01-07:12/11	07:11	17:41-18:49/68	07:42	17:56-18:11/15	07:19	07:50
	21:04		20:33	19:42-20:09/27	19:42		18:52		17:13	17:03
16	06:12	20:07-20:38/31	06:41	07:02-07:11/9	07:12	17:40-18:49/69	07:44		07:20	07:50
	21:04		20:32	19:41-20:07/26	19:40		18:50		17:12	17:03
17	06:12	20:06-20:38/32	06:42	07:03-07:08/5	07:13	17:40-18:49/69	07:45		07:21	07:51
	21:03		20:30	19:39-20:06/27	19:39		18:49		17:11	17:03
18	06:13	20:05-20:37/32	06:43	19:38-20:05/27	07:14	17:39-18:48/69	07:46		07:22	07:52
	21:02		20:29		19:37		18:47		17:10	17:04
19	06:14	20:05-20:36/31	06:44	19:36-20:03/27	07:15	17:39-18:48/69	07:47		07:24	07:52
	21:02		20:27		19:35		18:46		17:10	17:04
20	06:15	20:05-20:36/31	06:45	19:36-20:02/26	07:16	17:38-18:47/69	07:48		07:25	07:53
	21:01		20:26		19:33		18:44		17:09	17:05
21	06:16	20:05-20:35/30	06:46	19:35-20:00/25	07:17	17:38-18:47/69	07:49		07:26	07:54
	21:00		20:24		19:32		18:43		17:08	17:05
22	06:17	20:05-20:34/29	06:47	19:34-19:59/25	07:18	17:38-18:46/68	07:50		07:27	07:54
	20:59		20:23		19:30		18:41		17:07	17:06
23	06:17	20:05-20:34/29	06:48	19:32-19:58/26	07:19	17:37-18:46/69	07:51		07:28	07:55
	20:59		20:21		19:28		18:40		17:07	17:06
24	06:18	20:05-20:33/28	06:49	19:30-19:56/26	07:20	17:37-18:45/68	07:53		07:29	07:55
	20:58		20:20		19:26		18:38		17:06	17:07
25	06:19	20:02-20:32/30	06:50	19:29-19:55/26	07:21	17:37-18:44/67	07:54		07:31	07:55
	20:57		20:18		19:25		18:37		17:06	17:07
26	06:20	20:01-20:31/30	06:51	18:18-18:30/12	07:22	17:37-18:43/66	07:55		07:32	07:56
	20:56		20:17	19:28-19:53/25	19:23		18:36		17:05	17:08
27	06:21	07:00-07:09/9	06:52	18:13-18:35/22	07:23	17:38-18:42/64	07:56		07:33	07:56
	20:55	20:00-20:30/30	20:15	19:27-19:52/25	19:21		18:34		17:05	17:09
28	06:22	06:58-07:11/13	06:53	18:09-18:37/28	07:24	17:38-18:41/63	07:57		07:34	07:56
	20:54	19:59-20:29/30	20:14	19:27-19:50/23	19:20		18:33		17:04	17:09
29	06:23	06:57-07:13/16	06:54	18:06-18:40/34	07:25	17:37-18:40/63	07:58		07:35	07:57
	20:53	19:58-20:28/30	20:12	19:26-19:49/23	19:18		18:32		17:04	17:10
30	06:24	06:56-07:14/18	06:55	18:03-18:41/38	07:26	17:37-18:38/61	08:00		07:36	07:57
	20:52	19:57-20:28/31	20:10	19:26-19:47/21	19:16		18:30		17:04	17:11
31	06:25	06:55-07:15/20	06:56	18:01-18:43/42			08:01			07:57
	20:51	19:57-20:27/30	20:09	19:23-19:46/23			18:29			17:11
Potential sun hours	460		429		375		345		297	287
Sum of minutes with flicker	1028		1308		2138		672		0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T2 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (421)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:58		07:44	16:47-17:23/36	07:07	17:03-18:00/57	07:16	18:36-19:06/30	06:30	19:18-20:01/43	06:01	19:46-20:29/43
	17:13		17:47		18:22		19:56		20:27		20:57	19:36-19:45/9
2	07:58		07:43	16:47-17:24/37	07:06	17:04-18:01/57	07:14	18:38-19:02/24	06:29	19:17-20:00/43	06:01	19:45-20:29/44
	17:13		17:48		18:23		19:57		20:28		20:58	
3	07:58		07:42	16:47-17:26/39	07:04	17:06-18:03/57	07:13	18:41-18:59/18	06:27	19:17-20:01/44	06:00	19:46-20:29/43
	17:14		17:50		18:24		19:58		20:29		20:59	
4	07:58		07:41	16:48-17:27/39	07:03	17:08-18:03/55	07:11	18:44-18:55/11	06:26	19:17-20:01/44	06:00	19:46-20:30/44
	17:15		17:51		18:25		19:59		20:30		21:00	
5	07:58		07:40	16:48-17:28/40	07:01	17:09-18:04/55	07:09	19:23-19:36/13	06:25	19:17-20:01/44	05:59	19:45-20:30/45
	17:16		17:52		18:26		20:00		20:31		21:00	
6	07:58		07:38	16:49-17:30/41	06:59	17:10-18:06/56	07:08	19:20-19:40/20	06:24	19:17-20:01/44	05:59	19:45-20:31/46
	17:17		17:53		18:27		20:00		20:33		21:01	
7	07:58		07:37	16:48-17:30/42	06:58	17:09-18:07/58	07:06	19:17-19:41/24	06:22	19:16-20:01/45	05:59	19:45-20:31/46
	17:18		17:55		18:29		20:01		20:34		21:02	
8	07:58		07:36	16:49-17:32/43	07:56	18:09-19:08/59	07:04	19:15-19:41/26	06:21	19:16-20:01/45	05:59	19:46-20:32/46
	17:19		17:56		19:30		20:03		20:35		21:02	
9	07:57		07:35	16:50-17:34/44	07:55	18:10-19:09/59	07:03	19:14-19:43/29	06:20	19:16-20:01/45	05:58	19:45-20:31/46
	17:20		17:57		19:31		20:04		20:36		21:03	
10	07:57		07:34	16:51-17:35/44	07:53	18:10-19:10/60	07:01	19:12-19:43/31	06:19	19:16-20:00/44	05:58	19:45-20:32/47
	17:21		17:59		19:32		20:05		20:37		21:03	
11	07:57		07:33	16:53-17:36/43	07:51	18:10-19:11/61	07:00	19:12-19:45/33	06:18	19:16-20:00/44	05:58	19:45-20:33/48
	17:22		18:00		19:33		20:06		20:38		21:04	
12	07:57		07:31	16:53-17:36/43	07:50	18:11-19:13/62	06:58	19:11-19:45/34	06:17	19:17-20:00/43	05:58	19:45-20:34/49
	17:23		18:01		19:34		20:07		20:39		21:04	
13	07:56		07:30	16:55-17:37/42	07:48	18:11-19:14/63	06:56	19:09-19:45/36	06:16	19:17-20:00/43	05:58	19:46-20:35/49
	17:24		18:02		19:35		20:08		20:40		21:05	
14	07:56		07:29	16:58-17:38/40	07:46	18:12-19:15/63	06:55	19:09-19:45/36	06:15	19:17-19:59/42	05:58	19:46-20:36/50
	17:25		18:03		19:36		20:09		20:41		21:05	
15	07:56		07:28	16:59-17:38/39	07:45	18:14-19:16/62	06:53	19:08-19:45/37	06:14	19:18-19:59/41	05:58	19:46-20:37/51
	17:27		18:05		19:38		20:10		20:42		21:06	
16	07:55		07:26	16:59-17:39/40	07:43	18:15-19:17/62	06:52	19:09-19:45/36	06:13	19:18-19:58/40	05:58	19:46-20:37/51
	17:28		18:06		19:39		20:11		20:43		21:06	
17	07:55		07:25	16:59-17:39/40	07:41	18:16-19:18/62	06:50	19:08-19:45/37	06:12	20:05-20:06/1	05:58	19:46-20:38/52
	17:29		18:07		19:40		20:12		20:44	19:19-19:58/39	21:07	
18	07:54	16:56-17:05/9	07:23	16:58-17:39/41	07:40	18:20-19:20/60	06:49	19:08-19:45/37	06:11	19:59-20:13/14	05:58	19:46-20:38/52
	17:30		18:08		19:41		20:13		20:45	19:20-19:58/38	21:07	
19	07:54	16:54-17:06/12	07:22	16:58-17:40/42	07:38	18:23-19:20/57	06:47	19:08-19:44/36	06:10	19:20-20:16/56	05:58	19:46-20:38/52
	17:31		18:10		19:42		20:14		20:46		21:07	
20	07:53	16:52-17:07/15	07:21	16:58-17:43/45	07:36	18:32-19:20/48	06:46	19:08-19:46/38	06:09	19:21-20:17/56	05:58	19:47-20:39/52
	17:32		18:11		19:43		20:15		20:47		21:08	
21	07:53	16:52-17:09/17	07:19	16:58-17:46/48	07:35	18:32-19:20/48	06:44	19:08-19:49/41	06:08	19:21-20:19/58	05:58	19:47-20:39/52
	17:34		18:12		19:44		20:16		20:48		21:08	
22	07:52	16:50-17:10/20	07:18	16:58-17:47/49	07:33	18:32-19:20/48	06:43	19:09-19:52/43	06:07	19:22-20:20/58	05:58	19:47-20:39/52
	17:35		18:13		19:45		20:18		20:49		21:08	
23	07:51	16:49-17:11/22	07:16	16:58-17:52/54	07:31	18:31-19:19/48	06:41	19:09-19:54/45	06:07	19:24-20:22/58	05:59	19:47-20:39/52
	17:36		18:14		19:46		20:19		20:50		21:08	
24	07:51	16:49-17:12/23	07:15	16:58-17:53/55	07:30	18:32-19:19/47	06:40	19:10-19:55/45	06:06	19:24-20:23/59	05:59	19:47-20:39/52
	17:37		18:16		19:47		20:20		20:50		21:09	
25	07:50	16:49-17:14/25	07:13	16:59-17:55/56	07:28	18:32-19:18/46	06:38	19:11-19:57/46	06:05	19:25-20:23/58	05:59	19:48-20:40/52
	17:38		18:17		19:48		20:21		20:51		21:09	
26	07:49	16:48-17:15/27	07:12	16:59-17:56/57	07:26	18:32-19:17/45	06:37	19:12-19:57/45	06:04	19:26-20:25/59	06:00	19:48-20:39/51
	17:40		18:18		19:50		20:22		20:52		21:09	
27	07:48	16:48-17:16/28	07:10	17:01-17:57/56	07:24	18:32-19:16/44	06:35	19:13-19:58/45	06:04	19:27-20:25/58	06:00	19:49-20:40/51
	17:41		18:19		19:51		20:23		20:53		21:09	
28	07:47	16:47-17:17/30	07:09	17:01-17:58/57	07:23	18:33-19:15/42	06:34	19:15-19:59/44	06:03	19:29-20:26/57	06:00	19:49-20:39/50
	17:42		18:20		19:52		20:24		20:54		21:09	
29	07:47	16:47-17:19/32			07:21	18:33-19:13/40	06:33	19:17-19:59/42	06:03	19:30-20:26/56	06:01	19:49-20:39/50
	17:43				19:53		20:25		20:55		21:09	
30	07:46	16:47-17:20/33			07:19	18:34-19:11/37	06:31	19:19-20:00/41	06:02	19:32-20:28/56	06:01	19:50-20:39/49
	17:45				19:54		20:26		20:56		21:09	
31	07:45	16:47-17:21/34			07:18	18:35-19:09/34			06:01	19:33-20:28/55		
	17:46				19:55				20:56			
Potential sun hours	297		297		370		399		449		453	
Sum of minutes with flicker		327		1252		1652		1023		1530		1476

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T2 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (421)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December	
1	06:02 19:49-20:38/49 21:09	06:26 19:27-20:11/44 20:50	06:57 19:11-19:44/33 20:07	07:28 17:50-18:52/62 19:15	07:02 16:21-17:05/44 17:28	07:37 17:03	
2	06:02 19:50-20:38/48 21:09	06:27 19:27-20:11/44 20:49	06:58 19:11-19:42/31 20:06	07:29 17:49-18:50/61 19:13	07:03 16:20-17:03/43 17:26	07:38 17:03	
3	06:03 19:50-20:37/47 21:09	06:28 19:27-20:11/44 20:48	06:59 19:12-19:41/29 20:04	07:30 17:48-18:48/60 19:11	07:05 16:19-17:02/43 17:25	07:39 17:03	
4	06:03 19:51-20:37/46 21:09	06:29 19:27-20:11/44 20:47	07:00 19:13-19:39/26 20:02	07:31 17:48-18:48/60 19:10	07:06 16:18-17:00/42 17:24	07:40 17:03	
5	06:04 19:51-20:36/45 21:08	06:30 19:27-20:11/44 20:46	07:01 19:14-19:38/24 20:01	07:32 17:47-18:46/59 19:08	07:07 16:18-17:00/42 17:23	07:41 17:02	
6	06:04 19:51-20:37/46 21:08	06:31 19:26-20:11/45 20:45	07:02 19:16-19:36/20 19:57	07:33 17:46-18:44/58 19:06	07:08 16:18-16:58/40 17:22	07:42 17:02	
7	06:05 19:52-20:37/45 21:08	06:32 19:26-20:11/45 20:44	07:03 19:17-19:32/15 19:56	07:34 17:45-18:42/57 19:05	07:09 16:17-16:57/40 17:21	07:43 17:02	
8	06:06 19:52-20:37/45 21:08	06:33 19:26-20:11/45 20:42	07:04 18:39-18:48/9 19:54	07:35 17:45-18:41/56 19:03	07:11 16:18-16:56/38 17:20	07:44 17:02	
9	06:06 19:53-20:37/44 21:07	06:34 19:26-20:10/44 20:41	07:05 18:34-18:52/18 19:52	07:36 17:44-18:39/55 19:01	07:12 16:18-16:55/37 17:19	07:45 17:02	
10	06:07 19:53-20:37/44 21:07	06:35 19:26-20:09/43 20:40	07:06 18:31-18:54/23 19:51	07:37 17:41-18:37/56 19:00	07:13 16:18-16:53/35 17:17	07:46 17:02	
11	06:08 19:53-20:36/43 21:06 19:45-19:50/5	06:36 19:26-20:09/43 20:38	07:07 18:29-18:57/28 19:49	07:38 17:38-18:35/57 18:58	07:14 16:18-16:52/34 17:16	07:47 17:02	
12	06:08 19:43-20:36/53 21:06	06:37 19:26-20:08/42 20:37	07:08 18:27-19:00/33 19:47	07:39 17:36-18:34/58 18:57	07:15 16:19-16:52/33 17:16	07:48 17:02	
13	06:09 19:41-20:36/55 21:05	06:38 19:26-20:08/42 20:36	07:09 18:25-19:02/37 19:46	07:40 17:34-18:32/58 18:55	07:17 16:19-16:51/32 17:15	07:48 17:03	
14	06:10 19:39-20:35/56 21:05	06:39 19:24-20:07/43 20:34	07:10 18:24-19:03/39 19:44	07:41 17:34-18:31/57 18:53	07:18 16:19-16:49/30 17:14	07:49 17:03	
15	06:11 19:38-20:35/57 21:04	06:40 19:22-20:06/44 20:33	07:11 18:22-19:04/42 19:42	07:43 17:33-18:29/56 18:52	07:19 16:21-16:49/28 17:13	07:50 17:03	
16	06:12 19:37-20:35/58 21:04	06:41 19:20-20:05/45 20:32	07:12 18:21-19:05/44 19:40	07:44 17:32-18:28/56 18:50	07:20 16:21-16:48/27 17:12	07:51 17:03	
17	06:12 19:36-20:34/58 21:03	06:42 19:18-20:04/46 20:30	07:13 18:20-19:05/45 19:39	07:45 17:31-18:26/55 18:49	07:21 16:22-16:47/25 17:11	07:51 17:03	
18	06:13 19:36-20:34/58 21:03	06:43 19:17-20:02/45 20:29	07:14 18:19-19:05/46 19:37	07:46 17:30-18:24/54 18:47	07:23 16:23-16:46/23 17:10	07:52 17:04	
19	06:14 19:34-20:32/58 21:02	06:44 19:16-20:01/45 20:27	07:15 18:18-19:05/47 19:35	07:47 18:21-18:22/1 18:46 17:29-18:19/50	07:24 16:24-16:46/22 17:10	07:53 17:04	
20	06:15 19:33-20:32/59 21:01	06:45 19:15-19:59/44 20:26	07:16 18:18-19:05/47 19:34	07:48 17:29-18:18/49 18:44	07:25 16:25-16:45/20 17:09	07:53 17:05	
21	06:16 19:33-20:31/58 21:00	06:46 19:14-19:57/43 20:24	07:17 18:17-19:05/48 19:32	07:49 17:29-18:16/47 18:43	07:26 16:27-16:44/17 17:08	07:54 16:12-16:14/2 17:05	
22	06:17 19:32-20:30/58 21:00	06:47 19:13-19:54/41 20:23	07:18 18:17-19:05/48 19:30	07:50 17:28-18:13/45 18:41	07:27 16:28-16:43/15 17:08	07:54 16:13-16:15/2 17:06	
23	06:17 19:32-20:29/57 20:59	06:48 19:12-19:48/36 20:21	07:19 18:17-19:04/47 19:28	07:52 17:28-18:09/41 18:40	07:29 16:31-16:43/12 17:07	07:55 17:06	
24	06:18 19:31-20:27/56 20:58	06:49 19:12-19:48/36 20:20	07:20 18:16-19:03/47 19:27 18:09-18:15/6	07:53 17:29-18:10/41 18:38	07:30 16:33-16:42/9 17:06	07:55 17:07	
25	06:19 19:30-20:24/54 20:57	06:50 19:11-19:48/37 20:18	07:21 18:03-19:03/60 19:25	07:54 17:29-18:09/40 18:37	07:31 17:06	07:56 17:07	
26	06:20 20:11-20:21/10 20:56 19:29-20:08/39	06:51 19:11-19:47/36 20:17	07:22 18:00-19:01/61 19:23	07:55 17:29-18:08/39 18:36	07:32 17:05	07:56 17:08	
27	06:21 19:29-20:09/40 20:55	06:52 19:10-19:47/37 20:15	07:23 17:57-18:59/62 19:21	07:56 17:29-18:07/38 18:34	07:33 17:05	07:56 17:09	
28	06:22 19:29-20:09/40 20:54	06:53 19:10-19:47/37 20:14	07:24 17:55-18:57/62 19:20	07:57 17:26-18:07/41 18:33	07:34 17:04	07:57 17:09	
29	06:23 19:28-20:10/42 20:53	06:54 19:10-19:46/36 20:12	07:25 17:53-18:56/63 19:18	07:59 17:25-18:06/41 18:32	07:35 17:04	07:57 17:10	
30	06:24 19:28-20:10/42 20:52	06:55 19:10-19:46/36 20:11	07:26 17:51-18:54/63 19:16	08:00 17:23-18:05/42 18:30	07:36 17:04	07:57 17:11	
31	06:25 19:28-20:10/42 20:51	06:56 19:10-19:45/35 20:09		08:01 17:21-18:05/44 18:29		07:57 17:11	
Potential sun hours	460	429	375	345	297	287	
Sum of minutes with flicker	1557	1291	1203	1594	731	4	

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T20 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (439)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 14:20-15:21/61 17:13	07:43 17:47	07:07 17:50-18:00/10 18:21	07:16 18:57-19:34/37 19:56	06:30 19:19-20:05/46 20:27 06:58-07:26/28	06:01 19:42-20:33/51 20:57 06:28-06:52/24
2	07:57 14:20-15:21/61 17:13	07:42 17:48	07:06 17:47-18:01/14 18:23	07:14 18:58-19:35/37 19:57	06:29 19:19-20:05/46 20:28 06:58-07:25/27	06:01 19:41-20:33/52 20:58 06:27-06:53/26
3	07:58 14:21-15:21/60 17:14	07:41 17:50	07:04 17:45-18:02/17 18:24	07:13 19:00-19:37/37 19:58	06:27 19:20-20:05/45 20:29 06:59-07:24/25	06:00 19:42-20:34/52 20:59 06:27-06:54/27
4	07:58 14:23-15:21/58 17:15	07:40 17:51	07:02 17:45-18:03/18 18:25	07:11 19:02-19:37/35 19:59	06:26 19:22-20:07/45 20:30 07:00-07:23/23	06:00 19:43-20:35/52 20:59 06:26-06:56/30
5	07:58 14:24-15:21/57 17:16	07:39 17:52	07:01 17:44-18:04/20 18:26	07:09 19:03-19:38/35 20:00	06:25 19:24-20:09/45 20:31 07:01-07:22/21	05:59 19:42-20:35/53 21:00 06:25-06:56/31
6	07:58 14:25-15:21/56 17:17	07:38 17:53	06:59 17:43-18:06/23 18:27	07:08 19:04-19:40/36 20:00	06:24 19:25-20:10/45 20:32 07:02-07:21/19	05:59 19:43-20:36/53 21:01 06:25-06:57/32
7	07:57 14:27-15:20/53 17:18	07:37 17:55	06:58 17:43-18:07/24 18:28	07:06 19:03-19:40/37 20:01	06:22 19:24-20:10/46 20:33 07:03-07:18/15	05:59 19:44-20:37/53 21:01 06:21-06:58/37
8	07:57 14:27-15:19/52 17:19	07:36 17:56	07:56 18:42-19:08/26 19:30	07:04 19:03-19:41/38 20:02	06:21 19:25-20:11/46 20:34 07:06-07:16/10	05:59 19:44-20:37/53 21:02 06:21-06:59/38
9	07:57 14:29-15:18/49 17:20	07:35 17:57	07:54 18:42-19:10/28 19:31	07:03 19:03-19:43/40 20:03	06:20 19:25-20:12/47 20:35	05:58 19:44-20:37/53 21:03 06:20-06:59/39
10	07:57 14:31-15:18/47 17:21	07:34 17:58	07:53 18:42-19:10/28 19:32	07:01 19:03-19:43/40 20:04	06:19 19:26-20:13/47 20:36	05:58 19:44-20:37/53 21:03 06:20-06:59/39
11	07:57 14:33-15:17/44 17:22	07:32 18:00	07:51 18:42-19:11/29 19:33	07:00 19:03-19:44/41 20:06	06:18 19:26-20:14/48 20:38	05:58 19:45-20:38/53 21:04 06:20-07:00/40
12	07:56 14:35-15:14/39 17:23	07:31 18:01	07:49 18:43-19:13/30 19:34	06:58 19:04-19:45/41 20:07	06:17 19:27-20:15/48 20:39	05:58 19:45-20:39/54 21:04 06:20-07:00/40
13	07:56 14:37-15:12/35 17:24	07:30 18:02	07:48 18:43-19:14/31 19:35	06:56 19:05-19:46/41 20:08	06:16 19:28-20:16/48 20:40	05:58 19:46-20:39/53 21:05 06:20-07:01/41
14	07:56 14:40-15:01/21 17:25	07:29 18:03	07:46 18:44-19:15/31 19:36	06:55 07:14-07:21/7 20:09 19:07-19:48/41	06:15 19:28-20:17/49 20:41	05:58 19:46-20:40/54 21:05 06:20-07:01/41
15	07:55 14:44-14:58/14 17:27	07:27 18:05	07:44 18:46-19:16/30 19:37	06:53 07:12-07:23/11 20:10 19:08-19:48/40	06:14 19:29-20:18/49 20:42	05:58 19:46-20:40/54 21:06 06:20-07:02/42
16	07:55 17:28	07:26 18:06	07:43 18:48-19:17/29 19:39	06:52 07:11-07:25/14 20:11 19:10-19:50/40	06:13 19:30-20:19/49 20:43	05:58 19:46-20:40/54 21:06 06:20-07:02/42
17	07:55 17:29	07:25 18:07	07:41 18:48-19:18/30 19:40	06:50 07:09-07:26/17 20:12 19:10-19:50/40	06:12 19:30-20:20/50 20:44	05:58 19:47-20:41/54 21:06 06:20-07:02/42
18	07:54 17:30	07:23 18:08	07:39 18:48-19:20/32 19:41	06:49 07:08-07:27/19 20:13 19:10-19:52/42	06:11 19:31-20:21/50 20:45	05:58 19:47-20:41/54 21:07 06:20-07:03/43
19	07:53 17:31	07:22 18:10	07:38 18:48-19:21/33 19:42	06:47 07:06-07:27/21 20:14 19:10-19:52/42	06:10 19:32-20:22/50 20:46	05:58 19:47-20:41/54 21:07 06:20-07:03/43
20	07:53 17:32	07:20 18:11	07:36 18:48-19:21/33 19:43	06:45 07:05-07:28/23 20:15 19:11-19:53/42	06:09 19:33-20:23/50 20:46	05:58 19:48-20:42/54 21:07 06:21-07:04/43
21	07:52 17:34	07:19 18:12	07:34 18:49-19:22/33 19:44	06:44 07:03-07:28/25 20:16 19:11-19:54/43	06:08 19:33-20:24/51 20:47	05:58 19:48-20:42/54 21:08 06:21-07:04/43
22	07:52 17:35	07:18 18:13	07:33 18:50-19:24/34 19:45	06:42 07:02-07:28/26 20:17 19:12-19:56/44	06:07 19:34-20:24/50 20:48	05:58 19:48-20:42/54 21:08 06:21-07:04/43
23	07:51 17:36	07:16 18:14	07:31 18:51-19:25/34 19:46	06:41 07:00-07:28/28 20:18 19:13-19:56/43	06:07 19:36-20:26/50 20:49	05:59 19:48-20:42/54 21:08 06:21-07:04/43
24	07:50 17:37	07:15 18:16	07:29 18:51-19:25/34 19:47	06:40 19:15-19:58/43 20:19 06:59-07:28/29	06:06 19:36-20:26/50 20:50	05:59 19:48-20:42/54 21:08 06:22-07:05/43
25	07:50 17:38	07:13 18:17	07:28 18:52-19:27/35 19:48	06:38 19:17-19:59/42 20:21 06:58-07:29/31	06:05 19:37-20:27/50 20:51	05:59 19:49-20:43/54 21:08 06:22-07:04/42
26	07:49 17:40	07:12 18:18	07:26 18:53-19:26/33 19:49	06:37 19:16-20:00/44 20:22 06:57-07:28/31	06:04 19:39-20:28/49 20:52	06:00 19:49-20:42/53 21:09 06:22-07:04/42
27	07:48 17:41	07:10 18:19	07:24 18:53-19:29/36 19:50	06:35 19:17-20:01/44 20:23 06:57-07:28/31	06:04 19:40-20:29/49 20:53	06:00 19:48-20:43/55 21:09 06:23-07:05/42
28	07:47 17:42	07:09 17:53-17:58/5 18:20	07:23 18:55-19:30/35 19:52	06:34 19:17-20:01/44 20:24 06:58-07:28/30	06:03 19:41-20:30/49 20:54 06:35-06:45/10	06:00 19:49-20:43/54 21:09 06:23-07:05/42
29	07:46 17:43		07:21 18:55-19:31/36 19:53	06:33 19:17-20:03/46 20:25 06:57-07:27/30	06:03 19:41-20:30/49 20:55 06:32-06:47/15	06:01 19:49-20:42/53 21:09 06:23-07:04/41
30	07:45 17:45		07:19 18:55-19:32/37 19:54	06:31 19:18-20:04/46 20:26 06:58-07:27/29	06:02 19:41-20:31/50 20:55 06:31-06:50/19	06:01 19:49-20:43/54 21:09 06:24-07:05/41
31	07:44 17:46		07:18 18:57-19:34/37 19:55		06:01 19:41-20:32/51 20:56 06:29-06:51/22	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	707	5	900	1623	1731	2764

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T20 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (439)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02	19:49-20:42/53	06:26	19:37-20:26/49	06:57	19:03-19:44/41	07:27	18:22-18:52/30	07:02		07:37	14:15-14:59/44
	21:09	06:24-07:04/40	20:50		20:07		19:15		17:28		17:03	
2	06:02	19:49-20:43/54	06:27	19:37-20:25/48	06:58	19:02-19:42/40	07:28	18:21-18:50/29	07:03		07:38	14:14-15:01/47
	21:09	06:25-07:04/39	20:49		20:05		19:13		17:26		17:03	
3	06:03	19:49-20:42/53	06:28	19:36-20:24/48	06:59	19:01-19:41/40	07:29	18:20-18:49/29	07:04		07:39	14:13-15:02/49
	21:08	06:25-07:04/39	20:48		20:04		19:11		17:25		17:03	
4	06:03	19:49-20:43/54	06:29	19:36-20:23/47	07:00	19:00-19:38/38	07:31	18:19-18:47/28	07:06		07:40	14:12-15:04/52
	21:08	06:26-07:04/38	20:47	07:19-07:24/5	20:02		19:10		17:24		17:03	
5	06:04	19:49-20:42/53	06:30	19:35-20:22/47	07:01	18:59-19:37/38	07:32	18:18-18:45/27	07:07		07:41	14:12-15:05/53
	21:08	06:26-07:03/37	20:46	07:15-07:28/13	20:01		19:08		17:23		17:02	
6	06:04	19:49-20:42/53	06:31	19:35-20:21/46	07:02	18:59-19:35/36	07:33	18:19-18:44/25	07:08		07:42	14:11-15:07/56
	21:08	06:31-07:03/32	20:45	07:13-07:30/17	19:57		19:06		17:22		17:02	
7	06:05	19:50-20:42/52	06:32	19:35-20:19/44	07:03	18:58-19:33/35	07:34	18:19-18:42/23	07:09		07:43	14:11-15:08/57
	21:08	06:32-07:03/31	20:43	07:12-07:31/19	19:56		19:05		17:21		17:02	
8	06:06	19:49-20:41/52	06:33	19:32-20:17/45	07:04	18:56-19:32/36	07:35	18:19-18:41/22	07:10		07:44	14:11-15:09/58
	21:07	06:32-07:02/30	20:42	07:10-07:32/22	19:54		19:03		17:20		17:02	
9	06:06	19:49-20:41/52	06:34	19:30-20:15/45	07:05	18:53-19:30/37	07:36	18:19-18:39/20	07:12		07:45	14:10-15:09/59
	21:07	06:33-07:02/29	20:41	07:09-07:33/24	19:52		19:01		17:18		17:02	
10	06:07	19:50-20:41/51	06:35	19:29-20:14/45	07:06	18:51-19:28/37	07:37	18:20-18:37/17	07:13		07:46	14:10-15:10/60
	21:07	06:35-07:02/27	20:40	07:07-07:33/26	19:50		19:00		17:17		17:02	
11	06:08	19:49-20:40/51	06:36	19:28-20:13/45	07:07	18:49-19:27/38	07:38	18:20-18:35/15	07:14		07:47	14:10-15:11/61
	21:06	06:35-07:00/25	20:38	07:06-07:34/28	19:49		18:58		17:16		17:02	
12	06:08	19:49-20:40/51	06:37	19:27-20:13/46	07:08	18:48-19:25/37	07:39	18:22-18:34/12	07:15		07:47	14:10-15:12/62
	21:06	06:37-07:00/23	20:37	07:06-07:34/28	19:47		18:56		17:15		17:02	
13	06:09	19:50-20:40/50	06:38	19:26-20:11/45	07:09	18:47-19:23/36	07:40	18:23-18:32/9	07:16		07:48	14:10-15:13/63
	21:05	06:38-06:59/21	20:36	07:05-07:35/30	19:45		18:55		17:15		17:03	
14	06:10	19:49-20:39/50	06:39	19:25-20:10/45	07:10	18:46-19:22/36	07:41	18:28-18:30/2	07:18		07:49	14:10-15:14/64
	21:05	06:39-06:56/17	20:34	07:05-07:35/30	19:44		18:53		17:14		17:03	
15	06:11	19:49-20:39/50	06:40	19:24-20:09/45	07:11	18:45-19:20/35	07:42		07:19		07:50	14:10-15:14/64
	21:04	06:42-06:55/13	20:33	07:04-07:35/31	19:42		18:52		17:13		17:03	
16	06:12	19:49-20:38/49	06:41	19:24-20:07/43	07:12	18:43-19:18/35	07:44		07:20		07:50	14:10-15:15/65
	21:04	06:46-06:51/5	20:31	07:04-07:35/31	19:40		18:50		17:12		17:03	
17	06:12	19:49-20:38/49	06:42	19:23-20:06/43	07:13	18:41-19:15/34	07:45		07:21		07:51	14:11-15:16/65
	21:03		20:30	07:04-07:35/31	19:39		18:49		17:11		17:03	
18	06:13	19:47-20:37/50	06:43	19:22-20:05/43	07:14	18:40-19:14/34	07:46		07:22		07:52	14:11-15:16/65
	21:02		20:29	07:04-07:34/30	19:37		18:47		17:10		17:04	
19	06:14	19:46-20:36/50	06:44	19:20-20:03/43	07:15	18:39-19:13/34	07:47		07:24		07:52	14:11-15:17/66
	21:02		20:27	07:05-07:34/29	19:35		18:46		17:10		17:04	
20	06:15	19:45-20:36/51	06:45	07:06-07:33/27	07:16	18:38-19:11/33	07:48		07:25		07:53	14:11-15:17/66
	21:01		20:26	19:18-20:02/44	19:33		18:44		17:09		17:05	
21	06:16	19:45-20:35/50	06:46	07:07-07:33/26	07:17	18:36-19:10/34	07:49		07:26		07:54	14:12-15:18/66
	21:00		20:24	19:17-20:00/43	19:32		18:43		17:08		17:05	
22	06:17	19:44-20:34/50	06:47	07:08-07:32/24	07:18	18:34-19:08/34	07:50		07:27		07:54	14:12-15:18/66
	20:59		20:23	19:16-19:59/43	19:30		18:41		17:07		17:06	
23	06:17	19:43-20:34/51	06:48	07:09-07:32/23	07:19	18:33-19:06/33	07:51		07:28		07:55	14:13-15:19/66
	20:59		20:21	19:15-19:57/42	19:28		18:40		17:07		17:06	
24	06:18	19:43-20:33/50	06:49	07:10-07:31/21	07:20	18:32-19:04/32	07:53		07:29		07:55	14:13-15:19/66
	20:58		20:20	19:14-19:56/42	19:26		18:38		17:06		17:07	
25	06:19	19:41-20:32/51	06:50	07:11-07:30/19	07:21	18:31-19:03/32	07:54		07:31		07:55	14:15-15:20/65
	20:57		20:18	19:13-19:55/42	19:25		18:37		17:06		17:07	
26	06:20	19:41-20:31/50	06:51	07:12-07:29/17	07:22	18:30-19:01/31	07:55		07:32		07:56	14:15-15:20/65
	20:56		20:17	19:12-19:53/41	19:23		18:36		17:05		17:08	
27	06:21	19:40-20:30/50	06:52	07:13-07:27/14	07:23	18:30-18:59/29	07:56		07:33	14:23-14:37/14	07:56	14:15-15:20/65
	20:55		20:15	19:12-19:52/40	19:21		18:34		17:05		17:09	
28	06:22	19:40-20:29/49	06:53	07:14-07:25/11	07:24	18:28-18:57/29	07:57		07:34	14:20-14:40/20	07:56	14:16-15:20/64
	20:54		20:14	19:10-19:50/40	19:20		18:33		17:04		17:09	
29	06:23	19:39-20:28/49	06:54	07:15-07:22/7	07:25	18:25-18:56/31	07:58		07:35	14:17-14:51/34	07:57	14:17-15:21/64
	20:53		20:12	19:08-19:49/41	19:18		18:32		17:04		17:10	
30	06:24	19:39-20:28/49	06:55	19:06-19:47/41	07:26	18:23-18:54/31	08:00		07:36	14:16-14:55/39	07:57	14:18-15:21/63
	20:52		20:10		19:16		18:30		17:04		17:11	
31	06:25	19:38-20:27/49	06:56	19:04-19:45/41			08:01				07:57	14:19-15:21/62
	20:51		20:09				18:29				17:11	
Potential sun hours	460		429		375		345		297		287	
Sum of minutes with flicker	2022		1945		1046		288		107		1888	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T21 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (440)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:41-10:45/124 17:13	07:44 16:05-17:14/69 08:06-08:37/31 17:47 09:41-10:41/60	07:07 16:25-17:11/46 18:22 17:46-18:00/14	07:16 18:42-19:27/45 19:56	06:30 06:54-07:22/28 20:27 19:11-19:57/46	06:01 19:31-20:19/48 20:57
2	07:58 08:41-10:46/125 17:13	07:43 16:05-17:15/70 08:06-08:37/31 17:48 09:42-10:39/57	07:06 16:28-17:08/40 18:23 17:43-18:01/18	07:14 18:41-19:26/45 19:57	06:29 06:55-07:22/27 20:28 19:10-19:56/46	06:01 19:30-20:19/49 20:58
3	07:58 08:42-10:46/124 17:14	07:42 16:05-17:16/71 08:06-08:38/32 17:50 09:43-10:38/55	07:04 16:43-17:05/22 18:24 17:40-18:02/22	07:13 18:42-19:27/45 19:58	06:27 06:55-07:21/26 20:29 19:10-19:56/46	06:00 19:31-20:19/48 20:59
4	07:58 08:42-10:46/124 17:15	07:41 16:05-17:17/72 08:06-08:38/32 17:51 09:45-10:36/51	07:02 16:47-17:01/14 18:25 17:39-18:03/24	07:11 18:41-19:26/45 19:59	06:26 06:56-07:20/24 20:30 19:10-19:57/47	06:00 19:31-20:20/49 20:59
5	07:58 08:43-10:47/124 17:16	07:39 16:05-17:18/73 08:07-08:37/30 17:52 09:47-10:35/48	07:01 17:38-18:04/26 18:26	07:09 18:41-19:25/44 20:00	06:25 19:10-19:57/47 20:31 06:56-07:19/23	05:59 19:31-20:19/48 21:00
6	07:58 08:44-10:47/123 17:17	07:38 16:05-17:18/73 08:08-08:37/29 17:54 09:49-10:33/44	06:59 17:37-18:06/29 18:27	07:08 18:41-19:25/44 20:00	06:24 19:11-20:02/51 20:32 06:58-07:18/20	05:59 19:31-20:20/49 21:01
7	07:58 08:45-10:48/123 17:18	07:37 16:04-17:19/75 08:07-08:36/29 17:55 09:50-10:29/39	06:58 17:36-18:07/31 18:28	07:06 18:41-19:24/43 20:01	06:22 19:10-20:04/54 20:33 06:59-07:17/18	05:59 19:32-20:20/48 21:01
8	07:57 08:44-10:47/123 17:19	07:36 16:04-17:20/76 08:08-08:36/28 17:56 09:53-10:26/33	07:56 18:35-19:08/33 19:30	07:04 18:41-19:23/42 20:02	06:21 19:10-20:06/56 20:34 07:00-07:14/14	05:59 19:32-20:20/48 21:02
9	07:57 08:45-10:48/123 17:20	07:35 16:05-17:20/75 08:10-08:35/25 17:57 09:57-10:23/26	07:54 18:35-19:10/35 19:31	07:03 18:42-19:23/41 20:03	06:20 19:10-20:08/58 20:36 07:02-07:12/10	05:58 19:32-20:20/48 21:03
10	07:57 16:24-16:32/8 17:21 08:46-10:48/122	07:34 16:05-17:21/76 08:11-08:34/23 17:59 10:02-10:18/16	07:53 18:34-19:10/36 19:32 08:12-08:21/9	07:01 18:42-19:22/40 20:05	06:19 19:11-20:09/58 20:37	05:58 19:32-20:20/48 21:03
11	07:57 16:22-16:37/15 17:22 08:47-10:49/122	07:32 16:05-17:21/76 18:00 08:13-08:33/20	07:51 18:34-19:11/37 19:33 08:10-08:23/13	07:00 18:43-19:21/38 20:06	06:18 19:11-20:10/59 20:38	05:58 19:33-20:20/47 21:04
12	07:57 16:19-16:39/20 17:23 08:48-10:48/120	07:31 16:05-17:21/76 18:01 08:14-08:30/16	07:50 18:34-19:13/39 19:34 08:09-08:25/16	06:58 18:43-19:20/37 20:07	06:17 19:12-20:11/59 20:39	05:58 19:33-20:20/47 21:04
13	07:56 16:18-16:42/24 17:24 08:49-10:49/120	07:30 16:06-17:22/76 18:02 08:17-08:28/11	07:48 18:34-19:14/40 19:35 08:07-08:26/19	06:56 18:44-19:18/34 20:08	06:16 19:12-20:12/60 20:40	05:58 19:33-20:20/47 21:05
14	07:56 16:16-16:43/27 08:49-09:25/36 17:25 09:26-10:48/82	07:29 16:06-17:22/76 18:04	07:46 18:34-19:15/41 19:36 08:05-08:27/22	06:55 18:46-19:17/31 20:09	06:15 19:12-20:13/61 20:41	05:58 19:34-20:21/47 21:05
15	07:55 16:15-16:45/30 08:51-09:25/34 17:27 09:27-10:49/82	07:27 16:06-17:21/75 18:05	07:45 18:35-19:16/41 19:37 08:04-08:28/24	06:53 18:46-19:14/28 20:10	06:14 19:13-20:13/60 20:42	05:58 19:34-20:21/47 21:06
16	07:55 16:14-16:47/33 08:52-09:26/34 17:28 09:27-10:48/81	07:26 16:07-17:22/75 18:06	07:43 18:35-19:17/42 19:39 08:02-08:28/26	06:52 18:49-19:13/24 20:11	06:13 19:14-20:14/60 20:43	05:58 19:34-20:21/47 21:06
17	07:55 16:13-16:49/36 08:53-09:25/32 17:29 09:28-10:49/81	07:25 16:07-17:21/74 18:07	07:41 18:36-19:18/42 19:40 08:00-08:28/28	06:50 18:50-19:10/20 20:12 19:34-19:38/4	06:12 19:14-20:14/60 20:44	05:58 19:34-20:21/47 21:07
18	07:54 16:12-16:50/38 08:15-08:22/7 17:30 09:28-10:48/80 08:54-09:24/30	07:23 16:08-17:21/73 18:08	07:40 18:38-19:20/42 19:41 07:59-08:29/30	06:49 18:54-19:06/12 19:28-19:45/17 20:13 07:08-07:17/9	06:11 19:16-20:16/60 20:45	05:58 19:34-20:21/47 21:07
19	07:54 16:12-16:52/40 08:15-08:25/10 17:31 09:30-10:49/79 08:55-09:23/28	07:22 16:09-17:21/72 18:10	07:38 18:39-19:20/41 19:42 07:58-08:28/30	06:47 07:06-07:19/13 20:14 19:24-19:47/23	06:10 19:16-20:16/60 20:46	05:58 19:34-20:21/47 21:07
20	07:53 16:11-16:53/42 08:14-08:27/13 17:32 09:30-10:48/78 08:57-09:22/25	07:21 16:09-17:20/71 18:11	07:36 18:42-19:19/37 19:43 07:57-08:27/30	06:46 07:05-07:21/16 20:15 19:22-19:49/27	06:09 19:17-20:16/59 20:47	05:58 19:35-20:22/47 21:08
21	07:52 16:10-16:54/44 08:14-08:29/15 17:34 09:30-10:48/78 08:58-09:21/23	07:19 16:11-17:20/69 18:12	07:35 18:47-19:18/31 19:44 07:58-08:27/29	06:44 07:03-07:21/18 20:16 19:20-19:50/30	06:08 19:18-20:16/58 20:48	05:58 19:36-20:22/46 21:08
22	07:52 16:10-16:56/46 08:13-08:30/17 17:35 09:32-10:48/76 09:01-09:20/19	07:18 16:11-17:19/68 18:13	07:33 18:48-19:19/31 19:45 07:58-08:26/28	06:43 07:02-07:22/20 20:17 19:19-19:52/33	06:07 19:19-20:16/57 20:48	05:59 19:35-20:22/47 21:08
23	07:51 16:09-16:57/48 08:12-08:31/19 17:36 09:32-10:48/76 09:03-09:17/14	07:16 16:13-17:19/66 18:14	07:31 18:49-19:21/32 19:46 07:58-08:25/27	06:41 07:01-07:23/22 20:18 19:17-19:52/35	06:07 19:21-20:17/56 20:49	05:59 19:35-20:22/47 21:08
24	07:50 16:08-16:58/50 08:11-08:32/21 17:37 09:33-10:47/74 09:07-09:13/6	07:15 16:14-17:17/63 18:16	07:29 18:51-19:22/31 19:47 07:59-08:25/26	06:40 06:59-07:23/24 20:20 19:16-19:54/38	06:06 19:22-20:17/55 20:50	05:59 19:36-20:23/47 21:08
25	07:50 16:07-16:59/52 08:10-08:33/23 17:38 09:33-10:46/73	07:13 16:16-17:17/61 18:17	07:28 18:50-19:24/34 19:48 08:00-08:23/23	06:38 06:58-07:24/26 20:21 19:15-19:55/40	06:05 19:23-20:17/54 20:51	05:59 19:36-20:23/47 21:09
26	07:49 16:08-17:03/55 08:10-08:35/25 17:40 09:35-10:47/72	07:12 16:17-17:15/58 18:18	07:26 18:48-19:25/37 19:49 08:01-08:21/20	06:37 06:56-07:23/27 20:22 19:13-19:55/42	06:05 19:25-20:18/53 20:52	06:00 19:36-20:23/47 21:09
27	07:48 16:07-17:05/58 08:09-08:35/26 17:41 09:36-10:46/70	07:10 16:19-17:14/55 18:19	07:24 18:46-19:25/39 19:51 08:02-08:18/16	06:35 06:55-07:23/28 20:23 19:13-19:56/43	06:04 19:26-20:18/52 20:53	06:00 19:37-20:24/47 21:09
28	07:47 16:07-17:07/60 08:08-08:36/28 17:42 09:37-10:45/68	07:09 16:21-17:12/51 18:20	07:23 18:46-19:26/40 19:52 08:05-08:15/10	06:34 06:54-07:24/30 20:24 19:13-19:56/43	06:03 19:29-20:19/50 20:54	06:00 19:37-20:24/47 21:09
29	07:46 16:06-17:09/63 08:07-08:36/29 17:43 09:37-10:44/67		07:21 18:44-19:26/42 19:53	06:33 06:54-07:23/29 20:25 19:11-19:56/45	06:03 19:30-20:18/48 20:55	06:01 19:36-20:24/48 21:09
30	07:45 16:06-17:11/65 08:06-08:37/31 17:45 09:38-10:43/65		07:19 18:43-19:26/43 19:54	06:31 06:54-07:23/29 20:26 19:11-19:56/45	06:02 19:30-20:19/49 20:55	06:01 19:37-20:24/47 21:09
31	07:45 16:06-17:12/66 08:05-08:37/32 17:46 09:39-10:42/63		07:18 18:43-19:27/44 19:55		06:02 19:30-20:19/49 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	4439	2731	1622	1414	1878	1423

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T21 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (440)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:37-20:24/47 21:09	06:26 19:22-20:21/59 20:50	06:57 18:42-19:20/38 20:07	07:27 18:13-18:52/39 19:15 07:47-08:05/18	07:02 15:34-16:50/76 07:39-08:03/24 17:28 09:29-09:48/19	07:37 16:03-16:19/16 17:03 08:30-10:31/121
2	06:02 19:37-20:25/48 21:09	06:27 19:22-20:20/58 20:49	06:58 18:41-19:21/40 20:06	07:29 18:12-18:50/38 19:13 07:48-08:03/15	07:03 15:35-16:50/75 07:39-08:05/26 17:27 09:26-09:53/27	07:38 16:07-16:16/9 17:03 08:29-10:31/122
3	06:03 19:37-20:25/48 21:08	06:28 19:21-20:19/58 20:48 07:15-07:20/5	06:59 18:40-19:21/41 20:04	07:30 18:12-18:49/37 19:11 07:49-08:00/11	07:04 15:34-16:49/75 07:38-08:05/27 17:25 09:22-09:57/35	07:39 08:29-10:32/123 17:03
4	06:03 19:38-20:25/47 21:08	06:29 19:21-20:18/57 20:47 07:12-07:24/12	07:00 18:39-19:21/42 20:02	07:31 18:12-18:47/35 19:10 07:53-07:55/2	07:06 15:34-16:49/75 07:37-08:06/29 17:24 09:20-09:59/39	07:40 08:30-10:32/122 17:03
5	06:04 19:37-20:25/48 21:08	06:30 19:21-20:16/55 20:46 07:10-07:26/16	07:01 18:38-19:21/43 20:01	07:32 18:12-18:46/34 19:08	07:07 15:35-16:49/74 07:37-08:07/30 17:23 09:18-10:03/45	07:41 08:30-10:33/123 17:02
6	06:05 19:38-20:26/48 21:08	06:31 19:20-20:14/54 20:45 07:08-07:27/19	07:02 18:37-19:21/44 19:57	07:33 18:12-18:44/32 19:06	07:08 15:35-16:48/73 07:37-08:07/30 17:22 09:16-10:05/49	07:42 08:30-10:33/123 17:02
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8	06:06 19:38-20:26/48 21:07	06:33 07:06-07:29/23 20:42 19:20-20:06/46	07:04 18:35-19:20/45 19:54	07:35 18:13-18:41/28 19:03	07:10 15:35-16:46/71 07:36-08:07/31 17:20 09:13-10:08/55	07:44 08:30-10:34/124 17:02
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10	06:07 19:38-20:27/49 21:07	06:35 07:04-07:30/26 20:40 19:19-20:05/46	07:06 18:35-19:19/44 19:51	07:37 17:20-17:38/18 19:00 18:14-18:37/23	07:13 15:36-16:44/68 07:36-08:08/32 17:18 09:11-10:12/61	07:46 08:30-10:35/125 17:02
11	06:08 19:38-20:26/48 21:06	06:36 07:04-07:31/27 20:38 19:19-20:05/46	07:07 18:34-19:19/45 19:49	07:38 17:16-17:41/25 18:16-18:35/19 18:58 17:06-17:14/8	07:14 15:36-16:43/67 07:36-08:08/32 17:17 09:10-10:13/63	07:47 08:31-10:35/124 17:02
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18	06:13 19:34-20:28/54 21:02	06:43 07:04-07:29/25 20:29 19:21-20:00/39	07:14 18:37-19:12/35 19:37 07:47-08:10/23	07:46 16:45-17:49/64 18:47	07:22 15:42-16:32/50 07:45-08:06/21 17:10 09:07-10:21/74 08:41-08:47/6	07:52 08:33-10:39/126 17:04
19	06:14 19:32-20:27/55 21:02	06:44 07:05-07:29/24 20:27 19:22-19:59/37	07:15 18:38-19:10/32 19:35 07:46-08:11/25	07:47 16:43-17:49/66 18:46	07:24 15:43-16:31/48 07:47-08:06/19 17:10 09:06-10:22/76 08:38-08:52/14	07:52 08:34-10:40/126 17:04
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24	06:18 19:27-20:27/60 20:58	06:49 07:10-07:22/12 20:20 19:28-19:50/22	07:20 18:24-19:03/39 19:27 07:41-08:11/30	07:53 16:37-17:51/74 18:38	07:29 15:50-16:28/38 07:53-08:00/7 17:06 09:06-10:26/80 08:32-09:02/30	07:55 08:36-10:42/126 17:07
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Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1645	1751	1590	1857	4518	3884

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T22 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (441)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:48-10:05/77	07:43 16:48-17:23/35	07:07 17:10-18:00/50	07:16 07:46-08:25/39	06:30 19:28-19:45/17 07:24-07:41/17	06:01 06:25-07:05/40
	17:13 16:30-16:46/16	17:47 08:06-08:44/38	18:21 07:50-08:22/32	19:56 18:48-19:34/46	20:27 19:57-20:05/8	20:57
2	07:57 08:49-10:05/76	07:42 16:49-17:24/35	07:06 17:11-18:01/50	07:14 07:46-08:24/38	06:29 19:29-19:42/13 07:26-07:36/10	06:01 06:25-07:04/39
	17:13 16:30-16:47/17	17:48 08:07-08:44/37	18:23 07:51-08:20/29	19:57 18:49-19:35/46	20:28 19:55-20:05/10	20:58
3	07:58 08:49-10:05/76	07:41 16:49-17:26/37	07:04 17:11-18:01/50	07:13 07:47-08:24/37	06:27 19:32-19:39/7	06:00 06:25-07:05/40
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4	07:58 08:50-10:05/75	07:40 16:50-17:27/37	07:02 17:12-18:03/51 07:32-07:33/1	07:11 07:47-08:23/36 07:38-07:40/2	06:26 19:53-20:08/15	06:00 06:26-07:05/39
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	17:34 16:38-17:08/30	18:12 07:47-08:28/41	19:44 07:55-08:48/53	20:16 07:14-07:53/39	20:47 19:55-20:20/25	21:08
22	07:52 09:06-09:56/50 08:13-08:44/31	07:18 17:02-17:49/47	07:33 18:35-19:24/49	06:43 19:17-19:53/36	06:07 06:28-07:05/37	05:58 06:30-07:04/34
	17:35 16:39-17:10/31	18:13 07:46-08:27/41	19:45 07:53-08:47/54	20:17 07:15-07:53/38	20:48 19:56-20:19/23	21:08
23	07:51 09:36-09:53/17 08:12-08:44/32	07:16 17:03-17:50/47	07:31 18:37-19:25/48	06:41 19:18-19:52/34	06:07 06:28-07:06/38	05:59 06:30-07:04/34
	17:36 16:40-17:11/31 09:07-09:34/27	18:14 07:47-08:27/40	19:46 07:51-08:45/54	20:18 07:15-07:51/36	20:49 19:58-20:20/22	21:08
24	07:50 09:41-09:48/7 08:11-08:45/34	07:15 17:04-17:50/46	07:29 18:37-19:25/48	06:40 19:20-19:52/32	06:06 06:27-07:05/38	05:59 06:31-07:05/34
	17:37 16:41-17:12/31 09:09-09:32/23	18:16 07:47-08:26/39	19:47 07:50-08:44/54	20:19 07:16-07:51/35	20:50 19:58-20:19/21	21:08
25	07:50 16:41-17:13/32 09:11-09:30/19	07:13 17:05-17:51/46	07:28 18:39-19:27/48	06:38 19:22-19:52/30	06:05 06:26-07:05/39	05:59 06:31-07:05/34
	17:38 08:10-08:45/35	18:17 07:47-08:26/39	19:48 07:49-08:43/54	20:21 07:16-07:50/34	20:51 19:59-20:18/19	21:08
26	07:49 16:42-17:14/32 09:15-09:28/13	07:12 17:06-17:51/45	07:26 18:40-19:28/48	06:37 19:22-19:51/29	06:04 06:26-07:06/40	06:00 06:31-07:05/34
	17:40 08:10-08:46/36	18:18 07:47-08:25/38	19:49 07:48-08:41/53	20:22 07:17-07:49/32	20:52 20:00-20:18/18	21:09
27	07:48 16:44-17:16/32	07:10 17:08-17:55/47	07:24 18:41-19:29/48	06:35 19:23-19:50/27	06:04 06:25-07:05/40	06:00 06:32-07:06/34
	17:41 08:09-08:46/37	18:19 07:48-08:24/36	19:50 07:47-08:39/52	20:23 07:18-07:48/30	20:53 20:00-20:17/17	21:09
28	07:47 16:45-17:18/33	07:09 17:08-17:57/49	07:23 07:48-08:37/49	06:34 19:23-19:49/26	06:03 06:25-07:06/41	06:00 06:31-07:06/35
	17:42 08:08-08:46/38	18:20 07:49-08:23/34	19:52 18:43-19:30/47	20:24 07:19-07:47/28	20:54 20:02-20:17/15	21:09
29	07:46 16:45-17:19/34		07:21 07:47-08:34/47	06:33 19:24-19:48/24	06:03 06:25-07:05/40	06:01 06:31-07:06/35
	17:43 08:07-08:45/38		19:53 18:44-19:31/47	20:25 07:20-07:44/24	20:55 20:03-20:16/13	21:09
30	07:45 16:46-17:20/34		07:19 07:46-08:30/44	06:31 19:26-19:47/21 07:22-07:43/21	06:02 06:25-07:05/40	06:01 06:32-07:07/35
	17:45 08:06-08:45/39		19:54 18:45-19:32/47	20:26 20:00-20:04/4	20:55 20:05-20:15/10	21:09
31	07:44 16:47-17:22/35		07:18 07:47-08:26/39		06:02 06:25-07:05/40	
	17:46 08:06-08:45/39		19:55 18:47-19:34/47		20:56 20:06-20:13/7	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3098	2307	2830	2325	1500	1069

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T22 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (441)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:31-07:07/36 21:09	06:26 06:48-07:12/24 20:50 20:00-20:26/26	06:57 19:00-19:44/44 07:18-07:54/36 20:07 07:57-08:07/10	07:27 18:04-18:52/48 19:15 07:50-08:29/39	07:02 16:18-17:04/46 17:28 07:23-07:58/35	07:37 08:37-09:48/71 16:15-16:39/24 17:03 08:01-08:17/16
2	06:02 06:32-07:08/36 21:08	06:27 06:49-07:11/22 20:49 20:00-20:25/25	06:58 18:58-19:42/44 20:05 07:19-08:10/51	07:28 17:59-18:50/51 19:13 07:50-08:28/38	07:03 16:19-17:03/44 17:26 07:26-08:01/35	07:38 08:37-09:48/71 16:15-16:38/23 17:03 08:02-08:17/15
3	06:03 06:32-07:08/36 21:08	06:28 06:50-07:10/20 20:48 20:00-20:24/24	06:59 18:57-19:41/44 20:04 07:20-08:13/53	07:29 17:56-18:49/53 19:11 07:51-08:26/35	07:04 16:18-17:02/44 17:25 07:28-08:02/34	07:39 08:37-09:49/72 16:16-16:38/22 17:03 08:03-08:16/13
4	06:03 06:32-07:09/37 21:08	06:29 06:51-07:09/18 20:47 20:00-20:23/23	07:00 18:55-19:38/43 20:02 07:21-08:14/53	07:31 17:54-18:47/53 19:10 07:51-08:25/34	07:06 16:18-17:00/42 17:24 07:30-08:06/36	07:40 08:37-09:50/73 16:16-16:38/22 17:03 08:04-08:15/11
5	06:04 06:32-07:09/37 21:08	06:30 06:52-07:07/15 20:46 20:01-20:22/21	07:01 18:53-19:37/44 20:01 07:22-08:15/53	07:32 17:52-18:45/53 19:08 07:53-08:24/31	07:07 16:18-16:59/41 17:23 07:39-08:09/30	07:41 08:37-09:51/74 16:17-16:37/20 17:02 08:05-08:14/9
6	06:04 06:32-07:10/38 21:08	06:31 06:53-07:05/12 20:44 20:01-20:21/20	07:02 18:51-19:35/44 19:57 07:24-08:16/52	07:33 17:51-18:44/53 19:06 07:55-08:22/27	07:08 16:19-16:58/39 17:22 07:38-08:11/33	07:42 08:37-09:52/75 16:17-16:37/20 17:02 08:06-08:13/7
7	06:05 06:33-07:11/38 21:08	06:32 06:54-07:01/7 20:43 20:01-20:19/18	07:03 18:49-19:33/44 07:25-07:41/16 19:56 07:42-08:16/34	07:34 17:50-18:42/52 19:05 07:56-08:20/24	07:09 16:20-16:57/37 17:21 07:37-08:12/35	07:43 08:38-09:53/75 16:18-16:37/19 17:02 08:08-08:11/3
8	06:06 06:32-07:11/39 21:07	06:33 06:55-06:57/2 20:42 20:01-20:17/16	07:04 07:41-08:17/36 07:31-07:35/4 19:54 18:46-19:32/46	07:35 17:49-18:39/50 07:58-08:17/19 19:03 08:34-08:47/13	07:10 16:19-16:56/37 17:20 07:37-08:13/36	07:44 08:38-09:53/75 17:02 16:18-16:37/19
9	06:06 06:33-07:12/39 21:07	06:34 20:02-20:16/14 20:41	07:05 07:40-08:17/37 19:52 18:44-19:30/46	07:36 17:47-18:38/51 08:02-08:13/11 19:01 08:30-08:50/20	07:12 16:19-16:55/36 17:18 07:37-08:15/38	07:45 08:37-09:53/76 17:02 16:18-16:36/18
10	06:07 06:33-07:12/39 21:06	06:35 19:40-19:49/9 20:40 20:03-20:15/12	07:06 07:39-08:17/38 19:50 18:42-19:28/46	07:37 17:47-18:37/50 19:00 08:28-08:52/24	07:13 16:19-16:54/35 17:17 07:37-08:15/38	07:46 08:38-09:54/76 17:02 16:19-16:36/17
11	06:08 06:33-07:12/39 21:06	06:36 19:37-19:52/15 07:34-07:46/12 20:38 20:04-20:14/10	07:07 07:39-08:17/38 19:49 18:41-19:27/46	07:38 17:45-18:35/50 18:58 08:25-08:53/28	07:14 16:18-16:52/34 17:16 07:37-08:16/39	07:47 08:38-09:55/77 17:02 16:20-16:36/16
12	06:08 06:33-07:13/40 21:06 20:15-20:20/5	06:37 19:35-19:53/18 07:31-07:49/18 20:37 20:06-20:12/6	07:08 07:38-08:17/39 19:47 18:39-19:25/46	07:39 17:43-18:33/50 18:56 08:24-08:54/30	07:15 16:17-16:51/34 17:15 07:38-08:17/39	07:47 08:39-09:56/77 17:02 16:20-16:37/17
13	06:09 06:33-07:14/41 21:05 20:14-20:22/8	06:38 19:33-19:55/22 07:29-07:51/22 20:36 20:10-20:11/1	07:09 07:37-08:20/43 19:45 18:36-19:23/47	07:40 17:42-18:31/49 18:55 08:22-08:55/33	07:16 16:17-16:51/34 17:15 07:39-08:17/38	07:48 08:39-09:56/77 17:03 16:21-16:37/16
14	06:10 06:33-07:13/40 21:05 20:12-20:23/11	06:39 19:32-19:56/24 20:34 07:27-07:53/26	07:10 07:37-08:24/47 19:44 18:34-19:22/48	07:41 17:40-18:28/48 18:53 08:22-08:57/35	07:18 16:16-16:50/34 17:14 07:40-08:18/38	07:49 08:40-09:57/77 17:03 16:21-16:36/15
15	06:11 06:33-07:14/41 21:04 20:11-20:25/14	06:40 19:31-19:57/26 20:33 07:26-07:54/28	07:11 07:37-08:26/49 19:42 18:33-19:20/47	07:42 17:40-18:26/46 18:52 08:21-08:57/36	07:19 16:16-16:48/32 17:13 07:41-08:18/37	07:50 08:40-09:57/77 17:03 16:22-16:37/15
16	06:12 06:34-07:14/40 21:04 20:10-20:26/16	06:41 19:30-19:57/27 20:31 07:24-07:55/31	07:12 18:31-19:18/47 19:40 07:37-08:28/51	07:44 17:38-18:23/45 18:50 08:20-08:57/37	07:20 16:16-16:48/32 08:48-09:01/13 17:12 07:43-08:19/36	07:50 08:40-09:58/78 17:03 16:23-16:37/14
17	06:12 06:35-07:15/40 21:03 20:10-20:27/17	06:42 19:29-19:58/29 20:30 07:23-07:56/33	07:13 18:28-19:17/49 19:39 07:37-08:29/52	07:45 17:37-18:22/45 18:49 08:19-08:58/39	07:21 16:15-16:47/32 08:45-09:04/19 17:11 07:44-08:19/35	07:51 08:41-09:59/78 17:04 16:24-16:38/14
18	06:13 06:36-07:15/39 21:02 20:08-20:27/19	06:43 19:27-19:58/31 20:29 07:22-07:56/34	07:14 18:26-19:15/49 19:37 07:37-08:30/53	07:46 17:35-18:22/47 18:47 08:18-08:58/40	07:22 09:15-09:22/7 07:45-08:19/34 17:10 16:15-16:46/31 08:43-09:06/23	07:52 08:41-09:59/78 17:04 16:24-16:38/14
19	06:14 06:36-07:15/39 21:02 20:08-20:28/20	06:44 19:25-19:58/33 20:27 07:21-07:57/36	07:15 18:25-19:13/48 19:35 07:37-08:31/54	07:47 17:34-18:21/47 18:46 08:17-08:58/41	07:24 09:10-09:27/17 07:46-08:18/32 17:10 16:14-16:45/31 08:41-09:08/27	07:52 08:42-10:00/78 17:04 16:25-16:38/13
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21	06:16 06:38-07:15/37 21:00 20:07-20:30/23	06:46 19:21-19:58/37 20:24 07:20-07:58/38	07:17 18:22-19:10/48 19:32 07:38-08:32/54	07:49 17:29-18:19/50 18:43 08:18-08:58/40	07:26 08:40-09:33/53 07:49-08:19/30 17:08 16:14-16:44/30	07:53 08:43-10:01/78 17:05 16:26-16:39/13
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23	06:17 06:40-07:16/36 20:59 20:05-20:31/26	06:48 19:19-19:57/38 20:21 07:19-07:58/39	07:19 18:15-19:06/51 19:28 07:40-08:32/52	07:51 17:24-18:16/52 18:40 08:17-08:57/40	07:28 08:38-09:37/59 07:51-08:19/28 17:07 16:13-16:42/29	07:55 08:44-10:02/78 17:06 16:27-16:40/13
24	06:18 06:41-07:16/35 20:58 20:04-20:31/27	06:49 19:17-19:56/39 20:20 07:18-07:58/40	07:20 18:13-19:04/51 19:26 07:41-08:32/51	07:53 17:23-18:14/51 18:38 08:17-08:57/40	07:29 08:38-09:39/61 07:53-08:19/26 17:06 16:12-16:41/29	07:55 08:44-10:02/78 17:07 16:27-16:40/13
25	06:19 06:42-07:16/34 20:57 20:02-20:31/29	06:50 19:16-19:55/39 20:18 07:18-07:58/40	07:21 18:11-19:03/52 19:25 07:43-08:32/49	07:54 17:22-18:13/51 18:37 08:18-08:57/39	07:31 08:37-09:40/63 07:54-08:19/25 17:06 16:13-16:41/28	07:55 08:45-10:03/78 17:07 16:27-16:41/14
26	06:20 06:42-07:15/33 20:56 20:02-20:31/29	06:51 19:16-19:53/37 20:17 07:18-07:58/40	07:22 18:09-19:01/52 19:23 07:46-08:32/46	07:55 17:21-18:13/52 18:36 08:18-08:56/38	07:32 08:37-09:42/65 07:55-08:18/23 17:05 16:13-16:41/28	07:56 08:45-10:03/78 17:08 16:28-16:42/14
27	06:21 06:43-07:14/31 20:55 20:01-20:30/29	06:52 19:15-19:52/37 20:15 07:18-07:57/39	07:23 18:08-18:59/51 19:21 07:50-08:32/42	07:56 17:20-18:11/51 18:34 08:19-08:55/36	07:33 08:37-09:43/66 07:56-08:18/22 17:05 16:13-16:40/27	07:56 08:45-10:03/78 17:09 16:28-16:42/14
28	06:22 06:44-07:14/30 20:54 20:01-20:29/28	06:53 19:10-19:50/40 20:14 07:17-07:57/40	07:24 18:07-18:57/50 19:20 07:50-08:31/41	07:57 17:19-18:09/50 18:33 08:19-08:54/35	07:34 08:36-09:44/68 16:13-16:39/26 17:04 07:57-08:18/21	07:56 08:45-10:03/78 17:09 16:28-16:43/15
29	06:23 06:45-07:14/29 20:53 20:01-20:28/27	06:54 19:07-19:49/42 20:12 07:18-07:56/38	07:25 18:06-18:56/50 19:18 07:50-08:30/40	07:58 17:18-18:08/50 18:32 08:20-08:54/34	07:35 08:36-09:45/69 16:13-16:39/26 17:04 07:58-08:17/19	07:57 08:47-10:04/77 17:10 16:29-16:44/15
30	06:24 06:46-07:13/27 20:52 20:01-20:27/26	06:55 19:04-19:47/43 20:10 07:18-07:56/38	07:26 18:05-18:54/49 19:16 07:50-08:30/40	08:00 17:19-18:07/48 18:30 08:21-08:53/32	07:36 08:36-09:46/70 16:13-16:38/25 17:04 08:00-08:18/18	07:57 08:47-10:04/77 17:11 16:29-16:45/16
31	06:25 06:47-07:13/26 20:51 20:00-20:27/27	06:56 19:02-19:46/44 20:09 07:18-07:55/37		08:01 17:18-18:06/48 18:29 08:22-08:56/34		07:57 08:48-10:04/76 17:12 16:29-16:45/16
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1552	1744	2846	2627	2740	2948

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T23 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (442)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:44-09:14/30 17:13 14:42-16:21/99	07:44 15:19-16:41/82 17:47 17:12-17:23/11	07:07 07:44-08:47/63 18:22 15:49-16:19/30	07:16 08:38-09:30/52 19:56	06:30 06:50-07:46/56 20:27 19:15-19:55/40	06:01 06:23-07:23/60 19:06-20:05/59 20:57 20:22-20:25/3
2	07:57 08:45-09:14/29 17:14 14:43-16:22/99	07:43 15:19-16:42/83 17:49 17:12-17:24/12	07:06 07:42-08:48/66 18:23 15:53-16:15/22	07:14 08:39-09:27/48 19:57	06:29 06:49-07:45/56 20:28 19:12-19:56/44	06:01 06:22-07:22/60 19:06-20:05/59 20:58 20:18-20:28/10
3	07:58 08:45-09:14/29 17:14 14:44-16:22/98	07:42 15:20-16:42/82 17:50 17:11-17:26/15	07:04 07:40-08:48/68 18:24 16:01-16:06/5	07:13 08:41-09:26/45 19:58	06:27 06:47-07:43/56 20:29 19:11-19:57/46	06:00 06:22-07:21/59 19:07-20:05/58 20:59 20:16-20:30/14
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Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3056	2715	2521	1544	3450	4292

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T23 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (442)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:24-07:25/61 19:13-20:10/57	06:26 06:50-07:42/52	06:57 07:18-07:53/35	07:27 08:13-09:29/76	07:02 14:51-16:11/80	07:37 08:37-08:54/17
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2	06:02 06:25-07:26/61 19:14-20:10/56	06:27 06:52-07:43/51	06:58 07:19-07:52/33	07:29 08:13-09:28/75	07:03 14:52-16:12/80	07:38 08:36-08:56/20
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23	06:18 06:40-07:37/57	06:48 07:09-07:57/48	07:19 08:17-09:30/73	07:51 08:36-08:57/21	07:28 14:55-16:11/76	07:55 08:39-09:11/32
	20:59 19:14-20:15/61	20:21	19:28 07:39-08:03/24	18:40 15:59-17:07/68	17:07	17:06 14:36-16:15/99
24	06:19 06:43-07:38/55	06:49 07:10-07:57/47	07:20 08:16-09:30/74	07:53 08:43-08:48/5	07:29 14:56-16:12/76	07:55 08:39-09:11/32
	20:58 19:14-20:15/61	20:20	19:27 07:40-08:03/23	18:38 15:58-17:07/69	17:06	17:07 14:37-16:15/98
25	06:19 06:44-07:38/54	06:50 07:11-07:57/46	07:21 08:15-09:30/75	07:54 15:57-17:09/72	07:31 14:45-16:12/87	07:55 08:40-09:12/32
	20:57 19:15-20:15/60	20:18	19:25 07:41-08:02/21	18:37	17:06	17:07 14:37-16:15/98
26	06:20 06:45-07:38/53	06:51 07:12-07:57/45	07:22 08:15-09:30/75	07:55 15:56-17:09/73	07:32 14:42-16:12/90	07:56 08:40-09:12/32
	20:56 19:14-20:14/60	20:17	19:23 07:42-08:01/19	18:36 17:47-17:57/10	17:05	17:08 14:38-16:17/99
27	06:21 06:45-07:38/53	06:52 07:13-07:57/44	07:23 08:14-09:30/76	07:56 15:55-17:09/74	07:33 14:40-16:11/91	07:56 08:40-09:12/32
	20:55 19:14-20:14/60	20:15	19:21 07:43-08:00/17	18:34 17:44-17:59/15	17:05	17:09 14:38-16:17/99
28	06:22 06:46-07:38/52	06:53 07:14-07:56/42	07:24 08:14-09:30/76	07:57 15:54-17:09/75	07:34 08:42-08:45/3	07:56 08:41-09:12/31
	20:54 19:14-20:14/60	20:14	19:20 07:44-07:59/15	18:33 17:42-18:00/18	17:05 14:38-16:11/93	17:09 14:39-16:17/98
29	06:23 06:47-07:38/51	06:54 07:15-07:56/41	07:25 08:14-09:30/76	07:58 15:54-17:10/76	07:35 08:38-08:49/11	07:57 08:42-09:13/31
	20:53 19:15-20:14/59	20:12	19:18 07:45-07:57/12	18:32 17:42-18:02/20	17:04 14:37-16:11/94	17:10 14:40-16:19/99
30	06:24 06:48-07:39/51	06:55 07:16-07:55/39	07:26 08:13-09:29/76	08:00 15:53-17:11/78	07:36 08:38-08:52/14	07:57 08:43-09:14/31
	20:52 19:15-20:14/59	20:10	19:16 07:46-07:55/9	18:30 17:41-18:02/21	17:04 14:36-16:11/95	17:11 14:41-16:19/98
31	06:25 06:49-07:40/51	06:56 07:17-07:54/37		08:01 15:52-17:11/79		07:57 08:43-09:14/31
	20:51 19:15-20:13/58	20:09		18:29 17:40-18:03/23		17:12 14:41-16:20/99
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	3839	2290	2089	2710	2703	3953

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T24 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (443)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:23-10:11/108	07:44 08:04-09:20/76	07:07 07:27-08:11/44	07:16	06:30 07:12-08:22/70	06:01 06:37-08:12/95
	17:13 15:16-15:42/26	17:47 17:04-17:23/19	18:22 17:37-18:00/23	19:56	20:27	20:57
2	07:58 08:23-10:11/108	07:43 08:03-09:18/75	07:06 07:26-08:07/41	07:15	06:29 07:12-08:23/71	06:01 06:37-08:12/95
	17:14 15:17-15:41/24	17:49 17:04-17:24/20	18:23 17:36-18:00/24	19:57	20:28	20:58
3	07:58 08:23-10:10/107	07:42 08:02-09:15/73	07:04 07:26-08:05/39	07:13	06:28 07:11-08:22/71	06:01 06:37-08:11/94
	17:15 15:18-15:41/23	17:50 17:04-17:26/22	18:24 17:37-18:00/23	19:58	20:29	20:59
4	07:58 08:23-10:10/107	07:41 08:01-09:12/71	07:03 07:26-08:01/35	07:11	06:26 07:11-08:22/71	06:00 06:37-08:11/94
	17:16 15:19-15:41/22	17:51 17:05-17:27/22	18:25 17:37-17:58/21	19:59	20:30	20:59
5	07:58 08:23-10:10/107	07:40 08:00-09:10/70	07:01 07:27-07:59/32	07:10 19:28-19:39/11	06:25 07:11-08:22/71	06:00 06:37-08:11/94
	17:16 15:21-15:40/19	17:53 17:05-17:29/24	18:26 17:38-17:57/19	20:00	20:31	21:00
6	07:58 08:23-10:09/106	07:39 07:59-09:08/69	07:00 07:27-07:55/28	07:08 19:24-19:40/16	06:24 07:11-08:22/71	05:59 06:37-08:10/93
	17:17 15:23-15:39/16	17:54 17:05-17:30/25	18:28 17:40-17:56/16	20:00	20:33	21:01
7	07:58 08:24-10:09/105	07:37 07:58-09:05/67	06:58 07:28-07:50/22	07:06 19:21-19:40/19	06:23 07:11-08:22/71	05:59 06:37-08:10/93
	17:18 15:26-15:38/12	17:55 17:05-17:31/26	18:29 17:41-17:53/12	20:02	20:34	21:01
8	07:58 08:24-10:09/105	07:36 07:56-09:02/66	07:56 08:30-08:48/18	07:05 19:20-19:42/22	06:22 06:59-08:22/83	05:59 06:37-08:10/93
	17:19 15:30-15:35/5	17:56 17:06-17:32/26	19:30	20:03	20:35	21:02
9	07:57 08:23-10:08/105	07:35 07:55-09:01/66	07:55 08:32-08:44/12	07:03 19:18-19:43/25	06:20 06:55-08:22/87	05:59 06:38-08:10/92
	17:20	17:58 17:07-17:34/27	19:31	20:04	20:36	21:03
10	07:57 08:23-10:09/106	07:34 07:54-08:59/65	07:53	07:01 07:45-07:59/14	06:19 06:53-08:21/88	05:59 06:38-08:10/92
	17:21	17:59 17:08-17:36/28	19:32	20:05 19:16-19:43/27	20:37	21:03
11	07:57 08:23-10:09/106	07:33 07:53-08:55/62	07:51	07:00 07:40-08:04/24	06:18 06:50-08:20/90	05:58 06:38-08:10/92
	17:23	18:00 17:10-17:37/27	19:33	20:06 19:16-19:45/29	20:38	21:04
12	07:57 08:21-10:08/107	07:31 07:51-08:48/57	07:50	06:58 07:36-08:07/31	06:17 06:48-08:20/92	05:58 06:38-08:09/91
	17:24	18:01 17:12-17:38/26	19:34	20:07 19:15-19:46/31	20:39	21:04
13	07:56 08:20-10:08/108	07:30 07:50-08:46/56	07:48	06:57 07:33-08:10/37	06:16 06:47-08:20/93	05:58 06:38-08:09/91
	17:25	18:03 17:17-17:39/22	19:35	20:08 19:15-19:47/32	20:40	21:05
14	07:56 08:19-10:08/109	07:29 07:49-08:45/56	07:46	06:55 07:30-08:12/42	06:15 06:45-08:19/94	05:58 06:38-08:09/91
	17:26	18:04 17:18-17:41/23	19:37	20:09 19:14-19:46/32	20:41	21:05
15	07:56 08:18-10:08/110	07:28 07:47-08:41/54	07:45	06:53 07:29-08:14/45	06:14 06:45-08:20/95	05:58 06:38-08:09/91
	17:27	18:05 17:18-17:40/22	19:38	20:10 19:14-19:47/33	20:42	21:06
16	07:55 08:18-10:08/110	07:26 07:46-08:37/51	07:43	06:52 07:26-08:15/49	06:13 06:44-08:19/95	05:58 06:38-08:09/91
	17:28	18:06 17:18-17:40/22	19:39	20:11 19:13-19:46/33	20:43	21:06
17	07:55 08:17-10:07/110	07:25 07:45-08:36/51	07:41	06:50 07:25-08:17/52	06:12 06:43-08:19/96	05:58 06:39-08:10/91
	17:29	18:07 17:20-17:40/20	19:40	20:12 19:13-19:45/32	20:44	21:07
18	07:54 08:17-10:07/110	07:24 07:43-08:34/51	07:40	06:49 07:23-08:17/54	06:11 06:42-08:18/96	05:58 06:39-08:10/91
	17:30	18:09 17:20-17:38/18	19:41	20:13 19:13-19:45/32	20:45	21:07
19	07:54 08:16-10:06/110	07:22 07:42-08:32/50	07:38	06:47 07:22-08:19/57	06:10 06:41-08:18/97	05:58 06:40-08:10/90
	17:32	18:10 17:22-17:37/15	19:42	20:14 19:13-19:44/31	20:46	21:07
20	07:53 08:15-10:05/110	07:21 07:40-08:30/50	07:36	06:46 07:20-08:19/59	06:09 06:40-08:17/97	05:58 06:40-08:10/90
	17:33	18:11 17:23-17:34/11	19:43	20:15 19:14-19:44/30	20:47	21:08
21	07:53 08:15-10:04/109	07:19 07:39-08:30/51	07:35	06:44 07:19-08:20/61	06:09 06:40-08:17/97	05:59 06:40-08:09/89
	17:34	18:12 17:44-17:50/6	19:44	20:17 19:14-19:44/30	20:48	21:08
22	07:52 08:15-10:03/108	07:18 07:38-08:29/51	07:33	06:43 07:18-08:20/62	06:08 06:40-08:17/97	05:59 06:40-08:09/89
	17:35	18:14 17:41-17:51/10	19:45	20:18 19:15-19:42/27	20:49	21:08
23	07:51 08:13-10:01/108	07:16 07:36-08:27/51	07:31	06:41 07:17-08:21/64	06:07 06:39-08:16/97	05:59 06:41-08:11/90
	17:36	18:15 17:40-17:52/12	19:46	20:19 19:16-19:41/25	20:50	21:08
24	07:51 08:11-10:00/109	07:15 07:35-08:26/51	07:30	06:40 07:16-08:21/65	06:06 06:38-08:15/97	05:59 06:40-08:11/91
	17:38	18:16 17:38-17:53/15	19:48	20:20 19:16-19:39/23	20:50	21:09
25	07:50 17:10-17:14/4	07:13 07:33-08:24/51	07:28	06:38 07:15-08:22/67	06:05 06:38-08:15/97	06:00 06:40-08:11/91
	17:39 08:11-09:59/108	18:17 17:38-17:55/17	19:49	20:21 19:18-19:38/20	20:51	21:09
26	07:49 17:08-17:15/7 09:35-09:56/21	07:12 07:32-08:21/49	07:26	06:37 07:15-08:22/67	06:05 06:38-08:15/97	06:00 06:41-08:12/91
	17:40 08:10-09:34/84	18:18 17:37-17:56/19	19:50	20:22 19:19-19:35/16	20:52	21:09
27	07:48 08:09-09:32/83 09:39-09:52/13	07:10 07:30-08:17/47	07:25	06:36 07:14-08:22/68	06:04 06:38-08:15/97	06:00 06:41-08:12/91
	17:41 17:07-17:17/10	18:19 17:37-17:58/21	19:51	20:23 19:23-19:32/9	20:53	21:09
28	07:47 08:08-09:30/82	07:09 07:28-08:13/45	07:23	06:34 07:13-08:22/69	06:04 06:38-08:14/96	06:01 06:41-08:12/91
	17:42 17:06-17:18/12	18:21 17:36-17:58/22	19:52	20:24	20:54	21:09
29	07:46 08:07-09:27/80		07:21	06:33 07:13-08:23/70	06:03 06:37-08:13/96	06:01 06:42-08:13/91
	17:44 17:05-17:19/14		19:53	20:25	20:55	21:09
30	07:46 08:06-09:24/78		07:20	06:32 07:12-08:22/70	06:02 06:37-08:13/96	06:02 06:42-08:13/91
	17:45 17:05-17:20/15		19:54	20:26	20:56	21:09
31	07:45 08:05-09:21/76		07:18		06:02 06:38-08:13/95	
	17:46 17:05-17:22/17		19:55		20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3439	2199	409	1712	2761	2749

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T24 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (443)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:42-08:14/92 21:09	06:26 06:59-08:31/92 20:50	06:57 07:39-08:03/24 20:07 19:15-19:44/29	07:28 19:15	07:02 07:24-08:29/65 17:28 16:38-17:05/27	07:37 08:05-09:51/106 17:04
2	06:03 06:42-08:14/92 21:09	06:27 07:01-08:31/90 20:49	06:58 07:44-07:57/13 20:06 19:15-19:42/27	07:29 19:13	07:03 07:25-08:31/66 17:27 16:37-17:04/27	07:38 08:06-09:52/106 17:03
3	06:03 06:43-08:15/92 21:09	06:28 07:03-08:31/88 20:48	06:59 19:16-19:41/25 20:04	07:30 19:12	07:05 07:26-08:33/67 17:26 16:36-17:02/26	07:39 08:07-09:52/105 17:03
4	06:04 06:43-08:15/92 21:08	06:29 07:06-08:31/85 20:47	07:00 19:17-19:39/22 20:02	07:31 08:11-08:20/9 19:10	07:06 07:27-08:34/67 17:24 16:35-17:00/25	07:40 08:08-09:53/105 17:03 15:14-15:19/5
5	06:04 06:43-08:16/93 21:08	06:30 07:11-08:31/80 20:46	07:01 19:18-19:38/20 20:01	07:32 08:07-08:22/15 19:08	07:07 07:29-08:38/69 17:23 16:35-17:00/25	07:41 08:09-09:54/105 17:03 15:11-15:23/12
6	06:05 06:43-08:16/93 21:08	06:31 07:21-08:32/71 20:45	07:02 19:20-19:36/16 19:57	07:33 08:05-08:26/21 19:07 18:20-18:28/8	07:08 07:30-08:41/71 17:22 16:35-16:58/23	07:42 08:09-09:55/106 17:03 15:09-15:25/16
7	06:05 06:44-08:17/93 21:08	06:32 07:21-08:32/71 20:44	07:03 19:23-19:34/11 19:56	07:34 08:04-08:28/24 19:05 18:16-18:31/15	07:09 07:31-08:42/71 17:21 16:34-16:57/23	07:43 08:10-09:57/107 17:03 15:08-15:27/19
8	06:06 06:44-08:18/94 21:07	06:33 07:21-08:32/71 20:42	07:04 19:54	07:35 08:02-08:32/30 19:03 18:14-18:32/18	07:11 07:33-08:46/73 17:20 16:34-16:56/22	07:44 08:11-09:58/107 17:03 15:08-15:29/21
9	06:07 06:44-08:18/94 21:07	06:34 07:21-08:31/70 20:41	07:05 19:52	07:36 08:01-08:34/33 19:02 18:13-18:33/20	07:12 07:34-08:49/75 17:19 16:35-16:55/20	07:45 08:12-09:59/107 17:03 15:07-15:30/23
10	06:07 06:45-08:19/94 21:07	06:35 07:21-08:31/70 20:40	07:06 19:51	07:37 08:00-08:36/36 19:00 18:11-18:33/22	07:13 07:35-08:51/76 17:18 16:35-16:54/19	07:46 08:13-10:01/108 17:03 15:07-15:31/24
11	06:08 06:45-08:20/95 21:06	06:36 07:21-08:31/70 20:38	07:07 19:49	07:38 08:00-08:40/40 18:58 18:10-18:33/23	07:14 07:36-08:52/76 17:17 16:35-16:53/18	07:47 08:13-10:01/108 17:03 15:06-15:32/26
12	06:09 06:45-08:20/95 21:06	06:37 07:21-08:31/70 20:37	07:08 19:47	07:39 08:00-08:43/43 18:57 18:09-18:33/24	07:15 07:38-08:56/78 17:16 16:37-16:52/15	07:48 08:14-10:02/108 17:03 15:06-15:33/27
13	06:10 06:45-08:21/96 21:05	06:38 07:21-08:31/70 20:36	07:09 19:46	07:40 08:01-08:45/44 18:55 18:10-18:33/23	07:17 07:39-09:00/81 17:15 16:37-16:51/14	07:48 08:15-10:05/110 17:03 15:06-15:34/28
14	06:10 06:46-08:22/96 21:05	06:39 07:21-08:30/69 20:34	07:10 19:44	07:42 08:02-08:48/46 18:54 18:10-18:31/21	07:18 07:40-09:02/82 17:14 16:38-16:50/12	07:49 08:16-10:07/111 17:03 15:06-15:35/29
15	06:11 06:47-08:23/96 21:04	06:40 07:21-08:30/69 20:33	07:11 19:42	07:43 08:03-08:51/48 18:52 18:09-18:29/20	07:19 07:42-09:05/83 09:12-09:25/13 17:13 16:40-16:49/9	07:50 08:16-10:08/112 17:03 15:05-15:35/30
16	06:12 06:46-08:23/97 21:04	06:41 07:22-08:29/67 20:32 19:29-19:41/12	07:12 19:41	07:44 08:04-08:54/50 18:51 18:09-18:28/19	07:20 16:41-16:48/7 09:08-09:29/21 17:12 07:43-09:07/84	07:51 08:17-10:10/113 17:04 15:06-15:36/30
17	06:13 06:47-08:24/97 21:03	06:42 07:22-08:29/67 20:30 19:26-19:42/16	07:13 19:39	07:45 08:05-08:56/51 18:49 18:10-18:26/16	07:21 16:43-16:47/4 17:11 07:44-09:32/108	07:51 08:18-10:11/113 17:04 15:06-15:37/31
18	06:14 06:48-08:25/97 21:03	06:43 07:22-08:28/66 20:29 19:23-19:44/21	07:14 19:37	07:46 08:06-08:57/51 18:47 18:10-18:24/14	07:23 07:45-09:34/109 17:11	07:52 08:18-10:11/113 17:04 15:06-15:37/31
19	06:14 06:48-08:25/97 21:02	06:44 07:22-08:26/64 20:27 19:22-19:45/23	07:15 19:35	07:47 08:08-08:59/51 18:46 18:11-18:23/12	07:24 07:48-09:36/108 17:10	07:53 08:19-10:13/114 17:05 15:07-15:38/31
20	06:15 06:49-08:26/97 21:01	06:45 07:22-08:26/64 20:26 19:20-19:46/26	07:16 19:34	07:48 08:09-09:00/51 18:44 18:13-18:22/9	07:25 07:50-09:38/108 17:09	07:53 08:20-10:14/114 17:05 15:08-15:39/31
21	06:16 06:49-08:26/97 21:00	06:46 07:23-08:25/62 20:25 19:19-19:47/28	07:17 19:32	07:49 08:10-09:00/50 18:15-18:20/5 18:43 17:57-18:03/6	07:26 07:50-09:39/109 17:09	07:54 08:20-10:14/114 17:05 15:07-15:39/32
22	06:17 06:49-08:27/98 21:00	06:47 07:23-08:24/61 20:23 19:18-19:48/30	07:18 19:30	07:51 08:11-09:01/50 18:42 17:53-18:06/13	07:27 07:51-09:41/110 17:08	07:54 08:21-10:15/114 17:06 15:08-15:40/32
23	06:18 06:50-08:27/97 20:59	06:48 07:24-08:23/59 20:22 19:17-19:48/31	07:19 19:28	07:52 08:12-09:02/50 18:40 17:51-18:07/16	07:28 07:53-09:43/110 17:07	07:55 08:21-10:15/114 17:06 15:08-15:40/32
24	06:19 06:51-08:28/97 20:58	06:49 07:25-08:21/56 20:20 19:17-19:48/31	07:20 19:27	07:53 08:14-09:05/51 18:39 17:50-18:09/19	07:30 07:54-09:44/110 17:07	07:55 08:21-10:15/114 17:07 15:09-15:40/31
25	06:20 06:52-08:28/96 20:57	06:50 07:26-08:20/54 20:18 19:16-19:48/32	07:21 19:25	07:54 08:15-09:06/51 18:37 17:49-18:10/21	07:31 07:55-09:45/110 17:06	07:56 08:22-10:16/114 17:08 15:10-15:41/31
26	06:21 06:53-08:29/96 20:56	06:51 07:27-08:18/51 20:17 19:15-19:48/33	07:23 19:23	07:55 08:16-09:07/51 18:36 17:48-18:10/22	07:32 07:56-09:46/110 17:06	07:56 08:22-10:15/113 17:08 15:10-15:41/31
27	06:22 06:54-08:30/96 20:55	06:52 07:28-08:17/49 20:15 19:15-19:48/33	07:24 19:22	07:56 08:17-09:11/54 18:35 17:47-18:10/23	07:33 07:57-09:47/110 17:05	07:56 08:22-10:15/113 17:09 15:11-15:41/30
28	06:22 06:55-08:30/95 20:54	06:53 07:30-08:15/45 20:14 19:15-19:48/33	07:25 19:20	07:58 08:19-09:15/56 18:33 17:47-18:09/22	07:34 07:58-09:48/110 17:05	07:57 08:23-10:15/112 17:10 15:12-15:42/30
29	06:23 06:55-08:29/94 20:53	06:54 07:31-08:13/42 20:12 19:15-19:47/32	07:26 19:18	07:59 08:20-09:17/57 18:32 17:45-18:09/24	07:35 08:01-09:49/108 17:04	07:57 08:23-10:15/112 17:10 15:13-15:42/29
30	06:24 06:56-08:30/94 20:52	06:55 07:33-08:10/37 20:11 19:15-19:47/32	07:27 19:17	08:00 08:21-09:18/57 18:31 17:41-18:07/26	07:36 08:03-09:50/107 17:04	07:57 08:23-10:13/110 17:11 15:13-15:42/29
31	06:25 06:58-08:30/92 20:51	06:56 07:36-08:07/31 20:09 19:15-19:45/30	 	08:01 08:22-09:25/63 18:29 17:39-18:06/27	 	07:57 08:23-10:12/109 17:12 15:14-15:42/28
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2944	2454	187	1721	3061	4166

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T25 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (444)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:21-09:09/48 17:13 09:16-10:18/62	07:44 08:30-09:38/68 17:47	07:07 17:27-17:52/25 18:22 08:53-09:10/17	07:16 07:52-08:59/67 19:56	06:30 07:00-08:42/102 20:27 19:26-20:05/39	06:01 07:00-07:51/51 20:57 20:10-20:33/23
2	07:58 08:21-09:11/50 17:14 09:16-10:19/63	07:43 08:30-09:38/68 17:49	07:06 17:28-17:50/22 18:23	07:15 07:52-09:00/68 19:57	06:29 07:00-08:40/100 20:28 19:26-20:06/40	06:01 07:01-07:51/50 20:58 20:11-20:34/23
3	07:58 08:22-09:12/50 17:15 09:17-10:19/62	07:42 08:30-09:39/69 17:50	07:04 17:30-17:49/19 18:24	07:13 07:51-09:00/69 19:58	06:28 07:54-08:39/45 19:26-20:06/40 20:29 06:59-07:53/54	06:01 07:01-07:50/49 20:59 20:10-20:34/24
4	07:58 08:22-09:13/51 17:16 09:18-10:19/61	07:41 08:30-09:39/69 17:51	07:03 17:31-17:47/16 18:25	07:11 07:49-09:00/71 19:59	06:26 07:54-08:37/43 19:26-20:07/41 20:30 06:58-07:53/55	06:00 07:02-07:50/48 20:59 20:11-20:35/24
5	07:58 08:23-09:14/51 17:17 09:18-10:19/61	07:40 08:30-09:39/69 17:53	07:01 17:33-17:43/10 18:26	07:10 07:49-09:00/71 20:00	06:25 07:56-08:35/39 19:26-20:07/41 20:31 06:57-07:54/57	06:00 07:03-07:50/47 21:00 20:11-20:36/25
6	07:58 08:23-09:16/53 17:17 09:19-10:20/61	07:39 08:30-09:39/69 17:54	07:00 18:28	07:08 07:48-09:00/72 20:00	06:24 07:58-08:33/35 19:26-20:07/41 20:33 06:57-07:54/57	05:59 07:02-07:49/47 21:01 20:11-20:36/25
7	07:58 08:24-09:17/53 17:18 09:20-10:20/60	07:37 08:31-09:40/69 17:55	06:58 18:29	07:06 07:47-09:00/73 20:02	06:23 08:00-08:31/31 19:27-20:06/39 20:34 06:57-07:54/57	05:59 07:03-07:50/47 21:01 20:11-20:36/25
8	07:58 08:25-09:18/53 17:19 09:21-10:20/59	07:36 08:30-09:39/69 17:56	07:56 19:30	07:05 07:47-09:00/73 20:03	06:22 08:02-08:29/27 19:27-20:05/38 20:35 06:56-07:55/59	05:59 07:04-07:50/46 21:02 20:12-20:37/25
9	07:57 08:25-09:19/54 17:20 09:21-10:19/58	07:35 08:30-09:39/69 17:58	07:55 19:31	07:03 07:46-08:59/73 20:04	06:20 08:05-08:26/21 19:28-20:04/36 20:36 06:56-07:55/59	05:59 07:04-07:50/46 21:03 20:12-20:38/26
10	07:57 08:26-09:20/54 17:21 09:22-10:20/58	07:34 08:31-09:39/68 17:59	07:53 19:32	07:01 07:45-08:59/74 20:05	06:19 08:09-08:22/13 19:27-20:02/35 20:37 06:56-07:55/59	05:59 07:05-07:50/45 21:03 20:12-20:39/27
11	07:57 08:27-09:22/55 17:23 09:23-10:20/57	07:33 08:31-09:39/68 18:00	07:51 19:33	07:00 07:45-08:59/74 20:06	06:18 06:55-07:54/59 20:38 19:28-20:00/32	05:58 07:06-07:50/44 21:04 20:12-20:38/26
12	07:57 08:27-09:22/55 17:24 09:23-10:19/56	07:31 08:31-09:38/67 18:01	07:50 19:34	06:58 07:45-08:58/73 20:07	06:17 06:55-07:54/59 20:39 19:29-19:58/29	05:58 07:05-07:49/44 21:04 20:12-20:39/27
13	07:56 08:28-10:19/111 17:25	07:30 08:32-09:37/65 18:03	07:48 19:35	06:57 07:45-08:58/73 20:08	06:16 06:55-07:54/59 20:40 19:29-19:57/28	05:58 07:06-07:49/43 21:05 20:13-20:39/26
14	07:56 08:29-09:25/56 17:26 09:26-10:19/53	07:29 08:32-09:37/65 18:04	07:46 19:37	06:55 07:44-08:58/74 20:09	06:15 06:56-07:55/59 20:41 19:30-19:56/26	05:58 07:06-07:49/43 21:05 20:13-20:40/27
15	07:56 08:30-10:19/109 17:27	07:28 17:38-17:42/4 18:05 08:32-09:36/64	07:45 19:38	06:54 07:45-08:58/73 20:10	06:14 06:56-07:55/59 20:42 19:32-19:56/24	05:58 07:06-07:49/43 21:06 20:13-20:40/27
16	07:55 08:31-09:27/56 17:28 09:28-10:19/51	07:26 17:34-17:43/9 18:06 08:33-09:35/62	07:43 19:39	06:52 07:44-08:56/72 20:11	06:13 06:56-07:54/58 20:43 19:33-19:54/21	05:58 07:07-07:49/42 21:06 20:13-20:40/27
17	07:55 08:32-10:18/106 17:29	07:25 17:32-17:45/13 18:07 08:34-09:35/61	07:41 19:40	06:50 07:45-08:56/71 20:12	06:12 06:56-07:54/58 19:35-19:53/18 20:44 20:18-20:21/3	05:58 07:08-07:50/42 21:07 20:14-20:41/27
18	07:54 09:30-10:18/48 17:30 08:33-09:29/56	07:24 17:30-17:46/16 18:09 08:34-09:33/59	07:40 19:41	06:49 07:44-08:55/71 20:13	06:11 06:56-07:54/58 19:37-19:51/14 20:45 20:16-20:21/5	05:58 07:08-07:50/42 21:07 20:15-20:42/27
19	07:54 09:31-10:17/46 17:32 08:32-09:30/58	07:22 17:29-17:48/19 18:10 08:35-09:33/58	07:38 08:27-08:32/5 19:42	06:47 07:45-08:55/70 20:14	06:10 06:56-07:54/58 19:39-19:48/9 20:46 20:14-20:22/8	05:58 07:08-07:50/42 21:07 20:15-20:42/27
20	07:53 09:32-10:15/43 17:33 08:32-09:30/58	07:21 17:28-17:48/20 18:11 08:36-09:31/55	07:36 08:19-08:41/22 19:43	06:46 07:45-08:54/69 19:40-19:53/13 20:15 07:22-07:34/12	06:09 06:56-07:53/57 20:47 20:13-20:23/10	05:58 07:08-07:50/42 21:08 20:15-20:42/27
21	07:53 09:34-10:15/41 17:34 08:32-09:32/60	07:19 17:27-17:50/23 18:12 08:37-09:30/53	07:35 08:14-08:45/31 19:44	06:44 07:45-08:53/68 19:37-19:55/18 20:17 07:18-07:39/21	06:09 06:57-07:54/57 20:48 20:12-20:23/11	05:59 07:08-07:50/42 21:08 20:15-20:42/27
22	07:52 09:35-10:14/39 17:35 08:32-09:32/60	07:18 17:26-17:51/25 18:14 08:39-09:29/50	07:33 08:11-08:47/36 19:45	06:43 07:45-08:52/67 19:34-19:56/22 20:18 07:14-07:41/27	06:08 06:57-07:53/56 20:49 20:12-20:25/13	05:59 07:08-07:50/42 21:08 20:15-20:42/27
23	07:51 09:36-10:12/36 17:36 08:31-09:33/62	07:16 17:26-17:53/27 18:15 08:39-09:27/48	07:31 08:07-08:49/42 19:46	06:41 07:46-08:51/65 19:33-19:57/24 20:19 07:12-07:44/32	06:07 06:57-07:53/56 20:50 20:11-20:26/15	05:59 07:09-07:51/42 21:08 20:16-20:43/27
24	07:51 09:38-10:10/32 17:38 08:31-09:34/63	07:15 17:26-17:53/27 18:16 08:41-09:26/45	07:30 08:06-08:52/46 19:48	06:40 07:46-08:50/64 19:31-19:58/27 20:20 07:09-07:45/36	06:06 06:57-07:52/55 20:50 20:10-20:26/16	05:59 07:09-07:51/42 21:09 20:16-20:43/27
25	07:50 09:41-10:09/28 17:39 08:31-09:35/64	07:13 17:26-17:54/28 18:17 08:42-09:23/41	07:28 08:03-08:53/50 19:49	06:39 07:07-08:49/102 20:21 19:30-19:59/29	06:06 06:58-07:53/55 20:51 20:11-20:28/17	06:00 07:09-07:51/42 21:09 20:16-20:43/27
26	07:49 09:43-10:06/23 17:40 08:31-09:36/65	07:12 17:26-17:53/27 18:18 08:44-09:21/37	07:26 08:01-08:54/53 19:50	06:37 07:06-08:48/102 20:22 19:30-20:00/30	06:05 06:58-07:52/54 20:52 20:10-20:28/18	06:00 07:10-07:52/42 21:09 20:16-20:44/28
27	07:48 09:47-10:03/16 17:41 08:31-09:36/65	07:10 17:26-17:53/27 18:19 08:46-09:18/32	07:25 08:00-08:56/56 19:51	06:36 07:04-08:46/102 20:23 19:28-20:01/33	06:04 06:59-07:52/53 20:53 20:10-20:28/18	06:00 07:09-07:52/43 21:09 20:16-20:43/27
28	07:47 08:30-09:37/67 17:42	07:09 17:26-17:52/26 18:21 08:49-09:14/25	07:23 07:58-08:57/59 19:52	06:34 07:03-08:46/103 20:24 19:28-20:02/34	06:04 06:58-07:52/54 20:54 20:10-20:30/20	06:01 07:09-07:52/43 21:09 20:16-20:43/27
29	07:46 08:30-09:37/67 17:44		07:21 07:56-08:57/61 19:53	06:33 07:02-08:45/103 20:25 19:28-20:02/34	06:03 06:58-07:51/53 20:55 20:10-20:30/20	06:01 07:10-07:53/43 21:09 20:17-20:44/27
30	07:46 08:30-09:37/67 17:45		07:20 07:55-08:59/64 19:54	06:32 07:01-08:43/102 20:26 19:26-20:04/38	06:02 06:59-07:51/52 20:56 20:10-20:31/21	06:02 07:09-07:53/44 21:09 20:16-20:43/27
31	07:45 08:30-09:38/68 17:46		07:18 07:54-08:59/65 19:55		06:02 07:00-07:52/52 20:56 20:10-20:31/21	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3119	1933	699	2739	2901	2114

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T25 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (444)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 07:10-07:54/44 21:09 20:17-20:43/26	06:26 07:05-08:05/60 20:50 19:39-20:09/30	06:57 07:44-08:58/74 20:07	07:28 19:15	07:02 08:01-09:09/68 17:28	07:37 08:09-09:04/55 17:04 09:05-10:02/57
2	06:03 07:09-07:54/45 21:09 20:17-20:43/26	06:27 07:06-08:05/59 20:49 19:38-20:11/33	06:58 07:44-08:58/74 20:06	07:29 19:13	07:03 08:00-09:09/69 17:27	07:38 08:09-09:03/54 17:03 09:05-10:03/58
3	06:03 07:10-07:55/45 21:09 20:17-20:43/26	06:28 08:17-08:33/16 19:38-20:13/35 20:48 07:06-08:04/58	06:59 07:44-08:57/73 20:04	07:30 19:12	07:05 08:00-09:09/69 17:26	07:39 08:09-09:03/54 17:03 09:05-10:03/58
4	06:04 07:09-07:55/46 21:08 20:17-20:43/26	06:29 08:13-08:37/24 19:37-20:14/37 20:47 07:06-08:04/58	07:00 07:44-08:57/73 20:02	07:31 19:10	07:06 08:00-09:08/68 17:24	07:40 08:09-09:02/53 17:03 09:05-10:04/59
5	06:04 07:09-07:56/47 21:08 20:17-20:43/26	06:30 08:11-08:39/28 19:37-20:15/38 20:46 07:06-08:04/58	07:01 07:44-08:57/73 20:01	07:32 19:08	07:07 08:00-09:09/69 17:23	07:41 08:09-09:02/53 17:03 09:05-10:05/60
6	06:05 07:09-07:55/46 21:08 20:17-20:42/25	06:31 08:09-08:42/33 19:36-20:16/40 20:45 07:06-08:04/58	07:02 07:44-08:56/72 19:57	07:33 19:07	07:08 08:00-09:09/69 17:22	07:42 08:10-09:02/52 17:03 09:05-10:06/61
7	06:05 07:09-07:56/47 21:08 20:17-20:42/25	06:32 08:07-08:43/36 19:36-20:17/41 20:44 07:07-08:03/56	07:03 07:44-08:55/71 19:56	07:34 19:05	07:09 08:00-09:09/69 17:21	07:43 08:10-09:01/51 17:03 09:05-10:06/61
8	06:06 07:09-07:57/48 21:07 20:18-20:42/24	06:33 08:05-08:45/40 19:36-20:17/41 20:42 07:07-08:03/56	07:04 07:44-08:55/71 19:54	07:35 18:12-18:16/4 19:03	07:11 08:01-09:10/69 17:20	07:44 08:10-09:01/51 17:03 09:06-10:07/61
9	06:07 07:08-07:57/49 21:07 20:17-20:41/24	06:34 07:07-08:47/100 20:41 19:35-20:17/42	07:05 07:45-08:54/69 19:52	07:36 18:07-18:20/13 19:02	07:12 08:01-09:09/68 17:19	07:45 08:11-09:01/50 17:03 09:06-10:08/62
10	06:07 07:08-07:58/50 21:07 20:18-20:41/23	06:35 07:08-08:48/100 20:40 19:35-20:16/41	07:06 07:45-08:53/68 19:51	07:37 18:04-18:22/18 19:00	07:13 08:01-09:09/68 17:18	07:46 08:11-09:01/50 17:03 09:06-10:09/63
11	06:08 07:09-07:59/50 21:06 20:18-20:41/23	06:36 07:08-08:49/101 20:38 19:35-20:15/40	07:07 07:45-08:52/67 19:49	07:38 18:02-18:23/21 18:58	07:14 08:01-09:09/68 17:17	07:47 08:11-08:59/48 17:03 09:06-10:08/62
12	06:09 07:08-07:59/51 21:06 20:18-20:40/22	06:37 07:09-08:51/102 20:37 19:35-20:13/38	07:08 07:46-08:51/65 19:47	07:39 18:01-18:24/23 18:57 09:31-09:38/7	07:15 08:02-09:09/67 17:16	07:48 08:11-08:59/48 17:03 09:06-10:09/63
13	06:10 07:08-07:59/51 21:05 20:18-20:40/22	06:38 07:10-08:52/102 20:36 19:35-20:12/37	07:09 07:46-08:50/64 19:46	07:40 18:01-18:26/25 18:55 09:25-09:45/20	07:17 08:02-09:09/67 17:15	07:48 08:12-08:59/47 17:03 09:07-10:10/63
14	06:10 07:08-08:00/52 21:05 20:19-20:40/21	06:39 07:10-08:53/103 20:34 19:35-20:11/36	07:10 07:47-08:49/62 19:44	07:42 17:59-18:26/27 18:54 09:21-09:49/28	07:18 08:02-09:08/66 17:14	07:49 08:13-08:59/46 17:03 09:07-10:11/64
15	06:11 07:08-08:01/53 21:04 20:19-20:39/20	06:40 07:11-08:54/103 20:33 19:36-20:10/34	07:11 07:47-08:46/59 19:42	07:43 17:59-18:26/27 18:52 09:18-09:51/33	07:19 09:20-09:36/16 17:13 08:04-09:09/65	07:50 08:14-08:59/45 17:03 09:07-10:11/64
16	06:12 07:07-08:01/54 21:04 20:19-20:38/19	06:41 07:12-08:54/102 20:32 19:36-20:08/32	07:12 07:48-08:45/57 19:41	07:44 17:58-18:26/28 18:51 09:15-09:53/38	07:20 09:16-09:40/24 17:12 08:04-09:09/65	07:51 08:14-08:59/45 17:04 09:08-10:12/64
17	06:13 07:07-08:01/54 21:03 20:19-20:38/19	06:42 07:13-08:55/102 20:30 19:37-20:07/30	07:13 07:49-08:43/54 19:39	07:45 17:58-18:26/28 18:49 09:13-09:55/42	07:21 09:14-09:42/28 17:11 08:04-09:08/64	07:51 08:15-08:59/44 17:04 09:08-10:12/64
18	06:14 07:07-08:02/55 21:03 20:20-20:37/17	06:43 07:15-08:56/101 20:29 19:36-20:05/29	07:14 07:50-08:41/51 19:37	07:46 17:57-18:24/27 18:47 09:11-09:57/46	07:23 09:12-09:44/32 17:11 08:05-09:08/63	07:52 08:15-08:59/44 17:04 09:08-10:12/64
19	06:14 07:07-08:03/56 21:02 20:21-20:37/16	06:44 07:16-08:56/100 20:27 19:37-20:03/26	07:15 07:52-08:39/47 19:35	07:47 17:57-18:23/26 18:46 09:10-09:59/49	07:24 09:11-09:47/36 17:10 08:06-09:08/62	07:53 08:16-08:59/43 17:05 09:09-10:13/64
20	06:15 07:07-08:03/56 21:01 20:21-20:36/15	06:45 07:50-08:56/66 19:38-20:02/24 20:26 07:17-07:48/31	07:16 07:53-08:36/43 19:34	07:48 17:58-18:22/24 18:44 09:09-10:00/51	07:25 09:10-09:49/39 17:09 08:07-09:07/60	07:53 08:17-09:00/43 17:05 09:10-10:14/64
21	06:16 07:06-08:03/57 21:00 20:21-20:35/14	06:46 07:50-08:57/67 19:39-20:00/21 20:25 07:19-07:46/27	07:17 07:55-08:34/39 19:32	07:49 17:58-18:20/22 18:43 09:07-10:01/54	07:26 09:09-09:50/41 17:09 08:07-09:07/60	07:54 08:17-09:00/43 17:05 09:10-10:14/64
22	06:17 07:06-08:03/57 21:00 20:22-20:34/12	06:47 07:49-08:57/68 19:41-19:59/18 20:23 07:22-07:42/20	07:18 07:58-08:30/32 19:30	07:51 17:59-18:18/19 18:42 09:06-10:02/56	07:27 09:08-09:51/43 17:08 08:08-09:06/58	07:54 08:18-09:01/43 17:06 09:11-10:15/64
23	06:18 07:06-08:04/58 20:59 20:23-20:34/11	06:48 07:48-08:57/69 19:44-19:56/12 20:22 07:27-07:36/9	07:19 08:01-08:26/25 19:29	07:52 17:59-18:17/18 18:40 09:05-10:03/58	07:28 09:08-09:54/46 17:07 08:10-09:07/57	07:55 08:18-09:01/43 17:07 09:11-10:15/64
24	06:19 07:06-08:04/58 19:52-19:56/4 20:58 20:24-20:33/9	06:49 07:48-08:58/70 20:20	07:20 08:07-08:20/13 19:27	07:53 18:01-18:16/15 18:39 09:05-10:04/59	07:30 09:07-09:55/48 17:07 08:10-09:06/56	07:55 08:18-09:01/43 17:07 09:11-10:15/64
25	06:20 07:06-08:04/58 19:48-20:00/12 20:57 20:26-20:32/6	06:50 07:47-08:58/71 20:18	07:21 19:25	07:54 18:03-18:14/11 18:37 09:04-10:05/61	07:31 08:10-09:56/106 17:06	07:56 08:19-09:02/43 17:08 09:12-10:16/64
26	06:21 07:06-08:05/59 19:46-20:02/16 20:56 20:27-20:32/5	06:51 07:47-08:58/71 20:17	07:23 19:23	07:55 18:05-18:13/8 18:36 09:03-10:05/62	07:32 08:09-09:05/56 17:06 09:06-09:57/51	07:56 08:19-09:03/44 17:08 09:12-10:16/64
27	06:22 07:06-08:05/59 20:55 19:45-20:04/19	06:52 07:46-08:58/72 20:15	07:24 19:22	07:56 09:02-10:06/64 18:35	07:33 08:09-09:58/109 17:05	07:56 08:19-09:04/45 17:09 09:13-10:17/64
28	06:22 07:06-08:05/59 20:54 19:44-20:06/22	06:53 07:46-08:58/72 20:14	07:25 19:20	07:58 09:02-10:07/65 18:33	07:34 08:08-09:04/56 17:05 09:05-09:58/53	07:57 08:20-09:05/45 17:10 09:14-10:18/64
29	06:23 07:05-08:04/59 20:53 19:41-20:06/25	06:54 07:45-08:58/73 20:12	07:26 19:18	07:59 09:01-10:07/66 18:32	07:35 08:09-10:00/111 17:04	07:57 08:20-09:06/46 17:10 09:14-10:18/64
30	06:24 07:05-08:04/59 20:52 19:41-20:07/26	06:55 07:45-08:58/73 20:11	07:27 19:17	08:00 09:01-10:07/66 18:31	07:36 08:09-09:04/55 17:04 09:05-10:01/56	07:57 08:20-09:07/47 17:11 09:15-10:18/63
31	06:25 07:05-08:05/60 20:51 19:40-20:08/28	06:56 07:45-08:58/73 20:09		08:01 09:00-10:08/68 18:29		07:57 08:20-09:08/48 17:12 09:15-10:18/63
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2296	3443	1396	1377	2570	3404

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T26 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (445)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:20-08:34/14	07:44 08:23-08:50/27	07:07	07:16 07:39-08:09/30	06:30 18:34-20:05/91	06:01 18:29-19:56/87
	17:13 15:50-16:35/45	17:47 08:04-08:19/15	18:22	19:56 19:06-19:34/28	20:27	20:57 06:23-06:47/24
2	07:58 08:20-08:35/15	07:43 08:24-08:49/25	07:06	07:15 07:40-08:09/29	06:29 18:33-20:06/93	06:01 18:29-19:54/85
	17:14 15:50-16:35/45	17:49 08:03-08:21/18	18:23	19:57 19:06-19:34/28	20:28	20:58 06:23-06:47/24
3	07:58 08:20-08:36/16	07:42 08:25-08:48/23	07:04	07:13 07:40-08:08/28	06:28 18:32-20:06/94	06:01 18:29-19:53/84
	17:15 15:51-16:36/45	17:50 08:02-08:23/21	18:24	19:58 19:07-19:34/27	20:29	20:59 06:22-06:47/25
4	07:58 08:20-08:37/17	07:41 08:27-08:47/20	07:03 07:23-07:34/11	07:11 07:40-08:07/27	06:26 18:31-20:08/97	06:00 18:30-19:54/84
	17:16 15:51-16:36/45	17:51 08:01-08:24/23	18:25	19:59 19:06-19:33/27	20:30	20:59 06:22-06:47/25
5	07:58 08:20-08:38/18	07:40 08:29-08:45/16	07:01 07:20-07:36/16	07:10 07:41-08:06/25	06:25 18:31-20:09/98	06:00 18:30-19:54/84
	17:16 15:52-16:37/45	17:53 08:00-08:25/25	18:26	20:00 19:07-19:32/25	20:31	21:00 06:23-06:48/25
6	07:58 08:20-08:40/20	07:38 08:32-08:43/11	06:59 07:19-07:39/20	07:08 07:42-08:04/22	06:24 18:30-20:10/100	05:59 18:30-19:53/83
	17:17 15:52-16:37/45	17:54 07:59-08:27/28	18:28	20:00 19:08-19:31/23	20:33	21:01 06:22-06:47/25
7	07:58 08:20-08:41/21	07:37 07:58-08:27/29	06:58 07:17-07:40/23	07:06 07:43-08:02/19 19:38-19:39/1	06:23 18:30-20:11/101	05:59 18:30-19:54/84
	17:18 15:53-16:38/45	17:55	18:29	20:01 19:08-19:29/21	20:34	21:01 06:23-06:47/24
8	07:58 08:20-08:42/22	07:36 07:56-08:27/31	07:56 08:16-08:42/26	07:05 07:45-08:00/15 19:33-19:42/9	06:22 18:29-20:12/103	05:59 18:31-19:54/83
	17:19 15:54-16:39/45	17:56	19:30	20:03 19:10-19:28/18	20:35	21:02 06:23-06:48/25
9	07:57 08:19-08:42/23	07:35 07:56-08:28/32	07:55 08:14-08:42/28	07:03 07:48-07:56/8 19:30-19:43/13	06:20 18:29-20:12/103	05:59 18:31-19:54/83
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10	07:57 08:19-08:43/24	07:34 07:56-08:28/32	07:53 08:12-08:42/30	07:01 19:14-19:21/7	06:19 18:28-20:13/105	05:59 18:32-19:55/83
	17:21 15:54-16:39/45	17:59	19:32	20:05 19:27-19:43/16	20:37	21:03 06:24-06:48/24
11	07:57 08:19-08:45/26	07:33 07:56-08:29/33	07:51 08:11-08:43/32	07:00 19:26-19:45/19	06:18 18:27-20:14/107	05:58 18:31-19:54/83
	17:23 15:55-16:39/44	18:00	19:33 19:00-19:12/12	20:06	20:38	21:04 06:24-06:48/24
12	07:57 08:18-08:45/27	07:31 07:55-08:28/33	07:50 08:10-08:43/33	06:58 19:25-19:46/21	06:17 18:27-20:14/107	05:58 18:32-19:54/82
	17:24 15:55-16:39/44	18:01	19:34 18:57-19:13/16	20:07	20:39	21:04 06:25-06:48/23
13	07:56 08:18-08:46/28	07:30 07:55-08:29/34	07:48 08:09-08:42/33	06:57 19:25-19:47/22	06:16 18:27-20:14/107	05:58 18:32-19:54/82
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14	07:56 08:18-08:47/29	07:29 07:56-08:29/33	07:46 08:09-08:43/34	06:55 19:23-19:48/25	06:15 18:27-20:14/107	05:58 18:32-19:55/83
	17:26 15:57-16:40/43	18:04	19:37 18:53-19:16/23	20:09	20:41	21:05 06:25-06:48/23
15	07:56 08:17-08:47/30	07:28 07:56-08:28/32	07:45 08:09-08:42/33	06:53 19:23-19:49/26	06:14 18:27-20:14/107	05:58 18:32-19:55/83
	17:27 15:57-16:40/43	18:05	19:38 18:51-19:16/25	20:10	20:42	21:06 06:25-06:48/23
16	07:55 08:17-08:49/32	07:26 07:56-08:28/32	07:43 08:08-08:41/33	06:52 19:22-19:50/28	06:13 18:27-20:14/107	05:58 18:33-19:55/82
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17	07:55 08:16-08:49/33	07:25 07:57-08:27/30	07:41 08:09-08:41/32	06:50 19:22-19:50/28	06:12 18:27-20:14/107	05:58 18:33-19:55/82
	17:29 15:58-16:40/42	18:07	19:40 18:49-19:19/30	20:12	20:44 06:33-06:38/5	21:07 06:26-06:49/23
18	07:54 08:17-08:50/33	07:23 07:57-08:26/29	07:40 08:09-08:40/31	06:49 19:08-19:14/6	06:11 18:27-20:13/106	05:58 18:34-19:56/82
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19	07:54 08:17-08:50/33	07:22 07:59-08:25/26	07:38 08:09-08:39/30	06:47 19:00-19:49/49	06:10 18:27-20:13/106	05:58 18:34-19:56/82
	17:32 16:00-16:40/40	18:10	19:42 18:47-19:20/33	20:14	20:46 06:31-06:41/10	21:07 06:27-06:49/22
20	07:53 08:17-08:50/33	07:21 07:59-08:23/24	07:36 08:11-08:38/27	06:46 18:55-19:49/54	06:09 18:26-20:12/106	05:58 18:34-19:56/82
	17:33 16:00-16:40/40	18:11	19:43 18:46-19:19/33	20:15	20:47 06:30-06:42/12	21:08 06:27-06:49/22
21	07:53 08:17-08:51/34	07:19 08:01-08:22/21	07:35 08:11-08:36/25 18:47-19:20/33	06:44 18:52-19:48/56	06:09 18:26-20:11/105	05:59 18:34-19:56/82
	17:34 16:02-16:40/38	18:12	19:44 07:55-08:01/6	20:17	20:48 06:30-06:43/13	21:08 06:27-06:49/22
22	07:52 08:17-08:51/34	07:18 08:03-08:21/18	07:33 08:12-08:34/22 18:46-19:19/33	06:43 18:49-19:47/58	06:08 18:27-20:11/104	05:59 18:34-19:56/82
	17:35 16:02-16:40/38	18:14	19:45 07:52-08:05/13	20:18	20:49 06:29-06:44/15	21:08 06:27-06:49/22
23	07:51 08:17-08:51/34	07:16 08:06-08:17/11	07:31 08:13-08:32/19 18:46-19:18/32	06:41 18:47-19:46/59	06:07 18:27-20:10/103	05:59 18:35-19:57/82
	17:36 16:03-16:39/36	18:15	19:46 07:50-08:07/17	20:19	20:49 06:28-06:44/16	21:08 06:28-06:50/22
24	07:50 08:17-08:51/34	07:15	07:30 08:17-08:29/12 18:47-19:26/39	06:40 19:47-19:52/5	06:06 18:27-20:09/102	05:59 18:35-19:57/82
	17:38 16:04-16:38/34	18:16	19:48 07:49-08:09/20	20:20 18:44-19:44/60	20:50 06:27-06:44/17	21:08 06:27-06:50/23
25	07:50 08:19-08:52/33	07:13	07:28 07:47-08:09/22	06:38 18:42-19:57/75	06:05 18:28-20:09/101	06:00 18:35-19:57/82
	17:39 16:06-16:39/33	18:17	19:49 18:47-19:27/40	20:21	20:51 06:27-06:45/18	21:09 06:27-06:50/23
26	07:49 08:19-08:52/33	07:12	07:26 07:45-08:10/25	06:37 18:41-19:59/78	06:05 18:27-20:07/100	06:00 18:36-19:58/82
	17:40 16:07-16:38/31	18:18	19:50 18:47-19:28/41	20:22	20:52 06:26-06:45/19	21:09 06:28-06:51/23
27	07:48 08:19-08:52/33	07:10	07:25 07:44-08:11/27	06:36 18:39-20:01/82	06:04 18:27-20:05/98	06:00 18:36-19:58/82
	17:41 16:08-16:36/28	18:19	19:51 18:48-19:30/42	20:23	20:53 06:26-06:46/20	21:09 06:28-06:51/23
28	07:47 08:20-08:52/32	07:09	07:23 07:42-08:10/28	06:34 18:38-20:02/84	06:04 18:28-20:00/92	06:01 18:35-19:58/83
	17:42 16:10-16:35/25	18:21	19:52 18:49-19:30/41	20:24	20:54 06:25-06:46/21	21:09 06:28-06:51/23
29	07:46 08:20-08:52/32		07:21 07:40-08:10/30	06:33 18:37-20:02/85	06:03 18:28-19:59/91	06:01 18:36-19:59/83
	17:44 16:12-16:34/22		19:53 18:50-19:31/41	20:25	20:55 06:25-06:47/22	21:09 06:28-06:52/24
30	07:46 08:21-08:51/30		07:20 07:40-08:11/31	06:32 18:35-20:04/89	06:02 18:28-19:58/90	06:02 18:36-19:58/82
	17:45 16:15-16:31/16		19:54 18:53-19:32/39	20:26	20:56 06:24-06:47/23	21:09 06:28-06:51/23
31	07:45 08:22-08:51/29 08:05-08:17/12		07:18 07:40-08:10/30 18:56-19:05/9		06:02 18:28-19:56/88	
	17:46 16:18-16:28/10		19:55 19:07-19:34/27		20:56 06:24-06:47/23	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	2050	732	1468	1497	3369	3188

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T26 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (445)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 18:36-19:59/83	06:26 18:38-20:25/107	06:57 19:25-19:44/19	07:28 07:49-08:23/34	07:02 07:26-07:58/32	07:37 08:01-08:27/26
	21:09 06:29-06:52/23	20:50	20:07	19:15 18:34-18:52/18	17:28	17:04 15:37-16:21/44
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	20:51	20:09		18:29		17:12 15:50-16:34/44
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	3472	2196	1707	631	1721	1745

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T27 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (446)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:37/17 17:13 16:15-16:47/32	07:44 16:45-17:09/24 17:47 08:06-08:31/25	07:07 17:36-18:00/24 18:22	07:16 07:54-08:08/14 19:56 18:49-19:34/45	06:30 19:19-19:47/28 20:27 06:52-07:19/27	06:01 20:03-20:33/30 20:57 06:39-06:50/11
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26	07:49 16:35-17:11/36 17:40 08:10-08:31/21	07:12 07:46-07:59/13 18:18 17:41-17:56/15	07:26 18:44-19:20/36 19:50 07:49-08:17/28	06:37 19:16-19:51/35 20:22 06:56-07:19/23	06:05 20:04-20:28/24 20:52 06:33-06:54/21	06:00 20:06-20:40/34 21:09
27	07:48 16:42-17:11/29 17:41 08:09-08:31/22	07:10 07:50-07:56/6 18:19 17:39-17:58/19	07:24 18:45-19:26/41 19:51 07:50-08:17/27	06:36 19:17-19:51/34 20:23 06:55-07:19/24	06:04 20:03-20:28/25 20:53 06:34-06:53/19	06:00 20:07-20:41/34 21:09
28	07:47 16:42-17:11/29 17:42 08:08-08:31/23	07:09 17:37-17:58/21 18:21	07:23 07:50-08:16/26 19:52 18:46-19:30/44	06:34 19:18-19:50/32 20:24 06:54-07:20/26	06:03 20:04-20:30/26 20:54 06:35-06:53/18	06:01 20:07-20:41/34 21:09
29	07:46 16:43-17:10/27 17:44 08:07-08:31/24		07:21 07:50-08:14/24 19:53 18:46-19:31/45	06:33 19:17-19:49/32 20:25 06:52-07:19/27	06:03 20:03-20:30/27 20:55 06:35-06:52/17	06:01 20:08-20:42/34 21:09
30	07:45 16:43-17:10/27 17:45 08:06-08:32/26		07:19 07:51-08:12/21 19:54 18:46-19:32/46	06:31 19:18-19:48/30 20:26 06:52-07:19/27	06:02 20:03-20:31/28 20:55 06:37-06:52/15	06:02 20:07-20:42/35 21:09
31	07:45 16:44-17:09/25 17:46 08:06-08:32/26		07:18 07:53-08:11/18 19:55 18:48-19:34/46		06:02 20:02-20:31/29 20:56 06:37-06:51/14	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1841	1224	1573	1458	1089	1044

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T27 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (446)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:08-20:42/34 21:09	06:26 06:48-07:05/17 20:50	06:57 18:59-19:44/45 20:07	07:28 18:12-18:52/40 19:15	07:02 16:35-17:04/29 17:28 07:23-07:26/3	07:37 16:02-16:39/37 17:04 08:01-08:25/24
2	06:02 20:08-20:42/34 21:09	06:27 06:49-07:05/16 20:49	06:58 18:59-19:42/43 20:06	07:29 18:10-18:50/40 19:13	07:03 16:36-17:04/28 17:27	07:38 16:02-16:39/37 17:03 08:02-08:25/23
3	06:03 20:09-20:43/34 21:08	06:28 07:11-07:19/8 20:48 06:50-07:04/14	06:59 18:58-19:41/43 20:04	07:30 18:09-18:49/40 19:11	07:04 16:36-17:02/26 17:25 07:44-07:55/11	07:39 16:02-16:38/36 17:03 08:03-08:25/22
4	06:04 20:08-20:42/34 21:08	06:29 07:08-07:21/13 20:47 06:51-07:03/12	07:00 18:57-19:39/42 20:02	07:31 18:08-18:47/39 19:10	07:06 16:37-17:01/24 17:24 07:42-07:57/15	07:40 16:03-16:38/35 17:03 08:04-08:25/21
5	06:04 20:09-20:43/34 21:08	06:30 07:06-07:23/17 20:46 06:52-07:02/10	07:01 18:57-19:38/41 20:01	07:32 18:09-18:46/37 19:08	07:07 16:38-16:59/21 17:23 07:41-07:59/18	07:41 16:03-16:38/35 17:03 08:05-08:26/21
6	06:05 20:09-20:42/33 21:08	06:31 19:41-19:44/3 06:53-07:00/7 20:45 07:05-07:24/19	07:02 18:57-19:36/39 19:57	07:33 18:08-18:44/36 19:06	07:08 16:22-16:33/11 07:40-08:00/20 17:22 16:40-16:59/19	07:42 16:03-16:37/34 17:03 08:06-08:26/20
7	06:05 20:09-20:42/33 21:08	06:32 19:36-19:49/13 06:54-06:57/3 20:43 07:04-07:25/21	07:03 18:57-19:34/37 19:56	07:34 18:08-18:42/34 19:05	07:09 16:19-16:36/17 07:38-08:00/22 17:21 16:42-16:57/15	07:43 16:04-16:37/33 17:02 08:07-08:26/19
8	06:06 20:09-20:41/32 21:07	06:33 19:34-19:51/17 20:42 07:03-07:26/23	07:04 18:51-19:33/42 19:54	07:35 18:08-18:39/31 19:03	07:10 16:18-16:37/19 07:38-08:01/23 17:20 16:44-16:56/12	07:44 16:04-16:37/33 17:02 08:08-08:27/19
9	06:07 20:10-20:41/31 21:07 06:50-06:53/3	06:34 19:32-19:53/21 20:41 07:02-07:27/25	07:05 18:46-19:30/44 19:52	07:36 18:08-18:39/31 19:01	07:12 16:17-16:39/22 07:38-08:02/24 17:19 16:50-16:52/2	07:45 08:09-08:27/18 17:02 16:04-16:36/32
10	06:07 20:10-20:41/31 21:07 06:48-06:56/8	06:35 19:30-19:54/24 20:40 07:02-07:27/25	07:06 07:53-07:56/3 19:51 18:43-19:28/45	07:37 18:08-18:37/29 19:00	07:13 16:16-16:40/24 17:18 07:37-08:02/25	07:46 08:09-08:27/18 17:02 16:05-16:36/31
11	06:08 20:10-20:40/30 21:06 06:47-06:58/11	06:36 19:29-19:55/26 20:38 07:01-07:27/26	07:07 07:48-08:01/13 19:49 18:41-19:27/46	07:38 18:08-18:36/28 18:58	07:14 16:15-16:40/25 17:17 07:37-08:02/25	07:47 08:10-08:27/17 17:03 16:05-16:37/32
12	06:09 20:11-20:40/29 21:06 06:46-06:59/13	06:37 19:28-19:56/28 20:37 07:01-07:27/26	07:08 07:44-08:02/18 19:47 18:39-19:25/46	07:39 18:08-18:34/26 18:57	07:15 16:14-16:41/27 17:16 07:38-08:03/25	07:47 08:11-08:27/16 17:03 16:06-16:37/31
13	06:09 20:11-20:40/29 21:05 06:45-07:00/15	06:38 19:27-19:57/30 20:36 07:00-07:28/28	07:09 07:42-08:03/21 19:46 18:38-19:23/45	07:40 18:09-18:32/23 18:55	07:16 16:14-16:42/28 17:15 07:39-08:03/24	07:48 08:12-08:28/16 17:03 16:07-16:37/30
14	06:10 20:12-20:40/28 21:05 06:45-07:01/16	06:39 19:25-19:57/32 20:34 07:01-07:27/26	07:10 07:41-08:04/23 19:44 18:37-19:22/45	07:41 18:11-18:31/20 18:54	07:18 16:14-16:43/29 17:14 07:40-08:03/23	07:49 08:13-08:29/16 17:03 16:07-16:38/31
15	06:11 20:12-20:38/26 21:04 06:44-07:02/18	06:40 19:24-19:57/33 20:33 07:02-07:27/25	07:11 07:39-08:05/26 19:42 18:35-19:20/45	07:43 08:21-08:30/9 18:52 18:13-18:30/17	07:19 16:12-16:43/31 17:13 07:41-08:03/22	07:50 08:13-08:28/15 17:03 16:07-16:37/30
16	06:12 20:12-20:38/26 21:04 06:43-07:02/19	06:41 19:24-19:57/33 20:32 07:03-07:27/24	07:12 18:35-19:16/41 19:40 07:38-08:05/27	07:44 17:49-17:56/7 18:15-18:28/13 18:50 08:17-08:32/15	07:20 16:08-16:44/36 17:12 07:43-08:04/21	07:50 08:14-08:29/15 17:03 16:08-16:38/30
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18	06:13 20:14-20:37/23 21:02 06:43-07:04/21	06:43 19:22-19:58/36 20:29 07:04-07:25/21	07:14 18:30-19:08/38 19:37 07:37-08:05/28	07:46 17:42-18:01/19 18:47 08:14-08:35/21	07:22 16:04-16:44/40 17:11 07:45-08:13/28	07:52 08:15-08:29/14 17:04 16:09-16:38/29
19	06:14 20:15-20:37/22 21:02 06:42-07:05/23	06:44 19:22-19:58/36 20:27 07:05-07:24/19	07:15 18:28-19:08/40 19:35 07:36-08:05/29	07:47 17:40-18:03/23 18:46 08:13-08:35/22	07:24 16:03-16:44/41 17:10 07:47-08:15/28	07:52 08:16-08:30/14 17:05 16:10-16:39/29
20	06:15 20:15-20:35/20 21:01 06:42-07:06/24	06:45 19:21-19:58/37 20:26 07:06-07:23/17	07:16 18:26-19:08/42 19:34 07:36-08:05/29	07:48 17:39-18:05/26 18:44 08:13-08:36/23	07:25 16:03-16:45/42 17:09 07:48-08:17/29	07:53 08:16-08:30/14 17:05 16:10-16:38/28
21	06:16 20:16-20:35/19 21:00 06:41-07:05/24	06:46 19:20-19:57/37 20:24 07:07-07:22/15	07:17 18:25-19:07/42 19:32 07:37-08:04/27	07:49 17:38-18:05/27 18:43 08:12-08:37/25	07:26 16:02-16:44/42 17:08 07:49-08:18/29	07:54 08:17-08:31/14 17:05 16:11-16:39/28
22	06:17 20:18-20:34/16 20:59 06:41-07:06/25	06:47 19:19-19:57/38 20:23 07:08-07:20/12	07:18 18:24-19:07/43 19:30 07:38-08:04/26	07:50 17:36-18:06/30 18:41 08:11-08:36/25	07:27 16:01-16:43/42 17:08 07:50-08:19/29	07:54 08:17-08:31/14 17:06 16:11-16:39/28
23	06:18 20:19-20:34/15 20:59 06:41-07:06/25	06:48 19:18-19:56/38 20:21 07:09-07:18/9	07:19 18:22-19:06/44 19:28 07:39-08:03/24	07:52 17:35-18:06/31 18:40 08:12-08:36/24	07:28 16:01-16:42/41 17:07 07:51-08:19/28	07:55 08:18-08:32/14 17:06 16:12-16:40/28
24	06:19 20:21-20:33/12 20:58 06:41-07:07/26	06:49 19:13-19:56/43 20:20 07:10-07:13/3	07:20 18:22-19:04/42 19:27 07:40-08:01/21	07:53 17:35-18:06/31 18:39 08:13-08:36/23	07:29 16:01-16:42/41 17:07 07:53-08:21/28	07:55 08:18-08:32/14 17:07 16:12-16:41/29
25	06:20 20:24-20:32/8 20:57 06:42-07:07/25	06:50 19:10-19:55/45 20:18	07:21 18:21-19:03/42 19:25 07:41-08:00/19	07:54 17:35-18:07/32 18:37 08:15-08:36/21	07:31 16:01-16:42/41 17:06 07:54-08:21/27	07:55 08:19-08:33/14 17:08 16:12-16:41/29
26	06:20 20:27-20:32/5 20:56 06:43-07:07/24	06:51 19:07-19:53/46 20:17	07:22 18:20-19:01/41 19:23 07:42-07:58/16	07:55 17:34-18:07/33 18:36 08:16-08:36/20	07:32 16:01-16:41/40 17:06 07:58-08:22/24	07:56 08:19-08:33/14 17:08 16:13-16:42/29
27	06:21 06:44-07:07/23 20:55	06:52 19:05-19:52/47 20:15	07:23 18:20-18:59/39 19:22 07:43-07:56/13	07:56 17:34-18:07/33 18:34 08:17-08:35/18	07:33 16:00-16:40/40 17:05 07:58-08:22/24	07:56 08:19-08:34/15 17:09 16:13-16:42/29
28	06:22 06:44-07:06/22 20:54	06:53 19:04-19:50/46 20:14	07:24 18:17-18:57/40 19:20 07:44-07:53/9	07:57 17:34-18:07/33 18:33 08:18-08:34/16	07:34 16:00-16:40/40 17:05 07:58-08:23/25	07:56 08:19-08:34/15 17:10 16:13-16:43/30
29	06:23 06:45-07:06/21 20:53	06:54 19:02-19:49/47 20:12	07:25 18:15-18:56/41 19:18	07:59 17:34-18:07/33 18:32 08:20-08:33/13	07:35 16:00-16:39/39 17:04 07:58-08:23/25	07:57 08:20-08:35/15 17:10 16:14-16:44/30
30	06:24 06:46-07:06/20 20:52	06:55 19:01-19:47/46 20:10	07:26 18:13-18:53/40 19:16	08:00 17:34-18:07/33 18:30 08:21-08:32/11	07:36 16:01-16:38/37 17:04 08:00-08:24/24	07:57 08:20-08:36/16 17:11 16:15-16:45/30
31	06:25 06:47-07:06/19 20:51	06:56 19:00-19:45/45 20:09		08:01 17:34-18:06/32 18:29 08:22-08:29/7		07:57 08:20-08:36/16 17:12 16:15-16:46/31
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1108	1385	1659	1234	1677	1481

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T28 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (447)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	
1	07:57 08:46-09:19/33 17:13	07:43 08:16-08:57/41 17:47 16:53-17:09/16	07:07 07:29-08:34/65 18:22	07:16 07:39-08:35/56 19:56	06:30 07:04-07:57/53 20:27	06:01 20:57	
2	07:57 08:47-09:19/32 17:14 16:45-16:47/2	07:42 08:16-08:57/41 17:49 16:55-17:07/12	07:06 07:27-08:33/66 18:23	07:14 07:37-08:31/54 19:57	06:29 07:04-07:57/53 20:28	06:01 20:58	
3	07:57 08:47-09:19/32 17:14 16:44-16:48/4	07:41 08:16-08:56/40 17:50 16:58-17:04/6	07:04 07:26-08:31/65 18:24	07:13 07:36-08:26/50 19:58	06:27 07:03-07:55/52 20:29	06:00 20:58	
4	07:58 08:48-09:19/31 17:15 16:44-16:49/5	07:40 08:17-08:56/39 17:51	07:02 07:25-08:30/65 18:25	07:11 07:35-08:21/46 19:59	06:26 07:04-07:55/51 20:30	06:00 20:59	
5	07:58 08:50-09:18/28 16:43-16:50/7 17:16 08:26-08:30/4	07:39 08:18-08:56/38 17:52	07:01 07:24-08:28/64 18:26	07:09 07:33-08:21/48 20:00	06:25 07:05-07:54/49 20:31	06:00 21:00	
6	07:57 08:51-09:18/27 16:43-16:51/8 17:17 08:23-08:33/10	07:38 08:06-08:55/49 17:54 17:24-17:28/4	06:59 07:24-08:27/63 18:27	07:08 07:33-08:22/49 20:00	06:24 07:05-07:53/48 20:32	05:59 21:01	
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9	07:57 08:55-09:15/20 16:42-16:54/12 17:20 08:20-08:39/19	07:35 07:59-08:53/54 17:57 17:16-17:34/18	07:54 08:16-09:19/63 19:31	07:03 07:25-08:22/57 20:03	06:20 07:07-07:49/42 20:35	05:59 21:02	
10	07:57 09:08-09:12/4 16:42-16:55/13 17:21 08:19-08:40/21 08:58-09:05/7	07:34 07:58-08:52/54 17:59 17:15-17:36/21	07:53 08:14-09:06/52 19:32 09:07-09:12/5	07:01 07:23-08:21/58 20:05	06:19 07:08-07:48/40 20:36	05:58 21:03	
11	07:57 08:19-08:42/23 17:22 16:41-16:56/15	07:32 07:56-08:50/54 18:00 17:14-17:36/22	07:51 08:12-09:06/54 19:33	07:00 07:21-08:22/61 20:06	06:18 07:09-07:47/38 20:38	05:58 21:04	
12	07:56 08:18-08:43/25 17:23 16:41-16:57/16	07:31 07:55-08:48/53 18:01 17:13-17:38/25	07:50 08:11-09:06/55 19:34	06:58 07:19-08:21/62 20:07	06:17 07:10-07:45/35 20:39	05:58 21:04	
13	07:56 08:18-08:44/26 17:24 16:42-16:59/17	07:30 07:54-08:46/52 18:02 17:13-17:39/26	07:48 08:10-09:05/55 19:35	06:56 07:18-08:21/63 20:08	06:16 07:11-07:43/32 20:40	05:58 21:05	
14	07:56 08:17-08:45/28 17:26 16:41-16:59/18	07:29 07:53-08:44/51 18:04 17:11-17:40/29	07:46 08:08-09:04/56 19:36	06:55 07:15-08:20/65 20:09	06:15 07:12-07:41/29 20:41	05:58 21:05	
15	07:55 08:17-08:47/30 17:27 16:42-17:01/19	07:27 17:11-17:42/31 18:05 07:52-08:35/43	07:45 08:08-09:04/56 19:37	06:53 07:13-08:19/66 20:10	06:14 07:14-07:39/25 20:42	05:58 21:06	
16	07:55 08:16-08:47/31 17:28 16:41-17:02/21	07:26 17:12-17:43/31 18:06 07:52-08:36/44	07:43 08:07-09:02/55 19:39	06:52 07:12-08:19/67 20:11	06:13 07:16-07:33/17 20:43	05:58 06:28-06:29/1 21:06	
17	07:54 08:16-08:49/33 17:29 16:42-17:04/22	07:25 17:11-17:44/33 18:07 07:50-08:36/46	07:41 08:06-09:01/55 19:40	06:50 07:10-08:18/68 20:12	06:12 07:20-07:30/10 20:44	05:58 06:26-06:31/5 21:06	
18	07:54 08:15-08:49/34 17:30 16:41-17:04/23	07:23 17:11-17:45/34 18:08 07:50-08:37/47	07:40 08:06-09:00/54 19:41	06:49 07:09-08:18/69 20:13	06:11 20:45	05:58 06:25-06:32/7 21:07	
19	07:53 08:16-08:51/35 17:31 16:42-17:06/24	07:22 17:12-17:45/33 18:10 07:50-08:37/47	07:38 08:05-08:58/53 19:42	06:47 07:08-08:16/68 20:14	06:10 20:45	05:58 06:26-06:34/8 21:07	
20	07:53 08:15-08:51/36 17:33 16:42-17:07/25	07:20 17:11-17:44/33 18:11 07:49-08:37/48	07:36 08:05-08:56/51 19:43	06:46 07:07-08:16/69 20:15	06:09 20:46	05:58 06:26-06:34/8 21:07	
21	07:52 08:14-08:52/38 17:34 16:42-17:08/26	07:19 17:12-17:43/31 18:12 07:50-08:37/47	07:35 08:05-08:55/50 19:44	06:44 07:06-08:14/68 20:16	06:08 20:47	05:58 06:26-06:34/8 21:08	
22	07:52 08:15-08:53/38 17:35 16:43-17:10/27	07:18 17:12-17:41/29 18:13 07:49-08:37/48	07:33 08:05-08:52/47 19:45	06:43 07:06-08:13/67 20:17	06:08 20:48	05:59 06:26-06:34/8 21:08	
23	07:51 08:15-08:54/39 17:36 16:43-17:11/28	07:16 17:13-17:40/27 18:15 07:49-08:37/48	07:31 07:59-08:49/50 19:46	06:41 07:05-08:13/68 20:18	06:07 20:49	05:59 06:26-06:34/8 21:08	
24	07:50 08:14-08:54/40 17:37 16:44-17:11/27	07:15 07:41-08:36/55 18:16 17:14-17:39/25	07:29 07:54-08:48/54 19:47	06:40 07:04-08:11/67 20:20	06:06 20:50	05:59 06:27-06:34/7 21:08	
25	07:50 08:14-08:54/40 17:39 16:44-17:11/27	07:13 07:37-08:37/60 18:17 17:15-17:38/23	07:28 07:50-08:47/57 19:48	06:38 07:04-08:09/65 20:21	06:05 20:51	05:59 06:28-06:34/6 21:08	
26	07:49 08:15-08:56/41 17:40 16:45-17:11/26	07:12 07:34-08:36/62 18:18 17:16-17:36/20	07:26 07:47-08:45/58 19:49	06:37 07:03-08:07/64 20:22	06:05 20:52	06:00 06:29-06:32/3 21:09	
27	07:48 08:15-08:56/41 17:41 16:46-17:12/26	07:10 07:32-08:35/63 18:19 17:19-17:34/15	07:24 07:45-08:44/59 19:51	06:35 07:03-08:06/63 20:23	06:04 20:53	06:00 21:09	
28	07:47 08:15-08:56/41 17:42 16:47-17:12/25	07:09 07:30-08:34/64 18:20 17:23-17:29/6	07:23 07:44-08:43/59 19:52	06:34 07:04-08:04/60 20:24	06:03 20:54	06:01 21:09	
29	07:46 08:15-08:56/41 17:44 16:48-17:11/23		07:21 07:42-08:41/59 19:53	06:33 07:03-08:00/57 20:25	06:03 20:55	06:01 21:09	
30	07:45 08:15-08:56/41 17:45 16:49-17:10/21		07:19 07:40-08:39/59 19:54	06:31 07:03-07:57/54 20:26	06:02 20:55	06:01 21:09	
31	07:44 08:15-08:57/42 17:46 16:51-17:10/19		07:18 07:40-08:38/58 19:55		06:02 20:56		
Potential sun hours	297	297	370	399	449	453	
Sum of minutes with flicker	1638	1967	1790	1812	664	69	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T28 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (447)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:09	06:26 07:20-07:56/36 20:50	06:57 07:20-08:21/61 20:07	07:27 07:49-08:44/55 19:15	07:02 07:27-08:21/54 17:28 16:44-17:04/20	07:37 08:01-08:24/23 17:03 16:23-16:38/15
2	06:02 21:08	06:27 07:19-07:58/39 20:49	06:58 07:22-08:20/58 20:06	07:28 07:50-08:44/54 19:13	07:03 07:29-08:23/54 17:27 16:46-17:04/18	07:38 08:52-08:54/2 16:25-16:39/14 17:03 08:02-08:24/22 08:41-08:48/7
3	06:03 21:08	06:28 07:18-07:59/41 20:48	06:59 07:23-08:20/57 20:04	07:30 07:51-08:44/53 19:11	07:04 07:31-08:24/53 17:25 16:48-17:02/14	07:39 08:39-08:59/20 16:26-16:38/12 17:03 08:04-08:23/19
4	06:03 21:08	06:29 07:17-08:00/43 20:47	07:00 07:26-08:19/53 20:02	07:31 07:52-08:53/61 19:10	07:06 07:33-08:24/51 17:24 16:50-17:01/11	07:40 08:38-09:01/23 16:27-16:38/11 17:03 08:05-08:22/17
5	06:04 21:08	06:30 07:16-08:01/45 20:46	07:01 07:29-08:19/50 20:01	07:32 07:54-08:58/64 19:08	07:07 07:36-08:25/49 17:23	07:41 08:37-09:02/25 16:28-16:38/10 17:03 08:07-08:21/14
6	06:05 21:08	06:31 07:15-08:02/47 20:44	07:02 07:29-08:18/49 19:57	07:33 07:56-09:00/64 19:06	07:08 07:47-08:26/39 17:22	07:42 08:37-09:04/27 16:29-16:37/8 17:02 08:09-08:19/10
7	06:05 21:07	06:32 07:15-08:03/48 20:43	07:03 07:29-08:17/48 19:56	07:34 07:59-09:02/63 19:05	07:09 07:47-08:26/39 17:21	07:43 08:37-09:05/28 16:30-16:37/7 17:02 08:12-08:17/5
8	06:06 21:07	06:33 07:14-08:04/50 20:42	07:04 07:30-08:16/46 19:54	07:35 07:59-09:03/64 19:03	07:10 07:46-08:26/40 17:20 16:27-16:35/8	07:44 08:37-09:07/30 17:02 16:31-16:36/5
9	06:07 21:07	06:34 07:13-08:05/52 20:41	07:05 07:29-08:19/50 19:52	07:36 08:00-09:04/64 19:01	07:12 07:47-08:27/40 17:19 16:25-16:38/13	07:45 08:36-09:07/31 17:02 16:32-16:36/4
10	06:07 21:06	06:35 07:13-08:05/52 20:40	07:06 07:30-08:24/54 19:51	07:37 08:00-09:05/65 19:00	07:13 07:46-08:28/42 17:18 16:23-16:40/17	07:46 08:36-09:08/32 17:02 16:34-16:36/2
11	06:08 21:06	06:36 07:13-08:06/53 20:38	07:07 07:31-08:27/56 19:49	07:38 08:00-09:06/66 18:58	07:14 07:46-08:27/41 17:17 16:22-16:41/19	07:47 08:36-09:09/33 17:02
12	06:09 21:06	06:37 07:12-08:06/54 20:37	07:08 07:31-08:29/58 19:47	07:39 08:01-09:06/65 18:57	07:15 07:46-08:27/41 17:16 16:20-16:41/21	07:47 08:36-09:10/34 17:03
13	06:09 21:05	06:38 07:12-08:07/55 20:36	07:09 07:31-08:30/59 19:45	07:40 08:02-09:07/65 18:55	07:16 07:47-08:28/41 17:15 16:20-16:43/23	07:48 08:36-09:11/35 17:03
14	06:10 21:05	06:39 07:11-08:09/58 20:34	07:10 07:32-08:31/59 19:44	07:41 08:04-09:08/64 18:53 17:53-18:04/11	07:18 07:47-08:28/41 17:14 16:19-16:43/24	07:49 08:37-09:12/35 17:03
15	06:11 21:04	06:40 07:10-08:11/61 20:33	07:11 07:33-08:32/59 19:42	07:42 08:05-09:08/63 18:52 17:51-18:07/16	07:19 07:47-08:28/41 17:13 16:18-16:44/26	07:50 08:36-09:12/36 17:03
16	06:12 21:04	06:41 07:10-08:13/63 20:31	07:12 07:34-08:33/59 19:40	07:44 08:07-09:08/61 18:50 17:48-18:09/21	07:20 07:48-08:29/41 17:12 16:18-16:45/27	07:50 08:37-09:13/36 17:03
17	06:13 21:03	06:42 07:10-08:14/64 20:30	07:13 07:35-08:33/58 19:39	07:45 08:10-09:08/58 18:49 17:46-18:10/24	07:21 07:48-08:28/40 17:11 16:18-16:45/27	07:51 08:38-09:14/36 17:04
18	06:13 21:02	06:43 07:10-08:16/66 20:29	07:14 07:37-08:34/57 19:37	07:46 08:15-09:08/53 18:47 17:45-18:11/26	07:22 07:48-08:28/40 17:10 16:18-16:45/27	07:52 08:37-09:14/37 17:04
19	06:14 21:02	06:44 07:10-08:17/67 20:27	07:15 07:39-08:34/55 19:35	07:47 17:43-18:11/28 18:46 08:20-09:08/48	07:24 07:49-08:28/39 17:10 16:17-16:45/28	07:52 08:38-09:15/37 17:04
20	06:15 21:01	06:45 07:10-08:18/68 20:26	07:16 07:43-08:34/51 19:33	07:48 17:42-18:12/30 18:44 08:20-09:08/48	07:25 07:50-08:28/38 17:09 16:18-16:45/27	07:53 08:38-09:15/37 17:05
21	06:16 21:00	06:46 07:10-08:18/68 20:24	07:17 07:50-08:37/47 19:32	07:49 17:42-18:14/32 18:43 08:20-09:08/48	07:26 07:50-08:28/38 17:08 16:18-16:44/26	07:53 08:39-09:16/37 17:05
22	06:17 20:59	06:47 07:11-08:19/68 20:23	07:18 07:50-08:39/49 19:30	07:50 17:42-18:15/33 18:41 08:20-09:07/47	07:27 07:51-08:27/36 17:08 16:18-16:43/25	07:54 08:39-09:16/37 17:06
23	06:18 20:59	06:48 07:11-08:20/69 20:21	07:19 07:49-08:40/51 19:28	07:51 17:41-18:15/34 18:40 08:20-09:07/47	07:28 07:52-08:27/35 17:07 16:18-16:42/24	07:54 08:40-09:17/37 17:06
24	06:19 20:58	06:49 07:12-08:20/68 20:20	07:20 07:49-08:41/52 19:27	07:53 17:41-18:15/34 18:38 08:20-09:06/46	07:29 07:53-08:27/34 17:06 16:18-16:41/23	07:55 08:40-09:17/37 17:07
25	06:19 20:57	06:50 07:12-08:20/68 20:18	07:21 07:48-08:42/54 19:25	07:54 17:41-18:13/32 18:37 08:21-09:06/45	07:30 07:54-08:27/33 17:06 16:20-16:42/22	07:55 08:40-09:17/37 17:07
26	06:20 20:56	06:51 07:13-08:21/68 20:17	07:22 07:48-08:43/55 19:23	07:55 17:41-18:13/32 18:36 08:22-09:05/43	07:32 07:55-08:26/31 17:05 16:20-16:41/21	07:56 08:42-09:18/36 17:08
27	06:21 07:28-07:41/13 20:55	06:52 07:14-08:21/67 20:15	07:23 07:48-08:44/56 19:21	07:56 17:41-18:11/30 18:34 08:22-09:04/42	07:33 07:56-08:26/30 17:05 16:21-16:40/19	07:56 08:42-09:18/36 17:09
28	06:22 07:26-07:47/21 20:54	06:53 07:15-08:21/66 20:14	07:24 07:48-08:44/56 19:20	07:57 08:22-09:13/51 18:33 17:41-18:10/29	07:34 07:57-08:25/28 17:05 16:21-16:40/19	07:56 08:42-09:18/36 17:09
29	06:23 07:24-07:50/26 20:53	06:54 07:16-08:21/65 20:12	07:25 07:48-08:44/56 19:18	07:58 08:24-09:17/53 18:32 17:42-18:08/26	07:35 07:58-08:25/27 17:04 16:22-16:39/17	07:57 08:44-09:19/35 17:10
30	06:24 07:22-07:53/31 20:52	06:55 07:18-08:21/63 20:10	07:26 07:49-08:44/55 19:16	08:00 08:25-09:19/54 18:30 17:43-18:07/24	07:36 07:59-08:24/25 17:04 16:22-16:38/16	07:57 08:44-09:19/35 17:11
31	06:25 07:21-07:55/34 20:51	06:56 07:19-08:21/62 20:09		08:01 08:26-09:20/54 18:29 17:44-18:06/22		07:57 08:45-09:19/34 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	125	1794	1628	2212	1743	1176

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T29 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (448)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	10:01-11:17/76	07:44		07:07	07:44-08:48/64	07:16	07:48-08:02/14	06:30	18:57-19:52/55	06:01	18:56-19:56/60
	17:13		17:47		18:22	16:45-17:33/48	19:56	08:06-08:47/41	20:27		20:57	
2	07:58	10:02-11:17/75	07:43		07:06	07:43-08:48/65	07:15	07:51-07:59/8	06:29	18:56-19:53/57	06:01	18:57-19:56/59
	17:14		17:49		18:23	16:45-17:32/47	19:57	08:07-08:46/39	20:28		20:58	
3	07:58	10:02-11:16/74	07:42		07:04	07:43-08:48/65	07:13	08:08-08:44/36	06:28	18:55-19:53/58	06:01	18:57-19:55/58
	17:15		17:50		18:24	16:46-17:31/45	19:58		20:29		20:59	
4	07:58	10:03-11:16/73	07:41	17:07-17:11/4	07:03	07:42-08:48/66	07:11	08:09-08:42/33	06:26	18:54-19:54/60	06:00	18:57-19:56/59
	17:16		17:51		18:25	16:46-17:30/44	19:59		20:30		20:59	
5	07:58	10:04-11:15/71	07:40	17:01-17:17/16	07:01	07:41-08:48/67	07:10	08:11-08:40/29	06:25	18:54-19:54/60	06:00	18:58-19:56/58
	17:16		17:52		18:26	16:47-17:28/41	20:00		20:31		21:00	
6	07:58	10:05-11:14/69	07:38	16:58-17:21/23	06:59	07:41-08:48/67	07:08	08:13-08:37/24	06:24	18:54-19:55/61	05:59	18:58-19:55/57
	17:17		17:54		18:28	16:49-17:27/38	20:00		20:32		21:01	
7	07:58	10:06-11:13/67	07:37	16:55-17:22/27	06:58	07:26-08:48/82	07:06	08:15-08:33/18	06:23	18:53-19:55/62	05:59	18:59-19:55/56
	17:18		17:55		18:29	16:50-17:25/35	20:01		20:34		21:01	
8	07:57	10:06-11:10/64	07:36	16:53-17:24/31	07:56	08:23-09:48/85	07:05	08:22-08:27/5	06:22	18:53-19:56/63	05:59	18:59-19:56/57
	17:19		17:56		19:30	17:51-18:23/32	20:03		20:35		21:02	
9	07:57	10:07-11:09/62	07:35	16:52-17:26/34	07:55	08:20-09:47/87	07:03		06:20	18:53-19:56/63	05:59	19:00-19:56/56
	17:20		17:58		19:31	17:53-18:21/28	20:04		20:36		21:03	
10	07:57	10:08-11:09/61	07:34	16:51-17:28/37	07:53	08:17-09:46/89	07:01		06:19	18:52-19:55/63	05:59	19:00-19:56/56
	17:21		17:59		19:32	17:56-18:18/22	20:05		20:37		21:03	
11	07:57	10:10-11:09/59	07:33	16:50-17:30/40	07:51	08:16-09:47/91	07:00		06:18	18:52-19:56/64	05:58	19:00-19:55/55
	17:22		18:00		19:33	18:00-18:15/15	20:06		20:38		21:04	
12	07:57	10:10-11:08/58	07:31	16:48-17:30/42	07:50	08:14-09:46/92	06:58		06:17	18:51-19:56/65	05:58	19:00-19:55/55
	17:24		18:01		19:34		20:07		20:39		21:04	
13	07:56	10:12-11:08/56	07:30	16:47-17:31/44	07:48	08:12-09:45/93	06:57		06:16	18:51-19:56/65	05:58	19:01-19:55/54
	17:25		18:03		19:35		20:08		20:40		21:05	
14	07:56	10:12-11:07/55	07:29	08:11-08:24/13	07:46	08:11-09:44/93	06:55		06:15	18:51-19:56/65	05:58	19:01-19:55/54
	17:26		18:04	16:47-17:32/45	19:37		20:09		20:41		21:05	
15	07:56	10:14-11:06/52	07:27	08:05-08:28/23	07:45	08:10-09:43/93	06:53		06:14	18:51-19:56/65	05:58	19:01-19:55/54
	17:27		18:05	16:45-17:33/48	19:38		20:10		20:42		21:06	
16	07:55	10:16-11:06/50	07:26	08:02-08:32/30	07:43	08:08-09:42/94	06:52		06:13	18:52-19:57/65	05:58	19:02-19:56/54
	17:28		18:06	16:45-17:34/49	19:39		20:11		20:43		21:06	
17	07:55	10:17-11:04/47	07:25	08:00-08:35/35	07:41	08:08-09:41/93	06:50		06:12	18:52-19:57/65	05:58	19:02-19:56/54
	17:29		18:07	16:45-17:34/49	19:40		20:12		20:44		21:07	
18	07:54	10:18-11:03/45	07:23	07:57-08:37/40	07:40	08:07-09:40/93	06:49		06:11	18:52-19:57/65	05:58	19:03-19:57/54
	17:30		18:09	16:44-17:34/50	19:41	07:59-08:03/4	20:13		20:45		21:07	
19	07:54	10:20-11:02/42	07:22	07:56-08:39/43	07:38	07:57-09:38/101	06:47		06:10	18:52-19:57/65	05:58	19:03-19:57/54
	17:31		18:10	16:44-17:35/51	19:42		20:14		20:46		21:07	
20	07:53	10:22-11:00/38	07:21	07:53-08:40/47	07:36	07:56-09:37/101	06:46	19:21-19:32/11	06:09	18:52-19:56/64	05:58	19:03-19:57/54
	17:33		18:11	16:43-17:35/52	19:43		20:15		20:47		21:08	
21	07:52	10:25-10:58/33	07:19	07:52-08:42/50	07:35	07:54-09:36/102	06:44	19:16-19:38/22	06:09	18:52-19:56/64	05:59	19:03-19:57/54
	17:34		18:12	16:43-17:35/52	19:44		20:16		20:48		21:08	
22	07:52	10:28-10:55/27	07:18	07:50-08:42/52	07:33	07:52-09:34/102	06:43	19:12-19:40/28	06:08	18:53-19:57/64	05:59	19:03-19:57/54
	17:35		18:13	16:43-17:35/52	19:45		20:18		20:49		21:08	
23	07:51	10:31-10:52/21	07:16	07:50-08:44/54	07:31	07:50-09:32/102	06:41	19:09-19:43/34	06:07	18:53-19:56/63	05:59	19:04-19:58/54
	17:36		18:15	16:43-17:35/52	19:46		20:19		20:49		21:08	
24	07:50	10:37-10:45/8	07:15	07:48-08:44/56	07:30	07:49-09:30/101	06:40	19:06-19:44/38	06:06	18:53-19:56/63	05:59	19:04-19:58/54
	17:38		18:16	16:43-17:34/51	19:47		20:20		20:50		21:08	
25	07:50		07:13	07:47-08:46/59	07:28	07:47-09:28/101	06:38	19:05-19:46/41	06:05	18:54-19:57/63	06:00	19:04-19:58/54
	17:39		18:17	16:43-17:35/52	19:49		20:21		20:51		21:09	
26	07:49		07:12	07:46-08:46/60	07:26	07:45-09:25/100	06:37	19:03-19:47/44	06:05	18:54-19:56/62	06:00	19:05-19:59/54
	17:40		18:18	16:43-17:34/51	19:50		20:22		20:52		21:09	
27	07:48		07:10	07:45-08:47/62	07:25	07:45-09:23/98	06:36	19:01-19:48/47	06:04	18:54-19:56/62	06:00	19:05-19:58/53
	17:41		18:19	16:44-17:34/50	19:51		20:23		20:53		21:09	
28	07:47		07:09	07:44-08:47/63	07:23	08:54-09:19/25	06:34	19:00-19:50/50	06:04	18:55-19:56/61	06:01	19:04-19:58/54
	17:42		18:21	16:44-17:33/49	19:52	07:45-08:52/67	20:24		20:54		21:09	
29	07:46				07:21	08:58-09:13/15	06:33	18:58-19:50/52	06:03	18:54-19:56/62	06:01	19:05-19:59/54
	17:44				19:53	07:45-08:51/66	20:25		20:55		21:09	
30	07:46				07:20	07:46-08:50/64	06:32	18:58-19:51/53	06:02	18:55-19:56/61	06:02	19:04-19:59/55
	17:45				19:54		20:26		20:56		21:09	
31	07:45				07:18	07:47-08:04/17			06:02	18:55-19:55/60		
	17:46				19:55	08:05-08:49/44			20:56			
Potential sun hours	297		297		370		399		449		453	
Sum of minutes with flicker		1283		1738		3084		667		1935		1658

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T29 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (448)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:05-20:00/55 21:09	06:26 19:02-20:06/64 20:50	06:57 20:07	07:28 07:52-09:24/92 19:15	07:02 16:20-16:57/37 17:28	07:37 09:52-10:51/59 17:04
2	06:03 19:04-20:00/56 21:09	06:27 19:02-20:06/64 20:49	06:58 20:06	07:29 07:54-09:25/91 19:13 17:40-17:50/10	07:03 16:22-16:56/34 17:27	07:38 09:51-10:52/61 17:03
3	06:03 19:05-20:01/56 21:08	06:28 19:02-20:06/64 20:48	06:59 20:04	07:30 07:55-09:25/90 19:11 17:36-17:55/19	07:05 16:23-16:54/31 17:26	07:39 09:51-10:53/62 17:03
4	06:04 19:04-20:01/57 21:08	06:29 19:03-20:06/63 20:47	07:00 08:19-08:24/5 20:02	07:31 07:56-09:25/89 19:10 17:32-17:58/26	07:06 16:25-16:52/27 17:24	07:40 09:51-10:55/64 17:03
5	06:04 19:05-20:01/56 21:08	06:30 19:03-20:05/62 20:46	07:01 08:12-08:30/18 20:01	07:32 07:58-09:25/87 19:08 17:29-18:00/31	07:07 16:28-16:50/22 17:23	07:41 09:51-10:57/66 17:03
6	06:05 19:04-20:01/57 21:08	06:31 19:03-20:05/62 20:45	07:02 08:09-08:33/24 19:57	07:33 08:01-09:24/83 19:06 17:27-18:01/34	07:08 16:31-16:47/16 17:22	07:42 09:51-11:00/69 17:03
7	06:05 19:04-20:02/58 21:08	06:32 19:03-20:04/61 20:43	07:03 08:06-08:35/29 19:56	07:34 08:17-09:24/67 08:06-08:16/10 19:05 17:25-18:02/37	07:09 17:21	07:43 09:51-11:02/71 17:03
8	06:06 19:05-20:03/58 21:07	06:33 19:04-20:04/60 20:42	07:04 08:04-08:37/33 19:54	07:35 08:17-09:23/66 19:03 17:23-18:03/40	07:11 17:20	07:44 09:51-11:04/73 17:03
9	06:07 19:04-20:03/59 21:07	06:34 19:04-20:03/59 20:41	07:05 08:02-08:38/36 19:52	07:36 08:16-09:23/67 19:02 17:22-18:04/42	07:12 17:19	07:45 09:51-11:05/74 17:03
10	06:07 19:04-20:03/59 21:07	06:35 19:05-20:02/57 20:40	07:06 07:45-07:52/7 19:51 08:01-08:39/38	07:37 08:16-09:22/66 19:00 17:20-18:04/44	07:13 17:18	07:46 09:51-11:06/75 17:03
11	06:08 19:04-20:04/60 21:06	06:36 19:05-20:02/57 20:38	07:07 07:41-07:55/14 19:49 07:59-08:40/41	07:38 08:16-09:22/66 18:58 17:19-18:05/46	07:14 17:17	07:47 09:51-11:07/76 17:03
12	06:09 19:04-20:04/60 21:06	06:37 19:06-20:01/55 20:37	07:08 07:39-07:56/17 19:47 07:58-08:41/43	07:39 08:16-09:21/65 18:57 17:18-18:05/47	07:15 17:16	07:48 09:51-11:09/78 17:03
13	06:10 19:04-20:04/60 21:05	06:38 19:07-20:00/53 20:36	07:09 07:37-08:40/63 19:46	07:40 08:18-09:21/63 18:55 17:17-18:05/48	07:17 17:15	07:48 09:52-11:10/78 17:03
14	06:10 19:04-20:05/61 21:05	06:39 19:07-19:59/52 20:34	07:10 08:49-09:03/14 19:44 07:35-08:41/66	07:42 08:18-09:20/62 18:54 17:17-18:06/49	07:18 17:14	07:49 09:52-11:11/79 17:03
15	06:11 19:04-20:05/61 21:04	06:40 19:08-19:57/49 20:33	07:11 08:44-09:07/23 19:42 07:34-08:41/67	07:43 08:18-09:19/61 18:52 17:16-18:06/50	07:19 17:13	07:50 09:52-11:11/79 17:03
16	06:12 19:03-20:05/62 21:04	06:41 19:09-19:56/47 20:32	07:12 07:33-09:10/97 19:40	07:44 08:19-09:18/59 18:50 17:15-18:06/51	07:20 17:12	07:51 09:53-11:13/80 17:04
17	06:13 19:03-20:05/62 21:03	06:42 19:10-19:53/43 20:30	07:13 07:33-09:13/100 19:39	07:45 08:19-09:17/58 18:49 17:15-18:06/51	07:21 17:11	07:51 09:53-11:14/81 17:04
18	06:14 19:03-20:06/63 21:02	06:43 19:11-19:52/41 20:29	07:14 07:34-09:14/100 19:37	07:46 08:20-09:15/55 18:47 17:14-18:06/52	07:23 10:11-10:19/8 17:11	07:52 09:53-11:14/81 17:04
19	06:14 19:03-20:06/63 21:02	06:44 19:13-19:50/37 20:27	07:15 07:35-09:16/101 19:35	07:47 08:20-09:14/54 18:46 17:14-18:06/52	07:24 10:06-10:27/21 17:10	07:52 09:54-11:15/81 17:05
20	06:15 19:03-20:07/64 21:01	06:45 19:14-19:47/33 20:26	07:16 07:36-09:17/101 19:34	07:48 08:22-09:13/51 18:44 17:14-18:06/52	07:25 10:03-10:30/27 17:09	07:53 09:54-11:15/81 17:05
21	06:16 19:02-20:06/64 21:00	06:46 19:17-19:45/28 20:24	07:17 07:37-09:19/102 19:32	07:49 08:23-09:12/49 18:43 17:14-18:06/52	07:26 10:00-10:33/33 17:08	07:54 09:55-11:16/81 17:05
22	06:17 19:02-20:06/64 21:00	06:47 19:20-19:41/21 20:23	07:18 07:38-09:20/102 19:30	07:50 08:25-09:10/45 18:42 17:14-18:05/51	07:27 09:58-10:36/38 17:08	07:54 09:55-11:16/81 17:06
23	06:18 19:02-20:07/65 20:59	06:48 19:26-19:35/9 20:21	07:19 07:39-09:21/102 19:28	07:52 08:26-09:08/42 18:40 17:14-18:04/50	07:28 09:57-10:38/41 17:07	07:55 09:56-11:17/81 17:06
24	06:19 19:02-20:07/65 20:58	06:49 20:20	07:20 07:40-09:21/101 19:27	07:53 08:28-09:07/39 18:39 17:14-18:04/50	07:30 09:56-10:41/45 17:07	07:55 09:56-11:17/81 17:07
25	06:20 19:03-20:07/64 20:57	06:50 20:18	07:21 07:49-09:22/93 19:25 07:41-07:47/6	07:54 08:30-09:04/34 18:37 17:15-18:04/49	07:31 09:55-10:42/47 17:06	07:55 09:57-11:18/81 17:08
26	06:21 19:03-20:07/64 20:56	06:51 20:17	07:22 07:49-09:23/94 19:23	07:55 08:33-09:01/28 18:36 17:15-18:03/48	07:32 09:54-10:44/50 17:06	07:56 09:57-11:18/81 17:08
27	06:22 19:03-20:07/64 20:55	06:52 20:15	07:23 07:50-09:23/93 19:22	07:56 08:36-08:57/21 18:34 17:15-18:02/47	07:33 09:53-10:45/52 17:05	07:56 09:57-11:18/81 17:09
28	06:22 19:02-20:07/65 20:54	06:53 20:14	07:25 07:50-09:23/93 19:20	07:57 08:42-08:50/8 18:33 17:16-18:01/45	07:34 09:52-10:47/55 17:05	07:57 09:58-11:17/79 17:10
29	06:23 19:02-20:07/65 20:53	06:54 20:12	07:26 07:50-09:24/94 19:18	07:59 17:17-18:01/44 18:32	07:35 09:52-10:48/56 17:04	07:57 09:59-11:18/79 17:10
30	06:24 19:02-20:06/64 20:52	06:55 20:11	07:27 07:51-09:24/93 19:17	08:00 17:18-18:00/42 18:31	07:36 09:52-10:50/58 17:04	07:57 10:00-11:18/78 17:11
31	06:25 19:02-20:06/64 20:51	06:56 20:09	 	08:01 17:19-17:58/39 18:29	 	07:57 10:00-11:18/78 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1895	1141	2010	2966	698	2349

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T3 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (422)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:26-09:05/39 17:12	07:43 17:12-17:23/11 17:47	07:07 07:26-08:20/54 18:21	07:16 07:53-09:13/80 19:56 19:01-19:34/33	06:30 07:14-08:46/92 20:27 19:26-20:01/35	06:01 19:57-20:25/28 20:57 07:20-08:23/63
2	07:57 08:27-09:05/38 17:13	07:42 17:11-17:24/13 17:48	07:05 07:25-08:20/55 18:22	07:14 07:51-09:13/82 19:57 19:02-19:35/33	06:28 07:14-08:45/91 20:28 19:27-20:01/34	06:00 19:58-20:26/28 20:58 07:20-08:23/63
3	07:57 08:27-09:06/39 17:14	07:41 17:09-17:26/17 17:49	07:04 07:23-08:19/56 18:24	07:12 07:49-09:12/83 19:58 19:04-19:36/32	06:27 07:14-08:45/91 20:29 19:29-20:01/32	06:00 20:00-20:26/26 20:58 07:21-08:23/62
4	07:58 08:27-09:06/39 17:15	07:40 17:09-17:27/18 17:51	07:02 07:22-08:19/57 18:25	07:11 07:48-09:13/85 19:59 19:13-19:37/24	06:26 19:31-20:01/30 20:03-20:08/5 20:30 07:14-08:44/90	05:59 20:00-20:25/25 20:59 07:21-08:22/61
5	07:58 08:28-09:07/39 17:16	07:39 17:07-17:27/20 17:52	07:01 07:20-08:18/58 18:26	07:09 07:46-09:12/86 20:00 19:12-19:38/26	06:25 19:30-20:08/38 20:31 07:13-08:42/89	05:59 20:00-20:25/25 21:00 07:22-08:22/60
6	07:57 08:29-09:07/38 17:17	07:38 17:07-17:29/22 17:53	06:59 07:18-08:16/58 18:27	07:07 07:45-09:11/86 20:00 19:11-19:39/28	06:23 19:31-20:09/38 20:32 07:13-08:41/88	05:59 20:01-20:26/25 21:01 07:23-08:22/59
7	07:57 08:29-09:08/39 17:18	07:37 17:06-17:31/25 17:54	06:57 07:17-08:16/59 18:28	07:06 07:44-09:11/87 20:01 19:10-19:41/31	06:22 19:32-20:10/38 20:33 07:13-08:40/87	05:58 20:01-20:25/24 21:01 07:23-08:21/58
8	07:57 08:29-09:07/38 17:19	07:36 17:06-17:32/26 17:56	07:56 08:15-09:14/59 19:29	07:04 07:43-09:10/87 20:02 19:10-19:41/31	06:21 19:33-20:12/39 20:34 07:13-08:39/86	05:58 20:02-20:25/23 21:02 07:23-08:21/58
9	07:57 08:30-09:08/38 17:20	07:35 17:06-17:34/28 17:57	07:54 08:14-09:13/59 19:30	07:03 07:43-09:10/87 20:03 19:09-19:40/31	06:20 19:34-20:13/39 20:35 07:13-08:38/85	05:58 20:02-20:25/23 21:02 07:24-08:21/57
10	07:57 08:30-09:08/38 17:21	07:34 17:05-17:34/29 17:58	07:53 08:12-09:10/58 19:32	07:01 07:42-09:09/87 20:04 19:09-19:40/31	06:19 19:35-20:14/39 20:36 07:13-08:37/84	05:58 20:03-20:25/22 21:03 07:25-08:21/56
11	07:57 08:31-09:09/38 17:22	07:32 17:06-17:36/30 17:59	07:51 08:10-09:07/57 19:33	06:59 07:39-09:08/89 20:05 19:09-19:40/31	06:17 19:36-20:15/39 20:37 07:13-08:36/83	05:58 20:03-20:25/22 21:04 07:25-08:21/56
12	07:56 08:31-09:09/38 17:23	07:31 17:06-17:37/31 18:01	07:49 08:09-09:04/55 19:34	06:58 07:36-09:08/92 20:06 19:09-19:46/37	06:16 19:38-20:16/38 20:38 07:13-08:35/82	05:58 20:04-20:25/21 21:04 07:26-08:21/55
13	07:56 08:32-09:09/37 17:24	07:30 07:55-08:07/12 18:02 17:07-17:39/32	07:48 08:08-08:56/48 19:35	06:56 07:34-09:07/93 20:08 19:09-19:46/37	06:15 19:40-20:17/37 20:39 07:13-08:34/81	05:57 20:05-20:25/20 21:05 07:26-08:21/55
14	07:56 08:32-09:09/37 17:25	07:28 07:51-08:10/19 18:03 17:06-17:40/34	07:46 08:07-08:55/48 19:36	06:54 07:32-09:07/95 20:09 19:10-19:48/38	06:14 19:51-20:17/26 07:13-08:32/79 20:41 19:44-19:47/3	05:57 20:05-20:25/20 21:05 07:27-08:21/54
15	07:55 08:33-09:09/36 17:26	07:27 07:49-08:13/24 18:04 17:07-17:41/34	07:44 08:07-08:59/52 19:37	06:53 07:30-09:05/95 20:10 19:10-19:48/38	06:13 19:50-20:18/28 20:42 07:13-08:31/78	05:57 20:05-20:25/20 21:06 07:27-08:21/54
16	07:55 08:33-09:09/36 17:27	07:26 07:47-08:15/28 18:06 17:09-17:43/34	07:43 08:07-09:02/55 19:38	06:51 07:28-09:05/97 20:11 19:10-19:49/39	06:12 19:50-20:19/29 20:43 07:13-08:29/76	05:57 20:06-20:25/19 21:06 07:27-08:21/54
17	07:54 08:34-09:09/35 17:28	07:24 07:45-08:16/31 18:07 17:09-17:44/35	07:41 08:07-09:03/56 19:39 19:10-19:18/8	06:50 07:26-09:03/97 20:12 19:12-19:51/39	06:11 19:50-20:20/30 20:44 07:14-08:28/74	05:57 20:06-20:25/19 21:06 07:28-08:21/53
18	07:54 08:35-09:09/34 17:30	07:23 07:43-08:17/34 18:08 17:11-17:46/35	07:39 08:06-09:05/59 19:41 19:06-19:19/13	06:48 07:24-09:02/98 20:13 19:13-19:51/38	06:10 19:50-20:21/31 20:44 07:14-08:28/74	05:57 20:06-20:25/19 21:07 07:28-08:21/53
19	07:53 08:36-09:09/33 17:31	07:22 07:42-08:19/37 18:09 17:12-17:46/34	07:38 08:08-09:07/59 19:42 19:04-19:21/17	06:47 07:24-09:01/97 20:14 19:15-19:53/38	06:10 19:50-20:21/31 20:45 07:14-08:27/73	05:58 20:06-20:25/19 21:07 07:28-08:21/53
20	07:53 08:37-09:09/32 17:32	07:20 07:40-08:19/39 18:11 17:15-17:47/32	07:36 08:08-09:08/60 19:43 19:02-19:21/19	06:45 07:23-09:00/97 20:15 19:17-19:53/36	06:09 19:51-20:23/32 20:46 07:15-08:28/73	05:58 20:07-20:25/18 21:07 07:28-08:21/53
21	07:52 08:37-09:08/31 17:33	07:19 07:39-08:20/41 18:12 17:20-17:47/27	07:34 08:08-09:09/61 19:44 19:01-19:22/21	06:44 07:21-08:58/97 20:16 19:23-19:55/32	06:08 19:51-20:24/33 20:47 07:15-08:27/72	05:58 20:07-20:25/18 21:08 07:28-08:21/53
22	07:52 08:39-09:08/29 17:34	07:17 07:37-08:20/43 18:13 17:20-17:46/26	07:33 08:09-09:10/61 19:45 19:00-19:24/24	06:42 07:21-08:57/96 20:17 19:23-19:56/33	06:07 19:51-20:24/33 20:48 07:15-08:26/71	05:58 20:08-20:26/18 21:08 07:29-08:22/53
23	07:51 08:40-09:07/27 17:36	07:16 07:36-08:21/45 18:14 17:21-17:46/25	07:31 08:07-09:11/64 19:46 18:59-19:25/26	06:41 07:19-08:55/96 20:18 19:22-19:56/34	06:06 19:51-20:25/34 20:49 07:15-08:26/71	05:58 20:08-20:26/18 21:08 07:29-08:22/53
24	07:50 08:41-09:06/25 17:37	07:15 07:34-08:21/47 18:15 17:21-17:44/23	07:29 08:06-09:11/65 19:47 18:58-19:25/27	06:39 07:19-08:54/95 20:19 19:23-19:58/35	06:06 19:52-20:26/34 20:50 07:16-08:26/70	05:59 20:07-20:26/19 21:08 07:29-08:22/53
25	07:49 08:43-09:05/22 17:38	07:13 07:33-08:22/49 18:17 17:22-17:44/22	07:27 08:05-09:13/68 19:48 18:58-19:26/28	06:38 07:17-08:52/95 20:20 19:22-19:58/36	06:05 19:52-20:26/34 20:51 07:17-08:25/68	05:59 20:07-20:26/19 21:08 07:30-08:23/53
26	07:49 08:45-09:04/19 17:39	07:12 07:31-08:21/50 18:18 17:23-17:42/19	07:26 08:04-09:13/69 19:49 18:58-19:26/28	06:36 07:17-08:51/94 20:22 19:23-20:00/37	06:04 19:53-20:25/32 20:52 07:17-08:25/68	05:59 20:08-20:27/19 21:09 07:29-08:23/54
27	07:48 08:48-09:02/14 17:41	07:10 07:30-08:22/52 18:19 17:24-17:40/16	07:24 08:02-09:13/71 19:50 18:58-19:25/27	06:35 07:17-08:50/93 20:23 19:23-20:01/38	06:03 19:54-20:26/32 20:53 07:18-08:25/67	06:00 20:08-20:27/19 21:09 07:29-08:23/54
28	07:47 08:52-08:58/6 17:42	07:08 07:29-08:21/52 18:20 17:27-17:37/10	07:22 08:00-09:13/73 19:51 18:57-19:24/27	06:34 07:15-08:48/93 20:24 19:23-20:01/38	06:03 19:54-20:26/32 20:54 07:18-08:24/66	06:00 20:08-20:28/20 21:09 07:30-08:24/54
29	07:46 17:43		07:21 07:58-09:13/75 19:52 18:58-19:24/26	06:32 07:15-08:48/93 20:25 19:24-20:02/38	06:02 19:55-20:26/31 20:55 07:19-08:24/65	06:00 20:08-20:28/20 21:09 07:29-08:24/55
30	07:45 17:44		07:19 07:56-09:13/77 19:54 18:59-19:23/24	06:31 07:15-08:47/92 20:26 19:25-20:02/37	06:02 19:55-20:26/31 20:55 07:19-08:24/65	06:01 20:07-20:28/21 21:09 07:30-08:25/55
31	07:44 17:14-17:21/7 17:46		07:17 07:54-09:13/79 19:55 18:59-19:33/34		06:01 19:57-20:26/29 20:56 07:20-08:24/64	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	921	1311	2234	3773	3449	2311

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T3 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (422)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01 20:08-20:29/21	06:26 19:47-20:26/39	06:57 07:38-09:07/89	07:27 07:47-08:41/54	07:02 16:35-17:04/29	07:37 08:13-08:51/38
	21:09 07:29-08:25/56	20:50 07:24-08:46/82	20:07 19:07-19:39/32	19:14	17:27	17:03
2	06:02 20:07-20:29/22	06:27 19:45-20:24/39	06:58 07:40-09:07/87	07:28 07:48-08:45/57	07:03 16:35-17:02/27	07:38 08:13-08:52/39
	21:08 07:29-08:25/56	20:49 07:23-08:47/84	20:05 19:07-19:38/31	19:13	17:26	17:03
3	06:02 20:08-20:30/22	06:28 19:44-20:23/39	06:59 07:40-09:07/87	07:29 07:49-08:47/58	07:04 16:36-17:02/26	07:39 08:14-08:52/38
	21:08 07:29-08:26/57	20:48 07:22-08:47/85	20:04 19:07-19:38/31	19:11	17:25	17:02
4	06:03 20:07-20:30/23	06:29 19:43-20:22/39	07:00 07:40-09:07/87	07:30 07:50-08:48/58	07:05 16:36-17:00/24	07:40 08:14-08:52/38
	21:08 07:30-08:27/57	20:47 07:22-08:48/86	20:02 19:07-19:38/31	19:09	17:24	17:02
5	06:03 20:07-20:31/24	06:30 19:42-20:21/39	07:01 07:40-09:07/87	07:31 07:51-08:50/59	07:07 16:36-16:59/23	07:41 08:14-08:53/39
	21:08 07:29-08:27/58	20:46 07:22-08:49/87	20:00 19:07-19:37/30	19:08	17:23	17:02
6	06:04 20:08-20:32/24	06:31 19:41-20:20/39	07:02 07:41-09:07/86	07:32 07:52-08:51/59	07:08 16:38-16:58/20	07:42 08:15-08:53/38
	21:08 07:29-08:28/59	20:44 07:22-08:50/88	19:57 19:07-19:35/28	19:06	17:21	17:02
7	06:05 20:07-20:31/24	06:32 19:41-20:19/38	07:03 07:41-09:07/86	07:34 07:54-08:52/58	07:09 16:39-16:57/18	07:43 08:15-08:54/39
	21:07 07:28-08:28/60	20:43 07:22-08:51/89	19:55 19:07-19:33/26	19:04	17:20	17:02
8	06:05 20:07-20:32/25	06:33 19:40-20:17/37	07:04 07:42-09:07/85	07:35 07:55-08:53/58	07:10 16:39-16:55/16	07:44 08:16-08:54/38
	21:07 07:29-08:29/60	20:42 07:22-08:52/90	19:54 19:07-19:32/25	19:03	17:19	17:02
9	06:06 20:07-20:33/26	06:34 19:39-20:10/31	07:05 07:43-09:07/84	07:36 07:56-08:53/57	07:11 16:41-16:54/13	07:45 08:15-08:54/39
	21:07 07:29-08:30/61	20:41 07:22-08:53/91	19:52 18:59-19:30/31	19:01	17:18	17:02
10	06:07 20:06-20:33/27	06:35 07:22-08:54/92	07:06 07:44-09:06/82	07:37 07:57-08:54/57	07:13 16:43-16:53/10	07:46 08:16-08:54/38
	21:06 07:28-08:30/62	20:39 19:37-20:10/33	19:50 18:55-19:28/33	18:59	17:17	17:02
11	06:07 20:06-20:34/28	06:36 07:22-08:54/92	07:07 07:45-09:06/81	07:38 07:58-08:54/56	07:14 16:45-16:52/7	07:47 08:16-08:55/39
	21:06 07:28-08:31/63	20:38 19:35-20:10/35	19:49 18:53-19:27/34	18:58	17:16	17:02
12	06:08 20:05-20:34/29	06:37 07:23-08:55/92	07:08 07:46-09:05/79	07:39 07:59-08:54/55	07:15	07:47 09:08-09:14/6
	21:06 07:28-08:32/64	20:37 19:34-20:10/36	19:47 18:51-19:25/34	18:56	17:15	17:02 08:17-08:55/38
13	06:09 20:04-20:34/30	06:38 07:23-08:55/92	07:09 07:47-09:04/77	07:40 08:01-08:54/53	07:16	07:48 09:07-09:16/9
	21:05 07:27-08:32/65	20:36 19:33-20:10/37	19:45 18:50-19:14/24	18:55	17:14	17:02 08:18-08:56/38
14	06:10 20:04-20:34/30	06:39 07:23-08:56/93	07:10 07:48-09:04/76	07:41 08:02-08:53/51	07:18 08:23-08:30/7	07:49 09:06-09:18/12
	21:05 07:27-08:32/65	20:34 19:32-20:09/37	19:43 18:49-19:14/25	18:53 17:59-18:11/12	17:13	17:02 08:18-08:57/39
15	06:10 20:03-20:35/32	06:40 07:23-08:56/93	07:11 07:50-09:03/73	07:42 08:03-08:54/51	07:19 08:20-08:34/14	07:50 09:05-09:19/14
	21:04 07:27-08:33/66	20:33 19:31-20:09/38	19:42 18:48-19:15/27	18:52 17:56-18:13/17	17:12	17:03 08:18-08:56/38
16	06:11 20:03-20:35/32	06:41 07:23-08:57/94	07:12 07:52-09:02/70	07:43 08:04-08:54/50	07:20 08:18-08:37/19	07:50 09:06-09:20/14
	21:03 07:27-08:34/67	20:31 19:30-20:07/37	19:40 18:47-19:15/28	18:50 17:55-18:15/20	17:12	17:03 08:19-08:57/38
17	06:12 20:02-20:35/33	06:42 07:24-08:58/94	07:13 07:52-09:01/69	07:44 08:05-08:53/48	07:21 08:17-08:39/22	07:51 09:06-09:21/15
	21:03 07:26-08:34/68	20:30 19:29-20:06/37	19:38 18:46-19:15/29	18:48 17:53-18:16/23	17:11	17:03 08:20-08:58/38
18	06:13 20:02-20:35/33	06:43 07:24-08:59/95	07:14 07:52-09:00/68	07:46 08:06-08:52/46	07:22 08:15-08:40/25	07:52 09:05-09:22/17
	21:02 07:26-08:35/69	20:29 19:29-20:05/36	19:37 18:46-19:14/28	18:47 17:52-18:16/24	17:10	17:04 08:20-08:58/38
19	06:14 20:02-20:35/33	06:44 07:25-09:00/95	07:15 07:53-08:59/66	07:47 08:07-08:52/45	07:23 08:14-08:41/27	07:52 09:06-09:23/17
	21:02 07:26-08:35/69	20:27 19:28-20:03/35	19:35 18:46-19:13/27	18:45 17:51-18:17/26	17:09	17:04 08:20-08:59/39
20	06:15 20:02-20:36/34	06:45 07:25-09:01/96	07:16 07:54-08:58/64	07:48 08:08-08:51/43	07:25 08:14-08:43/29	07:53 09:06-09:23/17
	21:01 07:26-08:36/70	20:26 19:28-20:02/34	19:33 18:46-19:11/25	18:44 17:50-18:17/27	17:09	17:04 08:20-08:59/39
21	06:15 20:02-20:35/33	06:46 07:26-09:02/96	07:17 07:54-08:56/62	07:49 08:10-08:51/41	07:26 08:13-08:44/31	07:53 09:07-09:24/17
	21:00 07:26-08:37/71	20:24 19:28-20:01/33	19:31 18:46-19:10/24	18:42 17:50-18:18/28	17:08	17:05 08:21-08:59/38
22	06:16 20:02-20:35/33	06:47 07:26-09:03/97	07:18 07:54-08:55/61	07:50 08:11-08:50/39	07:27 08:13-08:45/32	07:54 09:07-09:24/17
	20:59 07:26-08:37/71	20:23 19:28-19:59/31	19:30 18:46-19:08/22	18:41 17:44-18:17/33	17:07	17:05 08:21-08:59/38
23	06:17 20:01-20:33/32	06:48 07:27-09:04/97	07:19 07:53-08:53/60	07:51 08:12-08:48/36	07:28 08:12-08:45/33	07:54 09:08-09:25/17
	20:59 07:25-08:37/72	20:21 19:22-19:58/36	19:28 18:47-19:06/19	18:40 17:42-18:16/34	17:07	17:06 08:22-09:01/39
24	06:18 20:01-20:32/31	06:49 07:28-09:05/97	07:20 07:51-08:51/60	07:52 08:13-08:47/34	07:29 08:13-08:47/34	07:55 09:08-09:25/17
	20:58 07:24-08:37/73	20:20 19:18-19:56/38	19:26 18:47-19:04/17	18:38 17:40-18:15/35	17:06	17:06 08:22-09:01/39
25	06:19 20:01-20:32/31	06:50 07:28-09:05/97	07:21 07:50-08:49/59	07:54 08:15-08:45/30	07:30 08:13-08:47/34	07:55 09:09-09:26/17
	20:57 07:24-08:38/74	20:18 19:16-19:55/39	19:25 18:49-19:03/14	18:37 17:38-18:13/35	17:05	17:07 08:24-09:02/38
26	06:20 20:01-20:31/30	06:51 07:29-09:06/97	07:22 07:49-08:47/58	07:55 08:18-08:44/26	07:32 08:12-08:48/36	07:56 09:10-09:26/16
	20:56 07:24-08:38/74	20:17 19:14-19:53/39	19:23 18:51-19:01/10	18:35 17:38-18:12/34	17:05	17:08 08:24-09:02/38
27	06:21 20:01-20:30/29	06:52 07:30-09:07/97	07:23 07:48-08:44/56	07:56 08:19-08:42/23	07:33 08:12-08:48/36	07:56 09:10-09:25/15
	20:55 07:24-08:39/75	20:15 19:13-19:52/39	19:21	18:34 17:37-18:11/34	17:04	17:08 08:24-09:02/38
28	06:22 20:01-20:29/28	06:53 07:32-09:07/95	07:24 07:48-08:41/53	07:57 08:21-08:39/18	07:34 08:12-08:49/37	07:56 09:11-09:25/14
	20:54 07:24-08:40/76	20:13 19:12-19:50/38	19:19	18:33 17:36-18:09/33	17:04	17:09 08:24-09:02/38
29	06:23 20:01-20:29/28	06:54 07:33-09:07/94	07:25 07:47-08:38/51	07:58 08:25-08:35/10	07:35 08:12-08:49/37	07:57 09:13-09:25/12
	20:53 07:24-08:42/78	20:12 19:10-19:48/38	19:18	18:31 17:35-18:08/33	17:04	17:10 08:25-09:04/39
30	06:24 20:01-20:28/27 07:24-08:43/79	06:55 07:35-09:08/93	07:26 07:47-08:35/48	07:59 17:36-18:07/31	07:36 08:12-08:50/38	07:57 09:14-09:25/11
	20:52 19:52-20:00/8	20:10 19:09-19:46/37	19:16	18:30	17:03	17:10 08:25-09:04/39
31	06:25 19:49-20:27/38	06:56 07:36-09:07/91		08:01 17:35-18:05/30		07:57 09:16-09:24/8
	20:51 07:24-08:45/81	20:09 19:08-19:44/36		18:29		17:11 08:26-09:04/38
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2976	4000	2836	1839	704	1472

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T30 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (449)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:49-16:42/53 17:13	07:44 16:11-17:16/65 17:47	07:07 16:46-17:50/64 18:22	07:16 19:56	06:30 18:53-19:54/61 20:27	06:01 19:27-20:22/55 20:57
2	07:57 15:49-16:42/53 17:14	07:43 16:12-17:18/66 17:49	07:06 16:50-17:50/60 18:23	07:14 19:57	06:29 18:53-19:55/62 20:28	06:01 19:27-20:23/56 20:58
3	07:58 15:50-16:43/53 17:15	07:42 16:13-17:19/66 17:50	07:04 16:55-17:50/55 18:24	07:13 19:58	06:28 18:53-19:54/61 20:29	06:00 19:26-20:22/56 20:58
4	07:58 15:50-16:44/54 17:15	07:40 16:14-17:22/68 17:51	07:03 16:57-17:51/54 18:25	07:11 19:59	06:26 18:53-19:54/61 20:30	06:00 19:27-20:23/56 20:59
5	07:58 15:51-16:45/54 17:16	07:39 16:15-17:24/69 17:52	07:01 16:56-17:50/54 18:26	07:09 20:00	06:25 18:53-19:54/61 20:31	06:00 19:27-20:23/56 21:00
6	07:58 15:51-16:46/55 17:17	07:38 16:16-17:26/70 17:54	06:59 16:57-17:51/54 18:27	07:08 20:00	06:24 18:54-19:54/60 20:32	05:59 19:27-20:23/56 21:01
7	07:57 15:52-16:47/55 17:18	07:37 16:17-17:27/70 17:55	06:58 16:56-17:50/54 18:29	07:06 20:01	06:23 18:54-19:53/59 20:33	05:59 19:27-20:23/56 21:01
8	07:57 15:51-16:47/56 17:19	07:36 16:19-17:29/70 17:56	07:56 17:56-18:49/53 19:30	07:05 20:02	06:21 18:54-19:56/62 20:34	05:59 19:27-20:24/57 21:02
9	07:57 15:52-16:48/56 17:20	07:35 16:21-17:30/69 17:57	07:55 17:56-18:49/53 19:31	07:03 20:03	06:20 18:54-20:01/67 20:35	05:59 19:28-20:24/56 21:03
10	07:57 15:53-16:49/56 17:21	07:34 16:23-17:32/69 17:59	07:53 17:56-18:49/53 19:32	07:01 20:05	06:19 18:55-20:04/69 20:37	05:58 19:27-20:24/57 21:03
11	07:57 15:53-16:50/57 17:22	07:32 16:26-17:32/66 18:00	07:51 17:56-18:48/52 19:33	07:00 19:18-19:32/14 20:06	06:18 18:55-20:06/71 20:38	05:58 19:27-20:24/57 21:04
12	07:56 15:53-16:50/57 17:23	07:31 16:31-17:33/62 18:01	07:50 17:57-18:47/50 19:34	06:58 19:13-19:36/23 20:07	06:17 18:56-20:08/72 20:39	05:58 19:28-20:24/56 21:04
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14	07:56 15:54-16:51/57 17:26	07:29 16:32-17:35/63 18:04	07:46 17:57-18:45/48 19:36	06:55 19:08-19:40/32 20:09	06:15 18:57-20:11/74 20:41	05:58 19:28-20:25/57 21:05
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16	07:55 15:55-16:52/57 17:28	07:26 16:32-17:39/67 18:06	07:43 17:59-18:43/44 19:39	06:52 19:04-19:44/40 20:11	06:13 18:58-20:13/75 20:43	05:58 19:28-20:25/57 21:06
17	07:55 15:56-16:53/57 17:29	07:25 16:31-17:41/70 18:07	07:41 18:00-18:41/41 19:40	06:50 19:02-19:46/44 20:12	06:12 19:00-20:15/75 20:44	05:58 19:29-20:25/56 21:06
18	07:54 15:56-16:53/57 17:30	07:23 16:32-17:43/71 18:09	07:40 18:02-18:40/38 19:41	06:49 19:01-19:48/47 20:13	06:11 19:01-20:15/74 20:45	05:58 19:29-20:26/57 21:07
19	07:54 15:58-16:54/56 17:31	07:22 16:33-17:45/72 18:10	07:38 18:03-18:38/35 19:42	06:47 18:59-19:49/50 20:14	06:10 19:02-20:16/74 20:46	05:58 19:30-20:27/57 21:07
20	07:53 15:58-16:54/56 17:33	07:21 16:33-17:45/72 18:11	07:36 18:04-18:36/32 19:43	06:46 18:58-19:50/52 20:15	06:09 19:02-20:16/74 20:47	05:58 19:30-20:27/57 21:07
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22	07:52 16:00-16:55/55 17:35	07:18 16:34-17:47/73 18:13	07:33 18:09-18:30/21 19:45	06:43 18:57-19:52/55 20:17	06:08 19:05-20:18/73 20:48	05:59 19:30-20:27/57 21:08
23	07:51 16:00-16:59/59 17:36	07:16 16:36-17:48/72 18:15	07:31 18:14-18:25/11 19:46	06:41 18:56-19:53/57 20:18	06:07 19:06-20:18/72 20:49	05:59 19:30-20:27/57 21:08
24	07:50 16:01-17:02/61 17:37	07:15 16:36-17:48/72 18:16	07:30 19:47	06:40 18:55-19:53/58 20:20	06:06 19:07-20:19/72 20:50	05:59 19:31-20:28/57 21:08
25	07:50 16:02-17:05/63 17:39	07:13 16:38-17:49/71 18:17	07:28 19:48	06:38 18:55-19:54/59 20:21	06:05 19:09-20:20/71 20:51	06:00 19:31-20:27/56 21:08
26	07:49 16:04-17:08/64 17:40	07:12 16:39-17:49/70 18:18	07:26 19:50	06:37 18:54-19:53/59 20:22	06:05 19:11-20:20/69 20:52	06:00 19:30-20:27/57 21:09
27	07:48 16:05-17:10/65 17:41	07:10 16:41-17:49/68 18:19	07:24 19:51	06:36 18:54-19:54/60 20:23	06:04 19:12-20:20/68 20:53	06:00 19:31-20:28/57 21:09
28	07:47 16:06-17:11/65 17:42	07:09 16:43-17:49/66 18:20	07:23 19:52	06:34 18:54-19:54/60 20:24	06:03 19:15-20:21/66 20:54	06:01 19:31-20:28/57 21:09
29	07:46 16:08-17:13/65 17:44		07:21 19:53	06:33 18:53-19:54/61 20:25	06:03 19:19-19:24/5 20:55 19:26-20:21/55	06:01 19:32-20:29/57 21:09
30	07:45 16:09-17:14/65 17:45		07:19 19:54	06:31 18:53-19:54/61 20:26	06:02 19:27-20:21/54 20:55	06:01 19:32-20:29/57 21:09
31	07:44 16:10-17:15/65 17:46		07:18 19:55		06:02 19:26-20:21/55 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1796	1919	1048	950	2093	1698

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T30 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (449)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:32-20:29/57 21:09	06:26 19:06-20:18/72 20:50	06:57 19:18-19:31/13 20:07	07:28 17:36-18:26/50 19:15	07:02 15:52-17:00/68 17:28	07:37 15:36-16:32/56 17:04
2	06:02 19:32-20:29/57 21:09	06:27 19:06-20:16/70 20:49	06:58 20:06	07:29 17:35-18:26/51 19:13	07:03 15:50-17:00/70 17:27	07:38 15:36-16:32/56 17:03
3	06:03 19:33-20:30/57 21:08	06:28 19:05-20:14/69 20:48	06:59 20:04	07:30 17:34-18:26/52 19:11	07:04 15:48-16:59/71 17:25	07:39 15:36-16:32/56 17:03
4	06:04 19:33-20:29/56 21:08	06:29 19:05-20:10/65 20:47	07:00 20:02	07:31 17:33-18:26/53 19:10	07:06 15:47-16:57/70 17:24	07:40 15:36-16:32/56 17:03
5	06:04 19:33-20:30/57 21:08	06:30 19:04-20:03/59 20:46	07:01 20:01	07:32 17:33-18:27/54 19:08	07:07 15:45-16:55/70 17:23	07:41 15:37-16:32/55 17:03
6	06:05 19:33-20:29/56 21:08	06:31 19:04-20:03/59 20:45	07:02 19:57	07:33 17:33-18:27/54 19:06	07:08 15:45-16:54/69 17:22	07:42 15:37-16:32/55 17:03
7	06:05 19:33-20:30/57 21:08	06:32 19:03-20:03/60 20:43	07:03 19:56	07:34 17:32-18:26/54 19:05	07:09 15:44-16:51/67 17:21	07:43 15:38-16:32/54 17:02
8	06:06 19:33-20:29/56 21:07	06:33 19:03-20:03/60 20:42	07:04 19:54	07:35 17:32-18:26/54 19:03	07:10 15:43-16:48/65 17:20	07:44 15:38-16:32/54 17:02
9	06:07 19:34-20:30/56 21:07	06:34 19:03-20:03/60 20:41	07:05 19:52	07:36 17:32-18:25/53 19:01	07:12 15:43-16:48/65 17:19	07:45 15:38-16:31/53 17:02
10	06:07 19:34-20:30/56 21:07	06:35 19:02-20:03/61 20:40	07:06 19:51	07:37 17:31-18:25/54 19:00	07:13 15:42-16:47/65 17:18	07:46 15:38-16:31/53 17:02
11	06:08 19:34-20:29/55 21:06	06:36 19:02-20:03/61 20:38	07:07 19:49	07:38 17:29-18:24/55 18:58	07:14 15:41-16:46/65 17:17	07:47 15:39-16:32/53 17:03
12	06:09 19:34-20:30/56 21:06	06:37 19:02-20:03/61 20:37	07:08 19:47	07:39 17:21-18:23/62 18:57	07:15 15:40-16:45/65 17:16	07:47 15:40-16:32/52 17:03
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14	06:10 19:36-20:30/54 21:05	06:39 19:01-20:02/61 20:34	07:10 19:44	07:41 17:15-18:23/68 18:53	07:18 15:38-16:43/65 17:14	07:49 15:40-16:32/52 17:03
15	06:11 19:25-20:29/64 21:04	06:40 19:00-20:01/61 20:33	07:11 19:42	07:42 17:13-18:22/69 18:52	07:19 15:37-16:42/65 17:13	07:50 15:41-16:32/51 17:03
16	06:12 19:23-20:29/66 21:04	06:41 19:00-20:01/61 20:32	07:12 19:40	07:44 17:11-18:21/70 18:50	07:20 15:37-16:41/64 17:12	07:50 15:42-16:33/51 17:03
17	06:13 19:21-20:29/68 21:03	06:42 19:01-20:00/59 20:30	07:13 19:39	07:45 17:09-18:20/71 18:49	07:21 15:36-16:39/63 17:11	07:51 15:42-16:34/52 17:04
18	06:13 19:19-20:29/70 21:02	06:43 19:01-19:59/58 20:29	07:14 19:37	07:46 17:07-18:19/72 18:47	07:22 15:35-16:36/61 17:11	07:52 15:42-16:33/51 17:04
19	06:14 19:18-20:29/71 21:02	06:44 19:01-19:58/57 20:27	07:15 19:35	07:47 17:06-18:18/72 18:46	07:24 15:34-16:33/59 17:10	07:52 15:43-16:34/51 17:05
20	06:15 19:16-20:28/72 21:01	06:45 19:01-19:58/57 20:26	07:16 18:02-18:09/7 19:33	07:48 17:06-18:18/72 18:44	07:25 15:35-16:30/55 17:09	07:53 15:43-16:34/51 17:05
21	06:16 19:15-20:28/73 21:00	06:46 19:01-19:57/56 20:24	07:17 17:56-18:15/19 19:32	07:49 17:05-18:17/72 18:43	07:26 15:34-16:30/56 17:08	07:54 15:44-16:35/51 17:05
22	06:17 19:14-20:27/73 20:59	06:47 19:02-19:55/53 20:23	07:18 17:52-18:17/25 19:30	07:50 17:03-18:15/72 18:41	07:27 15:34-16:30/56 17:08	07:54 15:44-16:35/51 17:06
23	06:18 19:13-20:27/74 20:59	06:48 19:02-19:54/52 20:21	07:19 17:49-18:19/30 19:28	07:52 17:03-18:14/71 18:40	07:28 15:34-16:30/56 17:07	07:55 15:45-16:36/51 17:06
24	06:19 19:13-20:27/74 20:58	06:49 19:03-19:52/49 20:20	07:20 17:47-18:21/34 19:27	07:53 17:02-18:12/70 18:39	07:29 15:34-16:31/57 17:07	07:55 15:45-16:36/51 17:07
25	06:20 19:12-20:26/74 20:57	06:50 19:04-19:51/47 20:18	07:21 17:45-18:22/37 19:25	07:54 17:02-18:11/69 18:37	07:31 15:34-16:31/57 17:06	07:55 15:45-16:36/51 17:08
26	06:20 19:11-20:25/74 20:56	06:51 19:05-19:48/43 20:17	07:22 17:43-18:23/40 19:23	07:55 17:01-18:09/68 18:36	07:32 15:34-16:31/57 17:06	07:56 15:46-16:38/52 17:08
27	06:21 19:09-20:24/75 20:55	06:52 19:06-19:46/40 20:15	07:23 17:41-18:24/43 19:22	07:56 17:01-18:06/65 18:34	07:33 15:34-16:31/57 17:05	07:56 15:46-16:38/52 17:09
28	06:22 19:09-20:23/74 20:54	06:53 19:07-19:43/36 20:14	07:24 17:40-18:25/45 19:20	07:57 17:00-18:03/63 18:33	07:34 15:34-16:31/57 17:05	07:56 15:47-16:38/51 17:10
29	06:23 19:08-20:22/74 20:53	06:54 19:09-19:41/32 20:12	07:25 17:38-18:25/47 19:18	07:58 17:01-18:04/63 18:32	07:35 15:34-16:31/57 17:04	07:57 15:48-16:40/52 17:10
30	06:24 19:07-20:21/74 20:52	06:55 19:11-19:39/28 20:10	07:26 17:37-18:26/49 19:16	08:00 16:59-18:03/64 18:30	07:36 15:34-16:31/57 17:04	07:57 15:48-16:40/52 17:11
31	06:25 19:07-20:19/72 20:51	06:56 19:13-19:35/22 20:09		08:01 16:55-18:01/66 18:29		07:57 15:49-16:41/52 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2007	1690	389	1948	1874	1630

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T31 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (450)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:55/35 16:18-16:43/25 17:13 15:59-16:06/7	07:43 08:04-08:46/42 17:47 17:07-17:23/16	07:07 07:27-08:11/44 18:22 17:52-18:00/8	07:16 07:35-07:50/15 19:56	06:30 06:50-07:36/46 20:27	06:01 20:57
2	07:57 08:20-08:55/35 16:18-16:43/25 17:14 16:03-16:04/1	07:42 08:03-08:44/41 17:49 17:06-17:25/19	07:06 07:25-08:10/45 18:23 17:49-18:01/12	07:14 07:33-07:52/19 19:57	06:29 06:49-07:32/43 20:28	06:01 20:58
3	07:57 08:20-08:55/35 17:14 16:19-16:44/25	07:41 08:02-08:41/39 17:50 17:06-17:26/20	07:04 07:23-08:08/45 18:24 17:48-18:02/14	07:13 07:32-07:54/22 19:58	06:27 06:47-07:28/41 20:29	06:00 20:58
4	07:58 08:20-08:56/36 17:15 16:19-16:44/25	07:40 08:01-08:34/33 17:51 17:06-17:27/21	07:02 07:22-08:07/45 18:25 17:47-18:04/17	07:11 07:30-07:54/24 19:59	06:26 06:46-07:27/41 20:30	06:00 20:59
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11	07:57 08:19-08:56/37 17:22 16:24-16:44/20	07:32 07:53-08:31/38 18:00 17:08-17:28/20	07:51 08:15-08:54/39 18:46-19:06/20 19:33 19:08-19:11/3	07:00 07:19-07:56/37 20:06 19:35-19:45/10	06:18 06:42-07:15/33 20:37	05:58 21:04
12	07:56 08:18-08:55/37 17:23 16:26-16:44/18	07:31 07:51-08:30/39 18:01 17:10-17:27/17	07:50 08:16-08:53/37 19:34 18:48-19:13/25	06:58 07:17-07:55/38 20:07 19:32-19:46/14	06:17 06:42-07:14/32 20:39	05:58 21:04
13	07:56 08:18-08:54/36 17:24 16:27-16:44/17	07:30 07:50-08:29/39 18:02 17:12-17:26/14	07:48 08:15-08:50/35 19:35 18:49-19:14/25	06:56 07:16-07:55/39 20:08 19:30-19:46/16	06:16 06:42-07:14/32 20:40	05:58 21:05
14	07:56 08:17-08:53/36 17:26 16:28-16:43/15	07:29 07:49-08:28/39 18:04 17:13-17:23/10	07:46 19:01-19:15/14 18:51-18:59/8 19:36 08:16-08:47/31	06:55 07:14-07:54/40 20:09 19:30-19:48/18	06:15 06:42-07:14/32 20:41	05:58 21:05
15	07:55 08:17-08:52/35 17:27 16:30-16:42/12	07:27 07:47-08:25/38 18:05	07:45 19:00-19:16/16 19:37 08:17-08:45/28	06:53 07:12-07:53/41 20:10 19:28-19:48/20	06:14 06:42-07:13/31 20:42	05:58 21:06
16	07:55 08:16-08:49/33 17:28 16:32-16:41/9	07:26 07:46-08:24/38 18:06	07:43 18:59-19:17/18 19:39 08:18-08:43/25	06:52 07:11-07:53/42 20:11 19:28-19:50/22	06:13 06:43-07:13/30 20:43	05:58 21:06
17	07:54 08:17-08:50/33 17:29	07:25 07:44-08:23/39 18:07	07:41 18:58-19:18/20 19:40 08:19-08:40/21	06:50 07:09-07:51/42 20:12 19:27-19:50/23	06:12 06:44-07:13/29 20:44	05:58 21:06
18	07:54 08:17-08:50/33 17:30	07:23 07:43-08:22/39 18:08	07:40 18:58-19:20/22 19:41 08:21-08:39/18	06:49 07:08-07:50/42 20:13 19:27-19:52/25	06:11 06:45-07:12/27 20:45	05:58 21:07
19	07:53 08:18-08:51/33 17:31	07:22 07:42-08:21/39 18:10	07:38 18:58-19:21/23 19:42 08:23-08:35/12	06:47 07:06-07:49/43 20:14 19:26-19:52/26	06:10 06:45-07:12/27 20:45	05:58 21:07
20	07:53 08:18-08:51/33 17:33	07:20 07:40-08:19/39 18:11	07:36 18:58-19:21/23 19:43	06:46 07:05-07:49/44 20:15 19:27-19:52/25	06:09 06:46-07:11/25 20:46	05:58 21:07
21	07:52 08:13-08:51/38 17:34	07:19 07:39-08:18/39 18:12	07:35 18:59-19:23/24 19:44	06:44 07:03-07:48/45 20:16 19:27-19:51/24	06:08 06:46-07:10/24 20:47	05:58 21:08
22	07:52 08:13-08:51/38 17:35	07:18 07:37-08:14/37 18:13	07:33 18:59-19:24/25 19:45	06:43 07:02-07:48/46 20:17 19:27-19:51/24	06:08 06:48-07:10/22 20:48	05:59 21:08
23	07:51 08:12-08:51/39 17:36	07:16 07:36-08:14/38 18:15	07:31 18:59-19:25/26 19:46	06:41 07:01-07:48/47 20:18 19:27-19:50/23	06:07 06:49-07:08/19 20:49	05:59 21:08
24	07:50 08:11-08:51/40 17:37	07:15 07:34-08:13/39 18:16	07:29 19:00-19:25/25 19:47	06:40 06:59-07:46/47 20:19 19:28-19:49/21	06:06 06:50-07:07/17 20:50	05:59 21:08
25	07:50 08:10-08:51/41 17:39	07:13 07:33-08:13/40 18:17	07:28 19:02-19:27/25 19:48	06:38 06:58-07:46/48 20:21 19:30-19:48/18	06:05 06:52-07:06/14 20:51	05:59 21:08
26	07:49 08:10-08:51/41 17:40	07:12 07:31-08:13/42 18:18	07:26 19:02-19:27/25 19:49	06:37 06:56-07:44/48 20:22 19:30-19:46/16	06:05 06:53-07:04/11 20:52	06:00 21:08
27	07:48 08:09-08:51/42 17:41 17:12-17:17/5	07:10 07:30-08:13/43 18:19	07:24 19:04-19:25/21 19:51	06:35 06:55-07:43/48 20:23 19:33-19:43/10	06:04 06:56-07:01/5 20:53	06:00 21:09
28	07:47 08:08-08:50/42 17:42 17:10-17:18/8	07:09 07:28-08:11/43 18:20 17:54-17:58/4	07:23 19:05-19:25/20 19:52	06:34 06:54-07:42/48 20:24	06:03 20:54	06:01 21:09
29	07:46 08:07-08:50/43 17:44 17:09-17:19/10		07:21 19:06-19:23/17 19:53	06:33 06:52-07:40/48 20:25	06:03 20:54	06:01 21:09
30	07:45 08:06-08:49/43 17:45 17:08-17:20/12		07:19 19:07-19:21/14 19:54	06:31 06:51-07:38/47 20:26	06:02 20:55	06:01 21:09
31	07:44 08:05-08:48/43 17:46 17:07-17:22/15		07:18 19:10-19:18/8 19:55 07:37-07:47/10		06:02 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1539	1366	1310	1491	821	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T31 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (450)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:09	06:26 06:52-07:25/33 20:50	06:57 07:18-07:55/37 20:07 19:34-19:44/10	07:27 07:54-08:31/37 19:15 18:27-18:52/25	07:02 07:23-08:02/39 17:28 16:37-16:59/22	07:37 08:01-08:38/37 17:03 16:06-16:26/20
2	06:02 21:08	06:27 06:52-07:25/33 20:49	06:58 07:19-07:55/36 20:06 19:36-19:42/6	07:28 07:54-08:32/38 18:25-18:44/19 19:13 18:45-18:50/5	07:03 07:25-08:03/38 17:27 16:37-17:00/23	07:38 08:02-08:39/37 17:03 16:07-16:28/21
3	06:03 21:08	06:28 06:52-07:29/37 20:48	06:59 07:20-07:54/34 20:04	07:30 07:53-08:33/40 19:11 18:24-18:45/21	07:04 07:26-08:03/37 17:25 16:36-17:00/24	07:39 08:03-08:40/37 17:03 16:07-16:28/21
4	06:03 21:08	06:29 06:52-07:31/39 20:47	07:00 07:21-07:54/33 20:02	07:31 07:52-08:33/41 19:10 18:23-18:45/22	07:06 07:27-08:04/37 17:24 16:36-17:00/24	07:40 08:04-08:40/36 17:03 16:07-16:29/22
5	06:04 21:08	06:30 06:52-07:33/41 20:46	07:01 07:22-07:53/31 20:01	07:32 07:53-08:35/42 19:08 18:22-18:45/23	07:07 07:28-08:04/36 17:23 16:35-16:59/24	07:41 08:05-08:41/36 17:03 16:07-16:30/23
6	06:05 21:08	06:31 06:53-07:34/41 20:44	07:02 07:23-07:52/29 19:57	07:33 07:53-08:35/42 19:06 18:22-18:44/22	07:08 07:30-08:04/34 17:22 16:36-16:59/23	07:42 08:06-08:42/36 17:02 16:07-16:31/24
7	06:05 21:07	06:32 06:54-07:36/42 20:43	07:03 07:24-07:51/27 19:56	07:34 07:54-08:37/43 19:05 18:22-18:43/21	07:09 07:31-08:04/33 17:21 16:36-16:57/21	07:43 08:07-08:43/36 17:02 16:07-16:31/24
8	06:06 21:07	06:33 06:55-07:37/42 20:42	07:04 07:25-07:49/24 19:54	07:35 07:55-08:39/44 19:03 18:22-18:41/19	07:10 07:32-08:11/39 17:20 16:36-16:56/20	07:44 08:08-08:44/36 17:02 16:06-16:31/25
9	06:07 21:07	06:34 06:56-07:37/41 20:41	07:05 07:25-07:47/22 19:52	07:36 07:56-08:41/45 19:01 18:22-18:39/17	07:12 07:34-08:15/41 17:19 16:37-16:55/18	07:45 08:08-08:43/35 17:02 16:07-16:32/25
10	06:07 21:06	06:35 06:57-07:38/41 20:40	07:06 07:26-07:45/19 19:51	07:37 07:57-08:42/45 19:00 18:22-18:37/15	07:13 07:35-08:17/42 17:18 16:37-16:54/17	07:46 08:09-08:44/35 17:02 16:07-16:32/25
11	06:08 21:06	06:36 06:58-07:42/44 20:38	07:07 07:27-07:42/15 19:49	07:38 07:58-08:43/45 18:58 18:23-18:36/13	07:14 07:36-08:19/43 17:17 16:38-16:53/15	07:47 08:10-08:45/35 16:08-16:33/25 17:02 15:50-15:56/6
12	06:09 21:06	06:37 06:59-07:45/46 20:37	07:08 19:02-19:09/7 19:47 07:28-07:39/11	07:39 07:59-08:43/44 18:57 18:23-18:34/11	07:15 07:37-08:20/43 17:16 16:39-16:51/12	07:47 08:11-08:46/35 16:08-16:34/26 17:03 15:49-15:58/9
13	06:09 21:05	06:38 07:00-07:47/47 20:36	07:09 18:58-19:12/14 19:45	07:40 08:00-08:44/44 18:55 18:25-18:32/7	07:16 07:39-08:21/42 17:15 16:41-16:51/10	07:48 08:12-08:46/34 16:09-16:34/25 17:03 15:48-16:00/12
14	06:10 21:05	06:39 07:00-07:48/48 20:34	07:10 18:56-19:13/17 19:44	07:41 08:02-08:45/43 18:53 18:28-18:30/2	07:18 07:40-08:22/42 17:14 16:42-16:50/8	07:49 08:12-08:47/35 16:08-16:34/26 17:03 15:47-16:00/13
15	06:11 21:04	06:40 07:01-07:49/48 20:33 19:43-19:47/4	07:11 18:54-19:14/20 19:42	07:42 08:03-08:45/42 18:52	07:19 07:41-08:23/42 17:13 16:44-16:49/5	07:50 08:13-08:47/34 16:09-16:35/26 17:03 15:47-16:02/15
16	06:12 21:03	06:41 07:02-07:50/48 20:31 19:39-19:51/12	07:12 18:53-19:14/21 19:40	07:44 08:04-08:45/41 18:50	07:20 07:43-08:24/41 17:12	07:50 08:14-08:48/34 16:10-16:36/26 17:03 15:48-16:03/15
17	06:13 07:04-07:12/8 21:03	06:42 07:04-07:51/47 20:30 19:37-19:53/16	07:13 18:51-19:15/24 19:39	07:45 08:05-08:45/40 18:49	07:21 07:44-08:25/41 17:11	07:51 08:15-08:49/34 16:10-16:36/26 17:04 15:47-16:03/16
18	06:13 07:02-07:15/13 21:02	06:43 07:04-07:51/47 20:29 19:35-19:54/19	07:14 18:49-19:15/26 19:37	07:46 08:06-08:45/39 18:47	07:22 07:45-08:25/40 17:10	07:52 08:15-08:49/34 16:10-16:36/26 17:04 15:48-16:04/16
19	06:14 07:01-07:17/16 21:02	06:44 07:05-07:52/47 20:27 19:34-19:55/21	07:15 18:48-19:13/25 19:35	07:47 08:07-08:44/37 18:46	07:24 07:46-08:25/39 17:10	07:52 08:16-08:50/34 16:11-16:37/26 17:04 15:48-16:05/17
20	06:15 06:59-07:17/18 21:01	06:45 07:06-07:52/46 20:26 19:33-19:55/22	07:16 18:46-19:11/25 19:33	07:48 08:09-08:47/38 18:44	07:25 07:48-08:26/38 17:09	07:53 08:16-08:49/33 16:11-16:37/26 17:05 15:48-16:05/17
21	06:16 06:58-07:18/20 21:00	06:46 07:07-07:53/46 20:24 19:32-19:56/24	07:17 18:44-19:10/26 19:32	07:49 08:10-08:49/39 18:43	07:26 07:49-08:27/38 17:08	07:53 08:17-08:50/33 16:12-16:38/26 17:05 15:49-16:06/17
22	06:17 06:57-07:20/23 20:59	06:47 07:08-07:53/45 20:23 19:31-19:56/25	07:18 18:43-19:08/25 19:30	07:50 08:11-08:50/39 18:41	07:27 07:54-08:27/33 17:08	07:54 08:17-08:50/33 16:12-16:38/26 17:06 15:49-16:06/17
23	06:18 06:57-07:21/24 20:59	06:48 07:09-07:53/44 20:21 19:31-19:56/25	07:19 18:42-19:06/24 19:28	07:51 08:12-08:51/39 18:40	07:28 07:54-08:27/33 17:07	07:54 08:18-08:51/33 16:13-16:39/26 17:06 15:50-16:07/17
24	06:19 06:56-07:22/26 20:58	06:49 07:10-07:53/43 20:20 19:30-19:56/26	07:20 18:41-19:04/23 19:27 08:08-08:17/9	07:53 08:13-08:52/39 18:38	07:29 07:55-08:28/33 17:06	07:55 08:18-08:52/34 16:13-16:39/26 17:07 15:50-16:07/17
25	06:19 06:55-07:23/28 20:57	06:50 07:11-07:53/42 20:18 19:30-19:55/25	07:21 18:41-19:03/22 19:25 08:04-08:20/16	07:54 08:15-08:54/39 18:37	07:30 07:55-08:28/33 17:06	07:55 08:18-08:52/34 16:13-16:39/26 17:07 15:51-16:07/16
26	06:20 06:55-07:23/28 20:56	06:51 07:12-07:54/42 20:17 19:30-19:53/23	07:22 18:41-19:01/20 19:23 08:02-08:22/20	07:55 08:16-08:54/38 18:36	07:32 07:56-08:28/32 17:05 16:11-16:19/8	07:56 08:19-08:53/34 16:15-16:40/25 17:08 15:52-16:08/16
27	06:21 06:54-07:23/29 20:55	06:52 07:13-07:55/42 20:15 19:30-19:52/22	07:23 18:40-18:59/19 19:21 08:00-08:24/24	07:56 08:17-08:55/38 18:34	07:33 07:56-08:31/35 17:05 16:09-16:21/12	07:56 08:19-08:53/34 16:15-16:41/26 17:09 15:53-16:08/15
28	06:22 06:53-07:24/31 20:54	06:53 07:14-07:55/41 20:14 19:30-19:50/20	07:24 18:41-18:57/16 19:20 07:58-08:25/27	07:57 08:18-08:57/39 18:33 17:42-17:53/11	07:34 07:57-08:33/36 17:05 16:08-16:23/15	07:56 08:19-08:53/34 16:15-16:41/26 17:09 15:53-16:08/15
29	06:23 06:53-07:24/31 20:53	06:54 07:15-07:55/40 20:12 19:31-19:49/18	07:25 18:41-18:56/15 18:34-18:38/4 19:18 07:56-08:27/31	07:58 08:20-08:59/39 18:32 17:40-17:55/15	07:35 07:58-08:34/36 17:04 16:07-16:24/17	07:57 08:20-08:54/34 16:15-16:41/26 17:10 15:54-16:08/14
30	06:24 06:53-07:24/31 20:52	06:55 07:16-07:55/39 20:10 19:31-19:47/16	07:26 07:55-08:29/34 18:29-18:41/12 19:16 18:42-18:54/12	08:00 08:22-09:00/38 18:30 17:39-17:57/18	07:36 07:59-08:36/37 17:04 16:07-16:25/18	07:57 08:20-08:54/34 16:17-16:42/25 17:11 15:56-16:08/12
31	06:25 06:52-07:25/33 20:51	06:56 07:17-07:55/38 20:09 19:32-19:45/13		08:01 08:23-09:01/38 18:29 17:38-17:58/20		07:57 08:20-08:55/35 16:17-16:43/26 17:12 15:57-16:08/11
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	359	1651	892	1561	1469	2150

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T32 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (451)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:48-16:19/31 17:13 08:37-09:26/49	07:44 17:47	07:07 16:46-17:30/44 18:22	07:16 18:10-19:04/54 19:56	06:30 19:07-19:55/48 20:27	06:01 06:27-07:09/42 20:57
2	07:58 15:49-16:19/30 17:14 08:37-09:27/50	07:43 17:49	07:06 16:46-17:29/43 18:23	07:15 18:11-19:02/51 19:57	06:29 19:07-19:55/48 20:28	06:01 06:28-07:10/42 20:58
3	07:58 15:49-16:19/30 17:15 08:38-09:27/49	07:42 17:01-17:14/13 17:50	07:04 16:48-17:28/40 18:24	07:13 18:12-19:02/50 19:58	06:28 19:06-19:55/49 20:29	06:01 06:27-07:10/43 20:59
4	07:58 15:50-16:19/29 17:16 08:38-09:27/49	07:41 16:58-17:18/20 17:51	07:03 16:49-17:26/37 18:25	07:11 18:12-19:01/49 19:59	06:26 19:06-19:55/49 20:30	06:00 06:27-07:10/43 20:59
5	07:58 15:51-16:19/28 17:16 08:39-09:28/49	07:40 16:56-17:21/25 17:53	07:01 16:50-17:24/34 18:26	07:10 18:14-19:00/46 20:00	06:25 19:06-19:55/49 20:31	06:00 06:27-07:11/44 21:00
6	07:58 15:52-16:19/27 17:17 08:40-09:28/48	07:38 16:54-17:23/29 17:54	06:59 16:52-17:23/31 18:28	07:08 18:14-18:58/44 20:00	06:24 19:07-19:55/48 20:32	05:59 06:26-07:11/45 21:01
7	07:58 15:53-16:19/26 17:18 08:40-09:29/49	07:37 16:52-17:24/32 17:55	06:58 16:53-17:20/27 18:29 17:36-17:51/15	07:06 18:15-18:56/41 20:01	06:23 19:07-19:55/48 20:34	05:59 06:27-07:11/44 21:01
8	07:57 15:54-16:18/24 17:19 08:40-09:28/48	07:36 16:50-17:26/36 17:56	07:56 17:56-18:17/21 19:30 18:31-18:55/24	07:05 18:17-18:55/38 20:03	06:22 19:07-19:55/48 20:35	05:59 06:27-07:12/45 21:02
9	07:57 15:55-16:18/23 17:20 08:41-09:29/48	07:35 16:49-17:27/38 17:58	07:55 18:00-18:13/13 19:31 18:29-18:58/29	07:03 18:18-18:52/34 20:04	06:20 19:07-19:54/47 20:36	05:59 06:27-07:13/46 21:03
10	07:57 15:57-16:18/21 17:21 08:41-09:29/48	07:34 16:49-17:29/40 17:59	07:53 18:26-19:00/34 19:32	07:01 18:20-18:50/30 20:05	06:19 19:07-19:53/46 20:37	05:59 06:27-07:13/46 21:03
11	07:57 15:59-16:18/19 17:23 08:42-09:30/48	07:33 16:48-17:30/42 18:00	07:51 18:24-19:03/39 19:33	07:00 18:23-18:48/25 20:06	06:18 19:07-19:53/46 20:38	05:58 06:27-07:13/46 21:04
12	07:57 16:00-16:16/16 17:24 08:42-09:29/47	07:31 07:51-07:57/6 18:01 16:46-17:30/44	07:50 18:22-19:04/42 19:34	06:58 18:25-18:44/19 20:07	06:17 19:08-19:52/44 20:39	05:58 06:27-07:13/46 21:04
13	07:56 16:02-16:15/13 17:25 08:43-09:30/47	07:30 07:50-07:59/9 18:03 16:46-17:31/45	07:48 18:20-19:04/44 19:35	06:57 18:33-18:37/4 20:08	06:16 19:08-19:52/44 20:40	05:58 06:27-07:13/46 21:05
14	07:56 16:05-16:13/8 17:26 08:44-09:30/46	07:29 07:49-08:01/12 18:04 16:46-17:32/46	07:46 18:19-19:06/47 19:37	06:55 20:09	06:15 19:09-19:51/42 20:41	05:58 06:27-07:13/46 21:05
15	07:56 08:44-09:30/46 17:27	07:27 07:47-08:02/15 18:05 16:44-17:32/48	07:45 18:17-19:07/50 19:38	06:53 20:10	06:14 19:09-19:50/41 20:42	05:58 06:27-07:14/47 21:06
16	07:55 08:46-09:30/44 17:28	07:26 07:46-08:03/17 18:06 16:44-17:33/49	07:43 18:16-19:07/51 19:39	06:52 19:27-19:41/14 20:11	06:13 19:11-19:51/40 20:43	05:58 06:27-07:14/47 21:06
17	07:55 08:46-09:30/44 17:29	07:25 07:45-08:04/19 18:07 16:44-17:34/50	07:41 18:14-19:07/53 19:40	06:50 19:22-19:44/22 20:12	06:12 19:12-19:50/38 20:44	05:58 06:28-07:15/47 21:07
18	07:54 08:46-09:29/43 17:30	07:23 07:43-08:04/21 18:09 16:43-17:33/50	07:40 18:14-19:08/54 19:41	06:49 19:20-19:46/26 20:13	06:11 19:12-19:49/37 20:45 06:43-06:51/8	05:58 06:28-07:15/47 21:07
19	07:54 08:48-09:30/42 17:32	07:22 07:42-08:05/23 18:10 16:44-17:34/50	07:38 18:13-19:08/55 19:42	06:47 19:17-19:48/31 20:14	06:10 19:13-19:48/35 20:46 06:39-06:55/16	05:58 06:28-07:15/47 21:07
20	07:53 08:48-09:29/41 17:33	07:21 07:40-08:04/24 18:11 16:43-17:33/50	07:36 18:12-19:08/56 19:43	06:46 19:16-19:50/34 20:15	06:09 19:14-19:47/33 20:47 06:37-06:57/20	05:58 06:28-07:15/47 21:08
21	07:52 08:50-09:29/39 17:34	07:19 07:39-08:05/26 18:12 16:43-17:34/51	07:35 18:12-19:09/57 19:44	06:44 19:15-19:51/36 20:16	06:09 19:14-19:46/32 20:48 06:36-06:59/23	05:59 06:28-07:15/47 21:08
22	07:52 08:50-09:29/39 17:35	07:18 07:39-08:04/25 18:13 16:43-17:33/50	07:33 18:11-19:09/58 19:45	06:43 19:13-19:52/39 20:18	06:08 19:16-19:46/30 20:48 06:34-07:01/27	05:59 06:28-07:15/47 21:08
23	07:51 08:51-09:28/37 17:36	07:16 07:40-08:04/24 18:15 16:43-17:33/50	07:31 18:10-19:08/58 19:46	06:41 19:12-19:53/41 20:19	06:07 19:17-19:45/28 20:49 06:33-07:02/29	05:59 06:29-07:16/47 21:08
24	07:50 08:52-09:27/35 17:38	07:15 07:41-08:03/22 18:16 16:43-17:33/50	07:30 18:11-19:09/58 19:47	06:40 19:11-19:53/42 20:20	06:06 19:18-19:43/25 20:50 06:31-07:02/31	05:59 06:29-07:16/47 21:08
25	07:50 08:54-09:27/33 17:39	07:13 07:41-08:02/21 18:17 16:44-17:33/49	07:28 18:10-19:08/58 19:49	06:38 19:10-19:54/44 20:21	06:06 19:20-19:43/23 20:51 06:31-07:04/33	06:00 06:29-07:16/47 21:09
26	07:49 08:56-09:25/29 17:40	07:12 07:41-08:00/19 18:18 16:44-17:32/48	07:26 18:10-19:08/58 19:50	06:37 19:09-19:54/45 20:22	06:05 19:21-19:41/20 20:52 06:30-07:05/35	06:00 06:30-07:17/47 21:09
27	07:48 08:57-09:24/27 17:41	07:10 07:43-07:59/16 18:19 16:45-17:32/47	07:25 18:10-19:08/58 19:51	06:36 19:08-19:54/46 20:23	06:04 19:23-19:39/16 20:53 06:30-07:06/36	06:00 06:30-07:17/47 21:09
28	07:47 08:59-09:22/23 17:42	07:09 07:45-07:56/11 18:21 16:45-17:30/45	07:23 18:10-19:07/57 19:52	06:34 19:08-19:55/47 20:24	06:04 19:26-19:37/11 20:54 06:29-07:06/37	06:01 06:30-07:17/47 21:09
29	07:46 09:01-09:20/19 17:44		07:21 18:10-19:06/56 19:53	06:33 19:07-19:54/47 20:25	06:03 19:30-19:33/3 20:55 06:28-07:07/39	06:01 06:31-07:17/46 21:09
30	07:46 09:05-09:17/12 17:45		07:20 18:10-19:06/56 19:54	06:32 19:07-19:55/48 20:26	06:02 06:28-07:08/40 20:55	06:02 06:31-07:17/46 21:09
31	07:45 17:46		07:18 18:10-19:05/55 19:55		06:02 06:28-07:09/41 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1553	1407	1512	1047	1483	1374

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T32 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (451)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:31-07:18/47 21:09	06:26 19:18-20:03/45 20:50	06:57 18:21-18:47/26 20:07	07:28 18:00-18:43/43 19:15	07:02 16:18-16:57/39 17:28	07:37 15:41-16:00/19 17:04 08:24-09:12/48
2	06:03 06:31-07:17/46 21:09	06:27 19:18-20:03/45 20:49	06:58 18:19-18:49/30 20:06	07:29 18:01-18:41/40 19:13	07:03 16:19-16:57/38 17:27	07:38 15:40-16:01/21 17:03 08:25-09:12/47
3	06:03 06:32-07:18/46 21:08	06:28 19:17-20:04/47 20:48	06:59 18:16-18:50/34 20:04	07:30 18:03-18:40/37 19:11	07:05 16:20-16:55/35 17:26	07:39 15:39-16:02/23 17:03 08:25-09:13/48
4	06:04 06:32-07:17/45 21:08	06:29 19:17-20:04/47 20:47	07:00 18:14-18:52/38 20:02	07:31 17:42-17:47/5 19:10 18:05-18:37/32	07:06 16:22-16:54/32 17:24	07:40 15:39-16:03/24 17:03 08:25-09:13/48
5	06:04 06:33-07:18/45 21:08	06:30 19:17-20:04/47 20:46	07:01 18:12-18:53/41 20:01	07:32 17:35-17:53/18 19:08 18:07-18:34/27	07:07 16:24-16:53/29 17:23	07:41 15:39-16:04/25 17:03 08:25-09:14/49
6	06:05 06:33-07:17/44 21:08	06:31 19:16-20:04/48 20:45	07:02 18:10-18:54/44 19:57	07:33 17:31-17:56/25 19:06 18:10-18:30/20	07:08 16:26-16:50/24 17:22	07:42 15:38-16:05/27 17:03 08:26-09:14/48
7	06:05 06:33-07:17/44 21:08	06:32 19:16-20:04/48 20:43	07:03 18:09-18:55/46 19:56	07:34 17:29-17:57/28 19:05 18:17-18:23/6	07:09 16:28-16:48/20 17:21	07:43 15:38-16:06/28 17:03 08:26-09:15/49
8	06:06 06:34-07:18/44 21:07	06:33 19:16-20:04/48 20:42	07:04 18:07-18:56/49 19:54	07:35 17:26-17:59/33 19:03	07:11 16:32-16:44/12 17:20	07:44 15:38-16:07/29 17:03 08:26-09:16/50
9	06:07 06:34-07:17/43 21:07	06:34 19:16-20:04/48 20:41	07:05 18:06-18:56/50 19:52	07:36 17:24-18:00/36 19:02	07:12 17:19	07:45 15:38-16:08/30 17:03 08:27-09:16/49
10	06:07 06:35-07:17/42 21:07	06:35 19:16-20:04/48 20:40	07:06 18:05-18:57/52 19:51	07:37 17:22-18:01/39 19:00	07:13 17:18	07:46 15:38-16:08/30 17:03 08:26-09:16/50
11	06:08 06:36-07:17/41 21:06	06:36 19:16-20:04/48 20:38	07:07 18:04-18:57/53 19:49	07:38 17:21-18:02/41 18:58	07:14 17:17	07:47 15:38-16:09/31 17:03 08:27-09:16/49
12	06:09 06:35-07:16/41 21:06	06:37 19:16-20:04/48 20:37	07:08 18:02-18:56/54 19:47	07:39 17:19-18:02/43 18:57	07:15 08:37-08:49/12 17:16	07:48 15:38-16:10/32 17:03 08:28-09:17/49
13	06:10 06:36-07:16/40 21:05	06:38 19:16-20:03/47 20:36	07:09 18:01-18:56/55 19:46	07:40 08:22-08:27/5 18:55 17:18-18:03/45	07:17 08:33-08:52/19 17:15	07:48 15:39-16:11/32 17:03 08:28-09:18/50
14	06:10 06:37-07:16/39 21:05	06:39 19:16-20:03/47 20:34	07:10 18:00-18:56/56 19:44	07:42 08:17-08:30/13 18:54 17:18-18:04/46	07:18 08:31-08:54/23 17:14	07:49 15:39-16:12/33 17:03 08:29-09:18/49
15	06:11 19:37-19:45/8 21:04 06:38-07:16/38	06:40 19:16-20:03/47 20:33	07:11 17:59-18:56/57 19:42	07:43 08:15-08:32/17 18:52 17:17-18:04/47	07:19 08:29-08:56/27 17:13	07:50 15:39-16:11/32 17:03 08:29-09:18/49
16	06:12 19:33-19:47/14 21:04 06:38-07:15/37	06:41 19:16-20:02/46 20:32	07:12 17:59-18:56/57 19:40	07:44 08:13-08:33/20 18:50 17:16-18:04/48	07:20 08:28-08:58/30 17:12	07:51 15:39-16:12/33 17:04 08:29-09:19/50
17	06:13 19:32-19:49/17 21:03 06:39-07:14/35	06:42 19:16-20:00/44 20:30	07:13 17:58-18:56/58 19:39	07:45 08:12-08:34/22 18:49 17:15-18:04/49	07:21 08:27-09:00/33 17:11	07:51 15:40-16:13/33 17:04 08:30-09:20/50
18	06:14 19:30-19:51/21 21:02 06:40-07:14/34	06:43 19:16-19:59/43 20:29	07:14 17:57-18:56/59 19:37	07:46 08:11-08:34/23 18:47 17:14-18:04/50	07:23 08:26-09:01/35 17:11	07:52 15:40-16:13/33 17:04 08:30-09:19/49
19	06:14 19:29-19:53/24 21:02 06:41-07:13/32	06:44 19:16-19:58/42 20:27	07:15 17:57-18:55/58 19:35	07:47 08:11-08:35/24 18:46 17:14-18:04/50	07:24 08:26-09:03/37 17:10	07:52 15:41-16:14/33 17:05 08:31-09:20/49
20	06:15 19:28-19:54/26 21:01 06:42-07:13/31	06:45 19:17-19:57/40 20:26	07:16 17:57-18:55/58 19:34	07:48 08:10-08:35/25 18:44 17:14-18:05/51	07:25 08:25-09:04/39 17:09	07:53 15:41-16:14/33 17:05 08:31-09:20/49
21	06:16 19:26-19:55/29 21:00 06:43-07:11/28	06:46 19:18-19:56/38 20:24	07:17 17:56-18:54/58 19:32	07:49 08:10-08:35/25 18:43 17:14-18:04/50	07:26 08:25-09:04/39 17:09	07:54 15:41-16:15/34 17:05 08:32-09:21/49
22	06:17 19:25-19:56/31 21:00 06:44-07:10/26	06:47 19:19-19:55/36 20:23	07:18 17:56-18:53/57 19:30	07:50 08:11-08:35/24 18:42 17:13-18:04/51	07:27 08:24-09:05/41 17:08	07:54 15:41-16:15/34 17:06 08:32-09:21/49
23	06:18 19:25-19:57/32 20:59 06:46-07:08/22	06:48 19:20-19:53/33 20:21	07:19 17:56-18:53/57 19:28	07:52 08:12-08:34/22 18:40 17:13-18:03/50	07:28 08:24-09:06/42 17:07	07:55 15:42-16:16/34 17:06 08:33-09:22/49
24	06:19 19:24-19:58/34 20:58 06:48-07:06/18	06:49 19:22-19:51/29 20:20	07:20 17:56-18:52/56 19:27	07:53 08:14-08:35/21 18:39 17:13-18:03/50	07:30 08:24-09:07/43 17:07	07:55 15:43-16:16/33 17:07 08:33-09:22/49
25	06:20 19:23-19:59/36 20:57 06:51-07:04/13	06:50 19:23-19:49/26 20:18	07:21 17:56-18:51/55 19:25	07:54 08:15-08:34/19 18:37 17:14-18:03/49	07:31 08:24-09:08/44 17:06	07:55 15:44-16:17/33 17:08 08:34-09:23/49
26	06:21 19:22-20:00/38 20:56	06:51 19:26-19:46/20 20:17	07:22 17:57-18:50/53 19:23	07:55 08:16-08:33/17 18:36 17:14-18:03/49	07:32 08:24-09:08/44 17:06	07:56 15:44-16:17/33 17:08 08:34-09:24/50
27	06:22 19:22-20:01/39 20:55	06:52 19:29-19:42/13 20:15	07:23 17:57-18:49/52 19:22	07:56 08:17-08:31/14 18:35 17:14-18:02/48	07:33 08:23-09:09/46 17:05	07:56 15:44-16:17/33 17:09 08:34-09:24/50
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Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1438	1143	1507	1701	961	2465

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T33 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (452)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:20-16:47/27 17:13	07:43 16:30-17:23/53 17:47	07:07 17:04-17:36/32 18:22	07:16 18:33-19:22/49 19:56	06:30 19:52-20:05/13 20:27	06:01 20:12-20:33/21 20:57
2	07:57 16:20-16:47/27 17:14	07:42 16:31-17:24/53 17:49	07:06 17:05-17:34/29 18:23	07:14 18:32-19:22/50 19:57	06:29 19:49-20:05/16 20:28	06:01 20:11-20:33/22 20:58
3	07:57 16:20-16:48/28 17:14	07:41 16:33-17:25/52 17:50	07:04 17:06-17:31/25 18:24	07:13 18:32-19:22/50 19:58	06:27 19:48-20:06/18 20:29	06:00 20:11-20:34/23 20:58
4	07:57 16:20-16:49/29 17:15	07:40 16:35-17:26/51 17:51	07:02 17:09-17:30/21 18:25	07:11 18:32-19:21/49 19:59	06:26 19:48-20:08/20 20:30	06:00 20:11-20:35/24 20:59
5	07:57 16:20-16:50/30 17:16	07:39 16:36-17:27/51 17:52	07:01 17:12-17:26/14 18:26	07:09 18:32-19:21/49 20:00	06:25 19:47-20:09/22 20:31	06:00 20:10-20:35/25 21:00
6	07:57 16:20-16:51/31 17:17	07:38 16:49-17:28/39 17:54 16:41-16:48/7	06:59 18:27	07:08 18:32-19:21/49 20:00	06:24 19:47-20:10/23 20:32	05:59 20:10-20:36/26 21:00
7	07:57 16:20-16:51/31 17:18	07:37 16:49-17:30/41 17:55	06:58 18:28	07:06 18:32-19:20/48 20:01	06:23 19:45-20:10/25 20:33	05:59 20:10-20:36/26 21:01
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11	07:57 16:20-16:54/34 17:22	07:32 16:49-17:35/46 18:00	07:51 19:33	07:00 18:34-19:16/42 20:06	06:18 19:45-20:13/28 20:37	05:58 20:10-20:38/28 21:04
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16	07:55 16:21-16:58/37 17:28	07:26 16:51-17:40/49 18:06	07:43 19:39	06:52 18:40-19:08/28 20:11	06:13 19:46-20:12/26 20:43	05:58 20:10-20:40/30 21:06
17	07:54 16:21-16:59/38 17:29	07:25 16:51-17:40/49 18:07	07:41 19:40	06:50 18:41-19:05/24 20:12	06:12 19:46-20:11/25 20:43	05:58 20:10-20:41/31 21:06
18	07:54 16:21-16:59/38 17:30	07:23 16:52-17:40/48 18:08	07:40 18:56-19:08/12 19:41	06:49 18:44-19:03/19 20:13	06:11 19:48-20:11/23 20:44	05:58 20:10-20:41/31 21:07
19	07:53 16:22-17:00/38 17:31	07:22 16:53-17:41/48 18:10	07:38 18:51-19:12/21 19:42	06:47 18:48-18:57/9 20:14	06:10 19:48-20:11/23 20:45	05:58 20:11-20:42/31 21:07
20	07:53 16:22-17:00/38 17:32	07:20 16:54-17:40/46 18:11	07:36 18:47-19:14/27 19:43	06:46 20:15	06:09 19:49-20:10/21 20:46	05:58 20:11-20:42/31 21:07
21	07:52 16:22-17:00/38 17:34	07:19 16:56-17:41/45 18:12	07:34 18:46-19:17/31 19:44	06:44 20:16	06:08 19:50-20:09/19 20:47	05:58 20:11-20:42/31 21:08
22	07:52 16:23-17:01/38 17:35	07:18 16:56-17:40/44 18:13	07:33 18:43-19:18/35 19:45	06:43 20:17	06:08 19:51-20:07/16 20:48	05:59 20:11-20:42/31 21:08
23	07:51 16:23-17:01/38 17:36	07:16 16:57-17:40/43 18:14	07:31 18:41-19:19/38 19:46	06:41 20:18	06:07 19:53-20:07/14 20:49	05:59 20:11-20:42/31 21:08
24	07:50 16:23-17:00/37 17:37	07:15 16:58-17:39/41 18:16	07:29 18:39-19:20/41 19:47	06:40 20:19	06:06 19:54-20:05/11 20:50	05:59 20:12-20:43/31 21:08
25	07:49 16:24-17:00/36 17:39	07:13 17:00-17:39/39 18:17	07:28 18:39-19:21/42 19:48	06:38 20:21	06:05 19:56-20:03/7 20:51	05:59 20:12-20:43/31 21:08
26	07:49 17:02-17:09/7 17:40 16:24-17:00/36	07:12 17:01-17:38/37 18:18	07:26 18:37-19:21/44 19:49	06:37 20:22	06:05 20:19-20:27/8 20:52	06:00 20:12-20:43/31 21:08
27	07:48 16:26-17:14/48 17:41	07:10 17:03-17:38/35 18:19	07:24 18:36-19:21/45 19:51	06:35 20:23	06:04 20:16-20:28/12 20:53	06:00 20:13-20:43/30 21:09
28	07:47 16:26-17:16/50 17:42	07:09 17:03-17:36/33 18:20	07:23 18:35-19:22/47 19:52	06:34 20:24	06:03 20:15-20:30/15 20:54	06:01 20:13-20:43/30 21:09
29	07:46 16:27-17:18/51 17:43		07:21 18:34-19:22/48 19:53	06:33 19:56-20:02/6 20:25	06:03 20:14-20:30/16 20:54	06:01 20:13-20:42/29 21:09
30	07:45 16:28-17:20/52 17:45		07:19 18:33-19:22/49 19:54	06:31 19:53-20:04/11 20:26	06:02 20:13-20:31/18 20:55	06:01 20:14-20:43/29 21:09
31	07:44 16:29-17:21/52 17:46		07:18 18:33-19:23/50 19:55		06:02 20:12-20:31/19 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1152	1274	651	763	629	855

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T33 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (452)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:14-20:42/28 21:08	06:26 19:56-20:24/28 20:50	06:57 18:33-19:15/42 20:07	07:27 19:15	07:02 16:18-17:03/45 17:28	07:37 16:02-16:37/35 17:03
2	06:02 20:15-20:43/28 21:08	06:27 19:56-20:24/28 20:49	06:58 18:32-19:16/44 20:05	07:28 19:13	07:03 16:19-17:02/43 17:27	07:38 16:02-16:36/34 17:03
3	06:03 20:14-20:42/28 21:08	06:28 19:56-20:24/28 20:48	06:59 18:31-19:16/45 20:04	07:29 19:11	07:04 16:19-17:00/41 17:25	07:39 16:04-16:37/33 17:03
4	06:03 20:15-20:42/27 21:08	06:29 19:56-20:22/26 20:47	07:00 18:30-19:16/46 20:02	07:31 19:10	07:06 16:19-16:59/40 17:24	07:40 16:05-16:38/33 17:03
5	06:04 20:16-20:43/27 21:08	06:30 19:56-20:21/25 20:46	07:01 18:29-19:17/48 20:01	07:32 19:08	07:07 16:10-16:58/48 17:23	07:41 16:06-16:38/32 17:03
6	06:05 20:16-20:42/26 21:08	06:31 19:56-20:20/24 20:44	07:02 18:27-19:16/49 19:57	07:33 19:06	07:08 16:07-16:58/51 17:22	07:42 16:06-16:38/32 17:02
7	06:05 20:17-20:42/25 21:07	06:32 19:57-20:19/22 20:43	07:03 18:27-19:16/49 19:56	07:34 19:05	07:09 16:04-16:56/52 17:21	07:43 16:06-16:36/30 17:02
8	06:06 20:17-20:41/24 21:07	06:33 19:57-20:18/21 20:42	07:04 18:26-19:15/49 19:54	07:35 17:50-17:59/9 19:03	07:10 16:03-16:55/52 17:20	07:44 16:07-16:36/29 17:02
9	06:07 20:18-20:41/23 21:07	06:34 19:58-20:17/19 20:41	07:05 18:26-19:15/49 19:52	07:36 17:45-18:03/18 19:01	07:12 16:01-16:54/53 17:19	07:45 16:08-16:36/28 17:02
10	06:07 20:19-20:41/22 21:06	06:35 19:57-20:15/18 20:39	07:06 18:25-19:15/50 19:50	07:37 17:42-18:05/23 19:00	07:13 16:01-16:53/52 17:18	07:46 16:09-16:37/28 17:02
11	06:08 20:19-20:40/21 21:06	06:36 19:58-20:14/16 20:38	07:07 18:25-19:15/50 19:49	07:38 17:40-18:07/27 18:58	07:14 16:00-16:52/52 17:17	07:46 16:10-16:37/27 17:02
12	06:09 20:20-20:40/20 21:06	06:37 20:00-20:12/12 20:37	07:08 18:25-19:14/49 19:47	07:39 17:38-18:08/30 18:57	07:15 15:59-16:51/52 17:16	07:47 16:11-16:37/26 17:03
13	06:09 20:21-20:40/19 21:05	06:38 20:02-20:11/9 20:36	07:09 18:25-19:13/48 19:45	07:40 17:36-18:09/33 18:55	07:16 15:59-16:50/51 17:15	07:48 16:12-16:37/25 17:03
14	06:10 20:22-20:40/18 21:05	06:39 20:06-20:10/4 20:34	07:10 18:25-19:13/48 19:44	07:41 17:35-18:09/34 18:53	07:18 15:58-16:48/50 17:14	07:49 16:12-16:37/25 17:03
15	06:11 20:23-20:38/15 21:04	06:40 20:33	07:11 18:25-19:12/47 19:42	07:42 17:35-18:11/36 18:52	07:19 15:57-16:46/49 17:13	07:50 16:13-16:37/24 17:03
16	06:12 20:24-20:38/14 21:03	06:41 20:31	07:12 18:25-19:11/46 19:40	07:43 17:33-18:11/38 18:50	07:20 16:36-16:42/6 17:12 15:57-16:33/36	07:50 16:14-16:38/24 17:03
17	06:13 20:27-20:37/10 21:03	06:42 20:30	07:13 18:25-19:10/45 19:39	07:45 17:31-18:11/40 18:49	07:21 15:58-16:34/36 17:11	07:51 16:14-16:37/23 17:04
18	06:13 20:30-20:34/4 21:02 20:09-20:11/2	06:43 20:29	07:14 18:26-19:09/43 19:37	07:46 17:29-18:11/42 18:47	07:22 15:57-16:34/37 17:10	07:52 16:15-16:38/23 17:04
19	06:14 20:04-20:14/10 21:02	06:44 20:27	07:15 18:26-19:07/41 19:35	07:47 17:28-18:11/43 18:46	07:23 15:57-16:35/38 17:10	07:52 16:16-16:39/23 17:04
20	06:15 20:03-20:16/13 21:01	06:45 20:26	07:16 18:27-19:06/39 19:33	07:48 17:26-18:11/45 18:44	07:25 15:58-16:36/38 17:09	07:53 16:16-16:39/23 17:05
21	06:16 20:02-20:17/15 21:00	06:46 20:24	07:17 18:28-19:04/36 19:32	07:49 17:26-18:11/45 18:43	07:26 15:58-16:36/38 17:08	07:53 16:17-16:39/22 17:05
22	06:17 20:01-20:19/18 20:59	06:47 20:23	07:18 18:29-19:02/33 19:30	07:50 17:24-18:11/47 18:41	07:27 15:58-16:36/38 17:08	07:54 16:17-16:39/22 17:06
23	06:18 20:00-20:20/20 20:59	06:48 20:21	07:19 18:31-18:59/28 19:28	07:51 17:23-18:11/48 18:40	07:28 15:58-16:36/38 17:07	07:54 16:18-16:40/22 17:06
24	06:19 19:59-20:21/22 20:58	06:49 18:51-19:02/11 20:20	07:20 18:33-18:57/24 19:27	07:53 17:21-18:10/49 18:38	07:29 15:58-16:36/38 17:06	07:55 16:18-16:41/23 17:07
25	06:19 19:59-20:22/23 20:57	06:50 18:47-19:06/19 20:18	07:21 18:36-18:53/17 19:25	07:54 17:20-18:09/49 18:37	07:30 15:59-16:37/38 17:06	07:55 16:18-16:41/23 17:07
26	06:20 19:57-20:21/24 20:56	06:51 18:44-19:08/24 20:17	07:22 19:23	07:55 17:20-18:09/49 18:36	07:32 16:00-16:37/37 17:05	07:56 16:19-16:42/23 17:08
27	06:21 19:57-20:22/25 20:55	06:52 18:41-19:10/29 20:15	07:23 19:21	07:56 17:19-18:09/50 18:34	07:33 16:00-16:37/37 17:05	07:56 16:19-16:42/23 17:09
28	06:22 19:57-20:22/25 20:54	06:53 18:39-19:12/33 20:13	07:24 19:20	07:57 17:19-18:07/48 18:33	07:34 16:00-16:37/37 17:05	07:56 16:19-16:43/24 17:09
29	06:23 19:56-20:23/27 20:53	06:54 18:38-19:13/35 20:12	07:25 19:18	07:58 17:18-18:06/48 18:32	07:35 16:01-16:37/36 17:04	07:57 16:19-16:43/24 17:10
30	06:24 19:56-20:23/27 20:52	06:55 18:36-19:14/38 20:10	07:26 19:16	08:00 17:19-18:06/47 18:30	07:36 16:01-16:37/36 17:04	07:57 16:20-16:45/25 17:11
31	06:25 19:56-20:24/28 20:51	06:56 18:35-19:15/40 20:09		08:01 17:18-18:05/47 18:29		07:57 16:20-16:46/26 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	658	509	1065	945	1295	814

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T34 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (453)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:25-09:30/65	07:44 08:07-09:16/69	07:07 07:33-08:38/65	07:16 07:55-08:41/46	06:30	06:02 19:50-20:24/34
	17:13 15:50-16:34/44	17:48 16:48-17:23/35	18:22	19:56	20:27	20:57 06:23-07:23/60
2	07:58 08:26-09:30/64	07:43 08:07-09:15/68	07:06 07:31-08:37/66	07:15 07:56-08:41/45	06:29	06:01 19:51-20:24/33
	17:14 15:50-16:34/44	17:49 16:48-17:25/37	18:23	19:57	20:28	20:58 06:23-07:24/61
3	07:58 08:26-09:30/64	07:42 08:06-09:15/69	07:04 07:29-08:38/69	07:13 07:56-08:40/44	06:28	06:01 19:51-20:24/33
	17:15 15:51-16:34/43	17:50 16:48-17:26/38	18:24	19:58	20:29	20:59 06:22-07:24/62
4	07:58 08:26-09:30/64	07:41 08:05-09:14/69	07:03 07:27-08:37/70	07:11 07:56-08:38/42	06:27 19:58-20:08/10	06:00 19:51-20:24/33
	17:16 15:51-16:34/43	17:51 16:48-17:27/39	18:25	19:59 19:30-19:37/7	20:30	20:59 06:22-07:25/63
5	07:58 08:26-09:30/64	07:40 08:04-09:13/69	07:01 07:26-08:37/71	07:10 07:57-08:37/40	06:25 19:55-20:09/14	06:00 19:52-20:24/32
	17:17 15:52-16:34/42	17:53 16:48-17:29/41	18:27	20:01 19:27-19:39/12	20:32	21:00 06:22-07:26/64
6	07:58 08:26-09:30/64	07:39 08:04-09:12/68	07:00 07:24-08:36/72	07:08 07:57-08:36/39	06:24 19:53-20:10/17	06:00 19:52-20:23/31
	17:18 15:53-16:34/41	17:54 16:49-17:30/41	18:28	20:01 19:24-19:40/16	20:33	21:01 06:22-07:26/64
7	07:58 08:27-09:29/62	07:37 08:02-09:11/69	06:58 07:23-08:35/72	07:06 07:58-08:34/36	06:23 19:52-20:11/19	05:59 19:53-20:23/30
	17:19 15:54-16:35/41	17:55 16:49-17:32/43	18:29	20:02 19:22-19:40/18	20:34	21:01 06:21-07:26/65
8	07:58 08:27-09:29/62	07:36 08:00-09:09/69	07:56 08:22-09:35/73	07:05 08:00-08:32/32	06:22 19:50-20:12/22	05:59 19:54-20:23/29
	17:20 15:55-16:34/39	17:56 16:49-17:32/43	19:30	20:03 19:21-19:42/21	20:35	21:02 06:21-07:26/65
9	07:57 08:25-09:28/63	07:35 07:59-09:07/68	07:55 08:21-09:33/72	07:03 08:01-08:30/29	06:21 19:50-20:13/23	05:59 19:54-20:23/29
	17:21 15:54-16:33/39	17:58 16:49-17:34/45	19:31	20:04 19:20-19:43/23	20:36	21:03 06:21-07:27/66
10	07:57 08:24-09:27/63	07:34 07:58-09:04/66	07:53 08:20-09:32/72	07:02 08:03-08:28/25	06:19 19:49-20:14/25	05:59 19:55-20:23/28
	17:22 15:55-16:33/38	17:59 16:50-17:35/45	19:32	20:05 19:19-19:44/25	20:37	21:03 06:21-07:27/66
11	07:57 08:23-09:27/64	07:33 07:57-09:00/63	07:51 08:20-09:31/71	07:00 08:05-08:25/20	06:18 19:48-20:15/27	05:59 19:56-20:23/27
	17:23 15:56-16:33/37	18:00 16:51-17:35/44	19:33	20:06 19:18-19:45/27	20:38	21:04 06:21-07:28/67
12	07:57 08:22-09:25/63	07:31 07:55-08:58/63	07:50 08:19-09:30/71	06:58 08:09-08:20/11	06:17 19:48-20:16/28	05:58 19:56-20:23/27
	17:24 15:57-16:32/35	18:01 16:51-17:34/43	19:34	20:07 19:17-19:46/29	20:39	21:04 06:21-07:28/67
13	07:56 08:22-09:12/50 15:58-16:33/35	07:30 07:55-08:57/62	07:48 08:16-09:28/72	06:57 19:17-19:47/30	06:16 19:47-20:17/30	05:58 19:56-20:22/26
	17:25 09:14-09:23/9	18:03 16:53-17:34/41	19:36 08:07-08:10/3	20:08	20:40	21:05 06:21-07:28/67
14	07:56 08:21-09:13/52	07:29 07:54-08:56/62	07:47 08:06-09:27/81	06:55 19:16-19:47/31	06:15 19:47-20:18/31	05:58 19:56-20:22/26
	17:26 15:59-16:33/34	18:04 16:54-17:34/40	19:37	20:09	20:41 06:52-07:02/10	21:05 06:21-07:29/68
15	07:56 08:20-09:13/53	07:28 07:52-08:53/61	07:45 08:04-09:25/81	06:54 19:17-19:47/30	06:14 19:46-20:19/33	05:58 19:57-20:22/25
	17:27 16:00-16:32/32	18:05 16:55-17:32/37	19:38	20:10	20:42 06:48-07:06/18	21:06 06:21-07:29/68
16	07:55 08:20-09:14/54	07:26 07:51-08:51/60	07:43 08:02-09:22/80	06:52 19:16-19:46/30	06:13 19:46-20:20/34	05:58 19:58-20:23/25
	17:28 16:01-16:32/31	18:06 16:58-17:31/33	19:39	20:11	20:43 06:45-07:09/24	21:06 06:21-07:29/68
17	07:55 08:19-09:15/56	07:25 07:50-08:50/60 17:16-17:29/13	07:42 08:01-09:20/79	06:51 19:17-19:46/29	06:12 19:46-20:21/35	05:58 19:58-20:23/25
	17:29 16:02-16:31/29	18:08 17:02-17:12/10	19:40	20:12	20:44 06:43-07:10/27	21:07 06:21-07:29/68
18	07:54 08:20-09:16/56	07:24 07:48-08:48/60	07:40 07:59-09:17/78	06:49 19:17-19:45/28	06:11 19:46-20:21/35	05:58 19:58-20:23/25
	17:30 16:04-16:32/28	18:09 17:19-17:25/6	19:41	20:13	20:45 06:41-07:12/31	21:07 06:21-07:30/69
19	07:54 08:19-09:16/57	07:22 07:47-08:47/60	07:38 07:57-09:16/79	06:47 19:18-19:44/26	06:10 19:45-20:22/37	05:58 19:59-20:23/24
	17:32 16:05-16:31/26	18:10	19:42	20:14	20:46 06:40-07:13/33	21:07 06:21-07:30/69
20	07:53 08:18-09:16/58 16:06-16:29/23	07:21 07:45-08:45/60	07:37 07:56-09:16/80	06:46 19:18-19:42/24	06:10 19:45-20:23/38	05:59 19:59-20:23/24
	17:33 16:58-17:06/8	18:11	19:43	20:16	20:47 06:38-07:14/36	21:08 06:21-07:30/69
21	07:53 08:18-09:17/59 16:08-16:29/21	07:19 07:45-08:44/59	07:35 07:54-09:14/80	06:44 19:19-19:42/23	06:09 19:46-20:24/38	05:59 19:59-20:23/24
	17:34 16:56-17:09/13	18:12	19:44	20:17	20:48 06:38-07:16/38	21:08 06:21-07:30/69
22	07:52 08:17-09:17/60 16:10-16:27/17	07:18 07:45-08:43/58	07:33 07:53-09:12/79	06:43 19:20-19:39/19	06:08 19:46-20:25/39	05:59 19:59-20:23/24
	17:35 16:54-17:10/16	18:14	19:45	20:18	20:49 06:37-07:17/40	21:08 06:22-07:31/69
23	07:51 08:16-09:17/61 16:13-16:25/12	07:16 07:42-08:42/60	07:31 07:53-09:11/78	06:42 19:22-19:38/16	06:07 19:46-20:25/39	05:59 20:00-20:24/24
	17:36 16:53-17:11/18	18:15	19:47	20:19	20:50 06:36-07:18/42	21:08 06:22-07:31/69
24	07:51 08:14-09:17/63	07:15 07:40-08:41/61	07:30 07:53-09:09/76	06:40 19:24-19:34/10	06:06 19:46-20:24/38	06:00 20:00-20:24/24
	17:38 16:51-17:12/21	18:16	19:48	20:20	20:50 06:36-07:19/43	21:09 06:22-07:31/69
25	07:50 08:14-09:18/64	07:14 07:38-08:39/61	07:28 07:53-09:07/74	06:39	06:06 19:47-20:25/38	06:00 19:59-20:24/25
	17:39 16:51-17:14/23	18:17	19:49	20:21	20:51 06:29-07:20/51	21:09 06:22-07:30/68
26	07:49 08:13-09:17/64	07:12 07:37-08:38/61	07:26 07:53-09:04/71	06:37	06:05 19:47-20:25/38	06:00 20:00-20:25/25
	17:40 16:50-17:15/25	18:18	19:50	20:22	20:52 06:26-07:20/54	21:09 06:23-07:31/68
27	07:48 08:12-09:17/65	07:11 07:35-08:38/63	07:25 07:55-09:02/67	06:36	06:04 19:48-20:25/37	06:01 20:00-20:25/25
	17:41 16:50-17:17/27	18:20	19:51	20:23	20:53 06:26-07:21/55	21:09 06:23-07:31/68
28	07:47 08:11-09:17/66	07:09 07:34-08:37/63	07:23 07:55-08:58/63	06:34	06:04 19:48-20:25/37	06:01 19:59-20:25/26
	17:43 16:49-17:18/29	18:21	19:52	20:24	20:54 06:25-07:21/56	21:09 06:24-07:31/67
29	07:47 08:11-09:17/66		07:21 07:55-08:53/58	06:33	06:03 19:49-20:25/36	06:01 20:00-20:26/26
	17:44 16:49-17:19/30		19:53	20:25	20:55 06:25-07:23/58	21:09 06:24-07:32/68
30	07:46 08:10-09:17/67		07:20 07:56-08:43/47	06:32	06:03 19:49-20:25/36	06:02 19:59-20:26/27
	17:45 16:48-17:20/32		19:54	20:26	20:56 06:24-07:23/59	21:09 06:24-07:31/67
31	07:45 08:09-09:16/67		07:18 07:55-08:42/47		06:02 19:50-20:25/35	
	17:46 16:48-17:22/34		19:55		20:56 06:24-07:24/60	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	2959	2455	2217	883	1604	2814

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T34 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (453)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:00-20:27/27 21:09 06:25-07:32/67	06:26 19:57-20:25/28 20:50	06:57 08:04-08:24/20 20:07 19:17-19:44/27	07:28 07:58-09:09/71 19:15	07:02 07:28-08:35/67 17:28 16:20-17:05/45	07:37 08:05-09:09/64 17:04 15:39-16:15/36
2	06:03 19:59-20:27/28 21:09 06:25-07:31/66	06:27 19:58-20:25/27 20:49	06:58 08:01-08:26/25 20:06 19:17-19:42/25	07:29 07:58-09:10/72 19:13	07:03 07:29-08:37/68 17:27 16:19-17:04/45	07:38 08:07-09:10/63 17:04 15:38-16:16/38
3	06:03 20:00-20:28/28 21:09 06:26-07:32/66	06:28 19:59-20:24/25 20:48	06:59 07:59-08:28/29 20:04 19:18-19:41/23	07:30 07:58-09:10/72 19:12	07:05 07:30-08:39/69 17:26 16:18-17:02/44	07:39 08:09-09:12/63 17:03 15:39-16:17/38
4	06:04 19:59-20:28/29 21:08 06:26-07:32/66	06:29 19:59-20:22/23 20:47	07:00 07:57-08:29/32 20:03 19:18-19:39/21	07:31 07:59-09:11/72 19:10	07:06 07:31-08:40/69 17:25 16:18-17:01/43	07:40 08:11-09:13/62 17:03 15:39-16:18/39
5	06:04 19:59-20:29/30 21:08 06:27-07:32/65	06:30 20:00-20:21/21 20:46	07:01 07:55-08:31/36 20:01 19:19-19:37/18	07:32 07:59-09:11/72 19:08	07:07 07:34-08:42/68 17:23 16:18-17:00/42	07:41 08:12-09:14/62 17:03 15:39-16:20/41
6	06:05 19:58-20:29/31 21:08 06:28-07:32/64	06:31 20:02-20:20/18 20:45	07:02 07:54-08:32/38 19:58 19:20-19:36/16	07:33 07:59-09:11/72 19:07	07:08 07:34-08:43/69 17:22 16:18-16:59/41	07:42 08:12-09:16/64 17:03 15:39-16:20/41
7	06:06 19:59-20:30/31 21:08 06:28-07:32/64	06:32 20:03-20:19/16 20:44	07:03 07:52-08:32/40 19:56 19:22-19:34/12	07:34 08:00-09:11/71 19:05	07:09 07:35-08:44/69 17:21 16:18-16:57/39	07:43 08:13-09:17/64 17:03 15:39-16:21/42
8	06:06 19:59-20:31/32 21:07 06:29-07:32/63	06:33 20:05-20:18/13 20:42	07:04 07:51-08:33/42 19:54 19:25-19:33/8	07:35 08:00-09:11/71 19:03	07:11 07:37-08:46/69 17:20 16:19-16:57/38	07:44 08:14-09:18/64 17:03 15:40-16:22/42
9	06:07 19:58-20:31/33 21:07 06:29-07:31/62	06:34 20:09-20:16/7 20:41	07:05 07:50-08:34/44 19:53	07:36 08:01-09:11/70 19:02	07:12 07:37-08:46/69 17:19 16:19-16:55/36	07:45 08:15-09:19/64 17:03 15:40-16:23/43
10	06:08 19:58-20:32/34 21:07 06:30-07:32/62	06:35 20:40	07:06 07:49-08:34/45 19:51	07:37 08:02-09:11/69 19:00	07:13 07:38-08:47/69 17:18 16:19-16:54/35	07:46 08:16-09:20/64 17:03 15:40-16:24/44
11	06:08 19:58-20:32/34 21:06 06:31-07:32/61	06:36 20:39	07:07 07:48-08:34/46 19:49	07:38 08:04-09:11/67 18:58	07:14 07:40-08:47/67 17:17 16:19-16:53/34	07:47 08:15-09:20/65 17:03 15:40-16:24/44
12	06:09 19:57-20:32/35 21:06 06:32-07:31/59	06:37 20:37	07:08 07:47-08:34/47 19:47	07:39 08:06-09:12/66 18:57	07:15 07:42-08:49/67 17:16 16:20-16:52/32	07:48 08:16-09:21/65 17:03 15:40-16:25/45
13	06:10 19:57-20:33/36 21:05 06:32-07:31/59	06:38 20:36	07:09 07:47-08:34/47 19:46	07:41 08:07-09:11/64 18:55	07:17 07:43-08:49/66 17:15 16:21-16:51/30	07:48 08:17-09:21/64 17:03 15:41-16:26/45
14	06:10 19:57-20:33/36 21:05 06:33-07:31/58	06:39 20:35	07:10 07:46-08:42/56 19:44	07:42 08:07-09:11/64 18:54	07:18 07:43-08:49/66 17:14 16:21-16:50/29	07:49 08:18-09:22/64 17:03 15:42-16:26/44
15	06:11 19:57-20:34/37 21:04 06:34-07:31/57	06:40 20:33	07:11 07:46-08:48/62 19:42	07:43 08:08-09:10/62 18:52	07:19 07:45-08:50/65 17:13 16:23-16:50/27	07:50 08:19-09:23/64 17:03 15:41-16:26/45
16	06:12 19:56-20:33/37 21:04 06:35-07:30/55	06:41 20:32	07:12 07:44-08:51/67 19:41	07:44 08:09-09:09/60 18:51	07:20 07:46-08:50/64 17:12 16:23-16:48/25	07:51 08:19-09:23/64 17:04 15:42-16:27/45
17	06:13 19:56-20:34/38 21:03 06:35-07:30/55	06:42 20:30	07:13 07:43-08:53/70 19:39	07:45 08:10-09:11/61 18:49	07:21 07:47-08:51/64 17:12 16:24-16:47/23	07:51 08:20-09:24/64 17:04 15:43-16:28/45
18	06:14 19:56-20:34/38 21:03 06:36-07:29/53	06:43 20:29	07:14 07:41-08:54/73 19:37	07:46 08:12-09:12/60 18:48	07:23 07:48-08:51/63 17:11 16:25-16:46/21	07:52 08:20-09:24/64 17:04 15:43-16:28/45
19	06:15 19:56-20:35/39 21:02 06:45-07:29/44	06:44 19:30-19:42/12 20:28	07:15 07:40-08:55/75 19:35	07:47 08:14-09:13/59 18:46	07:24 07:51-08:52/61 15:48-16:00/12 17:10 16:28-16:46/18	07:53 08:21-09:25/64 17:05 15:44-16:29/45
20	06:15 19:56-20:35/39 21:01 06:46-07:29/43	06:45 19:26-19:43/17 20:26	07:16 07:39-08:56/77 19:34	07:48 08:16-09:14/58 18:45	07:25 07:52-08:52/60 15:45-16:02/17 17:09 16:29-16:45/16	07:53 08:22-09:26/64 17:05 15:44-16:30/46
21	06:16 19:56-20:34/38 21:00 06:47-07:28/41	06:46 19:24-19:44/20 20:25	07:18 07:38-08:57/79 19:32	07:49 08:16-09:15/59 18:43	07:26 07:53-08:52/59 15:43-16:04/21 17:09 16:31-16:44/13	07:54 08:22-09:26/64 17:06 15:44-16:30/46
22	06:17 19:56-20:34/38 21:00 06:47-07:26/39	06:47 19:23-19:46/23 20:23	07:19 07:38-08:58/80 19:30	07:51 08:16-09:16/60 18:42	07:27 07:54-08:52/58 15:42-16:05/23 17:08 16:34-16:42/8	07:54 08:23-09:27/64 17:06 15:45-16:31/46
23	06:18 19:56-20:34/38 20:59 06:48-07:25/37	06:48 19:22-19:46/24 20:22	07:20 07:39-08:59/80 19:29	07:52 08:17-09:17/60 18:40	07:29 07:56-08:53/57 17:07 15:42-16:08/26	07:55 08:23-09:27/64 17:07 15:45-16:31/46
24	06:19 19:56-20:33/37 20:58 06:49-07:24/35	06:49 19:20-19:47/27 20:20	07:21 07:40-08:59/79 19:27	07:53 08:19-09:19/60 18:39 17:48-17:57/9	07:30 07:57-08:53/56 17:07 15:41-16:09/28	07:55 08:23-09:27/64 17:07 15:45-16:31/46
25	06:20 19:56-20:32/36 20:57 06:51-07:23/32	06:50 19:20-19:47/27 20:19	07:22 07:41-09:00/79 19:25	07:54 08:20-09:20/60 17:45-18:00/15 18:37 17:30-17:43/13	07:31 07:57-08:53/56 17:06 15:40-16:09/29	07:56 08:24-09:28/64 17:08 15:47-16:32/45
26	06:21 19:56-20:32/36 20:56 06:52-07:22/30	06:51 19:19-19:48/29 20:17	07:23 07:42-09:01/79 19:23	07:55 08:21-09:22/61 18:36 17:27-18:01/34	07:32 07:58-08:53/55 17:06 15:39-16:10/31	07:56 08:24-09:28/64 17:08 15:47-16:32/45
27	06:22 19:56-20:31/35 20:55 06:54-07:20/26	06:52 19:18-19:48/30 20:15	07:24 07:44-09:03/79 19:22	07:56 08:22-09:23/61 18:35 17:25-18:02/37	07:33 07:59-08:52/53 17:05 15:39-16:11/32	07:56 08:24-09:28/64 17:09 15:47-16:32/45
28	06:23 19:57-20:30/33 20:54 06:57-07:18/21	06:53 19:18-19:48/30 20:14	07:25 07:45-09:05/80 19:20	07:58 08:24-09:26/62 18:33 17:24-18:04/40	07:34 08:00-08:52/52 17:05 15:38-16:12/34	07:57 08:25-09:29/64 17:10 15:48-16:33/45
29	06:24 19:57-20:29/32 20:53 07:00-07:15/15	06:54 19:17-19:48/31 20:12	07:26 07:46-09:07/81 19:18	07:59 08:25-09:27/62 18:32 17:22-18:04/42	07:35 08:03-08:53/50 15:39-16:14/35 17:04 08:55-09:04/9	07:57 08:25-09:29/64 17:10 15:49-16:33/44
30	06:25 19:56-20:27/31 20:52 07:07-07:08/1	06:55 19:17-19:47/30 20:11	07:27 07:55-09:08/73 19:17 07:47-07:54/7	08:00 08:25-09:28/63 18:31 17:21-18:04/43	07:36 08:04-09:07/63 17:04 15:39-16:14/35	07:57 08:25-09:29/64 17:11 15:49-16:34/45
31	06:25 19:57-20:26/29 20:51	06:56 08:08-08:20/12 20:09 19:17-19:45/28		08:01 08:26-09:30/64 18:29 17:20-18:04/44		07:57 08:25-09:30/65 17:12 15:49-16:34/45
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2521	518	1917	2282	2904	3332

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T35 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (454)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:39-16:39/60 17:13	07:44 16:09-17:08/59 17:47	07:07 18:22	07:16 19:56	06:30 06:50-07:01/11 20:27 19:28-20:02/34	06:01 06:23-06:44/21 20:57 19:27-20:18/51
2	07:57 15:40-16:40/60 17:14	07:43 16:11-17:09/58 17:49	07:06 18:23	07:14 19:57	06:29 06:49-07:03/14 20:28 19:27-20:03/36	06:01 06:23-06:45/22 20:58 19:28-20:18/50
3	07:58 15:40-16:41/61 17:15	07:42 16:12-17:09/57 17:50	07:04 18:24	07:13 19:58	06:28 06:47-07:03/16 20:29 19:25-20:03/38	06:00 06:22-06:45/23 20:58 19:28-20:18/50
4	07:58 15:41-16:41/60 17:15	07:40 16:14-17:09/55 17:51	07:03 18:25	07:11 19:59	06:26 06:46-07:04/18 20:30 19:24-20:04/40	06:00 06:22-06:46/24 20:59 19:29-20:18/49
5	07:58 15:42-16:42/60 17:16	07:39 16:16-17:10/54 17:52	07:01 18:26	07:09 20:00	06:25 06:45-07:04/19 20:31 19:24-20:05/41	06:00 06:22-06:47/25 21:00 19:30-20:19/49
6	07:58 15:43-16:43/60 17:17	07:38 16:16-17:09/53 17:54	06:59 18:27	07:08 20:00	06:24 06:44-07:05/21 20:32 19:23-20:07/44	05:59 06:21-06:47/26 21:01 19:30-20:18/48
7	07:57 15:44-16:43/59 17:18	07:37 16:16-17:09/53 17:55	06:58 18:29	07:06 20:01	06:23 06:43-07:05/22 20:33 19:23-20:08/45	05:59 06:21-06:48/27 21:01 19:30-20:18/48
8	07:57 15:44-16:43/59 17:19	07:36 16:17-17:09/52 17:56	07:56 19:30	07:05 20:02	06:21 06:42-07:06/24 20:34 19:23-20:10/47	05:59 06:21-06:49/28 21:02 19:31-20:18/47
9	07:57 15:45-16:44/59 17:20	07:35 16:17-17:09/52 17:57	07:54 19:31	07:03 20:03	06:20 06:41-07:06/25 20:35 19:21-20:10/49	05:59 06:21-06:50/29 21:02 19:32-20:19/47
10	07:57 15:47-16:46/59 17:21	07:34 16:18-17:09/51 17:59	07:53 19:32	07:01 20:05	06:19 06:39-07:05/26 20:37 19:21-20:11/50	05:58 06:21-06:51/30 21:03 19:32-20:18/46
11	07:57 15:47-16:47/60 17:22	07:32 16:18-17:08/50 18:00	07:51 19:33	07:00 20:06	06:18 06:38-07:05/27 20:38 19:21-20:12/51	05:58 06:20-06:50/30 21:04 19:32-20:18/46
12	07:56 15:49-16:49/60 17:23	07:31 16:19-17:08/49 18:01	07:50 19:34	06:58 20:07	06:17 06:38-07:04/26 20:39 19:21-20:13/52	05:58 06:20-06:51/31 21:04 19:33-20:18/45
13	07:56 15:50-16:51/61 17:25	07:30 16:20-17:07/47 18:02	07:48 19:35	06:57 20:08	06:16 06:38-07:04/26 20:40 19:21-20:13/52	05:58 06:20-06:51/31 21:05 19:34-20:18/44
14	07:56 15:51-16:52/61 17:26	07:29 16:21-17:07/46 18:04	07:46 19:36	06:55 20:09	06:15 06:38-07:04/26 20:41 19:21-20:14/53	05:58 06:20-06:52/32 21:05 19:34-20:18/44
15	07:55 15:53-16:54/61 17:27	07:27 16:21-17:06/45 18:05	07:45 19:38	06:53 20:10	06:14 06:39-07:03/24 20:42 19:21-20:14/53	05:58 06:20-06:52/32 19:35-20:18/43 21:06 20:30-20:35/5
16	07:55 15:55-16:55/60 17:28	07:26 16:23-17:05/42 18:06	07:43 19:39	06:52 20:11	06:13 06:40-07:04/24 20:43 19:21-20:15/54	05:58 06:20-06:52/32 19:35-20:19/44 21:06 20:29-20:36/7
17	07:55 15:58-16:56/58 17:29	07:25 16:23-17:03/40 18:07	07:41 19:40	06:50 20:12	06:12 06:41-07:03/22 20:44 19:22-20:16/54	05:58 06:20-06:53/33 19:35-20:19/44 21:06 20:28-20:37/9
18	07:54 15:59-16:57/58 17:30	07:23 16:25-17:02/37 18:09	07:40 19:41	06:49 20:13	06:11 06:41-07:02/21 20:45 19:22-20:16/54	05:58 06:21-06:54/33 19:36-20:19/43 21:07 20:28-20:38/10
19	07:53 16:00-16:59/59 17:31	07:22 16:27-17:01/34 18:10	07:38 19:42	06:47 20:14	06:10 06:42-07:01/19 20:46 19:22-20:16/54	05:58 06:21-06:54/33 19:37-20:20/43 21:07 20:29-20:39/10
20	07:53 16:00-17:00/60 17:33	07:21 16:28-16:59/31 18:11	07:36 19:43	06:46 20:15	06:09 06:43-07:00/17 20:46 19:22-20:16/54	05:58 06:21-06:54/33 19:37-20:20/43 21:07 20:29-20:39/10
21	07:52 16:00-17:00/60 17:34	07:19 16:31-16:57/26 18:12	07:35 19:44	06:44 20:16	06:08 06:44-06:59/15 20:47 19:22-20:16/54	05:59 06:21-06:54/33 19:37-20:20/43 21:08 20:28-20:39/11
22	07:52 16:01-17:02/61 17:35	07:18 16:34-16:53/19 18:13	07:33 19:45	06:43 20:17	06:08 06:46-06:58/12 20:48 19:23-20:17/54	05:59 06:21-06:54/33 19:37-20:20/43 21:08 20:28-20:39/11
23	07:51 16:01-17:03/62 17:36	07:16 16:39-16:49/10 18:15	07:31 19:46	06:41 20:18	06:07 06:47-06:56/9 20:49 19:23-20:17/54	05:59 06:22-06:55/33 19:37-20:20/43 21:08 20:29-20:39/10
24	07:50 16:02-17:03/61 17:37	07:15 18:16	07:30 19:47	06:40 20:20	06:06 06:28-06:32/4 20:50 19:23-20:17/54	05:59 06:22-06:55/33 19:38-20:21/43 21:08 20:30-20:40/10
25	07:50 16:02-17:04/62 17:39	07:13 18:17	07:28 19:48	06:38 20:21	06:05 06:27-06:36/9 20:51 19:24-20:18/54	06:00 06:22-06:55/33 19:37-20:21/44 21:08 20:30-20:39/9
26	07:49 16:04-17:06/62 17:40	07:12 18:18	07:26 19:50	06:37 19:38-19:52/14 20:22	06:05 06:26-06:38/12 20:52 19:24-20:18/54	06:00 06:23-06:55/32 19:37-20:21/44 21:09 20:31-20:39/8
27	07:48 16:04-17:06/62 17:41	07:10 18:19	07:24 19:51	06:36 19:35-19:56/21 20:23	06:04 06:25-06:39/14 20:53 19:24-20:17/53	06:00 06:23-06:55/32 19:38-20:22/44 21:09 20:32-20:39/7
28	07:47 16:05-17:07/62 17:42	07:09 18:21	07:23 19:52	06:34 19:33-19:58/25 20:24	06:03 06:25-06:41/16 20:54 19:25-20:18/53	06:01 06:23-06:55/32 19:37-20:21/44 21:09 20:34-20:37/3
29	07:46 16:06-17:07/61 17:44		07:21 19:53	06:33 06:52-06:56/4 20:25 19:30-19:59/29	06:03 06:24-06:41/17 20:55 19:25-20:17/52	06:01 06:24-06:55/31 21:09 19:38-20:22/44
30	07:45 16:07-17:08/61 17:45		07:19 19:54	06:31 06:51-06:59/8 20:26 19:29-20:01/32	06:02 06:24-06:43/19 20:55 19:26-20:18/52	06:02 06:24-06:55/31 21:09 19:37-20:22/45
31	07:44 16:08-17:08/60 17:46		07:18 19:55		06:02 06:23-06:43/20 20:56 19:26-20:17/51	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1869	1020	0	133	2115	2379

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T35 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (454)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September	October		November		December	
1	06:02	06:25-06:55/30	06:26	06:48-07:15/27	06:57	07:28		07:02	15:47-16:38/51	07:37	15:30-16:30/60
	21:09	19:38-20:23/45	20:50	19:31-20:23/52	20:07	19:15		17:28		17:04	
2	06:02	06:25-06:55/30	06:27	06:49-07:15/26	06:58	07:29		07:03	15:47-16:39/52	07:38	15:30-16:29/59
	21:08	19:37-20:23/46	20:49	19:32-20:22/50	20:06	19:13		17:27		17:03	
3	06:03	06:26-06:55/29	06:28	06:50-07:15/25	06:59	07:30		07:04	15:47-16:39/52	07:39	15:29-16:28/59
	21:08	19:37-20:24/47	20:48	19:32-20:21/49	20:04	19:11		17:25		17:03	
4	06:04	06:26-06:55/29	06:29	06:51-07:15/24	07:00	07:31		07:06	15:46-16:39/53	07:40	15:29-16:28/59
	21:08	19:37-20:23/46	20:47	19:32-20:20/48	20:02	19:10		17:24		17:03	
5	06:04	06:27-06:55/28	06:30	06:52-07:15/23	07:01	07:32		07:07	15:46-16:39/53	07:41	15:29-16:28/59
	21:08	19:37-20:24/47	20:46	19:32-20:19/47	20:01	19:08		17:23		17:03	
6	06:05	06:27-06:54/27	06:31	06:53-07:15/22	07:02	07:33		07:08	15:46-16:39/53	07:42	15:29-16:29/60
	21:08	19:36-20:24/48	20:45	19:33-20:18/45	19:57	19:06		17:22		17:03	
7	06:05	06:28-06:54/26	06:32	06:54-07:14/20	07:03	07:34		07:09	15:44-16:39/55	07:43	15:29-16:29/60
	21:07	19:36-20:25/49	20:43	19:33-20:16/43	19:56	19:05		17:21		17:02	
8	06:06	06:29-06:54/25	06:33	06:55-07:14/19	07:04	07:35		07:10	15:42-16:39/57	07:44	15:29-16:29/60
	21:07	19:35-20:24/49	20:42	19:34-20:15/41	19:54	19:03		17:20		17:02	
9	06:07	06:29-06:53/24	06:34	06:56-07:13/17	07:05	07:36		07:12	15:41-16:40/59	07:45	15:28-16:29/61
	21:07	19:35-20:25/50	20:41	19:34-20:14/40	19:52	19:01		17:19		17:02	
10	06:07	06:30-06:53/23	06:35	06:57-07:12/15	07:06	07:37		07:13	15:40-16:39/59	07:46	15:29-16:29/60
	21:06	19:35-20:26/51	20:40	19:35-20:13/38	19:51	19:00		17:18		17:02	
11	06:08	06:31-06:53/22	06:36	06:58-07:11/13	07:07	07:38		07:14	15:39-16:39/60	07:47	15:29-16:29/60
	21:06	19:35-20:25/50	20:38	19:36-20:12/36	19:49	18:58		17:17		17:03	
12	06:09	06:31-06:51/20	06:37	06:59-07:09/10	07:08	07:39		07:15	15:38-16:39/61	07:47	15:29-16:30/61
	21:06	19:35-20:26/51	20:37	19:37-20:11/34	19:47	18:57		17:16		17:03	
13	06:09	06:32-06:51/19	06:38	07:00-07:07/7	07:09	07:40		07:16	15:38-16:39/61	07:48	15:30-16:30/60
	21:05	19:35-20:26/51	20:36	19:38-20:09/31	19:45	18:55		17:15		17:03	
14	06:10	06:33-06:51/18	06:39	07:01-07:03/2	07:10	07:41		07:18	15:37-16:39/62	07:49	15:29-16:30/61
	21:05	19:35-20:27/52	20:34	19:38-20:06/28	19:44	18:53		17:14		17:03	
15	06:11	06:34-06:51/17	06:40	19:40-20:04/24	07:11	07:42		07:19	15:36-16:38/62	07:50	15:30-16:31/61
	21:04	19:34-20:26/52	20:33		19:42	18:52		17:13		17:03	
16	06:12	06:34-06:49/15	06:41	19:42-20:02/20	07:12	07:44		07:20	15:37-16:39/62	07:50	15:31-16:31/60
	21:04	19:34-20:27/53	20:32		19:40	18:50		17:12		17:03	
17	06:13	06:35-06:48/13	06:42	19:46-19:58/12	07:13	07:45		07:21	15:36-16:38/62	07:51	15:31-16:32/61
	21:03	19:33-20:27/54	20:30		19:39	18:49		17:11		17:04	
18	06:13	06:36-06:47/11	06:43		07:14	07:46		07:22	15:36-16:37/61	07:52	15:31-16:32/61
	21:02	19:33-20:27/54	20:29		19:37	18:47		17:11		17:04	
19	06:14	06:37-06:45/8	06:44		07:15	07:47	07:07-17:22/15	07:24	15:35-16:37/62	07:52	15:32-16:33/61
	21:02	19:33-20:27/54	20:27		19:35	18:46		17:10		17:05	
20	06:15	06:59-07:05/6	06:45		07:16	07:48	07:04-17:26/22	07:25	15:36-16:37/61	07:53	15:32-16:33/61
	21:01	19:32-20:27/55	20:26		19:33	18:44		17:09		17:05	
21	06:16	06:56-07:07/11	06:46		07:17	07:49	17:01-17:28/27	07:26	15:36-16:36/60	07:53	15:33-16:33/60
	21:00	19:32-20:27/55	20:24		19:32	18:43		17:08		17:05	
22	06:17	06:55-07:09/14	06:47		07:18	07:50	16:58-17:30/32	07:27	15:36-16:36/60	07:54	15:33-16:33/60
	20:59	19:32-20:27/55	20:23		19:30	18:41		17:08		17:06	
23	06:18	06:54-07:10/16	06:48		07:19	07:52	16:56-17:31/35	07:28	15:36-16:35/59	07:54	15:34-16:34/60
	20:59	19:32-20:27/55	20:21		19:28	18:40		17:07		17:06	
24	06:19	06:53-07:11/18	06:49		07:20	07:53	16:54-17:32/38	07:29	15:36-16:34/58	07:55	15:34-16:35/61
	20:58	19:32-20:27/55	20:20		19:27	18:39		17:07		17:07	
25	06:20	06:52-07:12/20	06:50		07:21	07:54	16:54-17:34/40	07:31	15:36-16:35/59	07:55	15:34-16:35/61
	20:57	19:32-20:27/55	20:18		19:25	18:37		17:06		17:08	
26	06:20	06:51-07:13/22	06:51		07:22	07:55	16:52-17:35/43	07:32	15:34-16:34/60	07:56	15:35-16:36/61
	20:56	19:32-20:27/55	20:17		19:23	18:36		17:06		17:08	
27	06:21	06:51-07:14/23	06:52		07:23	07:56	16:51-17:35/44	07:33	15:32-16:33/61	07:56	15:35-16:36/61
	20:55	19:31-20:25/54	20:15		19:22	18:34		17:05		17:09	
28	06:22	06:50-07:14/24	06:53		07:24	07:57	16:50-17:36/46	07:34	15:31-16:32/61	07:56	15:36-16:37/61
	20:54	19:31-20:25/54	20:14		19:20	18:33		17:05		17:10	
29	06:23	06:49-07:14/25	06:54		07:25	07:58	16:49-17:37/48	07:35	15:30-16:31/61	07:57	15:37-16:37/60
	20:53	19:31-20:25/54	20:12		19:18	18:32		17:04		17:10	
30	06:24	06:49-07:15/26	06:55		07:26	08:00	16:49-17:37/48	07:36	15:30-16:30/60	07:57	15:38-16:38/60
	20:52	19:31-20:24/53	20:10		19:16	18:30		17:04		17:11	
31	06:25	06:49-07:15/26	06:56			08:01	16:48-17:38/50			07:57	15:38-16:39/61
	20:51	19:31-20:24/53	20:09			18:29				17:12	
Potential sun hours	460		429		375	345		297		287	
Sum of minutes with flicker		2247		888	0		488		1757		1870

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T36 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (455)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:31-08:51/20 17:13	07:43 08:07-08:38/31 17:47 08:04-08:05/1	07:07 07:38-08:01/23 18:22	07:16 19:27-19:34/7 19:56	06:30 19:01-19:54/53 20:27 06:50-07:33/43	06:01 06:23-06:42/19 20:57 19:03-19:55/52
2	07:57 08:32-08:51/19 17:14	07:42 08:03-08:38/35 17:49	07:06 07:39-07:59/20 18:23	07:14 19:24-19:35/11 19:57	06:29 18:59-19:54/55 20:28 06:49-07:33/44	06:01 06:23-06:44/21 20:58 19:03-19:54/51
3	07:57 08:33-08:51/18 17:14	07:41 08:02-08:38/36 17:50	07:04 07:40-07:57/17 18:24	07:13 19:23-19:37/14 19:58	06:27 18:59-19:55/56 20:29 06:48-07:32/44	06:00 06:22-06:44/22 20:58 19:04-19:54/50
4	07:57 08:34-08:51/17 17:15	07:40 08:01-08:38/37 17:51	07:02 07:43-07:55/12 18:25	07:11 19:21-19:37/16 19:59	06:26 18:59-19:56/57 20:30 06:48-07:31/43	06:00 06:22-06:45/23 20:59 19:04-19:55/51
5	07:57 08:35-08:51/16 17:16	07:39 08:00-08:37/37 17:52	07:01 18:26	07:09 19:20-19:38/18 20:00	06:25 18:58-19:56/58 20:31 06:47-07:31/44	06:00 06:22-06:46/24 21:00 19:04-19:54/50
6	07:57 08:36-08:50/14 17:17	07:38 07:58-08:36/38 17:54	06:59 18:27	07:08 19:20-19:40/20 20:00	06:24 18:58-19:57/59 20:32 06:47-07:30/43	05:59 06:21-06:46/25 21:01 19:05-19:54/49
7	07:57 08:38-08:50/12 17:18	07:37 07:57-08:35/38 17:55	06:58 18:29	07:06 19:19-19:40/21 20:01	06:23 18:58-19:57/59 20:33 06:47-07:29/42	05:59 06:21-06:47/26 21:01 19:06-19:54/48
8	07:57 08:39-08:48/9 17:19	07:36 07:56-08:34/38 17:56 17:29-17:32/3	07:56 19:30	07:04 19:18-19:41/23 20:02	06:21 18:57-19:56/59 20:34 06:48-07:28/40	05:59 06:21-06:47/26 21:02 19:07-19:54/47
9	07:57 08:41-08:47/6 17:20	07:35 07:55-08:32/37 17:57 17:26-17:34/8	07:54 19:31	07:03 19:19-19:43/24 20:03	06:20 18:57-19:56/59 20:35 06:47-07:26/39	05:59 06:21-06:48/27 21:02 19:07-19:54/47
10	07:57 17:21	07:34 07:54-08:30/36 17:59 17:24-17:36/12	07:53 19:32	07:01 19:18-19:43/25 20:04	06:19 18:56-19:57/61 20:36 06:47-07:24/37	05:58 06:20-06:49/29 21:03 19:07-19:53/46
11	07:57 17:22	07:32 17:22-17:36/14 18:00 07:52-08:19/27	07:51 19:33	07:00 19:19-19:45/26 20:06	06:18 18:56-19:57/61 20:37 06:47-07:23/36	05:58 06:20-06:48/28 21:04 19:07-19:53/46
12	07:56 17:23	07:31 17:21-17:38/17 18:01 07:51-08:19/28	07:50 19:34	06:58 19:19-19:46/27 20:07	06:17 18:56-19:57/61 20:38 06:48-07:23/35	05:58 06:20-06:49/29 21:04 19:08-19:53/45
13	07:56 17:24	07:30 17:20-17:39/19 18:02 07:50-08:20/30	07:48 19:35	06:56 19:19-19:46/27 20:08	06:16 18:56-19:57/61 20:40 06:48-07:22/34	05:58 06:20-06:49/29 21:05 19:08-19:53/45
14	07:56 08:17-08:22/5 17:26	07:29 07:49-08:20/31 18:04 17:19-17:40/21	07:46 19:36	06:55 19:20-19:48/28 20:09	06:15 18:56-19:57/61 20:41 06:48-07:22/34	05:58 06:20-06:49/29 21:05 19:09-19:53/44
15	07:55 08:17-08:25/8 17:27	07:27 07:47-08:19/32 18:05 17:19-17:42/23	07:45 19:37	06:53 19:20-19:48/28 20:10 07:12-07:25/13	06:14 18:56-19:57/61 20:42 06:49-07:21/32	05:58 06:20-06:50/30 21:06 19:09-19:53/44
16	07:55 08:16-08:27/11 17:28	07:26 07:46-08:19/33 18:06 17:19-17:43/24	07:43 19:39	06:52 19:21-19:50/29 20:11 07:11-07:28/17	06:13 18:56-19:57/61 20:43 06:49-07:20/31	05:58 06:20-06:50/30 21:06 19:10-19:54/44
17	07:54 08:16-08:29/13 17:29	07:25 07:44-08:17/33 18:07 17:18-17:44/26	07:41 19:40	06:50 19:21-19:50/29 20:12 07:09-07:29/20	06:12 18:57-19:57/60 20:44 06:51-07:20/29	05:58 06:20-06:50/30 21:06 19:10-19:54/44
18	07:54 08:15-08:30/15 17:30	07:23 07:43-08:17/34 18:08 17:19-17:45/26	07:40 19:41	06:49 19:23-19:52/29 20:13 07:08-07:31/23	06:11 18:57-19:57/60 20:44 06:51-07:20/29	05:58 06:20-06:51/31 21:07 19:10-19:54/44
19	07:53 08:15-08:31/16 17:31	07:22 07:42-08:16/34 18:10 17:19-17:45/26	07:38 19:42	06:47 19:25-19:52/27 20:14 07:06-07:32/26	06:10 18:58-19:57/59 20:45 06:52-07:19/27	05:58 06:21-06:51/30 21:07 19:11-19:55/44
20	07:53 08:14-08:32/18 17:33	07:20 07:40-08:14/34 18:11 17:19-17:44/25	07:36 19:43	06:46 19:21-19:53/32 20:15 07:05-07:33/28	06:09 18:58-19:57/59 20:46 06:53-07:17/24	05:58 06:21-06:52/31 21:07 19:11-19:55/44
21	07:52 08:13-08:33/20 17:34	07:19 07:39-08:13/34 18:12 17:20-17:44/24	07:35 19:44	06:44 19:16-19:52/36 20:16 07:03-07:33/30	06:08 18:58-19:56/58 20:47 06:54-07:16/22	05:58 06:21-06:52/31 21:08 19:11-19:55/44
22	07:52 08:13-08:35/22 17:35	07:18 07:37-08:09/32 18:13 17:20-17:43/23	07:33 19:45	06:43 19:14-19:52/38 20:17 07:02-07:34/32	06:08 18:59-19:57/58 20:48 06:56-07:16/20	05:59 06:21-06:52/31 21:08 19:11-19:55/44
23	07:51 08:12-08:35/23 17:36	07:16 07:36-08:05/29 18:15 17:21-17:42/21	07:31 19:46	06:41 19:11-19:51/40 20:18 07:01-07:35/34	06:07 18:59-19:56/57 20:49 06:57-07:14/17	05:59 06:21-06:51/30 21:08 19:11-19:55/44
24	07:50 08:11-08:36/25 17:37	07:15 07:35-08:04/29 18:16 17:22-17:40/18	07:29 19:47	06:40 19:09-19:51/42 20:19 06:59-07:34/35	06:06 18:59-19:56/57 20:50 06:58-07:12/14	05:59 06:22-06:52/30 21:08 19:12-19:56/44
25	07:49 08:10-08:36/26 17:39	07:13 07:36-08:05/29 18:17 17:24-17:39/15	07:28 19:48	06:38 19:08-19:50/42 20:21 06:58-07:35/37	06:05 19:00-19:56/56 20:51 07:01-07:11/10	06:00 06:22-06:52/30 21:08 19:12-19:56/44
26	07:49 08:10-08:37/27 17:40	07:12 07:36-08:04/28 18:18 17:26-17:35/9	07:26 19:49	06:37 19:06-19:50/44 20:22 06:56-07:34/38	06:05 19:00-19:56/56 20:52	06:00 06:22-06:52/30 21:08 19:12-19:56/44
27	07:48 08:09-08:38/29 17:41	07:10 07:37-08:03/26 18:19	07:24 19:51	06:35 19:05-19:51/46 20:23 06:55-07:34/39	06:04 06:28-06:33/5 20:53 19:00-19:55/55	06:00 06:23-06:53/30 21:09 19:12-19:57/45
28	07:47 08:08-08:38/30 17:42	07:09 07:37-08:02/25 18:20	07:23 19:52	06:34 19:04-19:52/48 20:24 06:54-07:35/41	06:03 06:25-06:37/12 20:54 19:01-19:56/55	06:01 06:23-06:52/29 21:09 19:12-19:56/44
29	07:46 08:07-08:38/31 17:44		07:21 19:53	06:33 19:02-19:53/51 20:25 06:52-07:34/42	06:03 06:24-06:38/14 20:54 19:01-19:55/54	06:01 06:24-06:53/29 21:09 19:13-19:57/44
30	07:45 08:06-08:38/32 17:45		07:19 19:54	06:31 19:01-19:54/53 20:26 06:51-07:34/43	06:02 06:24-06:40/16 20:55 19:02-19:55/53	06:01 06:24-06:53/29 21:09 19:12-19:57/45
31	07:44 08:06-08:38/32 17:46		07:18 19:32-19:34/2 19:55		06:02 06:23-06:41/18 20:56 19:02-19:55/53	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	514	1266	74	1399	2670	2215

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T36 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (455)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-06:53/28	06:26 19:07-20:07/60	06:57 19:18-19:44/26	07:27	07:02 07:23-08:00/37	07:37
	21:08 19:12-19:57/45	20:50 06:58-07:33/35	20:07	19:15	17:28 16:53-17:04/11	17:04
2	06:02 06:25-06:53/28	06:27 19:07-20:07/60	06:58 19:17-19:42/25	07:28	07:03 07:25-08:03/38	07:38
	21:08 19:12-19:58/46	20:49 06:58-07:34/36	20:05	19:13	17:27 16:56-17:04/8	17:03
3	06:03 06:26-06:53/27	06:28 19:07-20:07/60	06:59 19:17-19:41/24	07:30	07:04 07:26-08:04/38	07:39 08:25-08:31/6
	21:08 19:11-19:58/47	20:48 06:58-07:35/37	20:04	19:11	17:25 17:00-17:02/2	17:03
4	06:03 06:26-06:53/27	06:29 19:07-20:07/60	07:00 19:16-19:39/23	07:31	07:06 07:27-08:05/38	07:40 08:24-08:33/9
	21:08 19:12-19:59/47	20:47 06:57-07:37/40	20:02	19:10	17:24	17:03
5	06:04 06:27-06:53/26	06:30 19:07-20:07/60	07:01 19:16-19:37/21	07:32	07:07 07:28-08:06/38	07:41 08:23-08:35/12
	21:08 19:12-20:00/48	20:46 06:57-07:38/41	20:01	19:08	17:23	17:03
6	06:05 06:27-06:52/25	06:31 19:08-20:06/58	07:02 19:15-19:35/20	07:33	07:08 07:30-08:07/37	07:42 08:22-08:36/14
	21:08 19:11-20:00/49	20:44 06:57-07:39/42	19:57	19:06	17:22	17:03
7	06:05 06:28-06:52/24	06:32 19:08-20:06/58	07:03 19:15-19:33/18	07:34	07:09 07:31-08:08/37	07:43 08:22-08:38/16
	21:07 19:12-20:01/49	20:43 06:57-07:40/43	19:56	19:05	17:21	17:02
8	06:06 06:28-06:51/23	06:33 19:08-20:06/58	07:04 19:15-19:32/17	07:35	07:10 07:32-08:08/36	07:44 08:22-08:39/17
	21:07 19:11-20:01/50	20:42 06:57-07:40/43	19:54	19:03	17:20	17:02
9	06:07 06:29-06:51/22	06:34 19:08-20:05/57	07:05 19:16-19:30/14	07:36 08:20-08:27/7	07:12 07:34-08:09/35	07:45 08:21-08:39/18
	21:07 19:11-20:02/51	20:41 06:57-07:41/44	19:52	19:01	17:19	17:02
10	06:07 06:30-06:51/21	06:35 19:09-20:04/55	07:06 19:17-19:28/11	07:37 08:16-08:30/14	07:13 07:37-08:09/32	07:46 08:21-08:40/19
	21:06 19:11-20:02/51	20:40 06:57-07:41/44	19:51	19:00	17:18	17:02
11	06:08 06:30-06:50/20	06:36 19:09-20:04/55	07:07 19:19-19:27/8	07:38 08:14-08:32/18	07:14 07:37-08:09/32	07:46 08:21-08:41/20
	21:06 19:10-20:02/52	20:38 06:58-07:42/44	19:49	18:58	17:17	17:02
12	06:09 06:31-06:50/19	06:37 19:09-20:02/53	07:08 19:22-19:25/3	07:39 08:12-08:33/21	07:15 07:37-08:09/32	07:47 08:22-08:42/20
	21:06 19:10-20:03/53	20:37 06:59-07:42/43	19:47	18:57	17:16	17:03
13	06:09 06:32-06:49/17	06:38 19:09-20:01/52	07:09	07:40 08:10-08:34/24	07:16 07:39-08:10/31	07:48 08:22-08:43/21
	21:05 19:10-20:04/54	20:36 07:00-07:42/42	19:45	18:55	17:15	17:03
14	06:10 06:33-06:48/15	06:39 19:10-20:00/50	07:10	07:41 08:10-08:36/26	07:18 07:40-08:10/30	07:49 08:22-08:42/20
	21:05 19:10-20:04/54	20:34 07:00-07:41/41	19:44	18:53	17:14	17:03
15	06:11 06:33-06:46/13	06:40 19:11-19:59/48	07:11	07:42 08:09-08:36/27	07:19 07:41-08:10/29	07:50 08:22-08:43/21
	21:04 19:09-20:04/55	20:33 07:01-07:41/40	19:42	18:52	17:13	17:03
16	06:12 06:35-06:44/9	06:41 19:12-19:58/46	07:12	07:44 08:08-08:36/28	07:20 07:43-08:10/27	07:50 08:23-08:44/21
	21:03 19:09-20:05/56	20:31 07:02-07:41/39	19:40	18:50 17:58-18:09/11	17:12	17:03
17	06:13 19:09-20:05/56	06:42 19:13-19:56/43	07:13	07:45 08:07-08:36/29	07:21 07:44-08:10/26	07:51 08:23-08:45/22
	21:03	20:30 07:03-07:41/38	19:39	18:49 17:55-18:11/16	17:11	17:04
18	06:13 19:09-20:06/57	06:43 19:14-19:56/42	07:14	07:46 08:07-08:36/29	07:22 07:45-08:10/25	07:52 08:23-08:45/22
	21:02 07:12-07:18/6	20:29 07:04-07:41/37	19:37	18:47 17:53-18:12/19	17:10	17:04
19	06:14 19:09-20:06/57	06:44 19:15-19:57/42	07:15	07:47 08:07-08:36/29	07:24 07:46-08:09/23	07:52 08:24-08:46/22
	21:02 07:10-07:22/12	20:27 07:05-07:40/35	19:35	18:46 17:51-18:13/22	17:10	17:04
20	06:15 19:08-20:06/58	06:45 19:17-19:57/40	07:16	07:48 08:09-08:42/33	07:25 07:48-08:10/22	07:53 08:24-08:46/22
	21:01 07:07-07:23/16	20:26 07:06-07:39/33	19:33	18:44 17:50-18:14/24	17:09	17:05
21	06:16 19:08-20:06/58	06:46 19:19-19:57/38	07:17	07:49 08:10-08:44/34	07:26 07:49-08:09/20	07:53 08:25-08:47/22
	21:00 07:06-07:25/19	20:24 07:07-07:39/32	19:32	18:43 17:50-18:15/25	17:08	17:05
22	06:17 19:08-20:07/59	06:47 19:22-19:57/35	07:18	07:50 08:11-08:45/34	07:27 07:50-08:08/18	07:54 08:25-08:47/22
	20:59 07:05-07:26/21	20:23 07:08-07:38/30	19:30	18:41 17:49-18:15/26	17:08	17:06
23	06:18 19:08-20:07/59	06:48 19:25-19:57/32	07:19	07:51 08:12-08:46/34	07:28 07:51-08:07/16	07:54 08:26-08:48/22
	20:59 07:04-07:27/23	20:21 07:09-07:37/28	19:28	18:40 17:49-18:15/26	17:07	17:06
24	06:19 19:08-20:07/59	06:49 19:29-19:56/27	07:20	07:53 08:13-08:47/34	07:29 07:52-08:07/15	07:55 08:26-08:48/22
	20:58 07:03-07:28/25	20:20 07:10-07:35/25	19:27	18:38 17:48-18:15/27	17:06	17:07
25	06:19 19:08-20:08/60	06:50 19:26-19:55/29	07:21	07:54 08:15-08:48/33	07:30 07:54-08:07/13	07:55 08:26-08:48/22
	20:57 07:02-07:30/28	20:18 07:11-07:34/23	19:25	18:37 17:48-18:13/25	17:06	17:07
26	06:20 19:08-20:08/60	06:51 19:24-19:53/29	07:22	07:55 08:16-08:49/33	07:32 07:55-08:06/11	07:56 08:27-08:49/22
	20:56 07:02-07:30/28	20:17 07:12-07:32/20	19:23	18:36 17:49-18:13/24	17:05	17:08
27	06:21 19:07-20:07/60	06:52 19:23-19:52/29	07:23	07:56 08:17-08:49/32	07:33 07:56-08:04/8	07:56 08:28-08:49/21
	20:55 07:00-07:30/30	20:15 07:13-07:30/17	19:21	18:34 17:49-18:11/22	17:05	17:09
28	06:22 19:07-20:07/60	06:53 19:21-19:50/29	07:24	07:57 08:18-08:49/31	07:34 07:57-08:02/5	07:56 08:28-08:49/21
	20:54 07:00-07:31/31	20:14 07:15-07:26/11	19:20	18:33 17:49-18:10/21	17:05	17:09
29	06:23 19:07-20:07/60	06:54 19:20-19:49/29	07:25	07:58 17:49-18:08/19	07:35	07:57 08:29-08:50/21
	20:53 06:59-07:32/33	20:12	19:18	18:32 08:20-08:49/29	17:04	17:10
30	06:24 19:07-20:07/60	06:55 19:20-19:47/27	07:26	08:00 17:51-18:07/16	07:36	07:57 08:30-08:51/21
	20:52 06:59-07:32/33	20:10	19:16	18:30 08:21-08:49/28	17:04	17:11
31	06:25 19:07-20:07/60	06:56 19:19-19:45/26		08:01 08:51-08:56/5 08:22-08:49/27		07:57 08:30-08:51/21
	20:51 06:58-07:33/35	20:09		18:29 17:52-18:06/14		17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2374	2370	210	976	770	559

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T37 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (456)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:20-08:53/33 17:13	07:44 08:04-08:40/36 17:48 16:35-17:17/42	07:07 17:08-17:47/39 18:22 07:27-07:53/26	07:16 17:57-19:16/79 07:35-08:02/27 19:56 19:31-19:34/3	06:30 06:50-07:05/15 20:27	06:02 06:23-06:58/35 20:57
2	07:58 08:20-08:53/33 17:14	07:43 08:03-08:39/36 17:49 16:34-17:18/44	07:06 17:05-17:48/43 18:23 07:25-07:53/28	07:15 17:59-19:16/77 07:34-08:01/27 19:57 19:28-19:36/8	06:29 06:49-07:07/18 20:28	06:01 06:23-06:58/35 20:58
3	07:58 08:20-08:52/32 17:15	07:42 08:02-08:38/36 17:50 16:34-17:19/45	07:04 17:04-17:50/46 18:24 07:24-07:54/30	07:13 17:59-19:15/76 07:32-07:58/26 19:58 19:26-19:37/11	06:28 06:48-07:08/20 20:29	06:01 06:22-06:58/36 20:59
4	07:58 08:20-08:51/31 17:16	07:41 08:01-08:37/36 17:51 16:34-17:20/46	07:03 17:02-17:51/49 18:25 07:22-07:54/32	07:11 18:01-19:14/73 07:30-07:56/26 19:59 19:24-19:37/13	06:27 06:46-07:08/22 20:30	06:00 06:22-06:58/36 20:59
5	07:58 08:20-08:51/31 17:17	07:40 08:00-08:36/36 17:53 16:34-17:20/46	07:01 17:00-17:52/52 18:27 07:22-07:55/33	07:10 18:03-19:14/71 07:29-07:53/24 20:00 19:23-19:39/16	06:25 06:45-07:08/23 20:31	06:00 06:22-06:58/36 21:00
6	07:58 08:20-08:51/31 17:18	07:39 07:59-08:34/35 17:54 16:34-17:21/47	07:00 16:59-17:53/54 18:28 07:21-07:55/34	07:08 18:05-19:13/68 07:27-07:52/25 20:00 19:22-19:40/18	06:24 06:44-07:09/25 20:33	06:00 06:22-06:58/36 21:01
7	07:58 08:20-08:51/31 17:19	07:37 07:58-08:31/33 17:55 16:33-17:20/47	06:58 16:58-17:54/56 18:29 07:20-07:54/34	07:06 18:07-19:12/65 07:25-07:52/27 20:02 19:21-19:40/19	06:23 06:43-07:10/27 20:34	05:59 06:21-06:57/36 21:01
8	07:58 08:20-08:51/31 17:20	07:36 07:56-08:29/33 17:56 16:33-17:21/48	07:56 17:57-18:55/58 19:30 08:20-08:55/35	07:05 18:11-19:11/60 07:24-07:53/29 20:03 19:21-19:42/21	06:22 06:42-07:10/28 20:35	05:59 06:21-06:57/36 21:02
9	07:57 08:19-08:50/31 17:21	07:35 07:57-08:28/31 17:58 16:33-17:21/48	07:55 17:56-18:56/60 19:31 08:20-08:54/34	07:03 18:23-19:10/47 07:22-07:52/30 20:04 19:20-19:43/23	06:21 06:41-07:10/29 20:36	05:59 06:21-06:57/36 21:03
10	07:57 08:19-08:50/31 17:22	07:34 07:57-08:25/28 17:59 16:34-17:21/47	07:53 17:55-18:56/61 19:32 08:20-08:53/33	07:02 18:24-19:09/45 07:21-07:53/32 20:05 19:19-19:43/24	06:19 06:40-07:10/30 20:37	05:59 06:21-06:57/36 21:03
11	07:57 08:19-08:50/31 17:23	07:33 07:58-08:24/26 18:00 16:34-17:21/47	07:51 17:55-18:57/62 19:33 08:21-08:53/32	07:00 18:25-19:07/42 07:19-07:52/33 20:06 19:20-19:43/23	06:18 06:39-07:10/31 20:38	05:59 06:21-06:57/36 21:04
12	07:57 08:18-08:49/31 17:24	07:31 07:58-08:23/25 18:01 16:34-17:21/47	07:50 17:54-18:57/63 19:34 08:21-08:52/31	06:58 18:25-19:05/40 07:17-07:51/34 20:07 19:20-19:42/22	06:17 06:38-07:10/32 20:39	05:58 06:21-06:57/36 21:04
13	07:56 08:18-08:48/30 17:25	07:30 07:58-08:22/24 18:03 16:34-17:21/47	07:48 17:53-18:57/64 19:36 08:21-08:50/29	06:57 18:27-19:04/37 07:16-07:51/35 20:08 19:21-19:41/20	06:16 06:37-07:10/33 20:40	05:58 06:21-06:57/36 21:05
14	07:56 08:18-08:49/31 17:26	07:29 08:00-08:22/22 18:04 16:35-17:21/46	07:47 17:53-19:03/70 19:37 08:23-08:49/26	06:55 18:28-19:02/34 07:15-07:50/35 20:09 19:21-19:40/19	06:15 06:36-07:10/34 20:41	05:58 06:21-06:57/36 21:05
15	07:56 08:17-08:48/31 17:27	07:28 08:00-08:20/20 18:05 16:35-17:20/45	07:45 17:52-19:06/74 19:38 08:24-08:47/23	06:54 18:30-19:00/30 07:16-07:49/33 20:10 19:23-19:38/15	06:14 06:35-07:09/34 20:42	05:58 06:21-06:57/36 21:06
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23	07:51 08:12-08:46/34 17:36 16:42-17:06/24	07:16 16:44-17:11/27 18:15	07:31 17:52-19:15/83 19:47 07:51-08:07/16	06:41 07:21-07:35/14 20:19	06:07 06:28-07:05/37 20:50	05:59 06:22-06:57/35 21:08
24	07:51 08:11-08:46/35 17:38 16:40-17:08/28	07:15 16:47-17:09/22 18:16	07:30 17:52-19:17/85 19:48 07:49-08:07/18	06:40 07:24-07:31/7 20:20	06:06 06:28-07:04/36 20:50	06:00 06:22-06:57/35 21:09
25	07:50 08:11-08:46/35 17:39 16:40-17:10/30	07:13 17:21-17:35/14 07:35-07:44/9 18:17 16:49-17:05/16	07:28 17:52-19:17/85 19:49 07:47-08:07/20	06:39 20:21	06:06 06:27-07:03/36 20:51	06:00 06:22-06:58/36 21:09
26	07:49 08:10-08:46/36 17:40 16:39-17:11/32	07:12 17:15-17:39/24 18:18 07:32-07:48/16	07:26 17:52-19:16/84 19:50 07:45-08:06/21	06:37 20:22	06:05 06:26-07:01/35 20:52	06:00 06:23-06:59/36 21:09
27	07:48 08:09-08:45/36 17:41 16:38-17:13/35	07:10 17:12-17:43/31 18:20 07:30-07:50/20	07:25 17:54-19:17/83 19:51 07:44-08:07/23	06:36 20:23	06:04 06:26-07:02/36 20:53	06:00 06:23-06:59/36 21:09
28	07:47 08:08-08:44/36 17:43 16:37-17:14/37	07:09 17:09-17:45/36 18:21 07:28-07:51/23	07:23 17:54-19:17/83 19:52 07:42-08:06/24	06:34 20:24	06:04 06:25-07:01/36 20:54	06:01 06:24-07:00/36 21:09
29	07:47 08:07-08:43/36 17:44 16:36-17:15/39		07:21 17:54-19:16/82 19:53 07:40-08:05/25	06:33 06:53-07:01/8 20:25	06:03 06:25-07:00/35 20:55	06:01 06:24-07:00/36 21:09
30	07:46 08:06-08:42/36 17:45 16:36-17:16/40		07:20 17:56-19:17/81 19:54 07:39-08:05/26	06:32 06:51-07:03/12 20:26	06:03 06:24-06:59/35 20:56	06:02 06:24-07:00/36 21:09
31	07:45 08:05-08:40/35 17:46 16:35-17:17/42		07:18 17:56-19:16/80 19:55 07:39-08:04/25		06:02 06:24-06:59/35 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1361	1686	2890	1825	976	1072

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T37 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (456)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-07:01/36 21:09	06:26 06:48-07:20/32 20:50	06:57 18:24-19:06/42 07:18-07:51/33 20:07 19:19-19:42/23	07:28 17:33-18:37/64 19:15 08:01-08:31/30	07:02 07:27-07:56/29 17:28 16:03-16:51/48	07:37 08:01-08:32/31 17:04
2	06:03 06:25-07:01/36 21:09	06:27 06:49-07:20/31 20:49	06:58 18:22-19:07/45 07:19-07:51/32 20:06 19:18-19:42/24	07:29 17:33-18:36/63 19:13 08:00-08:31/31	07:03 07:26-07:58/32 17:27 16:03-16:51/48	07:38 08:02-08:33/31 17:04
3	06:03 06:26-07:02/36 21:09	06:28 06:50-07:20/30 20:48	06:59 18:21-19:08/47 07:20-07:50/30 20:04 19:18-19:41/23	07:30 17:33-18:35/62 19:12 07:59-08:31/32	07:05 07:26-07:59/33 17:26 16:03-16:50/47	07:39 08:03-08:34/31 17:03
4	06:04 06:26-07:02/36 21:08	06:29 06:51-07:20/29 20:47	07:00 18:08-19:08/60 07:21-07:50/29 20:03 19:18-19:39/21	07:31 17:33-18:34/61 19:10 07:58-08:31/33	07:06 07:27-08:00/33 17:24 16:03-16:50/47	07:40 08:04-08:35/31 17:03
5	06:04 06:27-07:03/36 21:08	06:30 06:52-07:19/27 20:46	07:01 18:04-19:09/65 07:22-07:49/27 20:01 19:18-19:37/19	07:32 17:34-18:33/59 19:08 07:57-08:31/34	07:07 07:29-08:04/35 17:23 16:04-16:50/46	07:41 08:05-08:36/31 17:03
6	06:05 06:28-07:04/36 21:08	06:31 06:53-07:19/26 20:45	07:02 18:01-19:09/68 07:23-07:48/25 19:58 19:18-19:36/18	07:33 17:34-18:31/57 19:07 07:57-08:31/34	07:08 07:30-08:06/36 17:22 16:04-16:50/46	07:42 08:06-08:37/31 17:03
7	06:06 06:28-07:04/36 21:08	06:32 06:54-07:19/25 20:44	07:03 17:58-19:09/71 07:24-07:47/23 19:56 19:18-19:34/16	07:34 17:35-18:30/55 19:05 07:56-08:31/35	07:09 07:31-08:07/36 17:21 16:04-16:49/45	07:43 08:07-08:38/31 17:03
8	06:06 06:29-07:05/36 21:07	06:33 06:55-07:18/23 20:42	07:04 17:56-19:09/73 07:25-07:50/25 19:54 19:19-19:33/14	07:35 17:35-18:28/53 19:03 07:56-08:30/34	07:11 07:33-08:09/36 17:20 16:05-16:50/45	07:44 08:08-08:39/31 17:03
9	06:07 06:29-07:05/36 21:07	06:34 06:56-07:17/21 20:41	07:05 17:54-19:09/75 07:26-07:52/26 19:52 19:20-19:31/11	07:36 17:36-18:27/51 19:02 07:56-08:29/33	07:12 07:34-08:10/36 17:19 16:05-16:49/44	07:45 08:09-08:41/32 17:03
10	06:08 06:30-07:06/36 21:07	06:35 06:57-07:16/19 20:40	07:06 17:52-19:09/77 07:27-07:54/27 19:51 19:21-19:29/8	07:37 17:37-18:25/48 19:00 07:57-08:28/31	07:13 07:35-08:11/36 17:18 16:06-16:48/42	07:46 08:10-08:43/33 17:03
11	06:08 06:31-07:06/35 21:06	06:36 06:58-07:15/17 20:39	07:07 17:50-19:09/79 07:28-07:55/27 19:49 19:24-19:28/4	07:38 17:38-18:23/45 18:58 07:58-08:27/29	07:14 07:36-08:11/35 17:17 16:06-16:47/41	07:47 08:10-08:43/33 17:03
12	06:09 06:32-07:07/35 21:06	06:37 06:59-07:13/14 20:37	07:08 17:48-19:09/81 19:47 07:31-07:56/25	07:39 17:39-18:21/42 18:57 08:00-08:27/27	07:15 07:38-08:14/36 17:16 16:08-16:48/40	07:48 08:11-08:44/33 17:03
13	06:10 06:32-07:07/35 21:05	06:38 07:00-07:11/11 20:36	07:09 17:47-19:08/81 19:46 07:31-07:56/25	07:41 17:42-18:20/38 18:55 08:01-08:26/25	07:17 07:39-08:15/36 17:15 16:08-16:47/39	07:48 08:12-08:45/33 17:03
14	06:10 06:33-07:08/35 21:05	06:39 07:01-07:08/7 20:35	07:10 17:45-19:08/83 19:44 07:31-07:56/25	07:42 17:44-18:17/33 18:54 08:02-08:24/22	07:18 07:40-08:16/36 17:14 16:09-16:46/37	07:49 08:13-08:46/33 17:03
15	06:11 06:34-07:09/35 21:04	06:40 20:33	07:11 17:43-19:06/83 19:42 07:32-07:56/24	07:43 17:46-18:14/28 18:52 08:03-08:22/19	07:19 07:42-08:18/36 17:13 16:11-16:45/34	07:50 08:13-08:47/34 17:03
16	06:12 06:35-07:11/36 21:04	06:41 20:32	07:12 17:42-19:06/84 19:41 07:33-07:56/23	07:44 08:04-08:19/15 17:24-17:34/10 18:51 17:49-18:10/21	07:20 07:43-08:19/36 17:12 16:12-16:44/32	07:51 08:14-08:47/33 17:04
17	06:13 06:35-07:10/35 21:03	06:42 20:30	07:13 17:41-19:05/84 19:39 07:34-07:56/22	07:45 17:56-18:03/7 08:10-08:13/3 18:49 17:19-17:38/19	07:21 07:44-08:19/35 17:12 16:13-16:43/30	07:51 08:15-08:48/33 17:04
18	06:14 06:36-07:12/36 21:03	06:43 20:29	07:14 17:40-19:04/84 19:37 07:35-07:55/20	07:46 17:16-17:41/25 18:48	07:23 07:45-08:20/35 17:11 16:14-16:42/28	07:52 08:15-08:48/33 17:04
19	06:15 06:37-07:13/36 21:02	06:44 07:30-07:38/8 20:27	07:15 17:39-19:03/84 19:35 07:35-07:53/18	07:47 17:15-17:43/28 18:46	07:24 07:47-08:21/34 17:10 16:17-16:41/24	07:53 08:16-08:50/34 17:05
20	06:15 06:38-07:15/37 21:01	06:45 07:27-07:41/14 20:26	07:16 17:38-19:02/84 19:34 07:36-07:52/16	07:48 17:13-17:45/32 18:45	07:25 07:48-08:21/33 17:09 16:19-16:39/20	07:53 08:17-08:51/34 17:05
21	06:16 06:39-07:16/37 21:00	06:46 07:24-07:43/19 20:25	07:17 17:37-19:01/84 19:32 07:37-07:51/14	07:49 17:11-17:46/35 18:43	07:26 07:49-08:22/33 17:09 16:21-16:37/16	07:54 08:17-08:51/34 17:06
22	06:17 06:39-07:16/37 21:00	06:47 07:23-07:44/21 20:23	07:18 17:36-19:00/84 19:30 07:38-07:49/11	07:51 17:09-17:46/37 18:42	07:27 07:50-08:22/32 17:08 16:25-16:33/8	07:54 08:18-08:52/34 17:06
23	06:18 06:40-07:17/37 20:59	06:48 07:20-07:44/24 20:22	07:20 17:36-18:58/82 19:29 07:39-07:46/7	07:52 17:08-17:47/39 18:40	07:28 07:52-08:23/31 17:07	07:55 08:18-08:52/34 17:07
24	06:19 06:41-07:17/36 20:58	06:49 07:19-07:45/26 20:20	07:21 17:35-18:56/81 19:27	07:53 08:37-08:44/7 18:39 17:07-17:49/42	07:30 07:53-08:24/31 17:07	07:55 08:18-08:52/34 17:07
25	06:20 06:42-07:18/36 20:57	06:50 18:42-18:53/11 20:18 07:18-07:47/29	07:22 17:34-18:55/81 19:25	07:54 08:33-08:47/14 18:37 17:06-17:49/43	07:31 07:54-08:25/31 17:06	07:56 08:19-08:52/33 17:08
26	06:21 06:43-07:19/36 20:56	06:51 18:37-18:57/20 07:18-07:48/30 20:17 19:31-19:33/2	07:23 17:34-18:53/79 19:23 08:10-08:23/13	07:55 08:31-08:49/18 18:36 17:05-17:49/44	07:32 07:55-08:26/31 17:06	07:56 08:19-08:52/33 17:08
27	06:22 06:44-07:19/35 20:55	06:52 18:34-18:59/25 07:17-07:49/32 20:15 19:26-19:38/12	07:24 17:33-18:50/77 19:22 08:07-08:26/19	07:56 08:29-08:50/21 18:35 17:04-17:49/45	07:33 07:56-08:27/31 17:05	07:56 08:19-08:52/33 17:09
28	06:23 06:45-07:20/35 20:54	06:53 18:31-19:01/30 07:17-07:50/33 20:14 19:24-19:39/15	07:25 17:33-18:47/74 19:20 08:06-08:28/22	07:58 08:29-08:52/23 18:33 17:05-17:50/45	07:34 07:57-08:28/31 17:05	07:57 08:20-08:53/33 17:10
29	06:24 06:46-07:20/34 20:53	06:54 18:29-19:03/34 07:16-07:50/34 20:12 19:22-19:41/19	07:26 17:33-18:44/71 19:18 08:04-08:29/25	07:59 08:28-08:52/24 18:32 17:04-17:50/46	07:35 07:59-08:29/30 17:04	07:57 08:20-08:53/33 17:10
30	06:24 06:47-07:21/34 20:52	06:55 18:27-19:04/37 07:16-07:51/35 20:11 19:21-19:41/20	07:27 17:32-18:38/66 19:17 08:02-08:30/28	08:00 08:27-08:53/26 18:31 17:03-17:50/47	07:36 08:00-08:31/31 17:04	07:57 08:20-08:53/33 17:11
31	06:25 06:47-07:20/33 20:51	06:56 18:25-19:05/40 07:17-07:51/34 20:09 19:20-19:42/22		08:01 08:26-08:53/27 18:29 17:03-17:50/47		07:57 08:20-08:53/33 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1105	938	3051	1998	1813	1013

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T38 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (457)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:38-09:56/78 17:13 08:20-08:24/4	07:44 08:45-10:04/79 17:48 08:24-08:39/15	07:07 17:44-18:00/16 18:22	07:16 07:49-08:51/62 19:56	06:30 07:31-08:27/56 20:27 19:36-20:04/28	06:02 19:59-20:33/34 20:57 06:44-06:58/14
2	07:58 08:38-09:57/79 17:14 08:20-08:26/6	07:43 08:46-10:03/77 17:49 08:27-08:37/10	07:06 17:42-18:01/19 18:23	07:15 07:47-08:52/65 19:57	06:29 07:32-08:24/52 20:28 19:37-20:04/27	06:01 20:00-20:34/34 20:58 06:42-07:01/19
3	07:58 08:39-09:57/78 17:15 08:20-08:28/8	07:42 08:46-10:03/77 17:50	07:04 17:41-18:03/22 18:24 07:32-07:46/14	07:13 07:45-08:52/67 19:58	06:28 07:33-08:23/50 20:29 19:37-20:03/26	06:01 20:01-20:34/33 20:59 06:40-07:02/22
4	07:58 08:39-09:58/79 17:16 08:20-08:29/9	07:41 08:47-10:02/75 17:51	07:03 17:40-18:04/24 18:25 07:28-07:49/21	07:11 07:42-08:51/69 19:59	06:27 07:33-08:21/48 20:30 19:37-20:02/25	06:00 20:02-20:35/33 20:59 06:39-07:04/25
5	07:58 08:39-09:59/80 17:17 08:20-08:30/10	07:40 08:48-10:01/73 17:53	07:01 17:38-18:04/26 18:27 07:26-07:52/26	07:10 07:41-08:52/71 20:01	06:25 19:37-20:02/25 20:32 07:34-08:20/46	06:00 20:03-20:36/33 21:00 06:38-07:06/28
6	07:58 08:39-09:59/80 17:18 08:20-08:32/12	07:39 08:49-10:01/72 17:54	07:00 07:23-07:53/30 18:28 17:38-18:06/28	07:08 07:40-08:52/72 20:01	06:24 19:38-20:01/23 20:33 07:35-08:19/44	06:00 20:04-20:36/32 21:01 06:37-07:07/30
7	07:58 08:40-10:00/80 17:19 08:20-08:33/13	07:37 08:50-10:00/70 17:55	06:58 17:38-18:07/29 18:29 07:21-07:54/33	07:06 07:38-08:51/73 20:02	06:23 20:07-20:11/4 07:37-08:18/41 20:34 19:39-20:00/21	05:59 20:04-20:36/32 21:01 06:36-07:08/32
8	07:58 08:40-10:01/81 17:20 08:20-08:34/14	07:36 08:50-09:58/68 17:56	07:56 18:38-19:09/31 19:30 08:20-08:56/36	07:05 07:37-08:52/75 20:03	06:22 20:04-20:12/8 07:38-08:17/39 20:35 19:40-19:59/19	05:59 20:05-20:37/32 21:02 06:36-07:09/33
9	07:57 08:39-10:00/81 17:21 08:19-08:34/15	07:35 08:51-09:57/66 17:58	07:55 18:37-19:10/33 19:31 08:17-08:56/39	07:03 07:36-08:51/75 20:04	06:21 20:02-20:13/11 07:39-08:15/36 20:36 19:42-19:58/16	05:59 20:06-20:38/32 21:03 06:35-07:10/35
10	07:57 08:40-10:01/81 17:22 08:19-08:36/17	07:34 08:52-09:55/63 17:59 17:29-17:36/7	07:53 18:37-19:10/33 19:32 08:15-08:56/41	07:02 07:35-08:51/76 20:05	06:19 20:00-20:14/14 07:41-08:14/33 20:37 19:43-19:56/13	05:59 20:07-20:39/32 21:03 06:35-07:11/36
11	07:57 08:40-10:02/82 17:23 08:19-08:37/18	07:33 08:54-09:54/60 18:00 17:27-17:37/10	07:51 18:38-19:12/34 19:33 08:14-08:58/44	07:00 07:34-08:50/76 20:06	06:18 19:59-20:15/16 07:43-08:12/29 20:38 19:46-19:54/8	05:59 20:08-20:39/31 21:04 06:35-07:12/37
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13	07:56 08:40-10:03/83 17:25 08:18-08:38/20	07:30 08:56-09:49/53 18:03 17:24-17:40/16	07:48 18:38-19:14/36 19:36 08:11-08:57/46	06:57 07:33-08:49/76 20:08	06:16 19:58-20:17/19 20:40 07:47-08:07/20	05:58 20:10-20:17/7 20:18-20:40/22 21:05 06:34-07:13/39
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15	07:56 08:17-10:03/106 17:27	07:28 08:59-09:43/44 18:05 17:22-17:42/20	07:45 18:40-19:16/36 19:38 08:10-08:58/48	06:54 07:31-08:48/77 20:10	06:14 19:57-20:19/22 20:42	05:58 20:12-20:15/3 20:19-20:41/22 21:06 06:34-07:14/40
16	07:55 08:17-10:04/107 17:28	07:26 09:02-09:38/36 18:06 17:22-17:43/21	07:43 18:41-19:16/35 19:39 08:08-08:57/49	06:52 07:30-08:47/77 20:11	06:13 19:56-20:20/24 20:43	05:58 06:34-07:15/41 21:06 20:19-20:41/22
17	07:55 08:16-10:04/108 17:29	07:25 09:06-09:24/18 18:08 17:22-17:45/23	07:42 18:44-19:16/32 19:40 08:09-08:57/48	06:51 07:31-08:47/76 20:12	06:12 19:56-20:21/25 20:44	05:58 06:34-07:15/41 21:07 20:19-20:42/23
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20	07:53 08:15-10:05/110 17:33	07:21 17:21-17:47/26 18:11	07:37 18:50-19:14/24 19:43 08:08-08:56/48	06:46 07:29-08:43/74 20:16 19:47-19:54/7	06:10 19:55-20:23/28 20:47	05:59 06:34-07:15/41 21:08 20:19-20:42/23
21	07:53 08:16-10:06/110 17:34	07:19 17:22-17:47/25 18:12	07:35 18:51-19:12/21 19:44 08:07-08:54/47	06:44 07:30-08:43/73 20:17 19:45-19:55/10	06:09 19:56-20:24/28 20:48	05:59 06:34-07:15/41 21:08 20:19-20:42/23
22	07:52 08:16-10:05/109 17:35	07:18 17:22-17:45/23 18:14	07:33 18:52-19:10/18 19:45 08:07-08:53/46	06:43 07:29-08:41/72 20:18 19:42-19:56/14	06:08 19:56-20:24/28 20:49	05:59 06:35-07:16/41 21:08 20:19-20:42/23
23	07:51 08:16-10:05/109 17:36	07:16 17:23-17:45/22 18:15	07:31 18:54-19:07/13 19:47 08:07-08:53/46	06:42 07:29-08:40/71 20:19 19:41-19:57/16	06:07 19:56-20:23/27 20:50	05:59 06:35-07:16/41 21:08 20:20-20:43/23
24	07:51 08:16-10:05/109 17:38	07:15 17:25-17:44/19 18:16	07:30 18:59-19:03/4 19:48 08:04-08:51/47	06:40 07:29-08:38/69 20:20 19:39-19:58/19	06:06 19:56-20:23/27 20:50	06:00 06:35-07:16/41 21:09 20:20-20:43/23
25	07:50 08:17-10:06/109 17:39	07:14 17:26-17:42/16 18:17	07:28 08:01-08:49/48 19:49	06:39 07:29-08:37/68 20:21 19:39-19:59/20	06:06 19:57-20:23/26 20:51 20:25-20:27/2	06:00 06:35-07:16/41 21:09 20:20-20:43/23
26	07:49 08:18-10:06/108 17:40	07:12 17:27-17:39/12 18:18	07:26 07:59-08:47/48 19:50	06:37 07:30-08:36/66 20:22 19:38-20:00/22	06:05 19:56-20:28/32 20:52	06:00 06:36-07:17/41 21:09 20:21-20:43/22
27	07:48 08:18-10:05/107 17:41	07:11 17:50-17:58/8 18:20	07:25 07:58-08:48/50 19:51	06:36 07:30-08:34/64 20:23 19:37-20:01/24	06:04 19:57-20:29/32 20:53	06:01 20:15-20:17/2 20:21-20:43/22 21:09 06:36-07:16/40
28	07:47 08:19-10:05/106 17:43	07:09 17:46-17:58/12 18:21	07:23 07:56-08:49/53 19:52	06:34 07:30-08:33/63 20:24 19:37-20:02/25	06:04 19:57-20:30/33 20:54	06:01 20:13-20:18/5 20:21-20:43/22 21:09 06:37-07:17/40
29	07:47 08:44-10:05/81 17:44 08:20-08:42/22		07:21 07:54-08:49/55 19:53	06:33 07:31-08:31/60 20:25 19:37-20:03/26	06:03 19:58-20:31/33 20:55	06:01 20:13-20:20/7 20:21-20:43/22 21:09 06:37-07:16/39
30	07:46 08:44-10:05/81 17:45 08:21-08:41/20		07:20 07:54-08:51/57 19:54	06:32 07:31-08:29/58 20:26 19:36-20:04/28	06:03 19:58-20:31/33 20:56	06:02 20:12-20:43/31 21:09 06:37-07:16/39
31	07:45 08:45-10:04/79 17:46 08:22-08:40/18		07:18 07:52-08:51/59 19:55		06:02 19:59-20:32/33 20:56 06:48-06:55/7	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3132	1402	1908	2339	1365	1908

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T38 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (457)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:12-20:43/31 21:09 06:39-07:16/37	06:26 20:08-20:25/17 20:50 07:54-08:20/26	06:57 07:33-08:49/76 20:07	07:28 18:18-18:53/35 19:15 07:52-08:37/45	07:02 08:22-09:25/63 17:28 17:00-17:05/5	07:37 08:22-09:44/82 17:04 08:01-08:19/18
2	06:03 20:11-20:43/32 21:09 06:39-07:15/36	06:27 20:09-20:24/15 07:52-08:22/30 20:49 19:54-20:04/10	06:59 07:33-08:49/76 20:06	07:29 18:17-18:51/34 19:13 07:52-08:36/44	07:03 08:20-09:27/67 17:27	07:38 08:23-09:44/81 17:04 08:02-08:19/17
3	06:03 20:11-20:43/32 21:09 06:40-07:15/35	06:28 20:11-20:23/12 07:50-08:24/34 20:48 19:52-20:06/14	07:00 07:34-08:49/75 20:04	07:30 18:16-18:50/34 19:12 07:53-08:35/42	07:05 08:19-09:28/69 17:26	07:39 08:23-09:44/81 17:03 08:03-08:19/16
4	06:04 20:10-20:42/32 21:08 06:40-07:14/34	06:29 20:12-20:22/10 07:49-08:25/36 20:47 19:51-20:08/17	07:01 07:34-08:49/75 20:03	07:31 18:15-18:48/33 19:10 07:54-08:34/40	07:06 08:18-09:29/71 17:25	07:40 08:24-09:45/81 17:03 08:04-08:18/14
5	06:04 20:10-20:43/33 21:08 06:42-07:14/32	06:30 20:14-20:21/7 07:47-08:27/40 20:46 19:49-20:09/20	07:02 07:35-08:48/73 20:01	07:32 18:15-18:46/31 19:08 07:56-08:33/37	07:07 08:18-09:31/73 17:23	07:41 08:25-09:45/80 17:03 08:05-08:18/13
6	06:05 20:09-20:42/33 21:08 06:43-07:14/31	06:31 19:48-20:10/22 20:45 07:46-08:28/42	07:03 07:36-08:48/72 19:58	07:33 18:14-18:44/30 19:07 07:57-08:31/34	07:08 08:17-09:31/74 17:22	07:42 08:25-09:45/80 17:03 08:06-08:18/12
7	06:06 20:09-20:42/33 21:08 06:44-07:13/29	06:32 19:48-20:11/23 20:44 07:45-08:29/44	07:04 07:36-08:47/71 19:56	07:34 07:58-08:30/32 19:05 18:14-18:43/29	07:09 08:17-09:32/75 17:21	07:43 08:26-09:46/80 17:03 08:07-08:17/10
8	06:06 20:09-20:42/33 21:07 06:45-07:12/27	06:33 19:47-20:11/24 20:42 07:44-08:30/46	07:05 07:37-08:47/70 19:54	07:35 18:14-18:41/27 19:03 07:59-08:28/29	07:11 08:17-09:34/77 17:20	07:44 08:27-09:46/79 17:03 08:08-08:17/9
9	06:07 20:08-20:41/33 21:07 06:46-07:10/24	06:34 07:43-08:31/48 20:41 19:46-20:12/26	07:06 07:39-08:46/67 19:53	07:36 18:14-18:39/25 19:02 08:01-08:25/24	07:12 08:16-09:34/78 17:19 07:57-08:08/11	07:45 08:28-09:46/78 17:03 08:09-08:17/8
10	06:08 20:08-20:41/33 21:07 06:48-07:09/21	06:35 07:42-08:32/50 20:40 19:46-20:12/26	07:07 07:40-08:45/65 19:51	07:37 18:14-18:37/23 19:00 08:03-08:22/19	07:13 08:16-09:35/79 17:18 07:55-08:10/15	07:46 08:28-09:47/79 17:03 08:10-08:16/6
11	06:08 20:08-20:41/33 21:06 06:51-07:08/17	06:36 07:41-08:34/53 20:39 19:45-20:12/27	07:07 07:42-08:44/62 19:49	07:38 18:15-18:36/21 18:59 08:08-08:17/9	07:14 08:15-09:35/80 17:17 07:54-08:12/18	07:47 08:28-09:46/78 17:03 08:10-08:15/5
12	06:09 20:07-20:40/33 21:06 06:54-07:05/11	06:37 07:40-08:36/56 20:37 19:45-20:12/27	07:08 07:44-08:43/59 19:47	07:39 18:16-18:34/18 18:57	07:15 08:16-09:37/81 17:16 07:53-08:13/20	07:48 08:29-09:47/78 17:03 08:11-08:13/2
13	06:10 20:07-20:40/33 21:05	06:38 07:39-08:38/59 20:36 19:45-20:12/27	07:09 07:45-08:42/57 19:46	07:41 18:18-18:33/15 18:55	07:17 08:16-09:37/81 17:15 07:52-08:14/22	07:48 08:30-09:47/77 17:03
14	06:11 20:07-20:40/33 21:05	06:39 07:38-08:40/62 20:35 19:45-20:11/26	07:10 07:45-08:41/56 19:44	07:42 18:20-18:31/11 18:54	07:18 07:51-09:37/106 17:14	07:49 08:31-09:48/77 17:03
15	06:11 20:07-20:39/32 21:04	06:40 07:38-08:41/63 20:33 19:45-20:10/25	07:11 07:46-08:39/53 19:42	07:43 18:02-18:10/8 18:52	07:19 07:51-09:38/107 17:13	07:50 08:31-09:48/77 17:03
16	06:12 20:06-20:38/32 21:04	06:41 07:37-08:42/65 20:32 19:45-20:08/23	07:12 07:47-08:38/51 19:41	07:44 17:59-18:13/14 18:51	07:20 07:51-09:39/108 17:12	07:51 08:32-09:48/76 17:04
17	06:13 20:06-20:38/32 21:03	06:42 07:37-08:43/66 20:30 19:45-20:07/22	07:13 07:48-08:36/48 19:39	07:45 17:57-18:14/17 18:49	07:21 07:50-09:39/109 17:12	07:51 08:32-09:49/77 17:04
18	06:14 20:06-20:37/31 21:03	06:43 07:36-08:44/68 20:29 19:45-20:06/21	07:14 07:48-08:37/49 19:37	07:46 17:55-18:15/20 18:48	07:23 07:50-09:39/109 17:11	07:52 08:32-09:49/77 17:04
19	06:15 20:06-20:33/27 21:02	06:44 07:36-08:45/69 20:28 19:46-20:04/18	07:16 07:50-08:37/47 19:35	07:47 17:55-18:17/22 18:46	07:24 07:51-09:40/109 17:10	07:53 08:33-09:50/77 17:05
20	06:15 20:06-20:34/28 21:01	06:45 07:35-08:46/71 20:26 19:47-20:03/16	07:17 18:41-18:52/11 19:34 07:52-08:38/46	07:48 17:54-18:17/23 18:45	07:25 07:51-09:40/109 17:09	07:53 08:34-09:51/77 17:05
21	06:16 20:05-20:33/28 21:00	06:46 07:35-08:47/72 20:25 19:47-20:00/13	07:18 18:38-18:54/16 19:32 07:52-08:38/46	07:49 17:53-18:17/24 18:43	07:26 07:51-09:41/110 17:09	07:54 08:34-09:51/77 17:06
22	06:17 20:05-20:33/28 21:00	06:47 07:34-08:48/74 20:23 19:49-19:59/10	07:19 18:36-18:56/20 19:30 07:52-08:39/47	07:51 17:52-18:17/25 18:42	07:27 07:51-09:41/110 17:08	07:54 08:35-09:52/77 17:06
23	06:18 20:06-20:33/27 20:59	06:48 07:33-08:47/74 20:22 19:52-19:57/5	07:20 18:34-18:57/23 19:29 07:51-08:39/48	07:52 17:51-18:17/26 18:40	07:28 07:52-09:42/110 17:07	07:55 08:35-09:52/77 17:07
24	06:19 20:06-20:33/27 20:58	06:49 07:33-08:48/75 20:20	07:21 18:33-18:57/24 19:27 07:51-08:39/48	07:53 09:40-09:50/10 18:39 17:52-18:16/24	07:30 07:53-09:42/109 17:07	07:55 08:35-09:52/77 17:07
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26	06:21 20:06-20:32/26 20:56	06:51 07:32-08:49/77 20:17	07:23 18:26-18:58/32 19:23 07:50-08:39/49	07:55 09:31-10:09/38 18:36 17:52-18:13/21	07:32 07:55-09:42/107 17:06	07:56 08:36-09:53/77 17:08
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28	06:23 20:07-20:30/23 20:54	06:53 07:32-08:49/77 20:14	07:25 18:21-18:57/36 19:20 07:51-08:39/48	07:58 09:27-10:17/50 18:33 17:54-18:11/17	07:34 07:58-09:43/105 17:05	07:57 08:38-09:55/77 17:10
29	06:24 20:07-20:29/22 20:53 08:05-08:10/5	06:54 07:32-08:49/77 20:12	07:26 18:19-18:56/37 19:18 07:51-08:39/48	07:59 09:25-10:19/54 18:32 17:54-18:09/15	07:35 08:21-09:44/83 17:05 07:59-08:19/20	07:57 08:38-09:55/77 17:11
30	06:25 20:07-20:27/20 20:52 08:00-08:16/16	06:55 07:33-08:49/76 20:11	07:27 18:18-18:54/36 19:17 07:51-08:38/47	08:00 09:24-10:21/57 18:31 17:55-18:07/12	07:36 08:22-09:44/82 17:04 08:00-08:19/19	07:57 08:38-09:55/77 17:11
31	06:25 20:08-20:26/18 20:51 07:56-08:18/22	06:56 07:33-08:49/76 20:09		08:01 09:22-10:23/61 18:29 17:57-18:06/9		07:57 08:38-09:56/78 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1285	2361	2019	1373	2884	2549

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T39 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (458)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:18-16:09/51	07:44 16:33-17:09/36	07:07 17:35-18:00/25	07:16 19:08-19:34/26	06:30 06:56-08:19/83	06:01 06:23-06:56/33
	17:13 08:20-08:35/15	17:48	18:22 07:27-07:55/28	19:56 07:35-08:41/66	20:27	20:57 06:57-07:41/44
2	07:58 15:19-16:09/50	07:43 16:33-17:09/36	07:06 17:35-18:01/26	07:15 19:07-19:34/27	06:29 06:56-08:19/83	06:01 06:23-06:57/34
	17:14 08:20-08:35/15	17:49	18:23 07:25-07:54/29	19:57 07:35-08:41/66	20:28	20:58 06:58-07:41/43
3	07:58 15:19-16:09/50	07:42 16:34-17:09/35	07:04 17:35-18:02/27	07:13 19:08-19:34/26	06:28 06:55-08:19/84	06:01 06:22-06:56/34
	17:15 08:20-08:36/16	17:50	18:24 07:26-07:55/29	19:58 07:35-08:40/65	20:29	20:59 06:58-07:40/42
4	07:58 15:20-16:09/49 16:39-16:45/6	07:41 16:35-17:09/34	07:03 17:35-18:01/26	07:11 19:08-19:33/25	06:26 06:54-08:18/84	06:00 06:22-06:56/34
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	17:18 08:20-08:39/19	17:55	18:29 07:27-07:51/24	20:01 07:35-08:34/59	20:34 19:57-20:11/14	21:01 07:00-07:39/39
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	17:22 08:19-08:40/21	17:59	19:32 18:41-18:52/11	20:05	20:37 19:54-20:13/19	21:03 07:02-07:39/37
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	17:39 16:30-17:08/38	18:17 07:33-07:53/20	19:49 19:15-19:27/12	20:21	20:51 19:58-20:17/19	21:09 07:07-07:40/33
26	07:49 08:27-08:39/12	07:12 17:37-17:56/19	07:26 19:13-19:28/15	06:37 07:03-08:21/78	06:05 06:26-08:00/94	06:00 06:23-06:59/36
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27	07:48 08:30-08:36/6	07:10 17:36-17:58/22	07:25 19:12-19:30/18	06:36 07:01-08:20/79	06:04 06:26-07:59/93	06:00 06:23-06:58/35
	17:41 16:31-17:09/38	18:19 07:30-07:54/24	19:51 07:44-08:45/61	20:23	20:53 20:00-20:16/16	21:09 07:07-07:41/34
28	07:47 16:31-17:10/39	07:09 17:35-17:58/23	07:23 19:11-19:30/19	06:34 07:00-08:20/80	06:04 06:25-07:57/92	06:01 06:23-06:58/35
	17:43	18:21 07:28-07:54/26	19:52 07:42-08:44/62	20:24	20:54 20:00-20:15/15	21:09 07:07-07:41/34
29	07:46 16:32-17:10/38		07:21 19:09-19:31/22	06:33 06:59-08:20/81	06:03 06:25-07:56/91	06:01 06:24-06:59/35
	17:44		19:53 07:40-08:43/63	20:25	20:55 20:01-20:13/12	21:09 07:07-07:42/35
30	07:46 16:32-17:10/38		07:20 19:09-19:33/24	06:32 06:57-08:19/82	06:02 06:24-07:53/89	06:02 06:24-06:59/35
	17:45		19:54 07:39-08:43/64	20:26	20:55 20:03-20:13/10	21:09 07:07-07:42/35
31	07:45 16:32-17:10/38		07:18 19:08-19:34/26		06:02 06:24-07:42/78 20:05-20:10/5	
	17:46		19:55 07:37-08:42/65		20:56 07:43-07:51/8	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	2287	572	1606	2114	3339	2135

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T39 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (458)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-07:00/35 21:09 07:07-07:43/36	06:26 07:01-08:24/83 06:48-06:58/10 20:50 20:04-20:25/21	06:57 07:30-08:25/55 20:07	07:28 07:48-08:09/21 19:15	07:02 16:12-16:31/19 17:28	07:37 15:08-15:52/44 16:15-16:39/24 17:04 08:01-08:23/22
2	06:03 06:25-07:00/35 21:09 07:07-07:43/36	06:27 07:02-08:24/82 06:49-06:56/7 20:49 20:04-20:24/20	06:58 07:31-08:27/56 20:06	07:29 07:49-08:07/18 19:13	07:03 16:10-16:34/24 17:27	07:38 15:08-15:53/45 16:16-16:39/23 17:03 08:02-08:23/21
3	06:03 06:26-07:01/35 21:08 07:07-07:44/37	06:28 07:02-08:25/83 20:48 20:05-20:23/18	06:59 19:11-19:23/12 20:04 07:33-08:29/56	07:30 07:50-08:06/16 08:11-08:22/11 19:12 18:21-18:29/8	07:05 16:09-16:35/26 17:26	07:39 15:08-15:54/46 16:18-16:38/20 17:03 08:03-08:24/21
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6	06:05 06:27-07:02/35 21:08 07:06-07:45/39	06:31 07:02-08:27/85 20:45 20:07-20:20/13	07:02 19:05-19:27/22 19:57 07:31-08:32/61	07:33 18:13-18:34/21 19:07 08:04-08:27/23	07:08 16:06-16:38/32 17:22	07:42 15:08-15:56/48 16:22-16:36/14 17:03 08:06-08:24/18
7	06:06 06:28-07:03/35 21:08 07:06-07:46/40	06:32 07:03-08:27/84 20:43 20:08-20:19/11	07:03 19:04-19:28/24 19:56 07:30-08:33/63	07:34 18:12-18:35/23 19:05 08:02-08:28/26	07:09 16:05-16:39/34 17:21	07:43 15:08-15:57/49 16:24-16:35/11 17:03 08:07-08:24/17
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11	06:08 06:31-07:04/33 21:06 07:05-07:49/44	06:36 07:05-08:28/83 20:38	07:07 19:01-19:28/27 19:49 07:28-08:34/66	07:38 18:08-18:35/27 18:58 07:59-08:28/29	07:14 16:03-16:41/38 17:17	07:47 15:08-15:59/51 17:03 08:10-08:25/15
12	06:09 06:31-07:49/78 21:06 20:15-20:16/1	06:37 07:05-08:28/83 20:37	07:08 18:59-19:25/26 19:47 07:29-08:35/66	07:39 18:08-18:34/26 18:57 07:59-08:28/29	07:15 16:04-16:42/38 17:16	07:47 15:09-15:59/50 17:03 08:11-08:25/14
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19	06:14 06:37-08:12/95 21:02 20:07-20:27/20	06:44 07:14-08:27/73 20:27	07:15 07:35-08:32/57 19:35 19:04-19:13/9	07:47 18:13-18:23/10 18:46 08:08-08:22/14	07:24 15:18-15:34/16 16:04-16:41/37 17:10 07:57-08:17/20	07:52 15:11-16:03/52 17:05 08:16-08:27/11
20	06:15 06:38-08:13/95 21:01 20:07-20:28/21	06:45 07:15-08:26/71 20:26	07:16 07:36-08:31/55 19:34	07:48 18:16-18:22/6 18:44 08:09-08:19/10	07:25 15:17-15:38/21 16:06-16:42/36 17:09 07:57-08:18/21	07:53 15:11-16:03/52 17:05 08:16-08:27/11
21	06:16 06:38-08:14/96 21:00 20:05-20:28/23	06:46 07:19-08:25/66 20:24	07:17 07:44-08:30/46 19:32	07:49 08:10-08:15/5 18:43	07:26 15:15-15:40/25 16:06-16:42/36 17:09 07:56-08:18/22	07:54 15:12-16:04/52 17:06 08:17-08:28/11
22	06:17 06:39-08:15/96 21:00 20:05-20:29/24	06:47 07:23-08:25/62 20:23	07:18 07:44-08:29/45 19:30	07:50 18:42	07:27 15:13-15:42/29 16:06-16:42/36 17:08 07:56-08:19/23	07:54 15:12-16:04/52 17:06 08:17-08:28/11
23	06:18 06:40-08:16/96 20:59 20:05-20:29/24	06:48 07:23-08:24/61 20:21	07:19 07:45-08:28/43 19:28	07:52 18:40	07:28 15:12-15:43/31 16:07-16:41/34 17:07 07:55-08:19/24	07:55 15:13-16:05/52 17:07 08:18-08:29/11
24	06:19 06:41-08:18/97 20:58 20:05-20:30/25	06:49 07:24-08:23/59 20:20	07:20 07:45-08:27/42 19:27	07:53 18:39	07:30 15:11-15:45/34 16:08-16:42/34 17:07 07:56-08:21/25	07:55 15:13-16:05/52 17:07 08:18-08:29/11
25	06:20 06:42-08:19/97 20:57 20:04-20:30/26	06:50 07:24-08:23/59 20:18	07:21 07:44-08:25/41 19:25	07:54 18:37	07:31 15:10-15:46/36 16:09-16:41/32 17:06 07:56-08:21/25	07:55 15:14-16:06/52 17:08 08:19-08:30/11
26	06:21 06:43-08:20/97 20:56 20:04-20:30/26	06:51 07:25-08:22/57 20:17	07:22 07:43-08:23/40 19:23	07:55 18:36	07:32 15:10-15:47/37 16:10-16:41/31 17:06 07:56-08:21/25	07:56 15:15-16:06/51 17:08 08:19-08:31/12
27	06:22 06:44-08:21/97 20:55 20:04-20:31/27	06:52 07:25-08:21/56 20:15	07:24 07:43-08:22/39 19:22	07:56 18:35	07:33 15:09-15:48/39 16:11-16:40/29 17:05 07:56-08:21/25	07:56 15:15-16:07/52 17:09 08:19-08:31/12
28	06:23 06:45-08:22/97 20:54 20:04-20:30/26	06:53 07:26-08:19/53 20:14	07:25 07:44-08:19/35 19:20	07:57 18:33	07:34 15:08-15:49/41 16:11-16:40/29 17:05 07:57-08:22/25	07:57 15:15-16:07/52 17:10 08:19-08:31/12
29	06:23 06:46-08:22/96 20:53 20:03-20:28/25	06:54 07:27-08:18/51 20:12	07:26 07:45-08:17/32 19:18	07:59 18:32	07:35 15:08-15:50/42 16:12-16:39/27 17:04 07:59-08:23/24	07:57 15:17-16:08/51 17:10 08:20-08:33/13
30	06:24 06:46-08:22/96 20:52 20:04-20:27/23	06:55 07:28-08:17/49 20:11	07:27 07:46-08:13/27 19:17	08:00 17:20-17:24/4 18:31	07:36 15:08-15:52/44 16:14-16:40/26 17:04 08:00-08:23/23	07:57 15:17-16:08/51 17:11 08:20-08:33/13
31	06:25 07:01-08:23/82 06:47-07:00/13 20:51 20:04-20:26/22	06:56 07:29-08:21/52 20:09		08:01 17:14-17:29/15 18:29		07:57 15:17-16:08/51 17:12 08:20-08:34/14
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	3092	2392	1948	844	1729	2133

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T4 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (423)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:54/34 17:12	07:43 08:04-09:07/63 17:47 16:55-17:23/28	07:07 17:08-17:57/49 18:21	07:16 18:54-19:34/40 19:56	06:30 06:51-07:53/62 20:27	06:01 06:24-07:27/63 20:57
2	07:57 08:20-08:55/35 17:13	07:42 08:03-09:06/63 17:48 16:55-17:24/29	07:05 17:11-17:58/47 18:22	07:14 18:53-19:35/42 19:57	06:28 06:50-07:53/63 20:28	06:00 06:24-07:27/63 20:58
3	07:57 08:20-08:56/36 17:14	07:41 08:02-09:06/64 17:49 16:54-17:26/32	07:04 17:14-17:59/45 18:24	07:12 18:53-19:35/42 19:58	06:27 06:49-07:52/63 20:29	06:00 06:23-07:27/64 20:58
4	07:57 08:20-08:57/37 17:15	07:40 08:01-09:05/64 17:51 16:54-17:26/32	07:02 17:20-18:02/42 18:25	07:11 18:53-19:36/43 19:59	06:26 06:49-07:51/62 20:30	05:59 06:22-07:26/64 20:59
5	07:57 08:20-08:58/38 17:16	07:39 08:00-09:04/64 17:52 16:53-17:26/33	07:01 17:20-18:03/43 18:26	07:09 18:53-19:36/43 20:00	06:25 06:47-07:49/62 20:31	05:59 06:22-07:26/64 21:00
6	07:57 08:20-08:58/38 17:17	07:38 07:58-09:02/64 17:53 16:53-17:27/34	06:59 17:19-18:04/45 18:27	07:07 18:52-19:36/44 20:00	06:23 06:46-07:48/62 20:32	05:59 06:21-07:26/65 21:01
7	07:57 08:20-08:59/39 17:18	07:37 07:57-09:01/64 17:54 16:54-17:30/36	06:57 17:20-18:06/46 18:28	07:06 18:53-19:37/44 20:01 07:33-07:47/14	06:22 06:42-07:46/64 20:33	05:58 06:20-07:25/65 21:01
8	07:57 08:19-08:59/40 17:19	07:36 07:56-09:00/64 17:56 16:54-17:32/38	07:56 18:19-19:06/47 19:29	07:04 18:53-19:36/43 20:02 07:28-07:50/22	06:21 06:41-07:45/64 20:34	05:58 06:20-07:25/65 21:02
9	07:57 08:19-09:00/41 17:20	07:35 07:56-09:00/64 17:57 16:55-17:34/39	07:54 18:19-19:06/47 19:30	07:02 18:53-19:36/43 20:03 07:26-07:53/27	06:20 06:40-07:44/64 20:35	05:58 06:20-07:25/65 21:02
10	07:57 08:19-09:01/42 17:21	07:33 07:56-08:59/63 17:58 16:54-17:34/40	07:53 18:20-19:07/47 19:32	07:01 18:55-19:36/41 20:04 07:23-07:54/31	06:19 06:39-07:43/64 20:36	05:58 06:20-07:25/65 21:03
11	07:57 08:19-09:02/43 17:22	07:32 07:56-08:57/61 17:59 16:55-17:36/41	07:51 18:20-19:07/47 19:33	06:59 18:55-19:35/40 20:05 07:21-07:55/34	06:17 06:38-07:43/65 20:37	05:58 06:20-07:25/65 21:04
12	07:56 08:18-09:02/44 17:23	07:31 07:57-08:56/59 18:01 16:56-17:37/41	07:49 18:20-19:07/47 19:34	06:58 18:57-19:35/38 20:06 07:20-07:56/36	06:16 06:37-07:42/65 20:38	05:58 06:20-07:25/65 21:04
13	07:56 08:18-09:04/46 17:24	07:30 07:58-08:54/56 18:02 16:57-17:38/41	07:48 18:22-19:07/45 19:35	06:56 18:58-19:34/36 20:08 07:18-07:57/39	06:15 06:36-07:41/65 20:39	05:57 06:20-07:25/65 21:05
14	07:56 08:17-09:04/47 17:25	07:28 07:59-08:52/53 18:03 16:57-17:38/41	07:46 18:23-19:07/44 19:36	06:54 07:18-07:58/40 20:09 19:00-19:34/34	06:14 06:35-07:40/65 20:40	05:57 06:20-07:25/65 21:05
15	07:55 08:17-09:05/48 17:26	07:27 08:01-08:52/51 18:04 16:59-17:39/40	07:44 18:24-19:06/42 19:37	06:53 07:16-07:58/42 20:10 19:00-19:32/32	06:13 06:34-07:39/65 20:41	05:57 06:20-07:25/65 21:06
16	07:55 08:16-09:05/49 17:27	07:26 17:01-17:40/39 18:06 08:04-08:51/47	07:43 18:26-19:06/40 19:38	06:51 07:15-07:59/44 20:11 19:00-19:30/30	06:12 06:33-07:38/65 20:42	05:57 06:20-07:25/65 21:06
17	07:54 08:16-09:06/50 17:28	07:24 17:02-17:39/37 18:07 08:12-08:50/38	07:41 18:27-19:05/38 19:39	06:50 07:12-07:59/47 20:12 19:01-19:30/29	06:11 06:32-07:37/65 20:43	05:57 06:20-07:25/65 21:06
18	07:54 08:15-09:06/51 17:30	07:23 17:02-17:40/38 18:08 08:13-08:49/36	07:39 18:27-19:04/37 19:41	06:48 07:10-07:58/48 20:13 19:02-19:28/26	06:10 06:31-07:36/65 20:44	05:57 06:20-07:25/65 21:07
19	07:53 08:15-09:07/52 17:31	07:22 08:14-08:47/33 18:09 17:02-17:39/37	07:38 18:28-19:04/36 19:42	06:47 07:09-07:59/50 20:14 19:04-19:26/22	06:10 06:30-07:35/65 20:45	05:58 06:20-07:25/65 21:07
20	07:53 08:14-09:07/53 17:32	07:20 08:16-08:46/30 18:11 17:02-17:40/38	07:36 18:29-19:03/34 19:43	06:45 07:08-07:59/51 20:15 19:05-19:24/19	06:09 06:30-07:35/65 20:46	05:58 06:20-07:25/65 21:07
21	07:52 08:13-09:07/54 17:33	07:19 08:18-08:44/26 18:12 17:03-17:40/37	07:34 18:29-19:01/32 19:44	06:44 07:06-07:59/53 20:16 19:08-19:21/13	06:08 06:29-07:34/65 20:47	05:58 06:20-07:25/65 21:08
22	07:52 08:13-09:08/55 17:34	07:17 08:19-08:41/22 18:13 17:02-17:48/46	07:33 18:31-19:00/29 19:45	06:42 07:05-07:59/54 20:17	06:07 06:29-07:33/64 20:48	05:58 06:21-07:26/65 21:08
23	07:51 08:12-09:08/56 17:36	07:16 08:23-08:39/16 18:14 17:03-17:51/48	07:31 18:32-18:58/26 19:46 19:08-19:22/14	06:41 07:03-07:58/55 20:18	06:06 06:29-07:32/63 20:49	05:58 06:21-07:26/65 21:08
24	07:50 08:11-09:08/57 17:37 17:05-17:11/6	07:15 17:03-17:52/49 18:15	07:29 18:33-18:56/23 19:47 19:04-19:24/20	06:39 07:02-07:58/56 20:19	06:06 06:29-07:32/63 20:50	05:59 06:21-07:26/65 21:08
25	07:49 08:10-09:08/58 17:38 17:01-17:13/12	07:13 17:04-17:54/50 18:17	07:27 18:35-18:53/18 19:48 19:01-19:26/25	06:38 07:00-07:57/57 20:20	06:05 06:28-07:31/63 20:51	05:59 06:22-07:27/65 21:08
26	07:49 08:09-09:08/59 17:39 16:59-17:14/15	07:12 17:05-17:55/50 18:18	07:26 18:40-18:49/9 19:49 19:00-19:28/28	06:36 06:59-07:57/58 20:22	06:04 06:27-07:30/63 20:52	05:59 06:22-07:27/65 21:08
27	07:48 08:09-09:09/60 17:41 16:59-17:16/17	07:10 17:05-17:56/51 18:19	07:24 18:58-19:28/30 19:50	06:35 06:58-07:57/59 20:23	06:03 06:27-07:30/63 20:53	06:00 06:22-07:27/65 21:09
28	07:47 08:08-09:08/60 17:42 16:58-17:17/19	07:08 17:07-17:57/50 18:20	07:22 18:57-19:29/32 19:51	06:34 06:56-07:56/60 20:24	06:03 06:26-07:29/63 20:54	06:00 06:23-07:28/65 21:09
29	07:46 08:07-09:08/61 17:43 16:57-17:19/22		07:21 18:56-19:30/34 19:52	06:32 06:55-07:55/60 20:25	06:02 06:26-07:29/63 20:54	06:00 06:23-07:28/65 21:09
30	07:45 08:06-09:08/62 17:44 16:56-17:20/24		07:19 18:55-19:31/36 19:54	06:31 06:54-07:55/61 20:26	06:02 06:25-07:28/63 20:55	06:01 06:24-07:29/65 21:09
31	07:44 08:05-09:07/62 17:46 16:55-17:21/26		07:17 18:54-19:32/38 19:55		06:01 06:25-07:28/63 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1648	2280	1262	1842	1976	1943

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T4 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (423)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01 06:24-07:29/65 21:09	06:26 06:48-07:53/65 20:50	06:57 18:54-19:34/40 20:07 07:20-07:54/34	07:27 18:00-18:46/46 19:14	07:02 07:25-08:28/63 17:27 16:24-17:04/40	07:37 08:01-08:44/43 17:03
2	06:02 06:24-07:29/65 21:08	06:27 06:49-07:54/65 20:49	06:58 18:53-19:34/41 20:05 07:21-07:52/31	07:28 17:59-18:46/47 19:13	07:03 07:25-08:30/65 17:26 16:23-17:02/39	07:38 08:02-08:44/42 17:03
3	06:02 06:25-07:30/65 21:08	06:28 06:50-07:53/63 20:48	06:59 18:51-19:34/43 20:04 07:23-07:50/27	07:29 17:58-18:45/47 19:11	07:04 07:26-08:30/64 17:25 16:24-17:02/38	07:39 08:03-08:44/41 17:02
4	06:03 06:26-07:31/65 21:08	06:29 06:50-07:54/64 20:47	07:00 18:50-19:33/43 20:02 07:25-07:47/22	07:30 17:57-18:44/47 19:09	07:05 07:27-08:31/64 17:24 16:24-17:00/36	07:40 08:04-08:44/40 17:02
5	06:03 06:26-07:31/65 21:08	06:30 06:51-07:55/64 20:46	07:01 18:49-19:33/44 20:00 07:28-07:43/15	07:31 17:56-18:43/47 19:08	07:07 07:28-08:32/64 17:23 16:23-16:56/33	07:41 08:05-08:45/40 17:02
6	06:04 06:27-07:32/65 21:08	06:31 06:52-07:57/65 20:44	07:02 18:48-19:32/44 19:57	07:32 17:55-18:42/47 19:06	07:08 07:30-08:34/64 17:21 16:24-16:57/33	07:42 08:06-08:45/39 17:02
7	06:05 06:27-07:32/65 21:07	06:32 06:56-07:58/62 20:43	07:03 18:48-19:31/43 19:55	07:34 17:55-18:40/45 19:04	07:09 07:31-08:35/64 17:20 16:24-16:56/32	07:43 08:07-08:45/38 17:02
8	06:05 06:29-07:33/64 21:07	06:33 06:57-07:59/62 20:42	07:04 18:47-19:30/43 19:54	07:35 17:55-18:40/45 19:03	07:10 07:32-08:36/64 17:19 16:24-16:55/31	07:44 08:08-08:45/37 17:02
9	06:06 06:30-07:34/64 21:07	06:34 06:58-08:00/62 20:41	07:05 18:47-19:29/42 19:52	07:36 17:55-18:38/43 19:01	07:11 07:34-08:37/63 17:18 16:25-16:54/29	07:45 08:08-08:44/36 17:02
10	06:07 06:31-07:34/63 21:06	06:35 06:58-08:01/63 20:39	07:06 18:46-19:28/42 19:50	07:37 17:55-18:35/40 18:59	07:13 07:35-08:38/63 17:17 16:26-16:54/28	07:46 08:09-08:44/35 17:02
11	06:07 06:32-07:35/63 21:06	06:36 06:59-08:02/63 20:38	07:07 18:46-19:27/41 19:49	07:38 17:47-18:32/45 18:58	07:14 07:36-08:38/62 17:16 16:26-16:52/26	07:47 08:10-08:44/34 17:02
12	06:08 06:33-07:36/63 21:06	06:37 07:01-08:02/61 20:37	07:08 18:46-19:25/39 19:47	07:39 17:43-18:31/48 18:56	07:15 07:37-08:39/62 17:15 16:27-16:51/24	07:47 08:11-08:45/34 17:02 16:01-16:05/4
13	06:09 06:33-07:36/63 21:05	06:38 07:02-08:03/61 20:35	07:09 18:46-19:23/37 19:45	07:40 17:41-18:30/49 18:55	07:16 07:39-08:40/61 17:14 16:29-16:51/22	07:48 08:12-08:45/33 17:02 16:00-16:07/7
14	06:10 06:34-07:37/63 21:05	06:39 07:03-08:03/60 20:34	07:10 18:46-19:20/34 19:43	07:41 17:39-18:29/50 18:53	07:18 07:40-08:40/60 17:13 16:30-16:49/19	07:49 08:13-08:46/33 17:02 15:59-16:08/9
15	06:10 06:35-07:38/63 21:04	06:40 07:04-08:03/59 20:33	07:11 18:47-19:19/32 19:42	07:42 17:37-18:28/51 18:52	07:19 07:41-08:41/60 17:12 16:31-16:48/17	07:50 08:13-08:45/32 17:03 15:59-16:09/10
16	06:11 06:36-07:39/63 21:03	06:41 07:05-08:04/59 20:31	07:12 18:47-19:18/31 19:40	07:43 17:37-18:27/50 18:50	07:20 07:43-08:42/59 17:12 16:32-16:47/15	07:50 08:14-08:46/32 17:03 15:59-16:10/11
17	06:12 06:36-07:39/63 21:03	06:42 07:06-08:04/58 20:30	07:13 18:29-18:36/7 19:38 18:48-19:16/28	07:44 17:36-18:25/49 18:48	07:21 07:44-08:42/58 17:11 16:35-16:47/12	07:51 08:15-08:46/31 17:03 15:59-16:12/13
18	06:13 06:37-07:40/63 21:02	06:43 07:07-08:04/57 20:29	07:14 18:24-18:40/16 19:37 18:49-19:15/26	07:46 08:57-09:06/9 18:47 17:34-18:23/49	07:22 07:45-08:42/57 17:10 16:39-16:45/6	07:52 08:15-08:46/31 17:04 15:59-16:12/13
19	06:14 06:38-07:41/63 21:02	06:44 07:08-08:04/56 20:27	07:15 18:21-18:43/22 19:35 18:51-19:12/21	07:47 08:52-09:10/18 18:45 17:34-18:21/47	07:23 07:46-08:42/56 17:09	07:52 08:16-08:47/31 17:04 16:00-16:13/13
20	06:15 06:39-07:42/63 21:01	06:45 07:09-08:04/55 20:26	07:16 18:19-18:44/25 19:33 18:53-19:09/16	07:48 08:49-09:13/24 18:44 17:33-18:17/44	07:25 07:48-08:43/55 17:09	07:53 08:16-08:47/31 17:04 15:59-16:13/14
21	06:15 06:39-07:43/64 21:00	06:46 07:10-08:04/54 20:24	07:17 18:17-18:45/28 19:31 18:57-19:04/7	07:49 08:48-09:16/28 18:42 17:33-18:11/38	07:26 07:49-08:43/54 17:08	07:53 08:17-08:47/30 17:05 16:00-16:14/14
22	06:16 06:40-07:44/64 20:59	06:47 07:11-08:04/53 20:23 19:13-19:26/13	07:18 18:15-18:46/31 19:30	07:50 08:46-09:17/31 18:41 17:33-18:10/37	07:27 07:50-08:43/53 17:07	07:54 08:17-08:47/30 17:05 16:00-16:14/14
23	06:17 06:39-07:44/65 20:59	06:48 07:12-08:03/51 20:21 19:10-19:29/19	07:19 18:13-18:47/34 19:28	07:51 08:44-09:18/34 18:40 17:32-18:10/38	07:28 07:51-08:43/52 17:07	07:54 08:18-08:48/30 17:06 16:01-16:15/14
24	06:18 06:40-07:45/65 20:58	06:49 07:13-08:03/50 20:20 19:08-19:30/22	07:20 18:12-18:47/35 19:26	07:52 17:32-18:10/38 18:38 08:43-09:19/36	07:29 07:53-08:43/50 17:06	07:55 08:18-08:49/31 17:06 16:02-16:15/13
25	06:19 06:41-07:46/65 20:57	06:50 07:14-08:02/48 20:18 19:06-19:32/26	07:21 18:11-18:48/37 19:25	07:54 17:31-18:09/38 18:37 08:41-09:20/39	07:30 07:54-08:44/50 17:05	07:55 08:19-08:49/30 17:07 16:02-16:15/13
26	06:20 06:42-07:47/65 20:56	06:51 07:16-08:02/46 20:17 19:04-19:33/29	07:22 18:10-18:48/38 19:23	07:55 17:30-18:09/39 18:35 08:33-09:21/48	07:32 07:55-08:44/49 17:05	07:56 08:19-08:50/31 17:08 16:03-16:16/13
27	06:21 06:43-07:48/65 20:55	06:52 07:17-08:01/44 20:15 19:03-19:33/30	07:23 18:09-18:48/39 19:21	07:56 08:30-09:22/52 18:34 17:28-18:09/41	07:33 07:56-08:44/48 17:04	07:56 08:19-08:50/31 17:08 16:04-16:15/11
28	06:22 06:44-07:49/65 20:54	06:53 07:18-08:00/42 20:13 19:02-19:34/32	07:24 18:06-18:48/42 19:19	07:57 08:28-09:22/54 18:33 17:27-18:08/41	07:34 07:57-08:44/47 17:04	07:56 08:19-08:51/32 17:09 16:05-16:15/10
29	06:23 06:45-07:50/65 20:53	06:54 07:19-07:59/40 20:12 19:00-19:33/33	07:25 18:04-18:47/43 19:18	07:58 08:27-09:23/56 18:31 17:25-18:07/42	07:35 07:58-08:44/46 17:04	07:57 08:20-08:52/32 17:10 16:05-16:15/10
30	06:24 06:46-07:51/65 20:52	06:55 18:58-19:34/36 20:10 07:19-07:58/39	07:26 18:02-18:47/45 19:16	07:59 08:27-09:26/59 18:30 17:25-18:07/42	07:36 07:59-08:44/45 17:03	07:57 08:20-08:53/33 17:10 16:08-16:15/7
31	06:25 06:47-07:52/65 20:51	06:56 18:56-19:34/38 20:09 07:19-07:55/36		08:01 08:26-09:27/61 18:29 17:25-18:05/40		07:57 08:20-08:54/34 17:11 16:09-16:14/5
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1989	2005	1308	1919	2202	1275

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T40 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (459)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57	07:43	07:07 07:35-08:40/65	07:16 19:25-19:34/9	06:30 19:29-20:05/36	06:01 19:55-20:32/37
	17:13	17:47	18:22	19:56	20:27 07:18-08:19/61	20:57 06:28-07:02/34
2	07:57	07:42	07:06 07:34-08:40/66	07:14 19:22-19:35/13	06:29 19:29-20:06/37	06:01 19:58-20:33/35
	17:14	17:49	18:23	19:57	20:28 07:18-08:19/61	20:58 06:28-07:03/35
3	07:57	07:41	07:04 07:34-08:40/66	07:13 19:20-19:37/17	06:28 19:28-20:06/38	06:01 19:58-20:34/36
	17:15	17:50	18:24	19:58	20:29 07:18-08:18/60	20:58 06:27-07:03/36
4	07:58	07:40	07:03 07:33-08:39/66	07:11 19:18-19:37/19	06:26 19:29-20:08/39	06:00 19:59-20:35/36
	17:16	17:51	18:25	19:59 07:47-08:05/18	20:30 07:18-08:17/59	20:59 06:27-07:04/37
5	07:58	07:39	07:01 07:32-08:38/66	07:10 19:16-19:38/22	06:25 19:29-20:09/40	06:00 20:00-20:35/35
	17:17	17:53	18:26	20:00 07:43-08:09/26	20:31 07:19-08:17/58	21:00 06:27-07:05/38
6	07:57	07:38	06:59 07:32-08:38/66	07:08 19:16-19:40/24	06:24 19:29-20:10/41	06:00 20:00-20:35/35
	17:17	17:54	18:28	20:00 07:39-08:12/33	20:32 07:19-08:16/57	21:01 06:26-07:05/39
7	07:57	07:37 07:57-08:02/5	06:58 07:32-08:37/65	07:06 19:15-19:40/25	06:23 19:30-20:11/41	05:59 20:00-20:36/36
	17:18	17:55	18:29	20:01 07:36-08:13/37	20:33 07:20-08:16/56	21:01 06:26-07:06/40
8	07:57	07:36 07:56-08:05/9	07:56 08:31-09:36/65	07:05 19:15-19:42/27	06:22 19:31-20:12/41	05:59 20:01-20:37/36
	17:19	17:56	19:30	20:02 07:35-08:16/41	20:34 07:21-08:15/54	21:02 06:26-07:07/41
9	07:57	07:35 07:55-08:07/12	07:55 08:32-09:36/64	07:03 19:14-19:43/29	06:20 19:30-20:13/43	05:59 20:02-20:38/36
	17:20	17:58	19:31	20:04 07:32-08:17/45	20:35 07:21-08:14/53	21:02 06:26-07:07/41
10	07:57	07:34 07:54-08:08/14	07:53 08:32-09:35/63	07:01 19:13-19:43/30	06:19 19:31-20:13/42	05:59 20:02-20:38/36
	17:21	17:59	19:32 19:02-19:10/8	20:05 07:30-08:17/47	20:36 07:22-08:14/52	21:03 06:26-07:08/42
11	07:57	07:32 08:09-08:16/7	07:51 08:32-09:34/62	07:00 19:14-19:45/31	06:18 19:32-20:14/42	05:58 20:03-20:39/36
	17:23	18:00 07:52-08:08/16	19:33 18:59-19:11/12	20:06 07:29-08:19/50	20:38 07:22-08:12/50	21:04 06:26-07:09/43
12	07:56	07:31 07:51-08:22/31	07:50 08:32-09:33/61	06:58 19:13-19:45/32	06:17 19:33-20:15/42	05:58 20:03-20:39/36
	17:24	18:01	19:34 18:58-19:13/15	20:07 07:27-08:19/52	20:39 07:22-08:11/49	21:04 06:26-07:09/43
13	07:56	07:30 07:50-08:26/36	07:48 08:32-09:31/59	06:57 19:14-19:45/31	06:16 19:34-20:16/42	05:58 20:03-20:39/36
	17:25	18:03	19:35 18:56-19:14/18	20:08 07:26-08:21/55	20:40 07:23-08:10/47	21:05 06:25-07:09/44
14	07:56	07:29 07:49-08:29/40	07:46 08:34-09:30/56	06:55 19:14-19:44/30	06:15 19:36-20:17/41	05:58 20:04-20:39/35
	17:26	18:04	19:37 18:54-19:15/21	20:09 07:25-08:21/56	20:41 07:24-08:09/45	21:05 06:25-07:09/44
15	07:55	07:27 07:47-08:30/43	07:45 08:34-09:28/54	06:53 19:14-19:43/29	06:14 19:37-20:18/41	05:58 20:04-20:40/36
	17:27	18:05	19:38 18:54-19:16/22	20:10 07:24-08:22/58	20:42 07:26-08:09/43	21:06 06:25-07:09/44
16	07:55	07:26 07:46-08:32/46	07:43 08:34-09:26/52	06:52 19:15-19:43/28	06:13 19:40-20:20/40	05:58 20:04-20:40/36
	17:28	18:06	19:39 18:53-19:17/24	20:11 07:23-08:22/59	20:43 07:27-08:08/41	21:06 06:26-07:11/45
17	07:54	07:25 07:46-08:33/47	07:41 08:35-09:24/49	06:50 19:15-19:42/27	06:12 19:40-20:20/40	05:58 20:05-20:41/36
	17:29	18:07	19:40 18:53-19:18/25	20:12 07:23-08:22/59	20:44 07:28-08:06/38	21:06 06:26-07:11/45
18	07:54	07:23 07:45-08:35/50	07:40 08:37-09:22/45	06:49 19:16-19:41/25	06:11 19:41-20:21/40	05:58 20:06-20:42/36
	17:30	18:09	19:41 18:53-19:20/27	20:13 07:21-08:22/61	20:45 07:29-08:05/36	21:07 06:26-07:11/45
19	07:53	07:22 07:46-08:36/50	07:38 08:38-09:19/41	06:47 19:17-19:40/23 19:44-19:49/5	06:10 19:41-20:22/41	05:58 20:06-20:42/36
	17:32	18:10	19:42 18:53-19:21/28	20:14 07:21-08:23/62	20:45 07:30-08:04/34	21:07 06:26-07:11/45
20	07:53	07:21 07:46-08:37/51	07:36 08:39-09:15/36	06:46 19:18-19:39/21 07:20-08:22/62	06:09 19:41-20:23/42	05:59 20:06-20:42/36
	17:33	18:11	19:43 18:53-19:21/28	20:15 19:40-19:54/14	20:46 07:31-08:02/31	21:07 06:26-07:11/45
21	07:52	07:19 07:45-08:38/53	07:35 08:43-09:10/27	06:44 19:19-19:36/17 07:20-08:23/63	06:09 19:41-20:23/42	05:59 20:06-20:42/36
	17:34	18:12	19:44 18:54-19:23/29	20:16 19:38-19:55/17	20:47 07:34-08:01/27	21:08 06:26-07:11/45
22	07:52	07:18 07:42-08:38/56	07:33 08:46-08:58/12	06:43 19:22-19:34/12 07:19-08:22/63	06:08 19:43-20:25/42	05:59 20:06-20:42/36
	17:35	18:13	19:45 18:54-19:23/29	20:17 19:35-19:56/21	20:48 07:35-07:59/24	21:08 06:26-07:11/45
23	07:51	07:16 07:41-08:39/58	07:31 18:55-19:22/27	06:41 19:26-19:30/4 07:19-08:22/63	06:07 19:43-20:25/42	05:59 20:07-20:43/36
	17:36	18:15	19:46	20:18 19:34-19:57/23	20:49 07:37-07:57/20	21:08 06:27-07:12/45
24	07:50	07:15 07:39-08:39/60	07:30 18:57-19:22/25	06:40 19:32-19:58/26	06:06 19:44-20:26/42 06:41-06:46/5	05:59 20:07-20:43/36
	17:38	18:16	19:47	20:20 07:18-08:22/64	20:50 07:40-07:54/14	21:08 06:27-07:12/45
25	07:50	07:13 07:39-08:40/61	07:28 18:59-19:21/22	06:38 19:32-19:59/27	06:06 19:45-20:27/42 06:37-06:52/15	06:00 20:06-20:43/37
	17:39	18:17	19:48	20:21 07:18-08:22/64	20:51 07:45-07:49/4	21:08 06:27-07:12/45
26	07:49	07:12 07:37-08:39/62	07:26 19:00-19:19/19	06:37 19:30-19:59/29	06:05 19:45-20:28/43	06:00 20:07-20:43/36
	17:40	18:18	19:50	20:22 07:18-08:22/64	20:52 06:35-06:54/19	21:08 06:28-07:13/45
27	07:48	07:10 07:36-08:40/64	07:25 19:01-19:17/16	06:36 19:30-20:01/31	06:04 19:47-20:29/42	06:00 20:07-20:43/36
	17:41	18:19	19:51	20:23 07:18-08:21/63	20:53 06:34-06:56/22	21:09 06:28-07:13/45
28	07:47	07:09 07:35-08:40/65	07:23 19:03-19:15/12	06:34 19:30-20:02/32	06:04 19:48-20:30/42	06:01 20:07-20:43/36
	17:42	18:21	19:52	20:24 07:18-08:21/63	20:54 06:32-06:57/25	21:09 06:28-07:12/44
29	07:46		07:21	06:33 19:29-20:02/33	06:03 19:48-20:30/42	06:01 20:08-20:43/35
	17:44		19:53	20:25 07:18-08:21/63	20:55 06:31-06:59/28	21:09 06:29-07:13/44
30	07:45		07:20	06:32 19:29-20:04/35	06:02 19:50-20:31/41	06:02 20:07-20:43/36
	17:45		19:54	20:26 07:18-08:20/62	20:55 06:30-07:00/30	21:09 06:29-07:12/43
31	07:44		07:18		06:02 19:52-20:31/39	
	17:46		19:55		20:56 06:29-07:01/32	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	0	936	1613	2271	2518	2349

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T40 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (459)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:07-20:43/36	06:26 19:43-20:25/42	06:57 19:13-19:44/31	07:28 08:11-09:11/60	07:02 07:23-07:37/14	07:37
	21:09 06:30-07:13/43	20:50 07:33-08:22/49	20:07 07:28-08:18/50	19:15 18:36-18:52/16	17:28	17:04
2	06:03 20:07-20:43/36	06:27 19:42-20:24/42	06:58 19:12-19:42/30	07:29 08:10-09:11/61	07:03 07:25-07:36/11	07:38
	21:08 06:30-07:12/42	20:49 07:32-08:23/51	20:06 07:29-08:16/47	19:13 18:37-18:50/13	17:27	17:03
3	06:03 20:07-20:43/36	06:28 19:42-20:23/41	06:59 19:12-19:41/29	07:30 08:09-09:12/63	07:04 07:26-07:34/8	07:39
	21:08 06:31-07:13/42	20:48 07:31-08:24/53	20:04 07:30-08:15/45	19:11 18:38-18:49/11	17:26	17:03
4	06:04 20:06-20:42/36	06:29 19:41-20:22/41	07:00 19:12-19:39/27	07:31 08:10-09:13/63	07:06 07:27-07:32/5	07:40
	21:08 06:31-07:12/41	20:47 07:31-08:24/53	20:02 07:32-08:13/41	19:10 18:41-18:47/6	17:24	17:03
5	06:04 20:07-20:43/36	06:30 19:40-20:21/41	07:01 19:12-19:37/25	07:32 08:09-09:14/65	07:07	07:41
	21:08 06:32-07:12/40	20:46 07:30-08:25/55	20:01 07:33-08:10/37	19:08	17:23	17:03
6	06:05 20:06-20:42/36	06:31 19:40-20:20/40	07:02 19:12-19:36/24	07:33 08:09-09:14/65	07:08	07:42
	21:08 06:32-07:12/40	20:44 07:29-08:26/57	19:57 07:35-08:08/33	19:06	17:22	17:03
7	06:05 20:06-20:42/36	06:32 19:39-20:19/40	07:03 19:13-19:34/21	07:34 08:08-09:14/66	07:09	07:43
	21:07 06:33-07:12/39	20:43 07:29-08:26/57	19:56 07:38-08:05/27	19:05	17:21	17:03
8	06:06 20:06-20:42/36	06:33 19:39-20:18/39	07:04 19:13-19:33/20	07:35 08:08-09:14/66	07:10	07:44
	21:07 06:34-07:12/38	20:42 07:28-08:27/59	19:54 07:41-08:00/19	19:03	17:20	17:03
9	06:07 20:06-20:41/35	06:34 19:38-20:17/39	07:05 19:14-19:31/17	07:36 08:08-09:14/66	07:12	07:45
	21:07 06:34-07:11/37	20:41 07:28-08:27/59	19:52	19:02	17:19	17:03
10	06:07 20:06-20:41/35	06:35 19:38-20:16/38	07:06 19:15-19:28/13	07:37 08:07-09:14/67	07:13	07:46
	21:06 06:35-07:11/36	20:40 07:27-08:28/61	19:51	19:00	17:18	17:03
11	06:08 20:06-20:41/35	06:36 19:38-20:14/36	07:07 19:17-19:27/10	07:38 08:07-09:13/66	07:14	07:47
	21:06 06:36-07:10/34	20:38 07:27-08:28/61	19:49	18:58	17:17	17:03
12	06:09 20:01-20:40/39	06:37 19:37-20:13/36	07:08	07:39 08:07-09:13/66	07:15	07:47
	21:06 06:36-07:09/33	20:37 07:27-08:28/61	19:47	18:57	17:16	17:03
13	06:10 19:59-20:40/41	06:38 19:37-20:12/35	07:09	07:40 08:08-09:13/65	07:16	07:48
	21:05 06:38-07:09/31	20:36 07:26-08:28/62	19:46	18:55	17:15	17:03
14	06:10 19:58-20:39/41	06:39 19:37-20:10/33	07:10	07:41 08:09-09:13/64	07:18	07:49
	21:05 06:39-07:08/29	20:34 07:26-08:29/63	19:44	18:54	17:14	17:03
15	06:11 19:58-20:39/41	06:40 19:38-20:09/31	07:11 18:53-19:04/11	07:43 08:09-09:12/63	07:19	07:50
	21:04 06:41-07:07/26	20:33 07:26-08:29/63	19:42	18:52	17:13	17:03
16	06:12 19:56-20:38/42	06:41 19:37-20:07/30	07:12 18:50-19:06/16	07:44 08:10-09:12/62	07:20	07:50
	21:03 06:41-07:05/24	20:32 07:25-08:29/64	19:40	18:50	17:12	17:04
17	06:13 19:55-20:37/42	06:42 19:37-20:06/29	07:13 18:48-19:07/19	07:45 08:10-09:11/61	07:21	07:51
	21:03 06:43-07:04/21	20:30 07:25-08:29/64	19:39	18:49	17:11	17:04
18	06:14 19:55-20:37/42	06:43 19:38-20:04/26	07:14 18:47-19:08/21	07:46 08:11-09:10/59	07:22	07:52
	21:02 06:45-07:02/17	20:29 07:24-08:28/64	19:37	18:47	17:11	17:04
19	06:14 19:54-20:37/43 06:49-06:59/10	06:44 19:38-20:03/25	07:15 18:44-19:08/24	07:47 08:12-09:09/57	07:24	07:52
	21:02 07:52-08:02/10	20:27 07:24-08:27/63	19:35	18:46	17:10	17:05
20	06:15 19:54-20:36/42	06:45 19:30-19:36/6 07:24-08:27/63	07:16 18:41-19:09/28	07:48 08:14-09:09/55	07:25	07:53
	21:01 07:49-08:06/17	20:26 19:39-20:02/23	19:34	18:44	17:09	17:05
21	06:16 19:52-20:35/43	06:46 19:26-19:39/13 07:24-08:27/63	07:17 08:34-08:41/7	07:49 08:16-09:08/52	07:26	07:53
	21:00 07:46-08:07/21	20:24 19:40-20:00/20	19:32 18:40-19:09/29	18:43	17:09	17:06
22	06:17 19:52-20:34/42	06:47 19:24-19:41/17 07:24-08:27/63	07:18 08:28-08:47/19	07:50 08:17-09:07/50	07:27	07:54
	20:59 07:44-08:10/26	20:23 19:42-19:59/17	19:30 18:38-19:08/30	18:41	17:08	17:06
23	06:18 19:52-20:33/41	06:48 19:22-19:43/21 07:24-08:26/62	07:19 08:25-08:58/33	07:52 08:16-09:05/49	07:28	07:54
	20:59 07:43-08:11/28	20:21 19:44-19:57/13	19:28 18:37-19:06/29	18:40	17:07	17:07
24	06:19 19:51-20:33/42	06:49 19:20-19:44/24 19:49-19:52/3	07:20 08:22-09:01/39	07:53 08:15-09:04/49	07:29	07:55
	20:58 07:41-08:13/32	20:20 07:24-08:26/62	19:27 18:36-19:04/28	18:39	17:07	17:07
25	06:20 19:51-20:32/41	06:50 19:19-19:44/25	07:21 08:20-09:04/44	07:54 08:15-09:03/48	07:30	07:55
	20:57 07:40-08:15/35	20:18 07:24-08:25/61	19:25 18:36-19:03/27	18:37	17:06	17:08
26	06:21 19:51-20:31/40	06:51 19:18-19:45/27	07:22 08:18-09:05/47	07:55 08:16-09:01/45	07:32	07:56
	20:56 07:39-08:16/37	20:17 07:24-08:24/60	19:23 18:35-19:01/26	18:36	17:06	17:08
27	06:22 19:51-20:31/40	06:52 19:17-19:45/28	07:23 08:16-09:07/51	07:56 08:17-08:59/42	07:33	07:56
	20:55 07:38-08:18/40	20:15 07:25-08:23/58	19:22 18:35-18:59/24	18:34	17:05	17:09
28	06:22 19:49-20:29/40	06:53 19:16-19:45/29	07:24 08:15-09:08/53	07:57 08:18-08:57/39	07:34	07:56
	20:54 07:37-08:19/42	20:14 07:25-08:23/58	19:20 18:35-18:57/22	18:33	17:05	17:10
29	06:23 19:47-20:28/41	06:54 19:15-19:45/30	07:25 08:13-09:09/56	07:58 08:20-08:55/35	07:35	07:57
	20:53 07:35-08:19/44	20:12 07:26-08:22/56	19:18 18:35-18:56/21	18:32	17:04	17:10
30	06:24 19:46-20:27/41	06:55 19:14-19:45/31	07:27 08:12-09:10/58	08:00 08:21-08:51/30	07:36	07:57
	20:52 07:34-08:20/46	20:10 07:26-08:20/54	19:16 18:35-18:54/19	18:31	17:04	17:11
31	06:25 19:44-20:26/42	06:56 19:13-19:45/32		08:01 08:22-08:38/16		07:57
	20:51 07:34-08:21/47	20:09 07:27-08:19/52		18:29		17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2267	2874	1327	1761	38	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T41 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (460)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:40-09:33/53 17:13	07:43 08:18-09:12/54 17:47	07:07 17:37-18:00/23 18:22	07:16 18:52-19:34/42 19:56 07:49-08:51/62	06:30 19:27-20:05/38 20:27	06:01 20:07-20:32/25 20:57
2	07:57 08:41-09:33/52 17:14	07:42 08:18-09:13/55 17:49	07:06 17:36-18:01/25 18:23	07:15 18:53-19:35/42 19:57 07:48-08:49/61	06:29 19:28-20:06/38 20:28	06:01 20:07-20:33/26 20:58
3	07:57 08:41-09:33/52 17:15	07:41 08:18-09:13/55 17:50 17:24-17:26/2	07:04 17:35-18:02/27 18:24	07:13 18:55-19:37/42 19:58 07:48-08:49/61	06:28 19:27-20:06/39 20:29	06:01 20:07-20:33/26 20:58
4	07:57 08:42-09:33/51 17:16	07:40 08:18-09:13/55 17:51 17:21-17:28/7	07:03 17:35-18:04/29 18:25	07:11 18:56-19:37/41 19:59 07:47-08:49/62	06:26 19:27-20:08/41 20:30	06:00 06:38-06:49/11 20:59 20:07-20:34/27
5	07:57 08:43-09:32/49 17:17	07:39 08:19-09:13/54 17:53 17:19-17:29/10	07:01 17:35-18:04/29 18:26	07:10 18:59-19:38/39 20:00 07:47-08:49/62	06:25 19:28-20:08/40 20:31	06:00 06:37-06:52/15 21:00 20:07-20:35/28
6	07:57 08:43-09:32/49 17:17 08:34-08:41/7	07:38 08:18-09:13/55 17:54 17:17-17:30/13	06:59 17:35-18:05/30 18:28 07:33-07:41/8	07:08 19:08-19:40/32 20:00 07:46-08:48/62	06:24 19:29-20:08/39 20:32	06:00 06:34-06:53/19 21:01 20:07-20:35/28
7	07:57 08:31-09:31/60 17:18	07:37 08:18-09:13/55 17:55 17:16-17:31/15	06:58 17:35-18:04/29 18:29 07:27-07:47/20	07:06 19:07-19:40/33 20:01 07:46-08:48/62	06:23 19:29-20:08/39 20:33	05:59 06:34-06:55/21 21:01 20:07-20:36/29
8	07:57 08:29-09:31/62 17:19	07:36 08:19-09:13/54 17:56 17:16-17:33/17	07:56 18:34-19:07/33 19:30 08:23-08:49/26	07:05 19:08-19:42/34 20:02 07:46-08:48/62	06:22 19:30-20:08/38 20:34	05:59 06:33-06:56/23 21:02 20:08-20:37/29
9	07:57 08:28-09:30/62 17:20	07:35 17:15-17:34/19 17:58 08:19-09:13/54	07:55 18:36-19:10/34 19:31 08:21-08:52/31	07:03 19:08-19:42/34 20:04 07:46-08:47/61	06:20 19:31-20:08/37 20:35	05:59 06:32-06:58/26 21:02 20:08-20:37/29
10	07:57 08:27-09:29/62 17:22	07:34 17:15-17:36/21 17:59 08:20-09:13/53	07:53 18:36-19:10/34 19:32 08:18-08:54/36	07:01 19:07-19:41/34 20:05 07:45-08:46/61	06:19 19:31-20:07/36 20:36	05:59 06:32-06:59/27 21:03 20:08-20:38/30
11	07:57 08:26-09:27/61 17:23	07:32 17:14-17:36/22 18:00 08:20-09:11/51	07:51 18:36-19:11/35 19:33 08:17-08:56/39	07:00 19:07-19:42/35 20:06 07:46-08:46/60	06:18 19:32-20:06/34 20:38	05:58 06:32-07:00/28 21:04 20:09-20:38/29
12	07:56 08:25-09:25/60 17:24	07:31 17:14-17:38/24 18:01 08:20-09:11/51	07:50 18:38-19:13/35 19:34 08:15-08:57/42	06:58 19:06-19:41/35 20:07 07:45-08:44/59	06:17 19:33-20:06/33 20:39	05:58 06:31-07:01/30 21:04 20:08-20:37/29
13	07:56 08:25-09:21/56 17:25	07:30 17:15-17:40/25 18:03 08:21-09:11/50	07:48 18:39-19:14/35 19:35 08:13-08:57/44	06:57 19:06-19:42/36 20:08 07:46-08:44/58	06:16 19:35-20:05/30 20:40	05:58 06:30-07:00/30 21:05 20:08-20:38/30
14	07:56 08:24-09:20/56 17:26	07:29 17:14-17:40/26 18:04 08:22-09:10/48	07:46 18:41-19:15/34 19:37 08:13-08:59/46	06:55 19:06-19:41/35 20:09 07:46-08:43/57	06:15 19:37-20:05/28 20:41	05:58 06:30-07:01/31 21:05 20:09-20:38/29
15	07:55 08:24-09:21/57 17:27	07:27 17:15-17:42/27 18:05 08:22-09:09/47	07:45 18:44-19:16/32 19:38 08:11-08:59/48	06:53 19:05-19:40/35 20:10 07:47-08:42/55	06:14 19:38-20:04/26 20:42	05:58 06:30-07:02/32 21:06 20:09-20:38/29
16	07:55 08:23-09:19/56 17:28	07:26 17:16-17:44/28 18:06 08:24-09:08/44	07:43 18:43-19:17/34 19:39 08:10-08:59/49	06:52 19:06-19:40/34 20:11 07:47-08:41/54	06:13 19:40-20:04/24 20:43	05:58 06:31-07:03/32 21:06 20:09-20:38/29
17	07:54 08:23-09:19/56 17:29	07:25 17:16-17:44/28 18:07 08:24-09:06/42	07:41 18:43-19:18/35 19:40 08:08-08:59/51	06:50 19:05-19:39/34 20:12 07:48-08:40/52	06:12 19:41-20:03/22 20:44	05:58 06:30-07:03/33 21:06 20:10-20:39/29
18	07:54 08:22-09:18/56 17:30	07:23 17:17-17:46/29 18:09 08:25-09:05/40	07:40 18:43-19:20/37 19:41 08:08-09:00/52	06:49 19:06-19:38/32 07:48-08:38/50 20:13 19:42-19:50/8	06:11 19:41-20:02/21 20:45 20:16-20:21/5	05:58 06:30-07:04/34 21:07 20:10-20:39/29
19	07:53 08:22-09:17/55 17:32	07:22 17:19-17:47/28 18:10 08:27-09:04/37	07:38 18:43-19:21/38 19:42 08:07-09:00/53	06:47 19:38-19:52/14 07:49-08:37/48 20:14 19:06-19:37/31	06:10 19:42-20:01/19 20:45 20:13-20:22/9	05:58 06:30-07:04/34 21:07 20:10-20:39/29
20	07:53 08:21-09:16/55 17:33	07:21 17:21-17:45/24 18:11 08:28-09:02/34	07:36 18:42-19:21/39 19:43 08:06-08:59/53	06:46 19:08-19:54/46 20:15 07:50-08:35/45	06:09 19:44-19:59/15 20:46 20:11-20:23/12	05:59 06:30-07:04/34 21:07 20:10-20:39/29
21	07:52 08:20-09:13/53 17:34	07:19 17:24-17:45/21 18:12 08:30-09:00/30	07:35 18:43-19:23/40 19:44 08:04-09:00/56	06:44 19:09-19:55/46 20:16 07:51-08:34/43	06:09 19:45-19:58/13 20:47 20:10-20:23/13	05:59 06:30-07:04/34 21:08 20:10-20:40/30
22	07:52 08:20-09:06/46 17:35	07:18 17:24-17:44/20 18:13 08:32-08:57/25	07:33 18:43-19:24/41 19:45 08:02-08:59/57	06:43 19:10-19:56/46 20:17 07:52-08:32/40	06:08 19:49-19:56/7 20:48 20:10-20:25/15	05:59 06:30-07:04/34 21:08 20:10-20:39/29
23	07:51 08:20-09:07/47 17:36	07:16 17:26-17:43/17 18:15 08:36-08:54/18	07:31 18:43-19:24/41 19:46 08:00-08:59/59	06:41 19:12-19:57/45 20:18 07:53-08:31/38	06:07 20:09-20:25/16 20:49	05:59 06:31-07:05/34 21:08 20:11-20:40/29
24	07:50 08:19-09:08/49 17:38	07:15 17:27-17:40/13 08:41-08:47/6 18:16 17:44-17:53/9	07:30 18:45-19:25/40 19:47 07:59-08:59/60	06:40 19:30-19:58/28 07:54-08:28/34 20:20 19:13-19:28/15	06:06 20:08-20:26/18 20:50	05:59 06:31-07:05/34 21:08 20:11-20:40/29
25	07:50 08:19-09:08/49 17:39	07:13 17:42-17:55/13 18:17 17:30-17:38/8	07:28 18:46-19:24/38 19:48 07:57-08:58/61	06:38 19:30-19:59/29 07:57-08:26/29 20:21 19:17-19:25/8	06:06 20:08-20:27/19 20:51	06:00 06:31-07:04/33 21:08 20:11-20:40/29
26	07:49 08:19-09:10/51 17:40	07:12 17:40-17:56/16 18:18	07:26 18:47-19:23/36 19:50 07:55-08:57/62	06:37 19:28-19:59/31 20:22 07:59-08:24/25	06:05 20:07-20:28/21 20:52	06:00 06:32-07:05/33 21:08 20:12-20:41/29
27	07:48 08:19-09:10/51 17:41	07:10 17:39-17:58/19 18:19	07:25 18:48-19:27/39 19:51 07:54-08:57/63	06:36 19:28-20:01/33 20:23 08:02-08:19/17	06:04 20:08-20:29/21 20:53	06:00 06:33-07:05/32 21:09 20:12-20:41/29
28	07:47 08:19-09:11/52 17:42	07:09 17:37-17:59/22 18:21	07:23 18:50-19:30/40 19:52 07:53-08:56/63	06:34 19:28-20:02/34 20:24 08:08-08:13/5	06:04 20:07-20:29/22 20:54	06:01 06:33-07:04/31 21:09 20:12-20:41/29
29	07:46 08:18-09:11/53 17:44		07:21 18:50-19:31/41 19:53 07:51-08:55/64	06:33 19:27-20:02/35 20:25	06:03 20:06-20:30/24 20:54	06:01 06:34-07:05/31 21:09 20:12-20:42/30
30	07:45 08:18-09:12/54 17:45		07:20 18:50-19:32/42 19:54 07:50-08:54/64	06:32 19:27-20:04/37 20:26	06:02 20:07-20:31/24 20:55	06:02 06:34-07:04/30 21:09 20:12-20:42/30
31	07:44 08:18-09:12/54 17:46		07:18 18:51-19:34/43 19:55 07:50-08:53/63		06:02 20:06-20:31/25 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1686	1590	2358	2520	901	1647

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T41 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (460)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November		December	
1	06:02	06:35-07:04/29	06:26	19:43-20:17/34	06:57	19:06-19:41/35	07:28	18:17-18:52/35	07:02	16:44-17:04/20	07:37	08:08-09:09/61
	21:08	20:13-20:42/29	20:50		20:07	07:45-08:45/60	19:15	07:53-08:36/43	17:28	07:49-08:41/52	17:04	
2	06:03	06:36-07:03/27	06:27	19:42-20:17/35	06:58	19:06-19:40/34	07:29	18:15-18:50/35	07:03	16:45-17:04/19	07:38	08:10-09:12/62
	21:08	20:13-20:42/29	20:49		20:06	07:44-08:45/61	19:13	07:54-08:34/40	17:27	07:49-08:43/54	17:03	
3	06:03	06:37-07:03/26	06:28	19:41-20:17/36	06:59	19:06-19:40/34	07:30	18:14-18:49/35	07:04	07:49-08:43/54	07:39	08:12-09:14/62
	21:08	20:13-20:43/30	20:48		20:04	07:44-08:45/61	19:11	07:55-08:32/37	17:26	16:46-17:02/16	17:03	
4	06:04	06:38-07:02/24	06:29	19:40-20:18/38	07:00	19:05-19:39/34	07:31	18:12-18:47/35	07:06	07:48-08:43/55	07:40	08:14-09:16/62
	21:08	20:13-20:42/29	20:47		20:02	07:43-08:45/62	19:10	07:58-08:31/33	17:24	16:46-17:01/15	17:03	
5	06:04	06:39-07:02/23	06:30	19:39-20:18/39	07:01	19:04-19:37/33	07:32	18:12-18:46/34	07:07	07:48-08:42/54	07:41	08:16-09:17/61
	21:08	20:13-20:43/30	20:46		20:01	07:43-08:45/62	19:08	07:59-08:28/29	17:23	16:47-16:59/12	17:03	
6	06:05	06:40-07:00/20	06:31	19:39-20:18/39	07:02	19:04-19:36/32	07:33	18:12-18:42/30	07:08	07:49-08:43/54	07:42	08:29-09:18/49
	21:08	20:13-20:42/29	20:44		19:57	07:42-08:44/62	19:06	08:02-08:25/23	17:22	16:49-16:59/10	17:03	08:20-08:28/8
7	06:06	06:42-06:59/17	06:32	19:38-20:18/40	07:03	18:56-19:34/38	07:34	18:11-18:41/30	07:09	07:48-08:43/55	07:43	08:30-09:19/49
	21:07	20:14-20:42/28	20:43		19:56	07:42-08:44/62	19:05	08:06-08:21/15	17:21	16:51-16:57/6	17:03	
8	06:06	06:44-06:58/14	06:33	19:37-20:17/40	07:04	18:52-19:33/41	07:35	18:10-18:40/30	07:10	07:48-08:43/55	07:44	08:29-09:20/51
	21:07	20:14-20:42/28	20:42		19:54	07:42-08:44/62	19:03		17:20	16:55-16:56/1	17:03	
9	06:07	06:47-06:54/7	06:34	19:37-20:17/40	07:05	18:49-19:31/42	07:36	18:10-18:39/29	07:12	07:49-08:44/55	07:45	08:29-09:21/52
	21:07	20:14-20:41/27	20:41		19:52	07:42-08:43/61	19:02		17:19		17:03	
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	21:06		20:40		19:51	07:42-08:43/61	19:00		17:18		17:03	
11	06:08	20:15-20:41/26	06:36	19:36-20:14/38	07:07	18:44-19:27/43	07:38	18:09-18:36/27	07:14	07:49-08:43/54	07:47	08:30-09:23/53
	21:06		20:38		19:49	07:42-08:44/62	18:58		17:17		17:03	
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	21:06		20:37		19:47	07:41-08:44/63	18:57		17:16		17:03	
13	06:10	20:15-20:40/25	06:38	19:36-20:12/36	07:09	18:42-19:23/41	07:40	18:10-18:32/22	07:16	07:50-08:43/53	07:48	08:31-09:25/54
	21:05		20:36		19:46	07:41-08:44/63	18:55		17:15		17:03	
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	21:05		20:34		19:44	07:41-08:45/64	18:54		17:14		17:03	
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	21:04		20:33	08:14-08:23/9	19:42	07:42-08:45/63	18:52		17:13		17:03	
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	21:03		20:32	08:09-08:28/19	19:40	07:42-08:45/63	18:50		17:12		17:04	
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	21:03		20:30	08:05-08:31/26	19:39	07:43-08:45/62	18:49	18:14-18:26/12	17:11		17:04	
18	06:14	20:17-20:37/20	06:43	19:35-20:04/29 08:02-08:32/30	07:14	18:33-19:11/38	07:46	17:58-18:13/15 09:10-09:22/12	07:22	07:53-08:42/49	07:52	08:33-09:28/55
	21:02		20:29	19:22-19:32/10	19:37	07:44-08:45/61	18:47	18:17-18:24/7	17:11		17:04	
19	06:14	20:18-20:37/19	06:44	19:36-20:03/27 08:00-08:34/34	07:15	18:31-19:11/40	07:47	17:56-18:14/18	07:24	07:54-08:41/47	07:52	08:34-09:29/55
	21:02		20:27	19:18-19:35/17	19:35	07:45-08:45/60	18:46	09:05-09:26/21	17:10		17:05	
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	21:01		20:26	07:58-08:36/38	19:34	07:46-08:45/59	18:44	09:03-09:29/26	17:09		17:05	
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	21:00		20:24	07:56-08:37/41	19:32	07:47-08:45/58	18:43	09:00-09:31/31	17:09		17:06	
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	20:59	20:20-20:34/14	20:23	07:55-08:38/43	19:30	07:48-08:44/56	18:42	08:58-09:33/35	17:08		17:06	
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	20:59	20:21-20:33/12	20:21	07:53-08:39/46	19:28	07:50-08:44/54	18:40	08:56-09:34/38	17:07		17:07	
24	06:19	19:54-20:11/17	06:49	19:42-19:56/14 07:52-08:40/48	07:20	18:26-19:04/38	07:53	17:47-18:15/28	07:29	07:59-08:55/56	07:55	08:36-09:31/55
	20:58	20:23-20:33/10	20:20	19:10-19:41/31	19:27	07:51-08:43/52	18:39	08:55-09:35/40	17:07		17:07	
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	20:57	20:25-20:32/7	20:18	19:46-19:52/6	19:25	07:51-08:42/51	18:37	08:54-09:37/43	17:06		17:08	
26	06:21	19:52-20:13/21	06:51	19:08-19:42/34	07:22	18:25-19:01/36	07:55	17:45-18:13/28	07:32	08:02-08:58/56	07:56	08:37-09:32/55
	20:56	20:28-20:31/3	20:17	07:50-08:42/52	19:23	07:51-08:42/51	18:36	08:53-09:38/45	17:06		17:08	
27	06:22	19:51-20:14/23	06:52	19:08-19:42/34	07:23	18:25-18:59/34	07:56	17:45-18:11/26	07:33	08:03-09:00/57	07:56	08:37-09:32/55
	20:55		20:15	07:49-08:43/54	19:22	07:51-08:41/50	18:35	08:52-09:39/47	17:05		17:09	
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	20:54		20:14	07:48-08:43/55	19:20	07:51-08:40/49	18:33	08:51-09:39/48	17:05		17:10	
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	20:53		20:12	07:47-08:44/57	19:18	07:52-08:38/46	18:32	08:51-09:41/50	17:04		17:10	
30	06:24	19:46-20:16/30	06:55	19:06-19:42/36	07:27	18:19-18:54/35	08:00	17:44-18:07/23	07:36	08:06-09:06/60	07:57	08:39-09:33/54
	20:52		20:10	07:46-08:44/58	19:16	07:52-08:37/45	18:31	08:50-09:41/51	17:04		17:11	
31	06:25	19:45-20:16/31	06:56	19:06-19:41/35			08:01	17:44-18:06/22			07:57	08:40-09:33/53
	20:51		20:09	07:45-08:44/59			18:29	08:49-09:41/52			17:12	
Potential sun hours	460		429		375		345		297		287	
Sum of minutes with flicker		973		1901		2879		1572		1707		1714

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T42 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (461)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:02-16:43/41	07:43 16:21-17:17/56	07:07 16:45-17:52/67	07:16 07:42-08:24/42	06:30 06:51-07:48/57	06:01 06:23-07:14/51
	17:13 08:29-09:00/31	17:47 08:04-08:28/24	18:22	19:56 18:30-19:12/42	20:27 19:11-19:54/43	20:57 19:52-20:30/38
2	07:57 16:03-16:44/41	07:42 16:22-17:19/57	07:06 16:47-17:54/67	07:14 07:42-08:21/39	06:29 06:49-07:48/59	06:01 06:23-07:14/51
	17:14 08:29-09:00/31	17:49 08:03-08:29/26	18:23	19:57 18:30-19:11/41	20:28 19:11-19:54/43	20:58 19:52-20:31/39
3	07:57 16:03-16:45/42	07:41 16:23-17:20/57	07:04 16:48-17:56/68	07:13 07:42-08:21/39	06:28 06:47-07:47/60	06:01 06:22-07:14/52
	17:15 08:30-09:00/30	17:50 08:02-08:30/28	18:24	19:58 18:31-19:10/39	20:29 19:11-19:53/42	20:58 19:51-20:31/40
4	07:57 16:03-16:46/43	07:40 16:23-17:22/59	07:03 16:52-17:58/66	07:11 07:42-08:20/38	06:26 06:46-07:46/60	06:00 06:22-07:14/52
	17:16 08:30-09:01/31	17:51 08:01-08:31/30	18:25	19:59 18:32-19:09/37	20:30 19:11-19:53/42	20:59 19:52-20:32/40
5	07:57 16:04-16:48/44	07:39 16:24-17:25/61	07:01 16:55-17:59/64	07:10 07:43-08:20/37	06:25 06:45-07:46/61	06:00 06:22-07:14/52
	17:17 08:31-09:01/30	17:53 08:00-08:31/31	18:26	20:00 18:32-19:07/35	20:31 19:12-19:52/40	21:00 19:52-20:33/41
6	07:57 16:04-16:49/45	07:38 16:24-17:27/63	06:59 17:05-18:01/56	07:08 07:43-08:18/35	06:24 06:44-07:45/61	06:00 06:21-07:13/52
	17:17 08:32-09:01/29	17:54 07:58-08:31/33	18:27	20:00 18:34-19:06/32	20:32 19:12-19:52/40	21:00 19:51-20:32/41
7	07:57 16:04-16:49/45	07:37 16:26-17:30/64	06:58 17:08-18:02/54	07:06 07:43-08:16/33	06:23 06:43-07:45/62	05:59 06:21-07:13/52
	17:18 08:32-09:01/29	17:55 07:57-08:31/34	18:29	20:01 18:35-19:03/28	20:33 19:13-19:51/38	21:01 19:51-20:33/42
8	07:57 16:04-16:50/46	07:36 16:27-17:32/65	07:56 18:19-19:02/43	07:05 07:44-08:16/32	06:22 06:42-07:44/62	05:59 06:21-07:13/52
	17:19 08:33-09:01/28	17:56 07:56-08:32/36	19:30	20:02 18:38-19:01/23	20:34 19:14-19:51/37	21:02 19:51-20:34/43
9	07:57 16:05-16:51/46	07:35 16:29-17:33/64	07:55 18:19-19:03/44	07:03 07:45-08:14/29	06:20 06:41-07:44/63	05:59 06:21-07:13/52
	17:20 08:34-09:01/27	17:58 07:56-08:32/36	19:31	20:03 18:40-18:58/18	20:35 19:14-19:50/36	21:02 19:52-20:34/42
10	07:57 16:05-16:53/48	07:34 16:31-17:35/64	07:53 18:18-19:03/45	07:01 07:25-07:27/2 18:44-18:52/8	06:19 06:40-07:43/63	05:59 06:21-07:13/52
	17:21 08:35-09:01/26	17:59 07:56-08:32/36	19:32 08:18-08:23/5	20:05 07:46-08:11/25	20:36 19:14-19:49/35	21:03 19:52-20:35/43
11	07:57 16:05-16:53/48	07:32 16:32-17:35/63	07:51 18:17-19:03/46	07:00 07:19-07:34/15	06:18 06:38-07:41/63	05:58 06:21-07:13/52
	17:23 08:35-09:01/26	18:00 07:55-08:31/36	19:33 08:13-08:29/16	20:06 07:48-08:09/21	20:37 19:15-19:48/33	21:04 19:52-20:35/43
12	07:56 16:05-16:54/49	07:31 16:34-17:36/62	07:50 18:16-19:06/50	06:58 07:17-07:37/20	06:17 06:37-07:40/63	05:58 06:21-07:12/51
	17:24 08:36-09:01/25	18:01 07:55-08:31/36	19:34 08:09-08:31/22	20:07 07:50-08:06/16	20:39 19:16-19:47/31	21:04 19:51-20:35/44
13	07:56 16:06-16:56/50	07:30 16:38-17:37/59	07:48 18:16-19:09/53	06:57 07:16-07:39/23	06:16 06:36-07:39/63	05:58 06:20-07:11/51
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14	07:56 16:06-16:56/50	07:29 16:37-17:37/60	07:46 18:15-19:10/55	06:55 07:14-07:40/26	06:15 06:36-07:39/63	05:58 06:20-07:11/51
	17:26 08:38-09:00/22	18:04 07:56-08:31/35	19:36 08:06-08:34/28	20:09 19:29-19:42/13	20:41 19:18-19:44/26	21:05 19:51-20:35/44
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26	07:49 16:12-17:03/51	07:12 16:41-17:37/56	07:26 18:18-19:16/58	06:37 07:02-07:49/47	06:05 06:26-07:16/50	06:00 06:23-07:14/51
	17:40 08:09-08:18/9	18:18	19:50 07:46-08:33/47	20:22 19:11-19:54/43	20:52 19:55-20:26/31	21:08 19:55-20:39/44
27	07:48 16:14-17:04/50	07:10 16:43-17:37/54	07:25 18:19-19:15/56	06:36 07:01-07:48/47	06:04 06:26-07:16/50	06:00 06:23-07:14/51
	17:41 08:09-08:22/13	18:19	19:51 07:46-08:33/47	20:23 19:11-19:54/43	20:53 19:54-20:27/33	21:09 19:55-20:39/44
28	07:47 16:15-17:06/51	07:09 16:43-17:36/53	07:23 18:21-19:15/54	06:34 07:01-07:49/48	06:04 06:25-07:16/51	06:01 06:23-07:14/51
	17:42 08:08-08:24/16	18:21 17:41-17:44/3	19:52 07:44-08:31/47	20:24 19:12-19:54/42	20:54 19:53-20:28/35	21:09 19:54-20:38/44
29	07:46 16:16-17:10/54		07:21 18:22-19:15/53	06:33 07:01-07:49/48	06:03 06:25-07:16/51	06:01 06:24-07:15/51
	17:44 08:07-08:25/18		19:53 07:43-08:30/47	20:25 19:11-19:54/43	20:54 19:53-20:28/35	21:09 19:55-20:39/44
30	07:45 16:17-17:13/56		07:19 18:24-19:14/50	06:32 06:55-07:48/53	06:02 06:24-07:15/51	06:02 06:24-07:15/51
	17:45 08:06-08:26/20		19:54 07:43-08:28/45	20:26 19:11-19:54/43	20:55 19:53-20:29/36	21:09 19:55-20:39/44
31	07:44 16:19-17:15/56		07:18 18:29-19:13/44		06:02 06:24-07:15/51	
	17:46 08:05-08:27/22		19:55 07:43-08:27/44		20:56 19:52-20:29/37	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	2075	2414	2567	2062	2715	2827

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T42 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (461)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-07:17/52	06:26 06:48-07:51/63	06:57 07:18-07:33/15	07:28 17:55-18:46/51	07:02 15:59-17:03/64	07:37 15:47-16:35/48
	21:08 19:56-20:39/43	20:50 19:26-19:58/32	20:07 07:47-08:08/21	19:15 07:47-08:10/23	17:28 07:25-08:01/36	17:04 08:17-08:43/26
2	06:03 06:25-07:17/52	06:27 06:49-07:52/63	06:58 07:24-07:26/2 18:43-18:51/8	07:29 17:55-18:42/47	07:03 15:58-17:03/65	07:38 15:47-16:35/48
	21:08 19:56-20:39/43	20:49 19:25-19:59/34	20:06 07:45-08:10/25	19:13 07:49-08:08/19	17:27 07:26-08:02/36	17:03 08:18-08:44/26
3	06:03 06:26-07:18/52	06:28 06:50-07:53/63	06:59 07:43-08:12/29	07:30 17:55-18:41/46	07:04 15:57-17:01/64	07:39 15:49-16:36/47
	21:08 19:57-20:39/42	20:48 19:24-19:59/35	20:04 18:38-18:56/18	19:11 07:52-08:04/12	17:26 07:26-08:01/35	17:03 08:18-08:45/27
4	06:04 06:26-07:18/52	06:29 06:51-07:54/63	07:00 07:41-08:13/32	07:31 17:55-18:40/45	07:06 15:55-16:59/64	07:40 15:49-16:35/46
	21:08 19:56-20:39/43	20:47 19:24-20:00/36	20:02 18:35-18:58/23	19:10	17:24 07:27-08:01/34	17:03 08:18-08:46/28
5	06:04 06:27-07:19/52	06:30 06:52-07:54/62	07:01 07:40-08:13/33	07:32 17:57-18:40/43	07:07 15:54-16:57/63	07:41 15:50-16:35/45
	21:08 19:57-20:39/42	20:46 19:23-20:01/38	20:01 18:32-19:00/28	19:08	17:23 07:28-08:01/33	17:03 08:18-08:47/29
6	06:05 06:27-07:19/52	06:31 06:53-07:55/62	07:02 07:39-08:14/35	07:33 17:47-18:39/52	07:08 15:54-16:54/60	07:42 15:50-16:35/45
	21:08 19:57-20:39/42	20:44 19:22-20:01/39	19:57 18:30-19:02/32	19:06	17:22 07:30-08:01/31	17:03 08:18-08:47/29
7	06:05 06:28-07:20/52	06:32 06:54-07:55/61	07:03 07:38-08:15/37	07:34 17:42-18:37/55	07:09 15:53-16:51/58	07:43 15:50-16:34/44
	21:07 19:58-20:39/41	20:43 19:22-20:02/40	19:56 18:28-19:03/35	19:05	17:21 07:31-08:01/30	17:03 08:18-08:48/30
8	06:06 06:29-07:21/52	06:33 06:55-07:56/61	07:04 07:37-08:15/38	07:35 17:39-18:36/57	07:10 15:52-16:50/58	07:44 15:50-16:34/44
	21:07 19:59-20:39/40	20:42 19:21-20:02/41	19:54 18:27-19:04/37	19:03	17:20 07:32-08:00/28	17:03 08:17-08:48/31
9	06:07 06:29-07:21/52	06:34 06:56-07:56/60	07:05 07:36-08:15/39	07:36 17:28-18:34/66	07:12 15:53-16:49/56	07:45 15:51-16:33/42
	21:07 19:58-20:38/40	20:41 19:21-20:02/41	19:52 18:25-19:04/39	19:02	17:19 07:34-08:00/26	17:03 08:18-08:48/30
10	06:07 06:30-07:22/52	06:35 06:57-07:56/59	07:06 07:36-08:15/39	07:37 17:24-18:32/68	07:13 15:51-16:48/57	07:46 15:52-16:33/41
	21:06 19:59-20:39/40	20:40 19:20-20:02/42	19:51 18:23-19:04/41	19:00	17:18 07:35-07:59/24	17:03 08:18-08:49/31
11	06:08 06:31-07:22/51	06:36 06:58-07:56/58	07:07 07:35-08:17/42	07:38 17:22-18:29/67	07:14 15:50-16:46/56	07:46 15:52-16:33/41
	21:06 20:00-20:39/39	20:38 19:20-20:03/43	19:49 18:22-19:04/42	18:58	17:17 07:36-07:58/22	17:03 08:19-08:50/31
12	06:09 06:31-07:22/51	06:37 07:01-07:57/56	07:08 18:21-19:05/44	07:39 17:19-18:26/67	07:15 15:48-16:44/56	07:47 15:53-16:33/40
	21:06 20:00-20:38/38	20:37 19:20-20:03/43	19:47 07:34-08:18/44	18:57	17:16 07:37-07:57/20	17:03 08:19-08:50/31
13	06:10 06:32-07:23/51	06:38 07:06-07:57/51	07:09 18:16-19:05/49	07:40 17:17-18:08/51	07:16 15:48-16:42/54	07:48 15:54-16:33/39
	21:05 20:01-20:38/37	20:36 19:20-20:03/43	19:45 07:34-08:19/45	18:55 18:09-18:22/13	17:15 07:39-07:57/18	17:03 08:20-08:51/31
14	06:10 06:33-07:24/51	06:39 07:09-07:57/48	07:10 18:13-19:05/52	07:41 17:15-18:08/53	07:18 15:47-16:38/51	07:49 15:54-16:33/39
	21:05 20:02-20:37/35	20:34 19:19-20:02/43	19:44 07:34-08:20/46	18:54	17:14 07:40-07:55/15	17:03 08:19-08:51/32
15	06:11 06:34-07:25/51	06:40 07:09-07:56/47	07:11 18:10-19:05/55	07:42 17:15-18:10/55	07:19 15:46-16:36/50	07:50 15:55-16:33/38
	21:04 20:03-20:37/34	20:33 19:19-20:02/43	19:42 07:34-08:21/47	18:52	17:13 07:41-07:54/13	17:03 08:20-08:52/32
16	06:12 06:34-07:24/50	06:41 07:09-07:56/47	07:12 18:08-19:05/57	07:44 17:13-18:10/57	07:20 15:45-16:36/51	07:50 15:56-16:34/38
	21:03 20:02-20:36/34	20:31 19:18-20:01/43	19:40 07:34-08:21/47	18:50	17:12 07:43-07:52/9	17:04 08:21-08:53/32
17	06:13 06:35-07:25/50	06:42 07:09-07:56/47	07:13 18:06-19:04/58	07:45 17:12-18:10/58	07:21 15:46-16:37/51	07:51 15:55-16:34/39
	21:03 20:04-20:36/32	20:30 19:18-20:00/42	19:39 07:34-08:21/47	18:49 08:41-08:46/5	17:11	17:04 08:21-08:52/31
18	06:14 06:36-07:26/50	06:43 07:08-07:54/46	07:14 18:05-19:04/59	07:46 17:11-18:10/59	07:22 15:45-16:37/52	07:52 15:56-16:34/38
	21:02 20:05-20:35/30	20:29 19:18-20:00/42	19:37 07:34-08:22/48	18:47 08:36-08:51/15	17:11	17:04 08:21-08:53/32
19	06:14 06:37-07:26/49	06:44 07:08-07:54/46	07:15 18:03-19:03/60	07:47 17:10-18:10/60	07:24 15:45-16:36/51	07:52 15:57-16:35/38
	21:02 20:06-20:34/28	20:27 19:18-19:59/41	19:35 07:35-08:22/47	18:46 08:33-08:53/20	17:10	17:05 08:22-08:54/32
20	06:15 06:38-07:27/49	06:45 07:09-07:53/44	07:16 18:02-19:03/61	07:48 17:09-18:09/60	07:25 15:45-16:37/52	07:53 15:57-16:35/38
	21:01 20:07-20:34/27	20:26 19:19-19:59/40	19:34 07:36-08:22/46	18:44 08:32-08:55/23	17:09	17:05 08:22-08:54/32
21	06:16 06:38-07:26/48	06:46 07:09-07:53/44	07:17 18:01-19:02/61	07:49 17:09-18:10/61	07:26 15:45-16:37/52	07:53 15:58-16:36/38
	21:00 20:08-20:32/24	20:24 19:19-19:58/39	19:32 07:37-08:21/44	18:43 08:30-08:57/27	17:09	17:06 08:23-08:55/32
22	06:17 06:39-07:27/48	06:47 07:09-07:52/43	07:18 18:00-19:01/61	07:50 17:08-18:10/62	07:27 15:45-16:37/52	07:54 15:58-16:36/38
	20:59 20:09-20:30/21	20:23 19:20-19:57/37	19:30 07:38-08:21/43	18:41 08:29-08:57/28	17:08	17:06 08:23-08:55/32
23	06:18 06:40-07:37/57	06:48 07:10-07:51/41	07:19 17:59-19:00/61	07:51 17:08-18:09/61	07:28 15:45-16:36/51	07:54 15:59-16:37/38
	20:59 20:11-20:29/18	20:21 19:20-19:56/36	19:28 07:40-08:20/40	18:40 08:27-08:58/31	17:07 08:25-08:29/4	17:07 08:24-08:56/32
24	06:19 06:41-07:39/58	06:49 07:10-07:49/39	07:20 17:58-18:59/61	07:53 17:07-18:09/62	07:29 15:45-16:36/51	07:55 15:59-16:37/38
	20:58 20:14-20:26/12	20:20 19:21-19:54/33	19:27 07:43-08:20/37	18:39 08:26-08:59/33	17:07 08:22-08:33/11	17:07 08:24-08:56/32
25	06:20 06:42-07:42/60	06:50 07:11-07:48/37	07:21 17:57-18:58/61	07:54 17:08-18:09/61	07:30 15:46-16:37/51	07:55 15:59-16:37/38
	20:57 19:40-19:45/5	20:18 19:22-19:53/31	19:25 07:43-08:19/36	18:37 08:26-09:00/34	17:06 08:21-08:36/15	17:08 08:24-08:56/32
26	06:21 06:43-07:43/60	06:51 07:12-07:47/35	07:22 17:57-18:57/60	07:55 17:07-18:09/62	07:32 15:46-16:37/51	07:56 16:00-16:39/39
	20:56 19:36-19:49/13	20:17 19:23-19:51/28	19:23 07:43-08:18/35	18:36 08:26-09:00/34	17:06 08:20-08:38/18	17:08 08:26-08:57/31
27	06:22 06:44-07:45/61	06:52 07:13-07:45/32	07:23 17:56-18:55/59	07:56 17:07-18:08/61	07:33 15:46-16:36/50	07:56 16:00-16:39/39
	20:55 19:34-19:52/18	20:15 19:25-19:49/24	19:22 07:43-08:17/34	18:34 08:25-09:00/35	17:05 08:19-08:39/20	17:09 08:26-08:58/32
28	06:22 06:45-07:47/62	06:53 07:14-07:43/29	07:24 17:56-18:53/57	07:57 17:07-18:07/60	07:34 15:46-16:36/50	07:56 16:01-16:39/38
	20:54 19:32-19:54/22	20:14 19:27-19:47/20	19:20 07:44-08:16/32	18:33 08:24-09:00/36	17:05 08:18-08:40/22	17:10 08:26-08:58/32
29	06:23 06:45-07:48/63	06:54 07:15-07:41/26	07:25 17:55-18:51/56	07:58 17:06-18:06/60	07:35 15:46-16:36/50	07:57 16:01-16:39/38
	20:53 19:30-19:54/24	20:12 19:30-19:43/13	19:18 07:45-08:14/29	18:32 08:25-09:01/36	17:04 08:18-08:41/23	17:10 08:26-08:58/32
30	06:24 06:46-07:49/63	06:55 07:16-07:39/23	07:26 17:55-18:49/54	08:00 17:04-18:06/62	07:36 15:46-16:35/49	07:57 16:02-16:41/39
	20:52 19:28-19:55/27	20:10 07:54-08:02/8	19:16 07:46-08:12/26	18:31 08:25-09:00/35	17:04 08:17-08:42/25	17:11 08:28-08:59/31
31	06:25 06:47-07:50/63	06:56 07:17-07:37/20		08:01 17:01-18:05/64		07:57 16:02-16:42/40
	20:51 19:27-19:57/30	20:09 07:50-08:06/16		18:29 08:25-09:01/36		17:12 08:28-08:59/31
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2630	2562	2549	2288	2188	2213

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T43 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (462)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:39-16:36/57 08:22-09:49/87 13:37-14:24/47	07:44 08:04-09:07/63 09:23-09:33/10	07:07 16:57-17:01/4	07:16 07:35-08:06/31	06:30 07:00-07:49/49	06:02 06:36-07:32/56
	17:13 09:50-10:12/22 14:27-15:27/60	17:48 15:53-17:17/84	18:22 17:45-18:00/15	19:56	20:27	20:57
2	07:58 15:39-16:37/58 08:22-09:49/87 13:38-14:23/45	07:43 08:03-09:05/62	07:06 17:43-18:01/18	07:15 07:34-08:07/33	06:29 06:59-07:49/50	06:01 06:36-07:33/57
	17:14 09:52-10:11/19 14:27-15:27/60	17:49 15:54-17:18/84	18:23	19:57	20:28	20:58
3	07:58 15:39-16:37/58 08:22-09:49/87 13:39-14:23/44	07:42 08:03-09:03/60	07:04 17:43-18:03/20	07:13 07:33-08:07/34	06:28 06:59-07:49/50	06:01 06:36-07:33/57
	17:15 09:54-10:10/16 14:28-15:27/59	17:50 15:56-17:19/83	18:24	19:58	20:29	20:59
4	07:58 15:40-16:38/58 08:22-09:50/88 13:41-14:23/42	07:41 08:02-09:01/59	07:03 17:42-18:04/22	07:11 07:32-08:07/35	06:27 06:58-07:49/51	06:00 06:36-07:33/57
	17:16 09:56-10:09/13 14:29-15:28/59	17:51 15:57-17:20/83	18:25	19:59	20:30	20:59
5	07:58 15:40-16:38/58 08:22-09:50/88 13:42-14:22/40	07:40 08:02-09:00/58	07:01 17:41-18:04/23	07:10 07:32-08:08/36	06:25 06:58-07:49/51	06:00 06:36-07:34/58
	17:17 10:02-10:05/3 14:30-15:28/58	17:53 15:59-17:21/82	18:27	20:00	20:31	21:00
6	07:58 15:41-16:40/59 14:31-15:28/57	07:38 08:02-08:36/34 08:38-08:58/20	07:00 17:41-18:06/25	07:08 07:31-08:07/36	06:24 06:58-07:49/51	06:00 06:36-07:34/58
	17:18 08:23-09:51/88 13:44-14:22/38	17:54 16:01-17:22/81	18:28	20:00	20:32	21:01
7	07:58 15:41-16:43/62 14:32-15:28/56	07:37 08:03-08:37/34 08:40-08:55/15	06:58 17:40-18:07/27	07:06 07:30-08:07/37	06:23 06:58-07:49/51	05:59 06:36-07:34/58
	17:19 08:23-09:51/88 13:46-14:21/35	17:55 16:02-17:22/80	18:29	20:02	20:34	21:01
8	07:57 15:40-16:45/65 14:32-15:27/55	07:36 08:02-08:36/34 08:44-08:51/7	07:56 18:41-19:09/28	07:05 07:31-08:07/36	06:22 06:59-07:49/50	05:59 06:36-07:34/58
	17:20 08:22-09:51/89 13:47-14:20/33	17:56 16:04-17:22/78	19:30	20:03	20:35	21:02
9	07:57 15:41-16:47/66 14:33-15:28/55	07:35 08:02-08:36/34	07:55 18:40-19:10/30	07:03 07:30-08:06/36	06:21 06:56-07:48/52	05:59 06:36-07:35/59
	17:21 08:22-09:51/89 13:50-14:19/29	17:58 16:08-17:23/75	19:31	20:04	20:36	21:03
10	07:57 15:42-16:49/67 14:35-15:28/53	07:34 08:03-08:36/33	07:53 18:40-19:10/30	07:02 07:31-08:06/35	06:20 06:52-07:48/56	05:59 06:37-07:35/58
	17:22 08:23-09:51/88 13:53-14:17/24	17:59 16:12-17:23/71	19:32	20:05	20:37	21:03
11	07:57 15:42-16:51/69 14:36-15:28/52	07:33 08:03-08:36/33	07:51 18:41-19:10/29	07:00 07:31-08:05/34	06:18 06:50-07:48/58	05:59 06:37-07:35/58
	17:23 08:23-09:52/89 13:57-14:15/18	18:00 16:26-17:24/58	19:33	20:06	20:38	21:04
12	07:57 15:42-16:51/69 14:37-15:27/50	07:31 08:03-08:35/32	07:50 18:42-19:10/28	06:58 07:31-08:03/32	06:17 06:48-07:48/60	05:59 06:37-07:36/59
	17:24 08:23-09:51/88 14:01-14:11/10	18:01 16:26-17:23/57	19:34	20:07	20:39	21:04
13	07:56 15:43-16:53/70 14:38-15:27/49	07:30 08:04-08:34/30	07:48 18:43-19:08/25	06:57 07:32-08:03/31	06:16 06:46-07:47/61	05:58 06:37-07:36/59
	17:25 08:23-09:52/89	18:03 16:28-17:24/56	19:36	20:08	20:40	21:05
14	07:56 15:42-16:55/73 14:39-15:26/47	07:29 08:05-08:34/29	07:47 18:45-19:08/23	06:55 07:32-08:01/29	06:15 06:45-07:47/62	05:58 06:37-07:36/59
	17:26 08:23-09:51/88	18:04 16:30-17:24/54	19:37	20:09	20:41	21:05
15	07:56 15:43-16:58/75 14:41-15:26/45	07:28 08:05-08:32/27	07:45 18:45-19:07/22	06:54 07:21-08:00/39	06:14 06:44-07:46/62	05:58 06:38-07:36/58
	17:27 08:23-09:52/89	18:05 16:30-17:23/53	19:38	20:10	20:42	21:06
16	07:55 15:43-16:59/76 14:42-15:25/43	07:26 08:07-08:31/24	07:43 18:46-19:05/19	06:52 07:17-07:58/41	06:13 06:43-07:46/63	05:58 06:38-07:36/58
	17:28 08:24-09:52/88	18:06 16:33-17:23/50	19:39	20:11	20:43	21:06
17	07:55 15:44-17:01/77 14:44-15:24/40	07:25 08:09-08:30/21	07:42 18:49-19:03/14	06:51 07:15-07:57/42	06:12 06:41-07:45/64	05:58 06:38-07:37/59
	17:29 08:23-09:52/89	18:08 16:35-17:23/48	19:40	20:12	20:44	21:07
18	07:54 15:44-17:02/78 14:46-15:23/37	07:24 08:10-08:27/17	07:40 18:51-18:59/8	06:49 07:12-07:53/41	06:11 06:40-07:44/64	05:59 06:38-07:37/59
	17:31 08:23-09:51/88	18:09 16:37-17:22/45	19:41	20:13	20:45	21:07
19	07:54 15:45-17:04/79 14:49-15:22/33	07:22 08:14-08:25/11	07:38	06:48 07:11-07:50/39	06:10 06:40-07:43/63	05:59 06:38-07:37/59
	17:32 08:24-09:51/87	18:10 16:38-17:22/44	19:42	20:14	20:46	21:07
20	07:53 15:45-17:05/80 14:51-15:20/29	07:21 16:38-17:21/43	07:37	06:46 07:09-07:45/36	06:10 06:40-07:44/64	05:59 06:38-07:37/59
	17:33 08:24-09:51/87	18:11	19:43	20:15	20:47	21:08
21	07:52 15:45-17:06/81 14:53-15:18/25	07:19 16:39-17:20/41	07:35	06:45 07:08-07:47/39	06:09 06:39-07:43/64	05:59 06:38-07:37/59
	17:34 08:25-09:51/86	18:12	19:44	20:17	20:48	21:08
22	07:52 15:46-17:08/82 14:57-15:16/19	07:18 16:39-17:19/40	07:33	06:43 07:07-07:47/40	06:08 06:38-07:42/64	05:59 06:39-07:38/59
	17:35 08:25-09:50/85	18:14	19:45	20:18	20:49	21:08
23	07:51 08:25-09:49/84 15:03-15:11/8	07:16 16:41-17:18/37	07:31	06:42 07:06-07:48/42	06:07 06:37-07:41/64	05:59 06:39-07:38/59
	17:37 15:46-17:09/83	18:15	19:47	20:19	20:49	21:08
24	07:50 08:13-08:20/7 15:47-17:09/82	07:15 16:42-17:16/34	07:30	06:40 07:05-07:49/44	06:06 06:38-07:41/63	06:00 06:39-07:38/59
	17:38 08:25-09:48/83	18:16	19:48	20:20	20:50	21:08
25	07:50 08:11-08:24/13 15:47-17:10/83	07:13 16:44-17:15/31	07:28	06:39 07:04-07:49/45	06:06 06:37-07:40/63	06:00 06:40-07:39/59
	17:39 08:26-09:48/82	18:17	19:49	20:21	20:51	21:09
26	07:49 08:10-08:26/16 15:49-17:11/82	07:12 16:45-17:13/28	07:26	06:37 07:03-07:49/46	06:05 06:36-07:38/62	06:00 06:40-07:39/59
	17:40 08:27-09:47/80	18:18	19:50	20:22	20:52	21:09
27	07:48 08:09-09:46/97	07:10 16:48-17:11/23	07:25 07:46-07:59/13	06:36 07:02-07:49/47	06:04 06:37-07:38/61	06:01 06:40-07:38/58
	17:41 15:49-17:12/83	18:20 17:50-17:58/8	19:51	20:23	20:53	21:09
28	07:47 08:08-09:11/63 09:12-09:44/32	07:09 16:50-17:07/17	07:23 07:43-08:01/18	06:34 07:01-07:49/48	06:04 06:36-07:37/61	06:01 06:40-07:39/59
	17:43 15:50-17:12/82	18:21 17:47-17:59/12	19:52	20:24	20:54	21:09
29	07:46 08:07-09:10/63 09:13-09:42/29		07:21 07:40-08:03/23	06:33 07:01-07:49/48	06:03 06:36-07:36/60	06:01 06:40-07:39/59
	17:44 15:50-17:13/83		19:53	20:25	20:55	21:09
30	07:46 08:06-09:09/63 09:16-09:40/24		07:20 07:39-08:05/26	06:32 07:00-07:49/49	06:03 06:36-07:35/59	06:02 06:40-07:39/59
	17:45 15:51-17:15/84		19:54	20:26	20:55	21:09
31	07:45 08:05-09:08/63 09:19-09:38/19		07:18 07:37-08:06/29		06:02 06:36-07:34/58	
	17:46 15:52-17:16/84		19:55		20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	6540	2327	519	1161	1811	1752

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T43 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (462)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:41-07:39/58 21:09	06:27 06:58-07:57/59 20:50	06:58 07:30-08:04/34 20:07	07:28 18:21-18:48/27 19:15	07:02 07:32-08:06/34 17:28 15:40-16:52/72	07:37 15:24-16:33/69 14:18-15:10/52 17:04 08:05-09:34/89 13:39-13:57/18
2	06:03 06:41-07:39/58 21:09	06:28 07:00-07:58/58 20:49	06:59 07:29-08:04/35 20:06	07:29 18:21-18:49/28 19:13	07:03 07:32-08:06/34 17:27 15:37-16:53/76	07:38 15:25-16:32/67 14:18-15:11/53 17:04 08:06-09:34/88 13:36-14:00/24
3	06:03 06:41-07:40/59 21:08	06:28 07:03-07:58/55 20:48	07:00 07:28-08:04/36 20:04	07:30 18:19-18:49/30 19:12	07:05 07:32-08:06/34 08:13-08:22/9 17:26 15:34-16:52/78	07:39 15:25-16:31/66 14:17-15:12/55 17:03 08:06-09:35/89 13:34-14:03/29
4	06:04 06:42-07:40/58 21:08	06:29 07:07-07:58/51 20:47	07:01 07:28-08:04/36 20:02	07:31 18:18-18:48/30 19:10	07:06 07:31-08:05/34 08:09-08:25/16 17:25 15:31-16:51/80	07:40 15:26-16:30/64 14:17-15:12/55 17:03 08:07-09:36/89 13:33-14:05/32
5	06:05 06:42-07:40/58 21:08	06:30 07:08-07:58/50 20:46	07:02 07:27-08:04/37 20:01	07:32 18:17-18:46/29 19:08	07:07 07:32-08:06/34 08:07-08:28/21 17:23 15:30-16:52/82	07:41 15:26-16:28/62 14:17-15:13/56 17:03 08:08-09:36/88 13:31-14:06/35
6	06:05 06:42-07:40/58 21:08	06:31 07:08-07:58/50 20:45	07:03 07:27-08:03/36 19:58	07:33 18:17-18:44/27 19:07	07:08 07:32-08:30/58 17:22 15:28-16:51/83	07:42 15:27-16:27/60 14:17-15:14/57 17:03 08:09-09:37/88 13:30-14:08/38
7	06:06 06:42-07:40/58 21:08	06:32 07:08-07:58/50 20:43	07:04 07:27-08:03/36 19:56	07:34 18:16-18:43/27 19:05	07:09 07:32-08:31/59 17:21 15:27-16:50/83	07:43 15:27-16:26/59 14:17-15:15/58 17:03 08:09-09:37/88 13:30-14:09/39
8	06:06 06:43-07:40/57 21:07	06:33 07:08-07:58/50 20:42	07:05 07:27-08:02/35 19:54	07:35 18:16-18:41/25 19:03	07:11 07:33-08:34/61 17:20 15:25-16:49/84	07:44 15:28-16:26/58 08:10-09:38/88 13:29-14:11/42 17:03 09:45-09:56/11 14:17-15:16/59
9	06:07 06:43-07:41/58 21:07	06:34 07:08-07:58/50 20:41	07:06 07:27-08:01/34 19:52	07:36 18:16-18:39/23 19:02	07:12 07:34-08:36/62 17:19 15:25-16:49/84	07:45 15:28-16:26/58 08:11-09:38/87 13:29-14:12/43 17:03 09:43-09:59/16 14:17-15:17/60
10	06:08 06:43-07:40/57 21:07	06:35 07:08-07:58/50 20:40	07:07 07:27-08:00/33 19:51	07:37 18:16-18:37/21 19:00	07:13 07:35-08:38/63 08:54-09:05/11 17:18 15:24-16:48/84	07:46 15:28-16:26/58 08:11-09:38/87 13:27-14:12/45 17:03 09:41-10:00/19 14:16-15:16/60
11	06:08 06:44-07:40/56 21:06	06:36 07:08-07:58/50 20:38	07:08 07:28-07:59/31 19:49	07:38 18:17-18:36/19 18:59	07:14 07:36-08:39/63 08:49-09:09/20 17:17 15:23-16:47/84	07:47 15:29-16:27/58 08:12-09:39/87 13:27-14:14/47 17:03 09:40-10:02/22 14:17-15:17/60
12	06:09 06:44-07:42/58 21:06	06:37 07:08-07:58/50 20:37	07:09 07:29-07:58/29 19:47	07:39 18:17-18:34/17 18:57	07:15 07:38-08:41/63 08:47-09:12/25 17:16 15:23-16:47/84	07:48 15:30-16:27/57 08:13-09:39/86 13:27-14:15/48 17:03 09:40-10:04/24 14:17-15:18/61
13	06:10 06:44-07:42/58 21:05	06:38 07:09-07:57/48 20:36	07:10 07:30-07:56/26 19:46	07:41 17:27-17:38/11 18:55 18:19-18:33/14	07:17 07:39-08:42/63 08:45-09:15/30 17:15 15:22-16:45/83	07:48 15:30-16:28/58 14:17-15:19/62 17:03 08:14-10:05/111 13:27-14:16/49
14	06:11 06:45-07:44/59 21:05	06:39 07:09-07:57/48 20:34	07:11 07:31-07:55/24 19:44	07:42 17:22-17:42/20 18:54 18:21-18:31/10	07:18 07:40-09:16/96 17:14 15:22-16:44/82	07:49 15:31-16:28/57 14:18-15:20/62 17:03 08:15-10:06/111 13:27-14:17/50
15	06:11 06:45-07:46/61 21:04	06:40 07:09-07:57/48 20:33	07:11 07:32-07:52/20 19:42	07:43 17:19-17:44/25 18:52 18:24-18:30/6	07:19 07:42-09:18/96 17:13 15:21-16:44/83	07:50 15:31-16:28/57 13:27-15:20/113 17:04 08:15-10:07/112
16	06:12 06:46-07:47/61 21:04	06:41 07:10-07:56/46 20:32	07:12 07:35-07:49/14 19:41	07:44 17:17-17:46/29 18:51	07:20 07:43-09:20/97 17:12 15:22-16:44/82	07:51 15:32-16:29/57 13:27-15:20/113 17:04 08:16-10:08/112
17	06:13 06:45-07:47/62 21:03	06:42 07:10-07:56/46 20:30	07:13 19:39	07:45 17:14-17:47/33 18:49	07:21 07:44-07:57/13 15:21-16:44/83 17:12 07:59-09:21/82	07:51 15:33-16:30/57 13:28-15:21/113 17:04 08:17-10:09/112
18	06:14 06:46-07:49/63 21:02	06:43 07:11-07:55/44 20:29	07:14 19:37	07:46 17:13-17:48/35 18:48	07:23 07:47-07:53/6 15:21-16:43/82 17:11 07:59-09:22/83	07:52 15:33-16:29/56 13:27-15:21/114 17:05 08:17-10:09/112
19	06:15 06:47-07:50/63 21:02	06:44 07:11-07:54/43 20:27	07:16 19:35	07:47 17:12-17:50/38 18:46	07:24 08:00-09:24/84 14:38-14:46/8 17:10 15:20-16:43/83	07:52 15:34-16:30/56 13:28-15:22/114 17:05 08:18-10:10/112
20	06:15 06:48-07:51/63 21:01	06:45 07:12-07:54/42 20:26	07:17 19:34	07:48 17:10-17:51/41 18:45	07:25 15:21-16:43/82 14:32-14:51/19 17:09 08:00-09:25/85	07:53 15:34-16:30/56 13:28-15:22/114 17:05 08:18-10:11/113
21	06:16 06:48-07:52/64 21:00	06:46 07:12-07:53/41 20:24	07:18 19:32	07:49 17:09-17:51/42 18:43	07:26 15:21-16:42/81 14:29-14:54/25 17:09 08:00-09:26/86	07:54 15:34-16:31/57 13:29-15:23/114 17:06 08:19-10:12/113
22	06:17 06:48-07:53/65 21:00	06:47 07:13-07:51/38 20:23	07:19 19:30	07:51 17:08-17:52/44 18:42	07:27 15:21-16:41/80 14:27-14:56/29 17:08 08:00-09:27/87	07:54 15:34-16:31/57 13:29-15:23/114 17:06 08:19-10:12/113
23	06:18 06:49-07:53/64 20:59	06:48 07:14-07:50/36 20:22	07:20 19:29	07:52 08:42-08:55/13 18:40 17:07-17:52/45	07:28 15:21-16:40/79 14:25-14:58/33 17:07 08:00-09:27/87	07:55 15:36-16:32/56 13:30-15:24/114 17:07 08:20-10:13/113
24	06:19 06:50-07:54/64 20:58	06:49 07:14-07:53/39 20:20	07:21 19:27	07:53 08:40-08:59/19 18:39 17:07-17:53/46	07:30 15:22-16:41/79 14:24-15:01/37 17:07 08:01-09:29/88	07:55 15:36-16:32/56 13:30-15:24/114 17:07 08:20-10:12/112
25	06:20 06:51-07:54/63 20:57	06:50 07:16-07:57/41 20:18	07:22 18:36-18:39/3 19:25	07:54 08:38-09:00/22 18:37 17:04-17:53/49	07:31 15:22-16:39/77 14:23-15:02/39 17:06 08:01-09:30/89	07:55 15:37-16:33/56 13:31-15:25/114 17:08 08:21-10:13/112
26	06:21 06:51-07:55/64 20:56	06:52 07:17-07:59/42 20:17	07:23 18:31-18:44/13 19:23	07:55 08:36-09:01/25 18:36 17:02-17:53/51	07:32 15:22-16:38/76 14:21-15:04/43 17:06 08:02-09:30/88	07:56 15:37-16:33/56 13:32-15:25/113 17:09 08:21-10:13/112
27	06:22 06:52-07:56/64 20:55	06:53 07:19-08:00/41 20:15	07:24 18:28-18:45/17 19:22	07:56 08:35-09:02/27 18:35 17:00-17:53/53	07:33 15:22-16:37/75 14:20-15:05/45 17:05 08:02-09:31/89	07:56 15:37-16:34/57 13:32-15:25/113 17:09 08:21-10:13/112
28	06:23 06:54-07:56/62 20:54	06:54 07:23-08:01/38 20:14	07:25 18:26-18:47/21 19:20	07:57 08:35-09:04/29 18:33 16:58-17:53/55	07:34 15:22-16:35/73 14:19-15:06/47 17:05 08:03-09:31/88	07:57 15:37-16:34/57 13:33-15:26/113 17:10 08:21-10:13/112
29	06:24 06:55-07:57/62 20:53	06:55 07:33-08:02/29 20:12	07:26 18:25-18:47/22 19:18	07:59 08:34-09:04/30 18:32 16:57-17:53/56	07:35 15:23-16:33/70 14:19-15:07/48 17:05 08:03-09:32/89	07:57 15:38-16:35/57 14:25-15:27/62 17:11 08:22-10:14/112 13:34-14:24/50
30	06:25 06:56-07:57/61 20:52	06:56 07:31-08:03/32 20:11	07:27 18:23-18:48/25 19:17	08:00 08:33-09:05/32 18:31 16:56-17:53/57	07:36 15:24-16:34/70 14:19-15:09/50 17:04 08:05-09:33/88 13:44-13:52/8	07:57 15:38-16:36/58 14:25-15:27/62 17:11 08:22-10:13/111 13:35-14:24/49
31	06:26 06:58-07:58/60 20:51	06:57 07:30-08:03/33 20:09		08:01 08:32-09:05/33 18:29 16:55-17:53/58		07:57 15:39-16:36/57 08:22-09:48/86 13:36-14:24/48 17:12 09:49-10:13/24 14:26-15:27/61
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1876	1398	597	1351	5140	8358

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T44 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (463)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:53/33 17:13 15:13-16:21/68	07:43 08:04-08:37/33 17:47	07:07 07:27-08:04/37 18:22 16:58-17:49/51	07:16 18:48-19:21/33 19:56	06:30 18:32-19:57/85 20:27 06:50-07:27/37	06:01 19:11-20:16/65 20:57
2	07:57 08:20-08:53/33 17:14 15:14-16:21/67	07:42 08:03-08:35/32 17:49	07:06 07:26-08:01/35 18:23 16:57-17:49/52	07:14 18:45-19:23/38 19:57	06:29 18:32-19:59/87 20:28 06:49-07:27/38	06:01 19:12-20:16/64 20:58
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Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	2472	1418	1355	2226	3025	1848

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T44 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (463)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:20-20:22/62 21:08	06:26 18:54-20:19/85 20:50 06:52-07:27/35	06:57 18:31-19:30/59 20:07	07:28 17:34-18:25/51 19:15	07:02 07:23-07:59/36 17:28	07:37 08:00-08:36/36 17:04 15:05-16:05/60
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29	06:23 19:18-20:21/63 19:02-19:15/13 20:53 06:54-07:26/32	06:54 18:31-19:33/62 20:12	07:25 17:36-18:25/49 19:18	07:58 08:20-08:59/39 18:32	07:35 07:58-08:35/37 17:04 15:07-16:04/57	07:57 08:19-08:51/32 17:10 15:10-16:19/69
30	06:24 18:58-20:20/82 20:52 06:52-07:26/34	06:55 18:31-19:32/61 20:10	07:26 17:35-18:25/50 19:16	08:00 08:21-08:59/38 18:31	07:36 07:59-08:35/36 17:04 15:06-16:04/58	07:57 08:20-08:52/32 17:11 15:11-16:20/69
31	06:25 18:56-20:20/84 20:51 06:52-07:26/34	06:56 18:31-19:31/60 20:09		08:01 08:22-08:59/37 18:29		07:57 08:20-08:53/33 17:12 15:12-16:20/68
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2323	3162	1010	2015	1716	3107

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T45 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (464)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:53/33 17:13 15:40-16:29/49	07:43 16:30-17:18/48 17:47	07:07 16:51-17:49/58 18:22 07:27-07:59/32	07:16 18:17-19:17/60 19:56	06:30 18:35-19:29/54 20:27	06:01 19:30-20:23/53 20:57
2	07:57 08:20-08:52/32 17:14 15:41-16:29/48	07:42 16:30-17:20/50 17:49	07:06 16:53-17:49/56 18:23 07:25-07:59/34	07:14 18:16-19:21/65 19:57	06:29 18:36-19:29/53 20:28	06:01 19:30-20:24/54 20:58
3	07:57 08:20-08:51/31 17:15 15:41-16:30/49	07:41 16:30-17:21/51 17:50	07:04 16:55-17:50/55 18:24 07:23-07:58/35	07:13 18:17-19:24/67 19:58	06:28 18:36-19:27/51 20:29	06:01 19:29-20:24/55 20:58
4	07:57 08:20-08:50/30 17:16 15:42-16:30/48	07:40 16:30-17:23/53 17:51	07:02 16:55-17:51/56 18:25 07:22-07:58/36	07:11 18:17-19:26/69 19:59	06:26 18:37-19:27/50 20:30	06:00 19:30-20:24/54 20:59
5	07:57 08:20-08:50/30 17:17 15:42-16:31/49	07:39 16:29-17:23/54 17:53	07:01 16:54-17:51/57 18:26 07:20-07:57/37	07:10 18:17-19:27/70 20:00	06:25 18:38-19:26/48 20:31	06:00 19:30-20:25/55 21:00
6	07:57 08:20-08:50/30 17:18 15:43-16:31/48	07:38 16:29-17:24/55 17:54	06:59 16:54-17:52/58 18:27 07:20-07:57/37	07:08 18:18-19:29/71 20:00	06:24 18:39-19:25/46 20:32	06:00 19:29-20:25/56 21:00
7	07:57 08:19-08:47/28 17:18 15:42-16:31/49	07:37 16:29-17:26/57 17:55	06:58 07:17-07:56/39 18:29 16:53-17:51/58	07:06 18:19-19:30/71 20:01	06:23 18:40-19:24/44 20:33	05:59 19:29-20:26/57 21:01
8	07:57 08:20-08:45/25 17:19 15:43-16:31/48	07:36 16:29-17:27/58 17:56	07:56 08:15-08:54/39 19:30 17:52-18:51/59	07:05 18:20-19:31/71 20:02	06:22 18:41-19:23/42 20:34	05:59 19:30-20:26/56 21:02
9	07:57 08:21-08:45/24 17:20 15:44-16:32/48	07:35 16:30-17:28/58 17:58	07:54 08:14-08:53/39 19:31 17:52-18:52/60	07:03 18:21-19:32/71 20:03	06:20 18:42-19:22/40 20:35	05:59 19:30-20:27/57 21:02
10	07:57 08:21-08:46/25 17:22 15:45-16:32/47	07:34 16:30-17:29/59 17:59	07:53 08:12-08:51/39 19:32 17:52-18:51/59	07:01 18:21-19:32/71 20:05	06:19 18:43-19:20/37 20:36	05:59 19:30-20:27/57 21:03
11	07:57 08:21-08:45/24 17:23 15:45-16:32/47	07:32 16:30-17:28/58 18:00	07:51 08:10-08:49/39 19:33 17:51-18:53/62	07:00 18:23-19:33/70 20:06	06:18 18:44-19:19/35 20:37	05:58 19:30-20:28/58 21:03
12	07:56 08:22-08:46/24 17:24 15:46-16:32/46	07:31 16:30-17:29/59 18:01	07:50 08:09-08:49/40 19:34 17:52-19:00/68	06:58 18:24-19:33/69 20:07	06:17 18:46-19:17/31 20:38	05:58 19:29-20:27/58 21:04
13	07:56 08:23-08:46/23 17:25 15:47-16:33/46	07:30 16:31-17:30/59 18:03	07:48 08:07-08:47/40 19:35 17:51-19:03/72	06:57 18:26-19:34/68 20:08	06:16 18:48-19:15/27 20:39	05:58 19:30-20:27/57 21:05
14	07:56 08:23-08:46/23 17:26 15:47-16:33/46	07:29 16:31-17:29/58 18:04	07:46 08:06-08:46/40 19:36 17:51-19:05/74	06:55 18:28-19:34/66 20:09	06:15 19:51-19:59/8 20:40 18:50-19:13/23	05:58 19:30-20:28/58 21:05
15	07:55 08:25-08:46/21 17:27 15:48-16:33/45	07:27 16:32-17:30/58 18:05	07:45 08:04-08:45/41 19:38 17:51-19:07/76	06:53 18:30-19:35/65 20:10	06:14 19:47-20:04/17 20:41 18:53-19:12/19	05:58 19:30-20:28/58 21:05
16	07:55 08:25-08:46/21 17:28 15:48-16:33/45	07:26 16:33-17:30/57 18:06	07:43 08:04-08:42/38 19:39 17:51-19:08/77	06:52 18:35-19:34/59 20:11	06:13 19:44-20:07/23 20:42 18:56-19:08/12	05:58 19:30-20:28/58 21:06
17	07:54 16:43-16:54/11 15:49-16:33/44 17:29 08:27-08:46/19	07:25 16:34-17:30/56 18:07	07:41 08:03-08:39/36 19:40 17:51-19:09/78	06:50 18:34-19:34/60 20:12	06:12 19:42-20:09/27 20:43	05:58 19:31-20:29/58 21:06
18	07:54 16:40-16:57/17 15:50-16:33/43 17:30 08:27-08:45/18	07:23 16:35-17:30/55 18:09	07:40 08:04-08:34/30 19:41 17:52-19:11/79	06:49 18:34-19:34/60 20:13	06:11 19:40-20:11/31 20:44	05:58 19:31-20:29/58 21:07
19	07:53 16:39-17:00/21 15:51-16:33/42 17:32 08:29-08:45/16	07:22 16:37-17:30/53 18:10	07:38 08:04-08:31/27 19:42 17:52-19:11/79	06:47 18:33-19:34/61 20:14	06:10 19:38-20:12/34 20:45	05:58 19:31-20:30/59 21:07
20	07:53 16:37-17:02/25 15:52-16:33/41 17:33 08:30-08:43/13	07:20 16:37-17:29/52 18:11 07:42-07:46/4	07:36 08:04-08:30/26 19:43 17:53-19:12/79	06:46 18:33-19:34/61 20:15	06:09 19:37-20:13/36 20:46	05:59 19:31-20:30/59 21:07
21	07:52 16:36-17:03/27 15:52-16:32/40 17:34 08:32-08:42/10	07:19 16:40-17:34/54 18:12 07:39-07:51/12	07:35 08:05-08:29/24 19:44 17:54-19:13/79	06:44 18:34-19:35/61 20:16	06:09 19:36-20:15/39 20:47	05:59 19:31-20:30/59 21:08
22	07:52 16:36-17:05/29 17:35 15:54-16:32/38	07:18 16:41-17:37/56 18:13 07:37-07:53/16	07:33 08:06-08:27/21 19:45 17:54-19:13/79	06:43 18:33-19:34/61 20:17	06:08 19:35-20:16/41 20:48	05:59 19:31-20:30/59 21:08
23	07:51 16:34-17:07/33 17:36 15:55-16:31/36	07:16 16:44-17:40/56 18:15 07:36-07:55/19	07:31 08:07-08:25/18 19:46 17:55-19:13/78	06:41 18:33-19:34/61 20:18	06:07 19:34-20:17/43 20:49	05:59 19:32-20:31/59 21:08
24	07:50 16:33-17:08/35 17:38 15:56-16:31/35	07:15 16:45-17:42/57 18:16 07:34-07:56/22	07:30 08:09-08:23/14 19:47 17:57-19:14/77	06:40 18:33-19:33/60 20:19	06:06 19:33-20:17/44 20:50	05:59 19:32-20:31/59 21:08
25	07:49 16:33-17:09/36 17:39 15:57-16:30/33	07:13 16:46-17:44/58 18:17 07:33-07:57/24	07:28 08:13-08:18/5 19:48 17:58-19:14/76	06:38 18:33-19:33/60 20:21	06:06 19:33-20:19/46 20:51	06:00 19:32-20:30/58 21:08
26	07:49 16:32-17:10/38 17:40 15:58-16:29/31	07:12 16:46-17:45/59 18:18 07:31-07:58/27	07:26 17:59-19:13/74 19:50	06:37 18:33-19:32/59 20:22	06:05 19:32-20:19/47 20:52	06:00 19:33-20:31/58 21:08
27	07:48 16:32-17:12/40 17:41 16:01-16:28/27	07:10 16:48-17:47/59 18:19 07:30-07:59/29	07:25 18:00-19:13/73 19:51	06:36 18:33-19:32/59 20:23	06:04 19:32-20:21/49 20:53	06:00 19:33-20:31/58 21:08
28	07:47 16:31-17:12/41 17:42 16:03-16:27/24	07:09 16:49-17:47/58 18:21 07:28-07:58/30	07:23 18:03-19:14/71 19:52	06:34 18:34-19:32/58 20:24	06:04 19:31-20:21/50 20:54	06:01 19:33-20:31/58 21:08
29	07:46 16:31-17:13/42 17:44 16:05-16:25/20		07:21 18:05-19:13/68 19:53	06:33 18:34-19:30/56 20:25	06:03 19:30-20:21/51 20:54	06:01 19:34-20:31/57 21:09
30	07:45 16:30-17:14/44 17:45 16:09-16:22/13		07:19 18:09-19:12/63 19:54	06:32 18:34-19:30/56 20:26	06:02 19:31-20:22/51 20:55	06:02 19:33-20:31/58 21:08
31	07:44 16:30-17:15/45 17:46		07:18 18:17-19:12/55 19:55		06:02 19:31-20:23/52 20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	2209	1748	2919	1916	1301	1718

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T45 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (464)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:34-20:32/58 21:08	06:26 18:56-19:28/32 20:50	06:57 18:22-19:32/70 20:07	07:28 07:47-08:27/40 19:15 17:30-18:40/70	07:02 15:59-16:57/58 17:28	07:37 08:03-08:27/24 17:04 15:27-16:14/47
2	06:03 19:34-20:31/57 21:08	06:27 18:54-19:30/36 20:49	06:58 18:20-19:31/71 20:06	07:29 07:48-08:27/39 19:13 17:30-18:35/65	07:03 15:59-16:57/58 17:27	07:38 08:05-08:29/24 17:03 15:27-16:14/47
3	06:03 19:35-20:32/57 21:08	06:28 18:53-19:31/38 20:48	06:59 18:19-19:30/71 20:04	07:30 07:49-08:28/39 19:11 17:29-18:29/60	07:04 15:59-16:56/57 17:26	07:39 08:05-08:29/24 17:03 15:27-16:15/48
4	06:04 19:35-20:31/56 21:08	06:29 18:52-19:32/40 20:47	07:00 18:17-19:28/71 20:02	07:31 07:51-08:30/39 19:10 17:29-18:29/60	07:06 15:59-16:55/56 17:24	07:40 08:05-08:30/25 17:03 15:27-16:15/48
5	06:04 19:35-20:32/57 21:08	06:30 18:50-19:33/43 20:46	07:01 18:16-19:27/71 20:01	07:32 07:52-08:31/39 19:08 17:30-18:29/59	07:07 15:59-16:54/55 17:23	07:41 08:05-08:33/28 17:03 15:28-16:16/48
6	06:05 19:35-20:31/56 21:08	06:31 18:49-19:34/45 20:44	07:02 18:15-19:25/70 19:57	07:33 07:53-08:32/39 19:06 17:30-18:28/58	07:08 15:59-16:54/55 17:22	07:42 08:06-08:35/29 17:03 15:28-16:16/48
7	06:06 19:36-20:32/56 21:07	06:32 18:48-19:35/47 20:43	07:03 18:13-19:23/70 19:56	07:34 07:55-08:32/37 19:05 17:29-18:28/59	07:09 15:59-16:53/54 17:21	07:43 08:07-08:37/30 17:03 15:28-16:17/49
8	06:06 19:37-20:32/55 21:07	06:33 18:47-19:36/49 20:42	07:04 18:12-19:21/69 19:54	07:35 17:30-18:27/57 19:03 07:55-08:33/38	07:10 15:59-16:51/52 17:20	07:44 08:07-08:37/30 17:03 15:29-16:17/48
9	06:07 19:37-20:31/54 21:07	06:34 18:46-19:37/51 20:41	07:05 18:11-19:18/67 19:52	07:36 17:30-18:26/56 19:02 07:56-08:33/37	07:12 16:00-16:49/49 17:19	07:45 08:08-08:39/31 17:03 15:29-16:18/49
10	06:08 19:37-20:31/54 21:06	06:35 18:45-19:37/52 20:39	07:06 18:10-19:14/64 19:51	07:37 17:30-18:25/55 19:00 07:57-08:33/36	07:13 16:01-16:48/47 17:18	07:46 08:09-08:41/32 17:03 15:30-16:18/48
11	06:08 19:38-20:31/53 21:06	06:36 18:45-19:38/53 20:38	07:07 18:09-19:10/61 19:49	07:38 17:28-18:24/56 18:58 07:58-08:32/34	07:14 16:01-16:46/45 17:17	07:46 08:10-08:43/33 17:03 15:30-16:19/49
12	06:09 19:38-20:30/52 21:05	06:37 18:44-19:38/54 20:37	07:08 18:08-19:04/56 19:47	07:39 17:25-18:22/57 18:57 07:59-08:32/33	07:15 16:01-16:45/44 17:16 15:39-15:53/14	07:47 08:11-08:44/33 17:03 15:31-16:20/49
13	06:10 19:39-20:30/51 21:05	06:38 18:43-19:39/56 20:36	07:09 18:01-19:03/62 19:45	07:40 17:23-18:21/58 18:55 08:00-08:31/31	07:16 16:03-16:45/42 17:15 15:37-15:57/20	07:48 08:12-08:45/33 17:03 15:31-16:20/49
14	06:10 19:40-20:30/50 21:05	06:39 18:42-19:39/57 20:34	07:10 17:56-19:03/67 19:44	07:41 17:21-18:19/58 18:54 08:02-08:32/30	07:18 16:03-16:44/41 17:14 15:35-15:59/24	07:49 08:12-08:46/34 17:03 15:31-16:20/49
15	06:11 19:40-20:30/50 21:04	06:40 18:42-19:39/57 20:33	07:11 17:53-19:03/70 19:42	07:42 17:20-18:19/59 18:52 08:03-08:31/28	07:19 16:04-16:43/39 17:13 15:33-16:00/27	07:50 08:13-08:47/34 17:03 15:32-16:21/49
16	06:12 19:40-20:29/49 21:03	06:41 18:41-19:40/59 20:31	07:12 17:50-19:02/72 19:40	07:44 17:18-18:17/59 18:50 08:04-08:30/26	07:20 16:05-16:43/38 17:12 15:31-16:02/31	07:50 08:14-08:48/34 17:04 15:33-16:21/48
17	06:13 19:41-20:29/48 21:03	06:42 18:39-19:39/60 20:30	07:13 17:47-19:02/75 19:39	07:45 17:17-18:15/58 18:49 08:05-08:29/24	07:21 16:07-16:43/36 17:11 15:31-16:04/33	07:51 08:14-08:48/34 17:04 15:32-16:21/49
18	06:14 19:42-20:29/47 21:02	06:43 18:39-19:39/60 20:29	07:14 17:45-19:01/76 19:37	07:46 17:16-18:13/57 18:47 08:06-08:27/21	07:22 16:07-16:42/35 17:11 15:30-16:05/35	07:52 08:15-08:49/34 17:04 15:33-16:22/49
19	06:14 19:43-20:28/45 21:01	06:44 18:38-19:39/61 20:27	07:15 07:56-08:09/13 19:35 17:43-19:00/77	07:47 17:14-18:10/56 18:46 08:07-08:25/18	07:23 16:08-16:41/33 17:10 15:29-16:05/36	07:52 08:16-08:50/34 17:05 15:34-16:23/49
20	06:15 19:44-20:28/44 21:01	06:45 18:38-19:39/61 20:26	07:16 07:53-08:11/18 19:33 17:42-19:00/78	07:48 17:11-18:07/56 18:44 08:09-08:24/15	07:25 16:10-16:39/29 17:09 15:28-16:06/38	07:53 08:16-08:50/34 17:05 15:34-16:23/49
21	06:16 19:44-20:26/42 21:00	06:46 18:38-19:39/61 20:24	07:17 07:51-08:12/21 19:32 17:40-18:59/79	07:49 17:10-18:03/53 18:43 08:10-08:21/11	07:26 16:12-16:39/27 15:28-16:08/40 17:09 08:08-08:18/10	07:53 08:17-08:51/34 17:06 15:35-16:24/49
22	06:17 19:45-20:25/40 20:59	06:47 18:37-19:38/61 20:23	07:18 07:50-08:13/23 19:30 17:39-18:58/79	07:50 17:08-18:00/52 18:41	07:27 16:13-16:38/25 15:28-16:09/41 17:08 08:06-08:19/13	07:54 08:17-08:51/34 17:06 15:35-16:24/49
23	06:18 19:47-20:24/37 20:58	06:48 18:37-19:38/61 20:21	07:19 07:48-08:14/26 19:28 17:37-18:56/79	07:51 17:06-18:00/54 18:40	07:28 16:15-16:36/21 15:27-16:09/42 17:07 08:05-08:21/16	07:54 08:18-08:52/34 17:07 15:36-16:25/49
24	06:19 19:48-20:23/35 20:58	06:49 18:37-19:38/61 20:20	07:20 07:47-08:14/27 19:27 17:36-18:55/79	07:53 17:04-17:59/55 18:39	07:29 16:17-16:34/17 15:27-16:10/43 17:07 08:04-08:22/18	07:55 08:18-08:52/34 17:07 15:36-16:25/49
25	06:20 19:49-20:22/33 20:57	06:50 18:37-19:37/60 20:18	07:21 07:46-08:15/29 19:25 17:35-18:54/79	07:54 17:03-17:59/56 18:37	07:30 16:21-16:32/11 15:27-16:11/44 17:06 08:05-08:24/19	07:55 08:18-08:52/34 17:08 15:36-16:25/49
26	06:21 19:51-20:21/30 20:56	06:51 18:37-19:37/60 20:17	07:22 07:46-08:20/34 19:23 17:34-18:52/78	07:55 17:03-18:00/57 18:36	07:32 08:04-08:25/21 17:06 15:27-16:12/45	07:56 08:19-08:53/34 17:08 15:37-16:26/49
27	06:22 19:53-20:19/26 20:55 19:10-19:15/5	06:52 18:36-19:36/60 20:15	07:23 07:45-08:23/38 19:22 17:33-18:50/77	07:56 17:02-17:59/57 18:35	07:33 08:04-08:25/21 17:05 15:27-16:12/45	07:56 08:19-08:53/34 17:09 15:38-16:26/48
28	06:23 19:56-20:17/21 20:54 19:05-19:21/16	06:53 18:32-19:36/64 20:14	07:24 07:45-08:24/39 19:20 17:32-18:48/76	07:57 17:01-17:59/58 18:33	07:34 08:04-08:26/22 17:05 15:27-16:13/46	07:56 08:19-08:53/34 17:10 15:38-16:27/49
29	06:23 19:58-20:12/14 20:53 19:01-19:23/22	06:54 18:29-19:35/66 20:12	07:25 07:45-08:26/41 19:18 17:31-18:46/75	07:58 17:00-17:58/58 18:32	07:35 08:03-08:26/23 17:04 15:27-16:13/46	07:57 08:19-08:53/34 17:10 15:38-16:27/49
30	06:24 18:59-19:25/26 20:52	06:55 18:26-19:34/68 20:10	07:26 07:46-08:26/40 19:16 17:31-18:43/72	08:00 17:00-17:59/59 18:31	07:36 08:03-08:27/24 17:04 15:27-16:14/47	07:57 08:20-08:53/33 17:11 15:38-16:27/49
31	06:25 18:57-19:27/30 20:51	06:56 18:24-19:33/69 20:09		08:01 16:59-17:58/59 18:29		07:57 08:20-08:53/33 17:12 15:40-16:28/48
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1426	1702	2510	2445	1908	2492

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T46 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (465)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:23-16:47/24 17:13	07:43 16:52-17:23/31 17:48	07:07 17:26-17:40/14 18:22	07:16 19:56	06:30 06:52-07:32/40 20:27 19:38-20:05/27	06:02 06:39-07:47/68 20:57
2	07:57 16:23-16:48/25 17:14	07:42 16:53-17:24/31 17:49	07:06 17:30-17:35/5 18:23	07:15 19:57	06:29 06:52-07:32/40 20:28 19:38-20:06/28	06:01 06:40-07:48/68 20:58
3	07:57 16:24-16:49/25 17:15	07:41 16:55-17:24/29 17:50	07:04 18:24	07:13 19:58	06:28 06:52-07:32/40 20:29 19:37-20:06/29	06:01 06:39-07:48/69 20:58
4	07:57 16:24-16:50/26 17:16	07:40 16:57-17:24/27 17:51	07:03 18:25	07:11 19:59	06:26 06:51-07:32/41 20:30 19:38-20:06/28	06:00 06:39-07:48/69 20:59
5	07:57 16:25-16:51/26 17:17	07:39 16:56-17:23/27 17:53	07:01 18:26	07:10 20:00	06:25 06:51-07:32/41 20:31 19:38-20:06/28	06:00 06:39-07:49/70 21:00
6	07:57 16:25-16:52/27 17:18	07:38 16:57-17:23/26 17:54	06:59 18:28	07:08 20:00	06:24 06:51-07:32/41 20:32 19:39-20:06/27	06:00 06:40-07:50/70 21:00
7	07:57 16:25-16:52/27 17:19	07:37 16:58-17:22/24 17:55	06:58 18:29	07:06 20:01	06:23 06:51-07:31/40 20:33 19:40-20:06/26	05:59 06:39-07:49/70 21:01
8	07:57 16:25-16:53/28 17:20	07:36 16:59-17:22/23 17:56	07:56 19:30	07:05 20:02	06:22 06:51-07:31/40 20:34 19:40-20:05/25	05:59 06:39-07:50/71 21:02
9	07:57 16:26-16:55/29 17:21	07:35 17:00-17:21/21 17:58	07:55 19:31	07:03 20:03	06:20 06:52-07:31/39 20:35 19:41-20:04/23	05:59 06:39-07:50/71 21:02
10	07:57 16:27-16:56/29 17:22	07:34 17:02-17:20/18 17:59	07:53 19:32	07:01 20:05	06:19 06:52-07:31/39 20:36 19:42-20:02/20	05:59 06:39-07:51/72 21:03
11	07:57 16:27-16:56/29 17:23	07:32 17:28-17:36/8 18:00 17:03-17:18/15	07:51 19:33	07:00 20:06	06:18 06:52-07:30/38 20:37 19:43-20:01/18	05:59 06:40-07:51/71 21:03
12	07:56 16:27-16:58/31 17:24	07:31 17:25-17:38/13 18:01 17:06-17:15/9	07:50 19:34	06:58 20:07	06:17 06:53-07:30/37 20:38 19:45-20:00/15	05:58 06:40-07:51/71 21:04
13	07:56 16:28-16:59/31 17:25	07:30 17:24-17:40/16 18:03	07:48 19:35	06:57 20:08	06:16 06:53-07:32/39 20:39 19:46-19:58/12	05:58 06:40-07:52/72 21:05
14	07:56 16:28-17:00/32 17:26	07:29 17:22-17:40/18 18:04	07:46 19:37	06:55 20:09	06:15 06:52-07:33/41 20:41 19:49-19:55/6	05:58 06:40-07:52/72 21:05
15	07:55 16:30-17:01/31 17:27	07:27 17:21-17:42/21 18:05	07:45 19:38	06:53 20:10	06:14 06:50-07:35/45 20:42	05:58 06:40-07:52/72 21:05
16	07:55 16:30-17:02/32 17:28	07:26 17:21-17:44/23 18:06	07:43 19:39	06:52 20:11	06:13 06:49-07:36/47 20:42	05:58 06:40-07:52/72 21:06
17	07:54 16:31-17:04/33 17:29	07:25 17:20-17:44/24 18:07	07:41 19:40	06:50 20:12	06:12 06:48-07:37/49 20:43	05:58 06:40-07:53/73 21:06
18	07:54 16:32-17:05/33 17:30	07:23 17:20-17:46/26 18:09	07:40 19:41	06:49 20:13	06:11 06:47-07:38/51 20:44	05:58 06:40-07:53/73 21:07
19	07:53 16:33-17:07/34 17:32	07:22 17:20-17:48/28 18:10	07:38 19:42	06:47 20:14	06:10 06:45-07:39/54 20:45	05:58 06:41-07:53/72 21:07
20	07:53 16:34-17:07/33 17:33	07:20 17:19-17:48/29 18:11	07:36 19:43	06:46 07:07-07:22/15 20:15	06:09 06:44-07:39/55 20:46	05:59 06:41-07:53/72 21:07
21	07:52 16:35-17:08/33 17:34	07:19 17:19-17:48/29 18:12	07:35 19:44	06:44 07:05-07:25/20 20:16 19:49-19:55/6	06:09 06:44-07:41/57 20:47	05:59 06:41-07:53/72 21:08
22	07:52 16:38-17:10/32 17:35	07:18 17:19-17:48/29 18:14	07:33 19:45	06:43 07:02-07:26/24 20:17 19:46-19:56/10	06:08 06:43-07:42/59 20:48	05:59 06:41-07:53/72 21:08
23	07:51 16:40-17:11/31 17:36	07:16 17:20-17:48/28 18:15	07:31 19:46	06:41 07:01-07:28/27 20:18 19:44-19:57/13	06:07 06:43-07:42/59 20:49	05:59 06:42-07:54/72 21:08
24	07:50 16:44-16:45/1 17:38 16:46-17:13/27	07:15 17:19-17:46/27 18:16	07:30 19:47	06:40 06:59-07:28/29 20:20 19:42-19:57/15	06:06 06:42-07:42/60 20:50	06:00 06:42-07:54/72 21:08
25	07:49 16:46-17:14/28 17:39	07:13 17:21-17:46/25 18:17	07:28 19:48	06:39 06:58-07:30/32 20:21 19:41-19:59/18	06:06 06:42-07:44/62 20:51	06:00 06:41-07:54/73 21:08
26	07:49 16:46-17:15/29 17:40	07:12 17:21-17:45/24 18:18	07:26 19:50	06:37 06:57-07:31/34 20:22 19:39-19:59/20	06:05 06:41-07:44/63 20:52	06:00 06:42-07:54/72 21:08
27	07:48 16:47-17:17/30 17:41	07:10 17:22-17:44/22 18:19	07:25 19:51	06:36 06:55-07:31/36 20:23 19:39-20:01/22	06:04 06:41-07:45/64 20:53	06:01 06:42-07:54/72 21:08
28	07:47 16:48-17:18/30 17:43	07:09 17:24-17:42/18 18:21	07:23 19:52	06:34 06:54-07:31/37 20:24 19:39-20:02/23	06:04 06:40-07:45/65 20:54	06:01 06:42-07:54/72 21:09
29	07:46 16:49-17:19/30 17:44		07:21 19:53	06:33 06:54-07:32/38 20:25 19:38-20:02/24	06:03 06:41-07:46/65 20:54	06:01 06:43-07:55/72 21:09
30	07:45 16:49-17:21/32 17:45		07:20 19:54	06:32 06:52-07:32/40 20:26 19:38-20:04/26	06:03 06:40-07:46/66 20:55	06:02 06:43-07:54/71 21:08
31	07:44 16:50-17:22/32 17:46		07:18 19:55		06:02 06:40-07:47/67 20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	920	689	19	509	1856	2138

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T46 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (465)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September	October		November		December	
1	06:02	06:44-07:55/71	06:26	07:02-07:39/37	06:57	07:28		07:02	16:30-16:49/19	07:37	16:09-16:38/29
	21:08		20:50	19:55-20:11/16	20:07	19:15		17:28		17:04	
2	06:03	06:44-07:55/71	06:27	07:02-07:40/38	06:58	07:29		07:03	16:30-16:51/21	07:38	16:09-16:38/29
	21:08		20:49	19:53-20:12/19	20:06	19:13		17:27		17:04	
3	06:03	06:44-07:55/71	06:28	07:01-07:40/39	06:59	07:30		07:04	16:28-16:52/24	07:39	16:09-16:38/29
	21:08		20:48	19:52-20:13/21	20:04	19:11		17:26		17:03	
4	06:04	06:44-07:55/71	06:29	07:01-07:41/40	07:00	07:31		07:06	16:27-16:52/25	07:40	16:09-16:37/28
	21:08		20:47	19:51-20:14/23	20:02	19:10		17:24		17:03	
5	06:04	06:45-07:55/70	06:30	07:01-07:41/40	07:01	07:32		07:07	16:27-16:53/26	07:41	16:10-16:37/27
	21:08		20:46	19:50-20:15/25	20:01	19:08		17:23		17:03	
6	06:05	06:45-07:55/70	06:31	07:01-07:41/40	07:02	07:33		07:08	16:27-16:54/27	07:42	16:10-16:37/27
	21:08		20:44	19:49-20:15/26	19:57	19:06		17:22		17:03	
7	06:06	06:45-07:55/70	06:32	07:01-07:41/40	07:03	07:34		07:09	16:26-16:54/28	07:43	16:11-16:37/26
	21:07		20:43	19:48-20:16/28	19:56	19:05		17:21		17:03	
8	06:06	06:46-07:56/70	06:33	07:00-07:41/41	07:04	07:35		07:10	16:25-16:54/29	07:44	16:11-16:37/26
	21:07		20:42	19:48-20:16/28	19:54	19:03		17:20		17:03	
9	06:07	06:46-07:55/69	06:34	07:00-07:41/41	07:05	07:36		07:12	16:23-16:54/31	07:45	16:12-16:37/25
	21:07		20:41	19:47-20:16/29	19:52	19:02		17:19		17:03	
10	06:08	06:47-07:55/68	06:35	07:00-07:41/41	07:06	07:37		07:13	16:22-16:54/32	07:46	16:12-16:37/25
	21:06		20:40	19:47-20:16/29	19:51	19:00		17:18		17:03	
11	06:08	06:47-07:55/68	06:36	07:01-07:41/40	07:07	07:38		07:14	16:21-16:53/32	07:46	16:13-16:37/24
	21:06		20:38	19:47-20:14/27	19:49	18:58		17:17		17:03	
12	06:09	06:47-07:54/67	06:37	07:01-07:41/40	07:08	07:39	18:01-18:11/10	07:15	16:20-16:52/32	07:47	16:14-16:37/23
	21:06		20:37	19:46-20:13/27	19:47	18:57		17:16		17:03	
13	06:10	06:48-07:55/67	06:38	07:01-07:40/39	07:09	07:40	17:58-18:13/15	07:16	16:20-16:51/31	07:48	16:14-16:38/24
	21:05		20:36	19:46-20:12/26	19:45	18:55		17:15		17:03	
14	06:10	06:49-07:55/66	06:39	07:01-07:40/39	07:10	07:41	17:55-18:15/20	07:18	16:20-16:50/30	07:49	16:14-16:37/23
	21:05		20:34	19:46-20:11/25	19:44	18:54		17:14		17:03	
15	06:11	06:49-07:55/66	06:40	07:02-07:39/37	07:11	07:42	17:54-18:17/23	07:19	16:19-16:49/30	07:50	16:15-16:38/23
	21:04		20:33	19:47-20:09/22	19:42	18:52		17:13		17:03	
16	06:12	06:49-07:54/65	06:41	07:03-07:38/35	07:12	07:44	17:53-18:18/25	07:20	16:19-16:48/29	07:50	16:16-16:38/22
	21:03		20:31	19:47-20:08/21	19:40	18:50		17:12		17:04	
17	06:13	06:50-07:53/63	06:42	07:04-07:37/33	07:13	07:45	17:52-18:18/26	07:21	16:20-16:48/28	07:51	16:16-16:38/22
	21:03		20:30	19:46-20:06/20	19:39	18:49		17:12		17:04	
18	06:14	06:51-07:53/62	06:43	07:05-07:36/31	07:14	07:46	17:51-18:18/27	07:22	16:18-16:19/1	07:52	16:17-16:38/21
	21:02		20:29	19:47-20:04/17	19:37	18:47		17:11	16:20-16:47/27	17:04	
19	06:14	06:52-07:53/61	06:44	07:06-07:35/29	07:15	07:47	17:50-18:18/28	07:23	16:14-16:45/31	07:52	16:18-16:39/21
	21:01		20:27	19:48-20:03/15	19:35	18:46		17:10		17:05	
20	06:15	06:53-07:53/60	06:45	07:06-07:32/26	07:16	07:48	17:49-18:18/29	07:25	16:12-16:44/32	07:53	16:18-16:39/21
	21:01		20:26	19:49-20:02/13	19:34	18:44		17:09		17:05	
21	06:16	06:52-07:51/59	06:46	07:07-07:30/23	07:17	07:49	17:50-18:19/29	07:26	16:11-16:44/33	07:53	16:18-16:40/22
	21:00		20:24	19:51-20:00/9	19:32	18:43		17:09		17:06	
22	06:17	06:53-07:51/58	06:47	07:09-07:28/19	07:18	07:50	17:49-18:19/30	07:27	16:10-16:44/34	07:54	16:18-16:40/22
	20:59		20:23	19:54-19:59/5	19:30	18:42		17:08		17:06	
23	06:18	06:54-07:50/56	06:48	07:12-07:25/13	07:19	07:51	17:49-18:17/28	07:28	16:09-16:43/34	07:54	16:19-16:41/22
	20:59		20:21		19:28	18:40		17:07		17:07	
24	06:19	06:55-07:50/55	06:49		07:20	07:53	17:49-18:15/26	07:29	16:09-16:42/33	07:55	16:20-16:41/21
	20:58		20:20		19:27	18:39		17:07		17:07	
25	06:20	06:56-07:49/53	06:50		07:21	07:54	17:49-18:14/25	07:30	16:09-16:42/33	07:55	16:20-16:41/21
	20:57		20:18		19:25	18:37		17:06		17:08	
26	06:21	06:58-07:48/50	06:51		07:22	07:55	17:51-18:13/22	07:32	16:09-16:41/32	07:56	16:21-16:43/22
	20:56		20:17		19:23	18:36		17:06		17:08	
27	06:22	06:59-07:47/48	06:52		07:23	07:56	17:51-18:11/20	07:33	16:09-16:41/32	07:56	16:21-16:43/22
	20:55		20:15		19:22	18:35		17:05		17:09	
28	06:23	07:00-07:46/46	06:53		07:24	07:57	17:52-18:10/18	07:34	16:09-16:40/31	07:56	16:21-16:43/22
	20:54		20:14		19:20	18:33		17:05		17:10	
29	06:23	07:02-07:45/43	06:54		07:25	07:58	17:53-18:08/15	07:35	16:09-16:39/30	07:57	16:21-16:44/23
	20:53		20:12		19:18	18:32		17:04		17:10	
30	06:24	07:02-07:42/40	06:55		07:27	08:00	17:56-18:08/12	07:36	16:09-16:39/30	07:57	16:21-16:44/23
	20:52	19:58-20:07/9	20:10		19:16	18:31	17:35-17:46/11	17:04		17:11	
31	06:25	07:03-07:40/37	06:56			08:01	17:58-18:06/8			07:57	16:23-16:46/23
	20:51	19:56-20:10/14	20:09			18:29	17:32-17:48/16			17:12	
Potential sun hours	460		429		375	345		297		287	
Sum of minutes with flicker		1914		1272	0		463		887		738

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T47 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (466)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-10:28/128 17:13	07:44 08:36-10:12/96 17:48	07:07 17:34-18:00/26 18:22 07:34-07:53/19	07:16 19:56	06:31 20:27	06:02 06:26-07:07/41 20:57
2	07:57 08:20-10:28/128 17:14	07:43 09:29-10:10/41 17:49 08:36-09:26/50	07:06 17:33-18:00/27 18:23 07:30-07:55/25	07:15 19:57	06:29 20:28	06:01 06:25-07:08/43 20:58
3	07:58 08:20-10:29/129 17:15	07:42 09:30-10:09/39 17:50 08:37-09:26/49	07:04 17:34-18:00/26 18:24 07:28-07:58/30	07:13 19:58	06:28 20:29	06:01 06:25-07:09/44 20:59
4	07:58 08:20-10:29/129 17:16	07:41 09:33-10:06/33 17:52 08:38-09:25/47	07:03 17:34-17:59/25 18:25 07:26-07:59/33	07:11 07:30-07:35/5 19:59	06:27 20:30	06:00 06:24-07:08/44 20:59
5	07:58 08:20-10:29/129 17:17	07:40 09:35-10:04/29 17:53 08:39-09:25/46	07:01 17:34-17:57/23 18:27 07:24-08:00/36	07:10 07:29-07:38/9 20:00	06:25 20:31	06:00 06:24-07:09/45 21:00
6	07:58 08:20-10:30/130 17:18	07:38 09:39-10:00/21 17:54 08:40-09:24/44	07:00 17:36-17:57/21 18:28 07:23-08:02/39	07:08 07:27-07:38/11 20:00	06:24 20:32	06:00 06:24-07:10/46 21:01
7	07:57 08:20-10:30/130 17:19	07:37 09:44-09:54/10 17:55 08:40-09:22/42	06:58 17:36-17:54/18 18:29 07:21-08:02/41	07:06 07:26-07:40/14 20:02	06:23 20:33	06:00 06:23-07:10/47 21:01
8	07:57 08:19-10:29/130 17:20	07:36 08:42-09:21/39 17:57	07:56 18:39-18:53/14 19:30 08:20-09:04/44	07:05 07:24-07:40/16 20:03	06:22 20:35	05:59 06:23-07:10/47 21:02
9	07:57 08:19-10:30/131 17:21	07:35 08:43-09:20/37 17:58	07:55 18:42-18:49/7 19:31 08:19-09:04/45	07:03 07:22-07:39/17 20:04	06:21 20:36	05:59 06:23-07:11/48 21:03
10	07:57 08:19-10:30/131 17:22	07:34 08:45-09:18/33 17:59	07:53 08:18-09:04/46 19:32	07:02 07:21-07:40/19 20:05	06:20 20:37	05:59 06:24-07:12/48 21:03
11	07:57 08:19-10:30/131 17:23	07:33 08:47-09:17/30 18:00	07:51 08:18-09:05/47 19:33	07:00 07:19-07:39/20 20:06	06:18 20:38	05:59 06:24-07:12/48 21:04
12	07:57 08:18-10:30/132 17:24	07:31 08:48-09:14/26 18:02	07:50 08:17-09:05/48 19:34	06:58 07:17-07:38/21 20:07	06:17 20:39	05:59 06:24-07:12/48 21:04
13	07:56 08:18-10:30/132 17:25	07:30 08:52-09:11/19 18:03	07:48 08:16-09:05/49 19:36	06:57 07:16-07:38/22 20:08	06:16 20:40	05:59 06:24-07:13/49 21:05
14	07:56 08:17-10:29/132 17:26	07:29 08:57-09:07/10 18:04	07:47 08:16-09:05/49 19:37	06:55 07:14-07:37/23 20:09	06:15 20:41	05:58 06:24-07:13/49 21:05
15	07:55 08:17-10:30/133 17:27	07:27 18:05	07:45 08:15-09:05/50 19:38	06:54 07:14-07:37/23 20:10	06:14 20:42	05:58 06:24-07:13/49 21:06
16	07:55 08:17-10:29/132 17:28	07:26 18:06	07:43 08:14-09:04/50 19:39	06:52 07:14-07:35/21 20:11	06:13 20:43	05:58 06:24-07:14/50 21:06
17	07:55 08:18-10:29/131 17:29	07:25 18:08	07:42 08:15-09:04/49 19:40	06:51 07:15-07:34/19 20:12	06:12 20:44	05:59 06:24-07:14/50 21:06
18	07:54 08:18-10:28/130 17:31	07:23 18:09	07:40 08:14-09:03/49 19:41	06:49 07:16-07:33/17 20:13	06:11 20:45	05:59 06:24-07:14/50 21:07
19	07:54 08:19-10:29/130 17:32	07:22 18:10	07:38 08:14-09:02/48 19:42	06:48 07:18-07:31/13 20:14	06:11 20:46	05:59 06:24-07:14/50 21:07
20	07:53 08:19-10:28/129 17:33	07:21 17:45-17:49/4 18:11	07:37 08:15-09:02/47 19:43	06:46 07:19-07:28/9 20:15	06:10 20:47	05:59 06:24-07:14/50 21:07
21	07:52 08:19-10:27/128 17:34	07:19 17:41-17:50/9 18:13	07:35 08:15-09:01/46 19:44	06:45 20:16	06:09 06:39-06:53/14 20:48	05:59 06:24-07:14/50 21:08
22	07:52 08:21-10:27/126 17:35	07:18 17:39-17:51/12 18:14	07:33 08:15-09:00/45 19:45	06:43 20:18	06:08 06:37-06:55/18 20:48	05:59 06:25-07:15/50 21:08
23	07:51 08:21-10:26/125 17:37	07:16 17:38-17:53/15 18:15	07:31 08:16-08:59/43 19:47	06:42 20:19	06:07 06:34-06:57/23 20:49	05:59 06:25-07:15/50 21:08
24	07:50 08:22-10:25/123 17:38	07:15 17:36-17:53/17 18:16	07:30 08:16-08:58/42 19:48	06:40 20:20	06:07 06:34-06:59/25 20:50	06:00 06:25-07:15/50 21:08
25	07:50 08:23-10:23/120 17:39	07:13 17:35-17:55/20 18:17	07:28 08:16-08:56/40 19:49	06:39 20:21	06:06 06:32-07:00/28 20:51	06:00 06:26-07:16/50 21:08
26	07:49 08:25-10:23/118 17:40	07:12 17:34-17:56/22 18:18	07:26 08:17-08:54/37 19:50	06:37 20:22	06:05 06:31-07:01/30 20:52	06:00 06:26-07:16/50 21:09
27	07:48 08:26-10:21/115 17:42	07:10 17:34-17:58/24 18:20	07:25 08:19-08:53/34 19:51	06:36 20:23	06:04 06:30-07:03/33 20:53	06:01 06:26-07:16/50 21:09
28	07:47 08:28-10:20/112 17:43	07:09 17:33-17:59/26 18:21 07:40-07:46/6	07:23 08:20-08:51/31 19:52	06:35 20:24	06:04 06:29-07:03/34 20:54	06:01 06:27-07:16/49 21:09
29	07:46 08:31-10:18/107 17:44		07:21 08:21-08:48/27 19:53	06:33 20:25	06:03 06:28-07:05/37 20:55	06:02 06:27-07:16/49 21:09
30	07:45 08:33-10:16/103 17:45		07:20 08:24-08:46/22 19:54	06:32 20:26	06:03 06:27-07:05/38 20:55	06:02 06:28-07:17/49 21:09
31	07:45 08:34-10:13/99 17:46		07:18 08:27-08:41/14 19:55		06:02 06:27-07:06/39 20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	3883	896	1412	279	319	1443

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T47 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (466)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:09 06:28-07:16/48	06:27 20:50	06:58 20:07 07:18-07:38/20	07:28 19:15 07:56-08:45/49	07:02 17:28 08:13-08:48/35	07:37 17:04 08:01-10:12/131
2	06:03 21:09 06:29-07:17/48	06:28 20:49	06:59 20:06 07:19-07:38/19	07:29 19:13 07:56-08:44/48	07:03 17:27 08:13-08:50/37	07:38 17:04 08:02-10:13/131
3	06:03 21:08 06:28-07:16/48	06:29 20:48	07:00 20:04 07:20-07:37/17	07:30 19:12 07:56-08:43/47	07:05 17:26 08:11-08:51/40	07:39 17:03 08:03-10:14/131
4	06:04 21:08 06:29-07:17/48	06:30 20:47	07:01 20:02 07:21-07:37/16	07:31 19:10 07:56-08:42/46	07:06 17:25 09:13-09:25/12	07:40 17:03 08:04-10:14/130
5	06:05 21:08 06:29-07:16/47	06:30 20:46	07:02 20:01 07:22-07:36/14	07:32 19:08 18:17-18:28/11	07:07 17:23 09:08-09:31/23	07:41 17:03 08:05-10:15/130
6	06:05 21:08 06:30-07:16/46	06:31 20:45	07:03 19:58 07:23-07:34/11	07:33 19:07 18:14-18:30/16	07:08 17:22 09:05-09:34/29	07:42 17:03 08:06-10:16/130
7	06:06 21:08 06:30-07:16/46	06:32 20:43	07:04 19:56 07:24-07:33/9	07:34 19:05 18:12-18:32/20	07:09 17:21 09:02-09:37/35	07:43 17:03 08:07-10:16/129
8	06:06 21:07 06:31-07:16/45	06:33 20:42	07:05 19:54 07:25-07:31/6	07:35 19:03 18:10-18:32/22	07:11 17:20 09:00-09:39/39	07:44 17:03 08:08-10:17/129
9	06:07 21:07 06:32-07:16/44	06:34 20:41	07:06 19:52 07:26-07:27/1	07:36 19:02 18:09-18:33/24	07:12 17:19 08:59-09:41/42	07:45 17:03 08:09-10:17/128
10	06:08 21:07 06:32-07:15/43	06:35 20:40	07:07 19:51	07:37 19:00 18:08-18:33/25	07:13 17:18 08:07-08:57/50	07:46 17:03 08:09-10:18/129
11	06:08 21:06 06:33-07:15/42	06:36 20:38	07:08 19:49	07:38 18:59 08:01-08:33/32	07:14 17:17 08:06-08:57/51	07:47 17:03 08:10-10:18/128
12	06:09 21:06 06:35-07:15/40	06:37 20:37	07:09 19:47 08:20-08:32/12	07:39 18:57 18:07-18:33/26	07:15 17:16 08:03-08:27/22	07:47 17:03 08:11-10:19/128
13	06:10 21:05 06:35-07:14/39	06:38 20:36	07:10 19:46 08:16-08:36/20	07:40 18:55 18:07-18:33/26	07:17 17:15 08:03-09:50/107	07:48 17:03 08:12-10:20/128
14	06:11 21:05 06:36-07:14/38	06:39 20:34	07:11 19:44 08:13-08:39/26	07:42 18:54 08:10-08:24/14	07:18 17:14 18:07-18:31/24	07:49 17:03 08:13-10:21/128
15	06:11 21:04 06:38-07:13/35	06:40 20:33	07:12 19:42 08:10-08:41/31	07:43 18:52 18:07-18:30/23	07:19 17:13 08:00-09:52/112	07:50 17:04 08:13-10:20/127
16	06:12 21:04 06:39-07:13/34	06:41 20:32	07:12 19:41 08:08-08:42/34	07:44 18:51 18:07-18:28/21	07:20 17:13 07:58-09:54/116	07:50 17:04 08:14-10:21/127
17	06:13 21:03 06:40-07:11/31	06:42 20:30	07:13 19:39 08:06-08:43/37	07:45 18:49 18:07-18:26/19	07:21 17:12 07:58-09:56/118	07:51 17:04 08:15-10:22/127
18	06:14 21:02 06:41-07:10/29	06:43 20:29	07:14 19:37 08:04-08:43/39	07:46 18:48 18:08-18:25/17	07:22 17:11 07:57-09:57/120	07:52 17:05 08:15-10:22/127
19	06:15 21:02 06:42-07:10/28	06:44 20:27	07:16 19:35 08:02-08:44/42	07:47 18:46 18:09-18:23/14	07:24 17:10 07:56-09:59/123	07:52 17:05 08:16-10:23/127
20	06:16 21:01 06:44-07:08/24	06:45 20:26	07:17 19:34 08:01-08:45/44	07:48 18:45 18:11-18:22/11	07:25 17:09 07:56-10:00/124	07:53 17:05 08:16-10:23/127
21	06:16 21:00 06:46-07:07/21	06:47 20:24	07:18 19:32 08:00-08:45/45	07:49 18:43 18:13-18:20/7	07:26 17:09 07:56-10:02/126	07:54 17:06 08:17-10:24/127
22	06:17 20:59 06:48-07:05/17	06:48 20:23	07:19 19:30 07:59-08:45/46	07:51 18:42	07:27 17:08 07:55-10:03/128	07:54 17:06 08:17-10:24/127
23	06:18 20:59 06:51-07:01/10	06:49 20:21 07:24-07:33/9	07:20 19:29 07:58-08:46/48	07:52 18:40	07:28 17:08 07:55-10:04/129	07:55 17:07 08:18-10:25/127
24	06:19 20:58	06:50 20:20 07:21-07:35/14	07:21 19:27 07:58-08:46/48	07:53 18:39	07:29 17:07 07:56-10:05/130	07:55 17:07 08:18-10:25/127
25	06:20 20:57	06:51 20:18 07:18-07:36/18	07:22 19:25 07:57-08:46/49	07:54 18:37	07:31 17:06 07:56-10:06/130	07:55 17:08 08:19-10:25/126
26	06:21 20:56	06:52 20:17 07:17-07:36/19	07:23 19:23 07:56-08:46/50	07:55 18:36	07:32 17:06 07:56-10:07/131	07:56 17:09 08:19-10:26/127
27	06:22 20:55	06:53 20:15 07:16-07:37/21	07:24 19:22 07:56-08:45/49	07:56 18:35	07:33 17:05 07:56-10:08/132	07:56 17:09 08:19-10:26/127
28	06:23 20:54	06:54 20:14 07:15-07:37/22	07:25 19:20 07:55-08:45/50	07:57 18:33 09:24-09:37/13	07:34 17:05 07:56-10:09/133	07:56 17:10 08:19-10:26/127
29	06:24 20:53	06:55 20:12 07:15-07:38/23	07:26 19:18 07:55-08:45/50	07:59 18:32 09:21-09:42/21	07:35 17:05 07:57-10:09/132	07:57 17:11 08:20-10:27/127
30	06:25 20:52	06:56 20:11 07:16-07:38/22	07:27 19:17 07:56-08:45/49	08:00 18:31 09:18-09:44/26	07:36 17:04 08:00-10:11/131	07:57 17:11 08:20-10:28/128
31	06:26 20:51	06:57 20:09 07:17-07:38/21		08:01 18:30 09:15-09:46/31		07:57 17:12 08:20-10:28/128
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	851	169	882	908	3122	3970

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T48 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (467)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57 15:26-16:32/66 17:13	07:43 15:31-16:49/78 17:48	07:07 18:22	07:16 19:56	06:30 20:27	06:02 20:57	06:02 21:08	06:27 20:50	06:58 20:07	07:28 19:15	07:02 15:06-16:15/69 17:28	07:37 15:09-16:21/72 17:04
2	07:57 15:26-16:32/66 17:14	07:43 15:32-16:49/77 17:49	07:06 18:23	07:15 19:57	06:29 20:28	06:01 20:58	06:03 21:08	06:28 20:49	06:58 20:06	07:29 19:13	07:03 15:06-16:17/71 17:27	07:38 15:09-16:21/72 17:04
3	07:57 15:26-16:33/67 17:15	07:41 15:32-16:49/77 17:50	07:04 18:24	07:13 19:58	06:28 20:29	06:01 20:58	06:03 21:08	06:29 20:48	06:59 20:04	07:30 19:12	07:04 15:05-16:17/72 17:26	07:39 15:11-16:22/71 17:03
4	07:57 15:27-16:34/67 17:16	07:40 15:33-16:49/76 17:51	07:03 18:25	07:11 19:59	06:27 20:30	06:00 20:59	06:04 21:08	06:29 20:47	07:00 20:02	07:31 19:10	07:06 15:04-16:17/73 17:25	07:40 15:12-16:22/70 17:03
5	07:57 15:27-16:35/68 17:17	07:39 15:34-16:49/75 17:53	07:01 18:27	07:10 20:00	06:25 20:31	06:00 21:00	06:05 21:08	06:30 20:46	07:01 20:01	07:32 19:08	07:07 15:03-16:17/74 17:23	07:41 15:12-16:22/70 17:03
6	07:57 15:27-16:36/69 17:18	07:38 15:33-16:48/75 17:54	06:59 18:28	07:08 20:00	06:24 20:32	06:00 21:00	06:05 21:08	06:31 20:44	07:02 19:57	07:33 19:07	07:08 15:03-16:19/76 17:22	07:42 15:13-16:22/69 17:03
7	07:57 15:26-16:36/70 17:19	07:37 15:34-16:47/73 17:55	06:58 18:29	07:06 20:01	06:23 20:33	06:00 21:01	06:06 21:07	06:32 20:43	07:03 19:56	07:34 19:05	07:09 15:03-16:19/76 17:21	07:43 15:13-16:21/68 17:03
8	07:57 15:27-16:37/70 17:20	07:36 15:35-16:47/72 17:56	07:56 19:30	07:05 20:03	06:22 20:34	05:59 21:02	06:06 21:07	06:33 20:42	07:04 19:54	07:35 19:03	07:10 15:02-16:19/77 17:20	07:44 15:14-16:21/67 17:03
9	07:57 15:27-16:38/71 17:21	07:35 15:36-16:47/71 17:58	07:55 19:31	07:03 20:04	06:21 20:35	05:59 21:02	06:07 21:07	06:34 20:41	07:05 19:52	07:36 19:02	07:12 15:03-16:20/77 17:19	07:45 15:15-16:21/66 17:03
10	07:57 15:27-16:39/72 17:22	07:34 15:37-16:46/69 17:59	07:53 19:32	07:02 20:05	06:20 20:36	05:59 21:03	06:08 21:06	06:35 20:40	07:06 19:51	07:37 19:00	07:13 15:02-16:20/78 17:18	07:46 15:15-16:22/67 17:03
11	07:57 15:27-16:39/72 17:23	07:32 15:37-16:45/68 18:00	07:51 19:33	07:00 20:06	06:18 20:38	05:59 21:04	06:08 21:06	06:36 20:38	07:07 19:49	07:38 18:58	07:14 15:02-16:20/78 17:17	07:46 15:16-16:22/66 17:03
12	07:56 15:27-16:40/73 17:24	07:31 15:39-16:44/65 18:01	07:50 19:34	06:58 20:07	06:17 20:39	05:59 21:04	06:09 21:06	06:37 20:37	07:08 19:47	07:39 18:57	07:15 15:01-16:20/79 17:16	07:47 15:17-16:22/65 17:03
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14	07:56 15:27-16:41/74 17:26	07:29 15:42-16:43/61 18:04	07:46 19:37	06:55 20:09	06:15 20:41	05:58 21:05	06:11 21:05	06:39 20:34	07:10 19:44	07:41 18:54	07:18 15:02-16:21/79 17:14	07:49 15:18-16:22/64 17:03
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16	07:55 15:27-16:42/75 17:28	07:26 15:44-16:40/56 18:06	07:43 19:39	06:52 20:11	06:13 20:43	05:58 21:06	06:12 21:03	06:41 20:32	07:12 19:40	07:44 18:51	07:20 15:03-16:21/78 17:13	07:50 15:20-16:23/63 17:04
17	07:54 15:28-16:44/76 17:29	07:25 15:45-16:37/52 18:08	07:41 19:40	06:51 20:12	06:12 20:44	05:59 21:06	06:13 21:03	06:42 20:30	07:13 19:39	07:45 18:49	07:21 15:03-16:21/78 17:12	07:51 15:20-16:23/63 17:04
18	07:54 15:28-16:44/76 17:31	07:23 15:47-16:35/48 18:09	07:40 19:41	06:49 20:13	06:11 20:45	05:59 21:07	06:14 21:02	06:43 20:29	07:14 19:37	07:46 18:48	07:22 15:03-16:21/78 17:11	07:52 15:21-16:24/63 17:05
19	07:53 15:28-16:45/77 17:32	07:22 15:50-16:33/43 18:10	07:38 19:42	06:47 20:14	06:11 20:45	05:59 21:07	06:15 21:02	06:44 20:27	07:15 19:35	07:47 16:32-16:49/17 18:46	07:24 15:03-16:21/78 17:10	07:52 15:21-16:24/63 17:05
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21	07:52 15:28-16:45/77 17:34	07:19 15:55-16:25/30 18:12	07:35 19:44	06:44 20:16	06:09 20:47	05:59 21:08	06:16 21:00	06:46 20:24	07:17 19:32	07:49 16:24-16:57/33 18:43	07:26 15:04-16:21/77 17:09	07:53 15:22-16:25/63 17:06
22	07:52 15:29-16:47/78 17:35	07:18 15:58-16:21/23 18:14	07:33 19:45	06:43 20:17	06:08 20:48	05:59 21:08	06:17 20:59	06:47 20:23	07:18 19:30	07:50 16:21-17:01/40 18:42	07:27 15:04-16:21/77 17:08	07:54 15:22-16:25/63 17:06
23	07:51 15:29-16:47/78 17:37	07:16 16:03-16:17/14 18:15	07:31 19:46	06:42 20:19	06:07 20:49	05:59 21:08	06:18 20:59	06:48 20:21	07:19 19:28	07:52 16:19-17:04/45 18:40	07:28 15:04-16:21/77 17:08	07:54 15:23-16:26/63 17:07
24	07:50 15:29-16:47/78 17:38	07:15 18:16	07:30 19:48	06:40 20:20	06:07 20:50	06:00 21:08	06:19 20:58	06:49 20:20	07:20 19:27	07:53 16:16-17:06/50 18:39	07:29 15:05-16:21/76 17:07	07:55 15:23-16:26/63 17:07
25	07:50 15:29-16:47/78 17:39	07:13 18:17	07:28 19:49	06:39 20:21	06:06 20:51	06:00 21:08	06:20 20:57	06:50 20:18	07:21 19:25	07:54 16:15-17:08/53 18:37	07:30 15:06-16:22/76 17:06	07:55 15:23-16:26/63 17:08
26	07:49 15:29-16:47/78 17:40	07:12 18:18	07:26 19:50	06:37 20:22	06:05 20:52	06:00 21:08	06:21 20:56	06:51 20:17	07:23 19:23	07:55 16:13-17:10/57 18:36	07:32 15:06-16:22/76 17:06	07:56 15:25-16:28/63 17:09
27	07:48 15:30-16:49/79 17:41	07:10 18:20	07:25 19:51	06:36 20:23	06:04 20:53	06:01 21:08	06:22 20:55	06:52 20:15	07:24 19:22	07:56 16:12-17:11/59 18:35	07:33 15:07-16:21/74 17:05	07:56 15:25-16:28/63 17:09
28	07:47 15:30-16:49/79 17:43	07:09 18:21	07:23 19:52	06:34 20:24	06:04 20:54	06:01 21:09	06:23 20:54	06:53 20:14	07:25 19:20	07:57 16:10-17:12/62 18:33	07:34 15:07-16:21/74 17:05	07:56 15:25-16:28/63 17:10
29	07:46 15:30-16:49/79 17:44		07:21 19:53	06:33 20:25	06:03 20:54	06:02 21:09	06:24 20:53	06:54 20:12	07:26 19:18	07:59 16:09-17:13/64 18:32	07:35 15:08-16:21/73 17:05	07:57 15:25-16:29/64 17:11
30	07:45 15:30-16:49/79 17:45		07:20 19:54	06:32 20:26	06:03 20:55	06:02 21:09	06:25 20:52	06:55 20:10	07:27 19:17	08:00 16:08-17:14/66 18:31	07:36 15:08-16:21/73 17:04	07:57 15:26-16:30/64 17:11
31	07:44 15:31-16:49/78 17:46		07:18 19:55		06:02 20:56		06:26 20:51	06:56 20:09		08:01 16:07-17:15/68 18:29		07:57 15:26-16:31/65 17:12
Potential sun hours	297	297	370	399	448	452	459	428	375	345	297	287
Sum of minutes with flicker	2294	1363	0	0	0	0	0	0	0	640	2279	2028

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T49 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (468)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:24-16:15/51 17:13	07:43 16:49-17:20/31 17:48 08:21-08:53/32	07:07 07:48-09:07/79 18:22	07:16 07:57-09:36/99 19:56	06:30 07:16-08:59/103 20:27	06:02 06:51-08:18/87 20:57
2	07:57 15:25-16:16/51 17:14	07:42 16:50-17:21/31 17:49 08:19-08:55/36	07:06 07:47-09:06/79 18:23	07:15 07:55-09:35/100 19:57	06:29 07:14-08:59/105 20:28	06:01 06:51-08:18/87 20:57
3	07:57 15:26-16:16/50 17:15	07:41 16:50-17:21/31 17:50 08:17-08:57/40	07:04 07:46-09:05/79 18:24	07:13 07:54-09:35/101 19:58	06:28 07:12-08:58/106 20:29	06:01 06:50-08:18/88 20:58
4	07:57 15:27-16:16/49 17:16	07:40 16:50-17:21/31 17:51 08:16-08:59/43	07:02 07:46-09:04/78 18:25	07:11 07:52-09:34/102 19:59	06:27 07:09-08:57/108 20:30	06:00 06:51-08:18/87 20:59
5	07:57 15:28-16:16/48 17:17	07:39 16:50-17:19/29 17:53 08:14-08:59/45	07:01 07:46-09:03/77 18:26	07:10 07:52-09:34/102 20:00	06:25 07:07-08:56/109 20:31	06:00 06:51-08:19/88 21:00
6	07:57 15:29-16:15/46 17:18	07:38 16:51-17:19/28 17:54 08:13-09:01/48	06:59 07:46-09:02/76 18:28	07:08 07:50-09:33/103 20:00	06:24 07:06-08:55/109 20:32	06:00 06:52-08:20/88 21:00
7	07:57 15:31-16:15/44 17:19	07:37 16:52-17:19/27 17:55 08:12-09:02/50	06:58 07:43-09:00/77 18:29	07:06 07:49-09:32/103 20:01	06:23 07:04-08:55/111 20:33	05:59 06:51-08:19/88 21:01
8	07:57 15:33-16:16/43 17:20	07:36 16:53-17:18/25 17:56 08:11-09:04/53	07:56 08:40-09:58/78 19:30	07:05 07:48-09:31/103 20:02	06:22 07:03-08:54/111 20:34	05:59 06:51-08:19/88 21:02
9	07:57 15:36-16:16/40 17:21	07:35 16:54-17:18/24 17:58 08:10-09:05/55	07:54 08:38-09:57/79 19:31	07:03 07:47-09:30/103 20:03	06:21 07:02-08:53/111 20:35	05:59 06:51-08:20/89 21:02
10	07:57 15:41-16:16/35 17:22	07:34 16:55-17:16/21 17:59 08:09-09:06/57	07:53 08:35-09:55/80 19:32	07:01 07:46-09:28/102 20:05	06:19 07:01-08:52/111 20:36	05:59 06:52-08:20/88 21:03
11	07:57 15:45-16:15/30 17:23	07:32 16:57-17:14/17 18:00 08:08-09:06/58	07:51 08:33-09:52/79 19:33	07:00 07:45-09:28/103 20:06	06:18 07:00-08:51/111 20:37	05:59 06:52-08:21/89 21:03
12	07:56 15:47-16:15/28 17:24	07:31 16:59-17:13/14 18:01 08:07-09:07/60	07:50 08:32-09:51/79 19:34	06:58 07:44-09:26/102 20:07	06:17 06:59-08:50/111 20:38	05:58 06:52-08:21/89 21:04
13	07:56 15:48-16:14/26 17:25	07:30 17:04-17:08/4 18:03 08:07-09:08/61	07:48 08:30-09:50/80 19:35	06:57 07:44-09:26/102 20:08	06:16 06:58-08:49/111 20:39	05:58 06:52-08:21/89 21:04
14	07:56 16:55-17:00/5 17:26 15:49-16:13/24	07:29 08:06-09:08/62 18:04	07:46 08:28-09:49/81 19:37	06:55 07:43-09:24/101 20:09	06:15 06:57-08:48/111 20:40	05:58 06:53-08:21/88 21:05
15	07:55 16:54-17:02/8 17:27 15:52-16:13/21	07:27 08:04-09:09/65 18:05	07:45 08:27-09:48/81 19:38	06:54 07:43-09:23/100 20:10	06:14 06:57-08:47/110 20:41	05:58 06:53-08:22/89 21:05
16	07:55 16:52-17:02/10 17:28 15:53-16:11/18	07:26 08:02-09:10/68 18:06	07:43 08:25-09:47/82 19:39	06:52 07:42-09:21/99 20:11	06:13 06:56-08:46/110 20:42	05:58 06:53-08:22/89 21:06
17	07:54 16:52-17:04/12 17:29 15:57-16:09/12	07:25 08:00-09:09/69 18:08	07:41 08:23-09:45/82 19:40	06:50 07:42-09:20/98 20:12	06:12 06:55-08:45/110 20:43	05:58 06:53-08:22/89 21:06
18	07:54 16:51-17:05/14 17:31	07:23 07:59-09:10/71 18:09	07:40 08:23-09:44/81 19:41	06:49 07:41-09:18/97 20:13	06:11 06:54-08:44/110 20:44	05:58 06:53-08:22/89 21:07
19	07:53 16:50-17:06/16 17:32	07:22 07:57-09:10/73 18:10	07:38 08:21-09:43/82 19:42	06:47 07:41-09:17/96 20:14	06:10 06:54-08:43/109 20:45	05:59 06:53-08:22/89 21:07
20	07:53 16:50-17:08/18 17:33	07:20 07:56-09:10/74 18:11	07:36 08:20-09:41/81 19:43	06:46 07:41-09:15/94 20:15	06:10 06:53-08:41/108 20:46	05:59 06:53-08:22/89 21:07
21	07:52 16:50-17:09/19 17:34	07:19 07:55-09:10/75 18:12	07:35 08:20-09:40/80 19:44	06:44 07:41-09:14/93 20:16	06:09 06:53-08:41/108 20:47	05:59 06:53-08:22/89 21:07
22	07:52 16:49-17:10/21 17:35	07:18 07:53-09:10/77 18:14	07:33 08:19-09:39/80 19:45	06:43 07:40-09:11/91 20:17	06:08 06:53-08:39/106 20:48	05:59 06:54-08:23/89 21:08
23	07:51 16:50-17:12/22 17:36	07:16 07:53-09:10/77 18:15	07:31 08:17-09:38/81 19:46	06:41 07:40-09:10/90 20:18	06:07 06:52-08:38/106 20:49	05:59 06:54-08:23/89 21:08
24	07:50 16:49-17:13/24 17:38	07:15 07:51-09:09/78 18:16	07:30 08:17-09:39/82 19:47	06:40 07:40-09:07/87 20:19	06:06 06:53-08:37/104 20:50	06:00 06:54-08:23/89 21:08
25	07:49 16:49-17:14/25 17:39	07:13 07:51-09:09/78 18:17	07:28 08:14-09:39/85 19:48	06:39 07:40-09:05/85 20:21	06:06 06:52-08:36/104 20:51	06:00 06:54-08:23/89 21:08
26	07:49 16:49-17:15/26 17:40	07:12 07:49-09:08/79 18:18	07:26 08:11-09:38/87 19:50	06:37 07:40-09:03/83 20:22	06:05 06:51-08:34/103 20:52	06:00 06:55-08:24/89 21:08
27	07:48 16:49-17:16/27 17:41	07:10 07:49-09:08/79 18:19	07:25 08:08-09:39/91 19:51	06:36 07:40-09:02/82 20:23	06:04 06:52-08:33/101 20:53	06:01 06:55-08:24/89 21:08
28	07:47 16:50-17:18/28 17:43	07:09 07:48-09:07/79 18:21	07:23 08:05-09:38/93 19:52	06:34 07:40-09:01/81 20:24	06:04 06:51-08:31/100 20:53	06:01 06:56-08:24/88 21:08
29	07:46 16:49-17:19/30 17:44 08:30-08:43/13		07:21 08:03-09:38/95 19:53	06:33 07:25-09:01/96 20:25	06:03 06:52-08:29/97 20:54	06:01 06:55-08:24/89 21:08
30	07:45 16:49-17:20/31 17:45 08:26-08:47/21		07:20 08:01-09:38/97 19:54	06:32 07:20-09:00/100 20:26	06:03 06:51-08:26/95 20:55	06:02 06:55-08:24/89 21:08
31	07:44 16:49-17:20/31 17:46 08:23-08:50/27		07:18 07:59-09:37/98 19:55		06:02 06:51-08:24/93 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1044	2055	2559	2898	3302	2656

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T49 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (468)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:56-08:25/89 21:08	06:26 07:09-09:00/111 20:50	06:57 07:44-09:27/103 20:07	07:28 08:10-09:30/80 19:15	07:02 16:24-16:46/22 17:28 07:38-08:35/57	07:37 15:27-15:57/30 17:04
2	06:03 06:56-08:24/88 21:08	06:27 07:10-09:01/111 20:49	06:58 07:45-09:27/102 20:06	07:29 08:11-09:30/79 19:13	07:03 16:23-16:47/24 17:27 07:40-08:35/55	07:38 15:23-15:58/35 17:04
3	06:03 06:57-08:25/88 21:08	06:28 07:11-09:02/111 20:48	06:59 07:45-09:28/103 20:04	07:30 08:12-09:32/80 19:11	07:04 16:22-16:48/26 17:26 07:41-08:33/52	07:39 15:19-15:59/40 17:03
4	06:04 06:56-08:25/89 21:08	06:29 07:12-09:03/111 20:47	07:00 07:45-09:28/103 20:02	07:31 08:15-09:34/79 19:10	07:06 16:21-16:49/28 17:24 07:42-08:32/50	07:40 15:17-16:00/43 17:03
5	06:04 06:57-08:25/88 21:08	06:30 07:13-09:04/111 20:46	07:01 07:46-09:29/103 20:01	07:32 08:16-09:35/79 19:08	07:07 16:21-16:49/28 17:23 07:43-08:31/48	07:41 15:16-16:00/44 17:03
6	06:05 06:58-08:26/88 21:08	06:31 07:15-09:04/109 20:44	07:02 07:46-09:29/103 19:57	07:33 08:19-09:36/77 19:06	07:08 16:21-16:50/29 17:22 07:45-08:30/45	07:42 15:15-16:01/46 17:03
7	06:06 06:57-08:25/88 21:07	06:32 07:16-09:05/109 20:43	07:03 07:47-09:29/102 19:56	07:34 08:21-09:37/76 19:05	07:09 16:20-16:50/30 17:21 07:46-08:28/42	07:43 15:15-16:02/47 17:03
8	06:06 06:58-08:26/88 21:07	06:33 07:17-09:06/109 20:42	07:04 07:47-09:29/102 19:54	07:35 08:21-09:38/77 19:03	07:10 16:20-16:50/30 17:20 07:47-08:27/40	07:44 15:14-16:03/49 17:03
9	06:07 06:58-08:25/87 21:07	06:34 07:19-09:06/107 20:41	07:05 07:48-09:29/101 19:52	07:36 08:21-09:38/77 19:02	07:11 16:20-16:50/30 17:19 07:49-08:25/36	07:45 15:14-16:04/50 17:03
10	06:08 06:58-08:26/88 21:06	06:35 07:21-09:07/106 20:39	07:06 07:49-09:29/100 19:51	07:37 08:21-09:39/78 19:00	07:13 16:20-16:51/31 17:18 07:52-08:23/31	07:45 15:14-16:05/51 17:03
11	06:08 06:59-08:26/87 21:06	06:36 07:23-09:08/105 20:38	07:07 07:50-09:29/99 19:49	07:38 08:21-09:39/78 18:58	07:14 16:20-16:51/31 17:17 07:54-08:21/27	07:46 15:14-16:05/51 17:03
12	06:09 07:00-08:29/89 21:05	06:37 07:26-09:08/102 20:37	07:08 07:50-09:28/98 19:47	07:39 08:21-09:40/79 18:57	07:15 16:20-16:51/31 17:16 07:57-08:18/21	07:47 15:14-16:06/52 17:03
13	06:10 06:59-08:33/94 21:05	06:38 07:29-09:09/100 20:36	07:09 07:51-09:28/97 19:45	07:40 08:21-09:40/79 18:55	07:16 16:21-16:51/30 17:15 08:02-08:14/12	07:48 15:13-16:06/53 17:03
14	06:11 07:00-08:36/96 21:04	06:39 07:34-09:09/95 20:34	07:10 07:53-09:28/95 19:44	07:41 08:21-09:40/79 18:54	07:17 16:22-16:50/28 17:14	07:49 15:14-16:07/53 17:03
15	06:11 07:00-08:39/99 21:04	06:40 07:48-09:09/81 20:33	07:11 07:54-09:27/93 19:42	07:42 08:22-09:41/79 18:52	07:19 16:22-16:49/27 17:13	07:49 15:14-16:08/54 17:04
16	06:12 07:01-08:40/99 21:03	06:41 07:47-09:10/83 20:31	07:12 07:56-09:27/91 19:40	07:44 08:22-09:41/79 18:51	07:20 16:22-16:48/26 17:12	07:50 15:14-16:09/55 17:04
17	06:13 07:01-08:42/101 21:03	06:42 07:47-09:10/83 20:30	07:13 07:58-09:27/89 19:39	07:45 08:23-09:41/78 18:49	07:21 16:23-16:48/25 17:12	07:51 15:14-16:09/55 17:04
18	06:14 07:01-08:44/103 21:02	06:43 07:47-09:12/85 20:29	07:14 08:01-09:26/85 19:37	07:46 08:23-09:41/78 18:47	07:22 16:23-16:47/24 17:11	07:51 15:15-16:09/54 17:04
19	06:15 07:02-08:46/104 21:01	06:44 07:46-09:14/88 20:27	07:15 08:04-09:26/82 19:35	07:47 08:23-09:41/78 18:46	07:23 16:24-16:46/22 17:10	07:52 15:14-16:09/55 17:05
20	06:15 07:02-08:48/106 21:01	06:45 07:45-09:15/90 20:26	07:16 08:04-09:25/81 19:34	07:48 08:24-09:40/76 18:44	07:25 16:24-16:45/21 17:09	07:53 15:15-16:10/55 17:05
21	06:16 07:03-08:49/106 21:00	06:46 07:45-09:16/91 20:24	07:17 08:04-09:24/80 19:32	07:49 08:26-09:41/75 18:43	07:26 16:26-16:45/19 17:09	07:53 15:16-16:11/55 17:06
22	06:17 07:03-08:50/107 20:59	06:47 07:45-09:18/93 20:23	07:18 08:04-09:24/80 19:30	07:50 08:27-09:41/74 18:42	07:27 16:26-16:44/18 17:08	07:54 15:16-16:11/55 17:06
23	06:18 07:03-08:51/108 20:58	06:48 07:44-09:19/95 20:21	07:19 08:04-09:25/81 19:28	07:51 08:27-09:40/73 18:40	07:28 16:27-16:43/16 17:07	07:54 15:16-16:11/55 17:07
24	06:19 07:04-08:52/108 20:58	06:49 07:44-09:20/96 20:20	07:20 08:05-09:26/81 19:27	07:53 08:29-09:39/70 18:39	07:29 16:28-16:42/14 17:07	07:55 15:17-16:12/55 17:07
25	06:20 07:05-08:54/109 20:57	06:50 07:44-09:21/97 20:18	07:21 08:05-09:27/82 19:25	07:54 08:31-09:40/69 18:37	07:30 16:29-16:41/12 17:06 15:34-15:46/12	07:55 15:18-16:12/54 17:08
26	06:21 07:05-08:55/110 20:56	06:51 07:44-09:22/98 20:17	07:22 08:06-09:27/81 19:23	07:55 08:32-09:39/67 18:36	07:31 16:31-16:41/10 17:06 15:32-15:50/18	07:56 15:18-16:12/54 17:08
27	06:22 07:06-08:56/110 20:55	06:52 07:44-09:23/99 20:15	07:23 08:06-09:28/82 19:22	07:56 08:34-09:38/64 18:35	07:33 16:33-16:41/8 17:05 15:31-15:52/21	07:56 15:19-16:14/55 17:09
28	06:23 07:07-08:57/110 20:54	06:53 07:44-09:24/100 20:14	07:24 08:07-09:28/81 19:20	07:57 08:36-09:38/62 18:33	07:34 16:35-16:40/5 17:05 15:30-15:53/23	07:56 15:20-16:14/54 17:10
29	06:24 07:07-08:58/111 20:53	06:54 07:44-09:25/101 20:12	07:25 08:08-09:29/81 19:18	07:58 17:31-17:39/8 18:32 08:36-09:37/61	07:35 15:29-15:54/25 17:05	07:56 15:20-16:14/54 17:11
30	06:25 07:08-08:59/111 20:52	06:55 07:44-09:26/102 20:10	07:26 08:09-09:29/80 19:16	08:00 17:28-17:43/15 18:31 08:37-09:37/60	07:36 15:28-15:56/28 17:04	07:57 15:21-16:14/53 17:11
31	06:25 07:08-08:59/111 20:51	06:56 07:44-09:26/102 20:09		08:01 17:26-17:45/19 18:29 08:38-09:36/58		07:57 15:23-16:15/52 17:12
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	3060	3081	2741	2340	1288	1568

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T5 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (424)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:53-16:38/45 17:12	07:43 08:04-08:24/20 17:47 16:02-17:04/62	07:07 16:31-17:44/73 18:21 07:49-08:05/16	07:16 18:30-19:23/53 19:56 07:35-07:48/13	06:30 19:43-20:04/21 06:49-07:28/39 20:27 18:38-19:26/48	06:01 06:22-07:00/38 20:57
2	07:57 15:53-16:38/45 17:13	07:42 08:03-08:25/22 17:48 16:03-17:09/66	07:05 16:32-17:45/73 18:22 07:54-08:02/8	07:14 18:29-19:24/55 19:57 07:33-07:50/17	06:28 19:43-20:06/23 06:48-07:27/39 20:28 18:39-19:26/47	06:00 06:22-07:00/38 20:58
3	07:57 15:54-16:39/45 17:14	07:41 08:02-08:26/24 17:49 16:03-17:13/70	07:04 16:32-17:45/73 18:24	07:12 18:28-19:25/57 19:58 07:31-07:51/20	06:27 19:43-20:07/24 06:47-07:26/39 20:29 18:40-19:25/45	06:00 06:22-07:00/38 20:58
4	07:57 15:54-16:40/46 17:15	07:40 08:01-08:27/26 17:51 16:04-17:15/71	07:02 16:33-17:45/72 18:25	07:11 18:28-19:28/60 19:59 07:30-07:53/23	06:26 19:43-20:08/25 06:46-07:24/38 20:30 18:41-19:24/43	05:59 06:21-07:00/39 20:59
5	07:57 15:55-16:41/46 17:16	07:39 08:00-08:27/27 17:52 16:03-17:16/73	07:01 16:34-17:45/71 18:26	07:09 07:28-07:53/25 20:00 18:27-19:29/62	06:24 19:42-20:08/26 06:44-07:22/38 20:31 18:42-19:22/40	05:59 06:21-07:00/39 21:00
6	07:57 15:55-16:43/48 17:17	07:38 07:58-08:27/29 17:53 16:04-17:18/74	06:59 16:34-17:45/71 18:27	07:07 07:26-07:53/27 20:00 18:26-19:29/63	06:23 19:42-20:09/27 06:43-07:22/39 20:32 18:43-19:21/38	05:59 06:21-07:00/39 21:01
7	07:57 15:55-16:43/48 17:18	07:37 07:57-08:28/31 17:54 16:05-17:20/75	06:57 16:36-17:45/69 18:28	07:06 07:25-07:54/29 20:01 18:26-19:31/65	06:22 19:42-20:10/28 06:42-07:21/39 20:33 18:45-19:19/34	05:58 06:20-06:59/39 21:01
8	07:57 15:55-16:44/49 17:19	07:36 07:56-08:28/32 17:56 16:06-17:22/76	07:56 17:37-18:44/67 19:29	07:04 07:23-07:54/31 20:02 18:25-19:31/66	06:21 19:42-20:12/30 06:41-07:20/39 20:34 18:46-19:18/32	05:58 06:20-06:59/39 21:02
9	07:57 15:56-16:45/49 17:20	07:35 07:55-08:28/33 17:57 16:07-17:23/76	07:54 17:38-18:44/66 19:30	07:02 07:22-07:54/32 20:03 18:25-19:32/67	06:20 19:43-20:13/30 06:40-07:19/39 20:35 18:48-19:16/28	05:58 06:20-06:58/38 21:02
10	07:57 15:56-16:46/50 17:21	07:33 07:54-08:29/35 17:58 16:07-17:24/77	07:53 17:40-18:44/64 19:32	07:01 07:20-07:53/33 20:04 18:25-19:33/68	06:19 19:43-20:14/31 06:39-07:18/39 20:36 18:50-19:14/24	05:58 06:20-06:58/38 21:03
11	07:57 15:56-16:46/50 17:22	07:32 07:52-08:28/36 17:59 16:08-17:25/77	07:51 17:42-18:43/61 19:33	06:59 07:18-07:53/35 20:05 18:25-19:33/68	06:17 19:44-20:15/31 06:38-07:17/39 20:37 18:53-19:12/19	05:58 06:20-06:58/38 21:04
12	07:56 15:57-16:48/51 17:23	07:31 07:51-08:28/37 18:01 16:09-17:26/77	07:49 17:42-18:42/60 19:34	06:58 07:17-07:53/36 20:06 18:25-19:34/69	06:16 19:45-20:16/31 06:37-07:16/39 20:38 18:56-19:08/12	05:57 06:20-06:58/38 21:04
13	07:56 15:58-16:49/51 17:24	07:30 07:50-08:28/38 18:02 16:11-17:27/76	07:48 17:43-18:42/59 19:35	06:56 07:15-07:52/37 20:08 18:25-19:33/68	06:15 19:45-20:17/32 20:39 06:36-07:15/39	05:57 06:20-06:58/38 21:05
14	07:56 15:57-16:49/52 17:25	07:28 07:48-08:26/38 18:03 16:11-17:27/76	07:46 17:43-18:41/58 19:36	06:54 07:14-07:52/38 20:09 18:26-19:34/68	06:14 19:46-20:17/31 20:40 06:35-07:14/39	05:57 06:20-06:58/38 21:05
15	07:55 15:58-16:51/53 17:26	07:27 07:47-08:26/39 18:04 16:13-17:28/75	07:44 17:43-18:40/57 19:37	06:53 07:12-07:50/38 20:10 18:26-19:34/68	06:13 19:48-20:18/30 20:41 06:34-07:13/39	05:57 06:20-06:58/38 21:06
16	07:55 15:58-16:51/53 17:27	07:26 07:46-08:25/39 18:06 16:15-17:29/74	07:43 17:44-18:40/56 19:38	06:51 07:11-07:50/39 20:11 18:25-19:33/68	06:12 19:49-20:19/30 20:42 06:33-07:12/39	05:57 06:20-06:58/38 21:06
17	07:54 15:59-16:52/53 17:28	07:24 07:44-08:23/39 18:07 16:17-17:30/73	07:41 17:44-18:39/55 19:39	06:50 07:09-07:48/39 20:12 18:26-19:34/68	06:11 19:51-20:20/29 20:43 06:32-07:11/39	05:57 06:20-06:57/37 21:06
18	07:54 15:59-16:53/54 17:30	07:23 07:43-08:22/39 18:08 16:19-17:32/73	07:39 17:45-18:37/52 19:40	06:48 07:07-07:46/39 20:13 18:26-19:33/67	06:10 19:52-20:20/28 20:44 06:31-07:10/39	05:57 06:20-06:57/37 21:07
19	07:53 16:01-16:54/53 17:31	07:22 07:43-08:20/37 18:09 16:22-17:34/72	07:38 17:46-18:37/51 19:42	06:47 07:06-07:44/38 20:14 18:28-19:33/65	06:10 19:52-20:20/28 20:45 06:30-07:09/39	05:58 06:20-06:57/37 21:07
20	07:53 16:01-16:54/53 17:32	07:20 07:43-08:20/37 18:11 16:27-17:36/69	07:36 17:47-18:35/48 19:43	06:45 07:05-07:43/38 20:15 18:28-19:33/65	06:09 19:54-20:21/27 20:46 06:31-07:09/38	05:58 06:20-06:57/37 21:07
21	07:52 16:01-16:55/54 17:33	07:19 16:31-17:38/67 18:12 07:43-08:19/36	07:34 17:48-18:33/45 19:44	06:44 07:03-07:42/39 20:16 18:29-19:33/64	06:08 19:55-20:20/25 20:47 06:30-07:08/38	05:58 06:20-06:57/37 21:08
22	07:52 16:01-16:56/55 17:34	07:17 16:30-17:39/69 18:13 07:43-08:16/33	07:33 17:50-18:32/42 19:45 18:50-19:09/19	06:42 07:02-07:41/39 20:17 18:30-19:33/63	06:07 19:56-20:20/24 20:48 06:30-07:07/37	05:58 06:21-06:58/37 21:08
23	07:51 16:01-16:56/55 17:36	07:16 16:30-17:40/70 18:14 07:44-08:15/31	07:31 17:51-18:30/39 19:46 18:46-19:13/27	06:41 07:00-07:39/39 20:18 18:31-19:32/61	06:06 19:57-20:19/22 20:49 06:30-07:05/35	05:58 06:21-06:58/37 21:08
24	07:50 16:01-16:57/56 17:37	07:14 16:30-17:41/71 18:15 07:44-08:13/29	07:29 17:53-18:27/34 19:47 18:43-19:15/32	06:39 06:59-07:38/39 20:19 18:33-19:32/59	06:05 20:00-20:19/19 20:50 06:31-07:06/35	05:59 06:21-06:58/37 21:08
25	07:49 16:01-16:57/56 17:38	07:13 16:30-17:42/72 18:17 07:45-08:13/28	07:27 17:55-18:24/29 19:48 18:40-19:16/36	06:38 06:57-07:36/39 19:52-19:58/6 20:20 18:33-19:31/58	06:05 20:00-20:18/18 20:51 06:31-07:05/34	05:59 06:22-06:59/37 21:08
26	07:49 16:01-16:57/56 17:39	07:11 16:30-17:43/73 18:18 07:45-08:11/26	07:26 17:58-18:21/23 19:49 18:38-19:18/40	06:36 06:56-07:35/39 19:50-20:00/10 20:21 18:35-19:31/56	06:04 20:01-20:17/16 20:52 06:31-07:04/33	05:59 06:22-07:00/38 21:08
27	07:48 16:02-16:58/56 17:41	07:10 16:30-17:43/73 18:19 07:47-08:10/23	07:24 18:03-18:16/13 19:50 18:36-19:19/43	06:35 18:36-19:30/54 19:48-20:01/13 20:23 06:55-07:34/39	06:03 20:02-20:17/15 20:53 06:28-07:04/36	06:00 06:22-07:00/38 21:09
28	07:47 08:08-08:17/9 17:42 16:02-16:59/57	07:08 16:31-17:44/73 18:20 07:48-08:08/20	07:22 18:34-19:20/46 19:51	06:34 18:36-19:29/53 19:46-20:01/15 20:24 06:53-07:31/38	06:03 20:03-20:16/13 20:54 06:26-07:03/37	06:00 06:23-07:01/38 21:09
29	07:46 08:07-08:19/12 17:43 16:02-16:59/57		07:21 18:34-19:22/48 19:52	06:32 18:37-19:28/51 19:45-20:03/18 20:25 06:52-07:31/39	06:02 20:05-20:15/10 20:54 06:25-07:02/37	06:00 06:23-07:01/38 21:09
30	07:45 08:06-08:21/15 17:44 16:02-16:59/57		07:19 18:32-19:22/50 19:54	06:31 18:38-19:28/50 19:45-20:04/19 20:26 06:51-07:30/39	06:02 20:06-20:13/7 20:55 06:23-07:01/38	06:01 06:24-07:02/38 21:09
31	07:44 08:05-08:23/18 17:46 16:02-16:59/57		07:17 18:30-19:22/52 19:55 07:37-07:44/7		06:01 06:23-07:01/38 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1664	2914	1905	2956	2316	1136

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T5 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (424)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:01 06:24-07:02/38 21:09	06:26 19:55-20:26/31 06:48-07:27/39 20:50 19:05-19:21/16	06:57 07:17-07:52/35 20:07 18:24-19:32/68	07:27 17:22-18:22/60 19:14	07:02 07:23-07:57/34 17:27 15:36-16:53/77	07:37 15:38-16:29/51 17:03
2	06:02 06:24-07:02/38 21:08	06:27 19:53-20:24/31 06:49-07:28/39 20:49 19:01-19:23/22	06:58 07:18-07:51/33 20:05 18:23-19:31/68	07:28 17:21-18:22/61 19:13	07:03 07:25-07:58/33 17:26 15:35-16:52/77	07:38 15:39-16:29/50 17:03
3	06:02 06:25-07:03/38 21:08	06:28 19:53-20:23/30 06:50-07:29/39 20:48 18:59-19:25/26	06:59 07:19-07:51/32 20:04 18:23-19:30/67	07:29 17:19-18:22/63 19:11	07:04 07:26-07:58/32 17:25 15:35-16:51/76	07:39 15:40-16:29/49 17:02
4	06:03 06:26-07:05/39 21:08	06:29 19:52-20:22/30 06:50-07:29/39 20:47 18:57-19:27/30	07:00 07:20-07:51/31 20:02 18:22-19:28/66	07:30 17:16-18:21/65 19:09	07:05 07:27-07:57/30 17:24 15:35-16:50/75	07:40 15:40-16:29/49 17:02
5	06:03 06:26-07:05/39 21:08	06:30 19:52-20:21/29 06:51-07:30/39 20:46 18:55-19:28/33	07:01 07:21-07:50/29 20:00 18:22-19:27/65	07:31 17:14-18:21/67 19:08	07:07 07:28-07:57/29 17:23 15:34-16:48/74	07:41 15:41-16:29/48 17:02
6	06:04 06:27-07:06/39 21:08	06:31 19:52-20:20/28 06:52-07:31/39 20:44 18:54-19:30/36	07:02 07:22-07:49/27 19:57 18:22-19:26/64	07:32 17:12-18:21/69 19:06	07:08 07:30-07:57/27 17:21 15:34-16:47/73	07:42 15:41-16:29/48 17:02
7	06:05 06:27-07:06/39 21:07	06:32 19:51-20:19/28 06:53-07:32/39 20:43 18:52-19:31/39	07:03 07:23-07:48/25 19:55 18:22-19:24/62	07:34 17:10-18:20/70 19:04	07:09 07:31-07:57/26 17:20 15:34-16:45/71	07:43 15:42-16:29/47 17:02
8	06:05 06:28-07:07/39 21:07	06:33 19:51-20:17/26 06:54-07:32/38 20:42 18:51-19:32/41	07:04 18:22-19:22/60 19:54 07:24-07:47/23	07:35 17:10-18:21/71 19:03	07:10 07:32-07:56/24 17:19 15:33-16:42/69	07:44 15:41-16:27/46 17:02
9	06:06 06:29-07:07/38 21:07	06:34 19:51-20:16/25 06:55-07:33/38 20:41 18:50-19:33/43	07:05 18:22-19:20/58 19:52 07:25-07:45/20	07:36 17:08-18:20/72 19:01	07:11 07:34-07:56/22 17:18 15:33-16:39/66	07:45 15:42-16:27/45 17:02
10	06:07 06:29-07:07/38 21:06	06:35 19:51-20:15/24 06:56-07:35/39 20:39 18:49-19:34/45	07:06 18:22-19:17/55 19:50 07:26-07:43/17	07:37 17:07-18:20/73 18:59	07:13 07:35-07:55/20 17:17 15:33-16:35/62	07:46 15:42-16:28/46 17:02
11	06:07 06:30-07:08/38 21:06	06:36 19:52-20:14/22 06:57-07:36/39 20:38 18:48-19:35/47	07:07 18:22-19:16/54 19:49 07:27-07:41/14	07:38 17:06-18:19/73 18:58	07:14 07:36-07:53/17 17:16 15:33-16:30/57	07:46 15:43-16:28/45 17:02
12	06:08 06:31-07:09/38 21:06	06:37 19:52-20:13/21 06:58-07:37/39 20:37 18:47-19:35/48	07:08 18:23-19:15/52 19:47 07:28-07:37/9	07:39 17:05-18:18/73 18:56 08:25-08:37/12	07:15 07:37-07:52/15 17:15 15:33-16:30/57	07:47 15:44-16:28/44 17:02
13	06:09 20:15-20:20/5 21:05 06:31-07:09/38	06:38 18:46-19:36/50 19:52-20:11/19 20:35 06:59-07:38/39	07:09 18:23-19:13/50 19:45	07:40 17:04-18:17/73 18:55 08:22-08:39/17	07:16 07:39-07:51/12 17:14 15:34-16:31/57	07:48 15:45-16:29/44 17:02
14	06:10 20:14-20:23/9 21:05 06:32-07:10/38	06:39 18:45-19:36/51 19:53-20:10/17 20:34 07:00-07:39/39	07:10 18:24-19:12/48 19:43	07:41 17:03-18:16/73 18:53 08:20-08:41/21	07:17 07:40-07:49/9 17:13 15:34-16:31/57	07:49 15:44-16:28/44 17:02
15	06:10 20:13-20:24/11 21:04 06:34-07:12/38	06:40 18:44-19:37/53 19:54-20:09/15 20:33 07:01-07:39/38	07:11 18:24-19:11/47 19:42	07:42 17:02-18:15/73 18:51 08:18-08:42/24	07:19 15:34-16:30/56 17:12	07:50 15:45-16:29/44 17:03
16	06:11 20:12-20:26/14 21:03 06:36-07:13/37	06:41 07:02-07:41/39 19:55-20:07/12 20:31 18:43-19:37/54	07:12 17:53-18:04/11 19:40 18:25-19:09/44	07:43 17:03-18:15/72 18:50 08:17-08:44/27	07:20 15:34-16:30/56 17:12	07:50 15:46-16:30/44 17:03
17	06:12 20:10-20:26/16 21:03 06:39-07:13/34	06:42 07:03-07:42/39 19:57-20:06/9 20:30 18:42-19:37/55	07:13 17:47-18:09/22 19:38 18:26-19:07/41	07:44 17:02-18:14/72 18:48 08:16-08:44/28	07:21 15:35-16:31/56 17:11	07:51 15:46-16:29/43 17:03
18	06:13 20:10-20:27/17 21:02 06:40-07:14/34	06:43 07:04-07:43/39 20:00-20:05/5 20:28 18:40-19:38/58	07:14 17:44-18:12/28 19:37 18:28-19:05/37	07:46 17:01-18:12/71 18:47 08:15-08:45/30	07:22 15:35-16:31/56 17:10	07:52 15:47-16:30/43 17:03
19	06:14 20:09-20:28/19 21:02 06:40-07:15/35	06:44 07:05-07:44/39 20:27 18:38-19:38/60	07:15 17:41-18:14/33 19:35 18:29-19:03/34	07:47 17:01-18:11/70 18:45 08:14-08:46/32	07:23 15:35-16:30/55 17:09	07:52 15:48-16:31/43 17:04
20	06:15 20:08-20:29/21 21:01 06:41-07:15/34	06:45 07:06-07:45/39 20:26 18:37-19:38/61	07:16 17:38-18:15/37 19:33 18:32-19:00/28	07:48 17:01-18:09/68 18:44 08:13-08:48/35	07:25 15:36-16:31/55 17:08	07:53 15:48-16:31/43 17:04
21	06:15 20:07-20:30/23 21:00 06:41-07:16/35	06:46 07:07-07:46/39 20:24 18:35-19:38/63	07:17 17:36-18:17/41 19:31 18:35-18:56/21	07:49 17:00-18:07/67 18:42 08:14-08:50/36	07:26 15:37-16:31/54 17:08	07:53 15:49-16:32/43 17:05
22	06:16 20:05-20:29/24 20:59 06:41-07:18/37	06:47 07:08-07:46/38 20:23 18:34-19:38/64	07:18 17:34-18:18/44 19:30 18:40-18:50/10	07:50 08:13-08:50/37 18:41 16:56-18:06/70	07:27 15:37-16:30/53 17:07	07:54 15:49-16:32/43 17:05
23	06:17 20:04-20:30/26 20:59 06:40-07:18/38	06:48 07:09-07:47/38 20:21 18:32-19:38/66	07:19 17:32-18:19/47 19:28	07:51 08:13-08:51/38 18:39 16:52-18:04/72	07:28 15:37-16:30/53 17:07	07:54 15:50-16:33/43 17:06
24	06:18 20:03-20:30/27 20:58 06:40-07:19/39	06:49 07:10-07:48/38 20:20 18:31-19:37/66	07:20 17:30-18:20/50 19:26	07:52 08:13-08:52/39 18:38 16:48-18:01/73	07:29 15:37-16:30/53 17:06	07:55 15:50-16:33/43 17:06
25	06:19 20:03-20:31/28 20:57 06:41-07:20/39	06:50 07:11-07:50/39 20:18 18:30-19:37/67	07:21 17:29-18:20/51 19:25	07:54 08:14-08:53/39 18:37 16:46-17:59/73	07:30 15:37-16:30/53 17:05	07:55 15:50-16:33/43 17:07
26	06:20 20:02-20:31/29 20:56 06:42-07:21/39	06:51 07:12-07:51/39 20:16 18:29-19:37/68	07:22 17:27-18:21/54 19:23	07:55 08:16-08:55/39 18:35 16:45-17:59/74	07:32 15:37-16:30/53 17:05	07:56 15:51-16:34/43 17:08
27	06:21 20:01-20:30/29 20:55 06:43-07:22/39	06:52 07:13-07:52/39 20:15 18:28-19:36/68	07:23 17:26-18:21/55 19:21	07:56 08:17-08:56/39 18:34 16:43-17:58/75	07:33 15:37-16:30/53 17:04	07:56 15:51-16:35/44 17:08
28	06:22 19:59-20:29/30 20:54 06:44-07:23/39	06:53 07:14-07:52/38 20:13 18:27-19:36/69	07:24 17:25-18:22/57 19:19	07:57 08:18-08:56/38 18:33 16:41-17:57/76	07:34 15:38-16:29/51 17:04	07:56 15:51-16:35/44 17:09
29	06:23 19:58-20:29/31 20:53 06:45-07:24/39	06:54 07:15-07:53/38 20:12 18:26-19:34/68	07:25 17:24-18:22/58 19:18	07:58 08:19-08:56/37 18:31 16:39-17:56/77	07:35 15:38-16:29/51 17:04	07:57 15:51-16:35/44 17:10
30	06:24 19:57-20:28/31 20:52 06:46-07:25/39	06:55 07:16-07:53/37 20:10 18:25-19:33/68	07:26 17:23-18:22/59 19:16	07:59 08:21-08:58/37 18:30 16:39-17:56/77	07:36 15:38-16:29/51 17:03	07:57 15:52-16:37/45 17:10
31	06:25 19:56-20:27/31 06:47-07:26/39 20:51 19:11-19:15/4	06:56 07:16-07:52/36 20:09 18:24-19:33/69		08:01 08:22-08:58/36 18:29 16:38-17:54/76		07:57 15:53-16:37/44 17:11
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1596	3202	2041	2840	2137	1395

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T50 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (469)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57	07:44	07:07	07:16	06:31	06:02	06:02	06:27	06:58 19:32-19:44/12	07:28 18:28-18:52/24	07:02	07:37
	17:13	17:48	18:22	19:56	20:27	20:57	21:08	20:50	20:07	19:15	17:28	17:04
2	07:57	07:43	07:06	07:15	06:29	06:01	06:03	06:28	06:59 19:33-19:42/9	07:29 18:28-18:51/23	07:03	07:38
	17:14	17:49	18:23	19:57	20:28	20:58	21:08	20:49	20:06	19:13	17:27	17:04
3	07:57	07:42	07:04	07:13	06:28	06:01	06:04	06:29	07:00 19:35-19:41/6	07:30 18:29-18:50/21	07:04	07:39
	17:15	17:50	18:24	19:58	20:29	20:58	21:08	20:48	20:04	19:12	17:26	17:04
4	07:57	07:40	07:03	07:11	06:27	06:01	06:04	06:30	07:01	07:31 18:29-18:48/19	07:06	07:40
	17:16	17:52	18:25	19:59	20:30	20:59	21:08	20:47	20:02	19:10	17:25	17:03
5	07:57	07:39	07:01	07:10	06:25	06:00	06:05	06:31	07:02	07:32 18:30-18:46/16	07:07	07:41
	17:17	17:53	18:27	20:00	20:31	21:00	21:08	20:46	20:01	19:08	17:23	17:03
6	07:57	07:38	06:59 17:58-18:06/8	07:08	06:24	06:00	06:05	06:32	07:03	07:33 18:31-18:45/14	07:08	07:42
	17:18	17:54	18:28	20:00	20:32	21:01	21:08	20:45	19:57	19:07	17:22	17:03
7	07:57	07:37	06:58 17:55-18:07/12	07:06	06:23	06:00	06:06	06:33	07:04	07:34 18:33-18:43/10	07:09	07:43
	17:19	17:55	18:29	20:01	20:33	21:01	21:07	20:43	19:56	19:05	17:21	17:03
8	07:57	07:36	07:56 18:53-19:08/15	07:05	06:22	05:59	06:06	06:33	07:05	07:35 18:36-18:41/5	07:10	07:44
	17:20	17:57	19:30	20:03	20:34	21:02	21:07	20:42	19:54	19:03	17:20	17:03
9	07:57	07:35	07:55 18:52-19:10/18	07:03 19:37-19:43/6	06:21	05:59	06:07	06:34	07:06	07:36	07:12	07:45
	17:21	17:58	19:31	20:04	20:35	21:02	21:07	20:41	19:52	19:02	17:19	17:03
10	07:57	07:34	07:53 18:51-19:11/20	07:02 19:35-19:44/9	06:20	05:59	06:08	06:35	07:07	07:37	07:13	07:46
	17:22	17:59	19:32	20:05	20:37	21:03	21:06	20:40	19:51	19:00	17:18	17:03
11	07:57	07:33	07:51 18:51-19:12/21	07:00 19:33-19:45/12	06:18	05:59	06:09	06:36	07:08	07:38	07:14	07:47
	17:23	18:00	19:33	20:06	20:38	21:04	21:06	20:38	19:49	18:59	17:17	17:03
12	07:56	07:31	07:50 18:50-19:13/23	06:58 19:31-19:45/14	06:17	05:59	06:09	06:37	07:09	07:39	07:15	07:47
	17:24	18:02	19:34	20:07	20:39	21:04	21:06	20:37	19:47	18:57	17:16	17:03
13	07:56	07:30	07:48 18:49-19:14/25	06:57 19:30-19:47/17	06:16	05:59	06:10	06:38	07:09	07:40	07:16	07:48
	17:25	18:03	19:36	20:08	20:40	21:05	21:05	20:36	19:46	18:55	17:15	17:03
14	07:56	07:29	07:46 18:49-19:15/26	06:55 19:29-19:48/19	06:15	05:59	06:11	06:39	07:10	07:42	07:18	07:49
	17:26	18:04	19:37	20:09	20:41	21:05	21:05	20:34	19:44	18:54	17:14	17:03
15	07:55	07:27	07:45 18:49-19:14/25	06:54 19:29-19:49/20	06:14	05:58	06:12	06:40	07:11	07:43	07:19	07:50
	17:27	18:05	19:38	20:10	20:42	21:06	21:04	20:33	19:42	18:52	17:13	17:04
16	07:55	07:26	07:43 18:49-19:13/24	06:52 19:28-19:50/22	06:13	05:59	06:12	06:41	07:12	07:44	07:20	07:50
	17:28	18:06	19:39	20:11	20:43	21:06	21:03	20:32	19:41	18:51	17:13	17:04
17	07:54	07:25	07:41 18:50-19:13/23	06:51 19:28-19:51/23	06:12	05:59	06:13	06:43	07:13	07:45	07:21	07:51
	17:30	18:08	19:40	20:12	20:44	21:06	21:03	20:30	19:39	18:49	17:12	17:04
18	07:54	07:23	07:40 18:50-19:12/22	06:49 19:28-19:51/23	06:11	05:59	06:14	06:44 19:42-19:48/6	07:14	07:46	07:22	07:52
	17:31	18:09	19:41	20:13	20:45	21:07	21:02	20:29	19:37	18:48	17:11	17:05
19	07:53	07:22	07:38 18:51-19:10/19	06:48 19:29-19:51/22	06:11	05:59	06:15	06:45 19:39-19:51/12	07:15	07:47	07:24	07:52
	17:32	18:10	19:42	20:14	20:45	21:07	21:02	20:27	19:35	18:46	17:10	17:05
20	07:53	07:21	07:36 18:52-19:07/15	06:46 19:28-19:50/22	06:10	05:59	06:16	06:46 19:37-19:52/15	07:16	07:48	07:25	07:53
	17:33	18:11	19:43	20:15	20:46	21:07	21:01	20:26	19:34	18:45	17:10	17:05
21	07:52	07:19	07:35 18:55-19:05/10	06:45 19:29-19:49/20	06:09	05:59	06:16	06:47 19:35-19:54/19	07:17	07:49	07:26	07:53
	17:34	18:13	19:44	20:16	20:47	21:08	21:00	20:24	19:32	18:43	17:09	17:06
22	07:52	07:18	07:33	06:43 19:30-19:48/18	06:08	05:59	06:17	06:48 19:33-19:53/20	07:18 18:40-18:49/9	07:50	07:27	07:54
	17:35	18:14	19:45	20:17	20:48	21:08	20:59	20:23	19:30	18:42	17:08	17:06
23	07:51	07:16	07:31	06:42 19:31-19:46/15	06:07	06:00	06:18	06:49 19:32-19:54/22	07:20 18:37-18:51/14	07:52	07:28	07:54
	17:37	18:15	19:46	20:19	20:49	21:08	20:59	20:21	19:29	18:40	17:08	17:07
24	07:50	07:15	07:30	06:40 19:33-19:44/11	06:07	06:00	06:19	06:50 19:31-19:54/23	07:21 18:35-18:53/18	07:53	07:29	07:55
	17:38	18:16	19:48	20:20	20:50	21:08	20:58	20:20	19:27	18:39	17:07	17:07
25	07:50	07:13	07:28	06:39 19:37-19:39/2	06:06	06:00	06:20	06:51 19:31-19:54/23	07:22 18:33-18:54/21	07:54	07:30	07:55
	17:39	18:17	19:49	20:21	20:51	21:08	20:57	20:18	19:25	18:37	17:06	17:08
26	07:49	07:12	07:26	06:37	06:05	06:00	06:21	06:52 19:30-19:53/23	07:23 18:31-18:54/23	07:55	07:32	07:56
	17:40	18:18	19:50	20:22	20:52	21:08	20:56	20:17	19:23	18:36	17:06	17:09
27	07:48	07:10	07:25	06:36	06:05	06:01	06:22	06:53 19:30-19:51/21	07:24 18:30-18:55/25	07:56	07:33	07:56
	17:42	18:20	19:51	20:23	20:53	21:09	20:55	20:15	19:22	18:35	17:06	17:09
28	07:47	07:09	07:23	06:35	06:04	06:01	06:23	06:54 19:30-19:50/20	07:25 18:30-18:55/25	07:57	07:34	07:56
	17:43	18:21	19:52	20:24	20:54	21:09	20:54	20:14	19:20	18:33	17:05	17:10
29	07:46		07:21	06:33	06:03	06:02	06:24	06:55 19:30-19:48/18	07:26 18:29-18:55/26	07:59	07:35	07:57
	17:44		19:53	20:25	20:54	21:09	20:53	20:12	19:18	18:32	17:05	17:11
30	07:45		07:20	06:32	06:03	06:02	06:25	06:56 19:30-19:47/17	07:27 18:28-18:54/26	08:00	07:36	07:57
	17:45		19:54	20:26	20:55	21:09	20:52	20:11	19:17	18:31	17:04	17:11
31	07:44		07:18		06:02		06:26	06:57 19:31-19:45/14		08:01		07:57
	17:47		19:55		20:56		20:51	20:09		18:30		17:12
Potential sun hours	297	297	370	399	448	452	459	428	375	345	297	287
Sum of minutes with flicker	0	0	306	275	0	0	0	253	214	132	0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T51 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (470)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:23-16:24/61 17:13	07:43 15:41-16:27/46 17:48	07:07 18:22	07:16 18:45-19:23/38 19:56 07:35-07:44/9	06:30 18:36-19:21/45 20:27	06:02 06:23-06:51/28 20:57 20:13-20:32/19
2	07:57 15:23-16:24/61 17:14	07:42 15:43-16:26/43 17:49	07:06 18:23	07:15 18:44-19:25/41 19:57 07:34-07:47/13	06:29 18:37-19:20/43 20:28	06:01 06:23-06:51/28 20:58 20:13-20:33/20
3	07:57 15:23-16:25/62 17:15	07:41 15:44-16:25/41 17:50	07:04 18:24	07:13 18:42-19:26/44 19:58 07:32-07:48/16	06:28 18:38-19:19/41 20:29	06:01 06:23-06:51/28 20:58 20:14-20:34/20
4	07:57 15:24-16:25/61 17:16	07:40 15:46-16:24/38 17:51	07:03 18:25	07:11 18:40-19:27/47 19:59 07:30-07:48/18	06:27 18:39-19:16/37 20:30	06:00 06:22-06:51/29 20:59 20:13-20:34/21
5	07:57 15:24-16:26/62 17:17	07:39 15:48-16:23/35 17:53	07:01 18:27	07:10 18:39-19:28/49 20:00 07:29-07:49/20	06:25 18:40-19:15/35 20:31	06:00 06:22-06:51/29 21:00 20:13-20:35/22
6	07:57 15:25-16:26/61 17:18	07:38 15:50-16:20/30 17:54	06:59 18:28	07:08 18:37-19:28/51 20:00 07:27-07:50/23	06:24 18:42-19:14/32 20:32	06:00 06:22-06:51/29 21:00 20:13-20:36/23
7	07:57 15:24-16:26/62 17:19	07:37 15:52-16:18/26 17:55	06:58 18:29	07:06 18:36-19:29/53 20:01 07:25-07:49/24	06:23 18:44-19:12/28 20:33	06:00 06:22-06:51/29 21:01 20:13-20:36/23
8	07:57 15:25-16:27/62 17:20	07:36 15:56-16:15/19 17:57	07:56 19:30	07:05 18:35-19:30/55 20:03 07:24-07:50/26	06:22 18:46-19:10/24 20:34	05:59 06:21-06:50/29 21:02 20:13-20:37/24
9	07:57 15:26-16:27/61 17:21	07:35 16:02-16:10/8 17:58	07:55 19:31	07:03 18:34-19:30/56 20:04 07:22-07:49/27	06:21 18:49-19:07/18 20:35	05:59 06:21-06:50/29 21:02 20:13-20:37/24
10	07:57 15:26-16:28/62 17:22	07:34 17:59	07:53 19:32	07:02 18:34-19:31/57 20:05 07:22-07:50/28	06:20 18:54-19:02/8 20:36	05:59 06:21-06:50/29 21:03 20:13-20:38/25
11	07:57 15:26-16:28/62 17:23	07:32 18:00	07:51 19:33	07:00 18:33-19:30/57 20:06 07:21-07:49/28	06:18 06:39-06:41/2 20:37	05:59 06:21-06:50/29 21:04 20:14-20:39/25
12	07:56 15:27-16:28/61 17:24	07:31 18:01	07:50 19:34	06:58 18:32-19:30/58 20:07 07:21-07:48/27	06:17 06:38-06:44/6 20:39	05:59 06:21-06:50/29 21:04 20:14-20:39/25
13	07:56 15:28-16:29/61 17:25	07:30 18:03	07:48 19:36	06:57 18:32-19:31/59 20:08 07:22-07:47/25	06:16 06:37-06:45/8 20:40	05:59 06:21-06:50/29 21:05 20:14-20:40/26
14	07:56 15:27-16:29/62 17:26	07:29 18:04	07:46 19:37	06:55 18:31-19:30/59 20:09 07:22-07:46/24	06:15 06:36-06:46/10 20:41	05:58 06:21-06:50/29 21:05 20:14-20:40/26
15	07:55 15:28-16:30/62 17:27	07:27 18:05	07:45 19:38	06:54 18:31-19:31/60 20:10 07:23-07:45/22	06:14 06:35-06:47/12 20:42	05:58 06:21-06:50/29 21:05 20:15-20:41/26
16	07:55 15:28-16:29/61 17:28	07:26 18:06	07:43 19:39	06:52 18:30-19:30/60 20:11 07:23-07:43/20	06:13 06:34-06:48/14 20:43	05:58 06:21-06:50/29 21:06 20:15-20:41/26
17	07:54 15:29-16:30/61 17:29	07:25 18:08	07:41 19:40	06:51 18:31-19:30/59 20:12 07:25-07:42/17	06:12 06:33-06:49/16 20:44	05:59 06:21-06:50/29 21:06 20:15-20:41/26
18	07:54 15:29-16:30/61 17:31	07:23 18:09	07:40 19:41	06:49 18:30-19:30/60 20:13 07:27-07:39/12	06:11 06:32-06:49/17 20:44	05:59 06:21-06:50/29 21:07 20:15-20:41/26
19	07:53 15:31-16:31/60 17:32	07:22 18:10	07:38 19:42	06:48 18:30-19:30/60 20:14	06:11 06:31-06:49/18 20:45	05:59 06:21-06:50/29 21:07 20:15-20:42/27
20	07:53 15:31-16:30/59 17:33	07:21 18:11	07:36 19:43	06:46 18:30-19:29/59 20:15	06:10 06:31-06:50/19 20:46	05:59 06:21-06:50/29 21:07 20:15-20:42/27
21	07:52 15:31-16:30/59 17:34	07:19 18:12	07:35 19:44	06:45 18:31-19:29/58 20:16	06:09 06:30-06:50/20 20:47	05:59 06:22-06:51/29 21:08 20:15-20:42/27
22	07:52 15:32-16:31/59 17:35	07:18 18:14	07:33 19:45	06:43 18:30-19:28/58 20:17	06:08 06:29-06:50/21 20:48	05:59 06:22-06:51/29 21:08 20:16-20:43/27
23	07:51 15:33-16:31/58 17:37	07:16 18:15	07:31 19:46	06:42 18:31-19:28/57 20:18	06:07 06:28-06:50/22 20:49 20:21-20:25/4	05:59 06:22-06:51/29 21:08 20:16-20:43/27
24	07:50 15:33-16:30/57 17:38	07:15 18:16	07:30 19:48	06:40 18:31-19:26/55 20:20	06:07 06:28-06:51/23 20:50 20:19-20:27/8	06:00 06:22-06:51/29 21:08 20:16-20:42/26
25	07:50 15:34-16:30/56 17:39	07:13 18:17	07:28 19:49	06:39 18:31-19:26/55 20:21	06:06 06:27-06:51/24 20:51 20:17-20:27/10	06:00 06:23-06:52/29 21:08 20:17-20:43/26
26	07:49 15:35-16:30/55 17:40	07:12 18:18	07:26 19:50	06:37 18:32-19:26/54 20:22	06:05 06:26-06:51/25 20:52 20:16-20:27/11	06:00 06:23-06:52/29 21:08 20:17-20:43/26
27	07:48 15:36-16:30/54 17:41	07:10 18:20	07:25 19:51	06:36 18:32-19:24/52 20:23	06:05 06:26-06:51/25 20:53 20:16-20:29/13	06:01 06:23-06:52/29 21:08 20:17-20:43/26
28	07:47 15:37-16:30/53 17:43	07:09 18:21	07:23 19:01-19:10/9 19:52	06:35 18:33-19:24/51 20:24	06:04 06:25-06:51/26 20:54 20:15-20:29/14	06:01 06:24-06:53/29 21:09 20:17-20:43/26
29	07:46 15:38-16:29/51 17:44		07:21 18:55-19:15/20 19:53	06:33 18:34-19:23/49 20:25	06:03 06:25-06:52/27 20:54 20:15-20:30/15	06:02 06:24-06:53/29 21:09 20:17-20:43/26
30	07:45 15:39-16:28/49 17:45		07:20 18:51-19:19/28 19:54	06:32 18:34-19:21/47 20:26	06:03 06:25-06:51/26 20:55 20:14-20:31/17	06:02 06:25-06:54/29 21:08 20:17-20:42/25
31	07:44 15:40-16:28/48 17:46		07:18 18:48-19:21/33 19:55		06:02 06:26-06:51/25 20:56 20:14-20:32/18	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1824	286	90	1997	807	1610

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T51 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (470)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November		December	
1	06:02	06:25-06:54/29	06:27	06:49-06:53/4	06:58	18:32-19:29/57	07:28	07:02		07:37	15:08-16:10/62
	21:08	20:18-20:43/25	20:50		20:07	07:20-07:48/28	19:15	17:28		17:04	
2	06:03	06:26-06:55/29	06:28		06:59	18:32-19:29/57	07:29	07:03	15:30-15:41/11	07:38	15:08-16:10/62
	21:08	20:18-20:42/24	20:49		20:06	07:20-07:48/28	19:13	17:27		17:04	
3	06:03	06:26-06:55/29	06:29	19:01-19:14/13	07:00	18:32-19:28/56	07:30	07:04	15:25-15:46/21	07:39	15:09-16:10/61
	21:08	20:18-20:43/25	20:48		20:04	07:20-07:47/27	19:12	17:26		17:03	
4	06:04	06:27-06:56/29	06:30	18:58-19:18/20	07:01	18:32-19:27/55	07:31	07:06	15:22-15:48/26	07:40	15:10-16:12/62
	21:08	20:18-20:42/24	20:47		20:02	07:21-07:47/26	19:10	17:25		17:03	
5	06:05	06:27-06:56/29	06:30	18:55-19:20/25	07:01	18:33-19:26/53	07:32	07:07	15:19-15:50/31	07:41	15:10-16:12/62
	21:08	20:19-20:42/23	20:46		20:01	07:22-07:46/24	19:08	17:23		17:03	
6	06:05	06:28-06:57/29	06:31	18:53-19:22/29	07:02	18:33-19:25/52	07:33	07:08	15:18-15:53/35	07:42	15:10-16:11/61
	21:08	20:20-20:42/22	20:44		19:57	07:23-07:46/23	19:07	17:22		17:03	
7	06:06	06:28-06:57/29	06:32	18:51-19:24/33	07:03	18:34-19:23/49	07:34	07:09	15:16-15:54/38	07:43	15:10-16:12/62
	21:07	20:19-20:42/23	20:43		19:56	07:24-07:45/21	19:05	17:21		17:03	
8	06:06	06:29-06:58/29	06:33	18:49-19:25/36	07:04	18:35-19:22/47	07:35	07:10	15:14-15:55/41	07:44	15:11-16:12/61
	21:07	20:20-20:42/22	20:42		19:54	07:25-07:43/18	19:03	17:20		17:03	
9	06:07	06:30-06:59/29	06:34	18:48-19:26/38	07:05	18:36-19:20/44	07:36	07:12	15:14-15:57/43	07:45	15:11-16:13/62
	21:07	20:21-20:42/21	20:41		19:52	07:26-07:42/16	19:02	17:19		17:03	
10	06:08	06:30-06:58/28	06:35	18:46-19:28/42	07:06	18:37-19:18/41	07:37	07:13	15:12-15:58/46	07:46	15:12-16:13/61
	21:06	20:21-20:41/20	20:40		19:51	07:27-07:40/13	19:00	17:18		17:03	
11	06:08	06:31-06:59/28	06:36	18:45-19:29/44	07:07	18:38-19:16/38	07:38	07:14	15:11-15:59/48	07:46	15:13-16:14/61
	21:06	20:21-20:41/20	20:38		19:49	07:28-07:37/9	18:58	17:17		17:03	
12	06:09	06:34-07:00/26	06:37	18:44-19:30/46	07:08	18:40-19:14/34	07:39	07:15	15:10-15:59/49	07:47	15:13-16:14/61
	21:06	20:22-20:40/18	20:37		19:47	07:29-07:32/3	18:57	17:16		17:03	
13	06:10	06:33-06:59/26	06:38	18:43-19:30/47	07:09	18:42-19:11/29	07:40	07:16	15:10-16:01/51	07:48	15:14-16:15/61
	21:05	20:22-20:39/17	20:36		19:46		18:55	17:15		17:03	
14	06:11	06:34-07:00/26	06:39	18:42-19:31/49	07:10	18:44-19:06/22	07:41	07:18	15:09-16:02/53	07:49	15:14-16:14/60
	21:05	20:23-20:39/16	20:34		19:44		18:54	17:14		17:03	
15	06:11	06:34-07:00/26	06:40	18:41-19:32/51	07:11	18:49-19:01/12	07:43	07:19	15:08-16:02/54	07:50	15:15-16:15/60
	21:04	20:24-20:39/15	20:33		19:42		18:52	17:13		17:04	
16	06:12	06:35-07:01/26	06:41	18:40-19:32/52	07:12		07:44	07:20	15:07-16:03/56	07:50	15:15-16:16/61
	21:03	20:25-20:39/14	20:32		19:40		18:51	17:13		17:04	
17	06:13	06:35-07:00/25	06:42	18:39-19:33/54	07:13		07:45	07:21	15:08-16:04/56	07:51	15:15-16:16/61
	21:03	20:25-20:37/12	20:30		19:39		18:49	17:12		17:04	
18	06:14	06:36-07:00/24	06:43	18:38-19:33/55	07:14		07:46	07:22	15:07-16:04/57	07:52	15:16-16:16/60
	21:02	20:26-20:37/11	20:29		19:37		18:48	17:11		17:05	
19	06:15	06:37-07:01/24	06:44	18:37-19:33/56	07:15		07:47	07:24	15:07-16:05/58	07:52	15:17-16:17/60
	21:02	20:28-20:36/8	20:27		19:35		18:46	17:10		17:05	
20	06:16	06:38-07:01/23	06:45	18:37-19:33/56	07:16		07:48	07:25	15:07-16:06/59	07:53	15:17-16:17/60
	21:01	20:30-20:36/6	20:26		19:34		18:45	17:09		17:05	
21	06:16	06:39-07:01/22	06:46	18:36-19:34/58	07:17		07:49	07:26	15:07-16:06/59	07:53	15:18-16:18/60
	21:00	20:33-20:35/2	20:24		19:32		18:43	17:09		17:06	
22	06:17	06:40-07:01/21	06:47	18:34-19:33/59	07:18		07:50	07:27	15:07-16:06/59	07:54	15:18-16:18/60
	20:59		20:23		19:30		18:42	17:08		17:06	
23	06:18	06:40-07:00/20	06:48	18:34-19:33/59	07:19		07:52	07:28	15:07-16:07/60	07:54	15:19-16:19/60
	20:59		20:21		19:28		18:40	17:08		17:07	
24	06:19	06:41-07:00/19	06:49	18:33-19:33/60	07:20		07:53	07:29	15:06-16:07/61	07:55	15:19-16:19/60
	20:58		20:20	07:34-07:38/4	19:27		18:39	17:07		17:07	
25	06:20	06:42-07:00/18	06:50	18:33-19:32/59	07:21		07:54	07:30	15:07-16:08/61	07:55	15:19-16:19/60
	20:57		20:18	07:29-07:42/13	19:25		18:37	17:06		17:08	
26	06:21	06:43-06:59/16	06:51	18:32-19:32/60	07:23		07:55	07:32	15:07-16:08/61	07:56	15:20-16:21/61
	20:56		20:17	07:27-07:44/17	19:23		18:36	17:06		17:09	
27	06:22	06:44-06:59/15	06:53	18:32-19:32/60	07:24		07:56	07:33	15:07-16:09/62	07:56	15:20-16:21/61
	20:55		20:15	07:25-07:45/20	19:22		18:35	17:05		17:09	
28	06:23	06:45-06:58/13	06:54	18:32-19:32/60	07:25		07:57	07:34	15:07-16:09/62	07:56	15:21-16:21/60
	20:54		20:14	07:24-07:46/22	19:20		18:33	17:05		17:10	
29	06:24	06:46-06:58/12	06:55	18:32-19:31/59	07:26		07:59	07:35	15:08-16:09/61	07:57	15:21-16:21/60
	20:53		20:12	07:22-07:47/25	19:18		18:32	17:05		17:11	
30	06:25	06:47-06:57/10	06:56	18:32-19:31/59	07:27		08:00	07:36	15:08-16:09/61	07:57	15:22-16:23/61
	20:52		20:10	07:21-07:47/26	19:17		18:31	17:04		17:11	
31	06:26	06:48-06:55/7	06:57	18:32-19:30/58			08:01			07:57	15:22-16:23/61
	20:51		20:09	07:21-07:48/27			18:29			17:12	
Potential sun hours	459		428		375		345	297		287	
Sum of minutes with flicker	1084		1555		882		0	1440		1885	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T52 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (471)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:29-16:00/31 17:13	07:44 17:48	07:07 07:27-07:42/15 18:22 16:45-18:00/75	07:16 17:56-18:21/25 19:56	06:31 19:40-20:04/24 20:27	06:02 06:43-07:03/20 20:57
2	07:57 15:30-16:00/30 17:14	07:43 17:49	07:06 07:25-07:42/17 18:23 16:44-18:01/77	07:15 18:00-18:18/18 19:57	06:29 19:41-20:03/22 20:28	06:01 06:43-07:02/19 20:58
3	07:57 15:31-16:00/29 17:15	07:42 17:50	07:04 07:24-07:43/19 18:24 16:44-18:03/79	07:13 19:58	06:28 19:41-20:03/22 20:29 06:48-06:57/9	06:01 06:44-07:02/18 20:58
4	07:58 15:32-16:00/28 17:16	07:41 17:52	07:03 07:22-07:43/21 18:25 16:42-18:04/82	07:11 19:59	06:27 19:42-20:02/20 20:30 06:47-07:00/13	06:01 06:44-07:00/16 20:59
5	07:58 15:33-15:59/26 17:17	07:39 17:53	07:01 07:21-07:43/22 18:27 16:41-18:05/84	07:10 20:00	06:26 19:42-20:01/19 20:31 06:45-07:01/16	06:00 06:46-07:00/14 21:00
6	07:57 15:35-15:59/24 17:18	07:38 17:54	07:00 07:19-07:42/23 18:28 16:41-18:06/85	07:08 20:00	06:24 19:43-20:00/17 20:32 06:44-07:02/18	06:00 06:47-06:59/12 21:01
7	07:57 15:35-15:58/23 17:19	07:37 17:55	06:58 07:19-07:41/22 18:29 16:40-18:07/87	07:07 20:02	06:23 19:45-19:58/13 20:33 06:43-07:04/21	06:00 06:49-06:59/10 21:01
8	07:57 15:37-15:57/20 17:20	07:36 17:57	07:56 08:20-08:41/21 19:30 17:41-19:09/88	07:05 20:03	06:22 19:47-19:56/9 20:34 06:42-07:04/22	05:59 06:50-06:57/7 21:02
9	07:57 15:39-15:57/18 17:21	07:35 17:58	07:55 08:21-08:39/18 19:31 17:40-19:10/90	07:03 20:04	06:21 06:41-07:05/24 20:35	05:59 06:53-06:54/1 21:02
10	07:57 15:42-15:56/14 17:22	07:34 17:59	07:53 08:22-08:37/15 19:32 17:39-19:11/92	07:02 20:05	06:20 06:40-07:06/26 20:37	05:59 21:03
11	07:57 15:44-15:53/9 17:23	07:33 18:00	07:51 08:24-08:35/11 19:33 17:39-19:12/93	07:00 20:06	06:19 06:39-07:06/27 20:38	05:59 21:04
12	07:56 17:24	07:31 18:02	07:50 17:39-19:13/94 19:35	06:58 20:07	06:17 06:38-07:07/29 20:39	05:59 21:04
13	07:56 17:25	07:30 18:03	07:48 17:38-19:14/96 19:36	06:57 20:08	06:16 06:37-07:07/30 20:40	05:59 21:05
14	07:56 17:26	07:29 18:04	07:47 17:39-19:16/97 19:37	06:55 20:09	06:15 06:36-07:07/31 20:41	05:59 21:05
15	07:55 17:27	07:27 18:05	07:45 17:39-19:17/98 19:38	06:54 20:10	06:14 06:35-07:07/32 20:42	05:59 21:06
16	07:55 17:28	07:26 18:07	07:43 17:39-19:17/98 19:39	06:52 20:11	06:13 06:35-07:07/32 20:43	05:59 21:06
17	07:55 17:30	07:25 18:08	07:42 17:39-19:19/100 19:40	06:51 20:12	06:12 06:35-07:07/32 20:44	05:59 21:06
18	07:54 17:31	07:23 17:09-17:28/19 18:09	07:40 17:39-19:20/101 19:41	06:49 20:13	06:12 06:35-07:07/32 20:45	05:59 21:07
19	07:53 17:32	07:22 17:04-17:32/28 18:10	07:38 17:39-19:21/102 19:42	06:48 20:14	06:11 06:35-07:06/31 20:46	05:59 21:07
20	07:53 17:33	07:21 17:00-17:34/34 18:11	07:37 17:41-19:21/100 19:43	06:46 19:51-19:54/3 20:15	06:10 06:36-07:07/31 20:46	05:59 21:07
21	07:52 17:34	07:19 16:58-17:37/39 18:13	07:35 17:41-18:55/74 19:44 18:57-19:22/25	06:45 19:48-19:55/7 20:16	06:09 06:36-07:07/31 20:47	05:59 21:08
22	07:52 17:35	07:18 16:55-17:38/43 18:14	07:33 17:41-18:52/71 19:45 18:57-19:21/24	06:43 19:45-19:56/11 20:18	06:08 06:36-07:06/30 20:48	05:59 21:08
23	07:51 17:37	07:16 16:54-17:40/46 18:15	07:31 17:41-18:50/69 19:47 18:57-19:20/23	06:42 19:44-19:57/13 20:19	06:07 06:36-07:06/30 20:49	06:00 21:08
24	07:50 17:38	07:15 16:51-17:41/50 18:16	07:30 17:43-18:47/64 19:48 18:58-19:19/21	06:40 19:43-19:58/15 20:20	06:07 06:37-07:06/29 20:50	06:00 21:08
25	07:50 17:39	07:13 07:33-07:36/3 17:47-17:55/8 18:17 16:50-17:43/53	07:28 17:44-18:37/53 19:49 18:59-19:17/18	06:39 19:42-19:59/17 20:21	06:06 06:37-07:05/28 20:51	06:00 21:08
26	07:49 17:40	07:12 07:31-07:38/7 18:18 16:48-17:56/68	07:26 17:44-18:35/51 19:50 19:00-19:15/15	06:37 19:42-20:00/18 20:22	06:05 06:39-07:06/27 20:52	06:00 21:08
27	07:48 17:42	07:10 07:30-07:40/10 18:20 16:48-17:58/70	07:25 17:46-18:34/48 19:51 19:03-19:13/10	06:36 19:40-20:00/20 20:23	06:05 06:39-07:05/26 20:53	06:01 21:09
28	07:47 17:43	07:09 07:28-07:41/13 18:21 16:46-17:59/73	07:23 17:47-18:32/45 19:52	06:35 19:40-20:02/22 20:24	06:04 06:39-07:04/25 20:54	06:01 21:09
29	07:46 17:44		07:21 17:49-18:30/41 19:53	06:33 19:41-20:03/22 20:25	06:03 06:40-07:04/24 20:55	06:02 21:09
30	07:45 17:45		07:20 17:51-18:28/37 19:54	06:32 19:40-20:03/23 20:26	06:03 06:40-07:03/23 20:55	06:02 21:09
31	07:44 17:47		07:18 17:53-18:25/32 19:55		06:02 06:41-07:03/22 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	252	564	2743	214	897	117

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T52 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (471)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 06:49-07:17/28 20:50	06:58 20:07	07:28 17:19-18:52/93 19:15	07:02 17:28	07:37 15:26-15:35/9 17:04
2	06:03 21:08	06:28 06:50-07:17/27 20:49	06:59 20:06	07:29 08:04-08:12/8 19:13 17:18-18:50/92	07:03 17:27	07:38 15:24-15:38/14 17:04
3	06:04 21:08	06:29 06:50-07:15/25 20:48	07:00 20:04	07:30 08:01-08:15/14 19:12 17:18-18:50/92	07:04 17:26	07:39 15:23-15:41/18 17:04
4	06:04 06:57-07:02/5 21:08	06:30 19:59-20:03/4 20:47 06:51-07:15/24	07:01 20:02	07:31 07:59-08:16/17 19:10 17:17-18:48/91	07:06 17:25	07:40 15:22-15:42/20 17:03
5	06:05 06:55-07:03/8 21:08	06:31 19:56-20:07/11 20:46 06:52-07:14/22	07:02 20:01	07:32 07:57-08:17/20 19:08 17:17-18:46/89	07:07 17:24	07:41 15:22-15:44/22 17:03
6	06:05 06:54-07:05/11 21:08	06:32 19:54-20:08/14 20:45 06:53-07:13/20	07:03 19:57	07:33 07:56-08:17/21 19:07 17:17-18:45/88	07:08 17:22	07:42 15:21-15:45/24 17:03
7	06:06 06:52-07:06/14 21:07	06:33 19:53-20:10/17 20:43 06:54-07:12/18	07:04 19:56	07:34 07:55-08:18/23 19:05 17:17-18:43/86	07:09 17:21	07:43 15:20-15:45/25 17:03
8	06:07 06:52-07:07/15 21:07	06:34 19:51-20:11/20 20:42 06:55-07:10/15	07:05 19:54	07:35 07:55-08:18/23 19:03 17:17-18:41/84	07:10 17:20	07:44 15:19-15:47/28 17:03
9	06:07 06:52-07:09/17 21:07	06:35 19:51-20:11/20 20:41 06:56-07:08/12	07:06 19:52	07:36 07:56-08:17/21 19:02 17:17-18:39/82	07:12 17:19	07:45 15:19-15:48/29 17:03
10	06:08 06:50-07:09/19 21:06	06:36 19:50-20:12/22 20:40 06:57-07:05/8	07:07 17:54-18:10/16 19:51	07:37 07:57-08:17/20 19:00 17:17-18:38/81	07:13 17:18	07:46 15:19-15:49/30 17:03
11	06:09 06:50-07:10/20 21:06	06:37 19:49-20:12/23 20:38	07:08 17:49-18:14/25 19:49	07:38 07:58-08:16/18 18:59 17:17-18:36/79	07:14 17:17	07:47 15:19-15:50/31 17:03
12	06:09 06:50-07:11/21 21:06	06:38 19:49-20:13/24 20:37	07:09 17:46-18:17/31 19:47	07:39 07:59-08:16/17 18:57 17:18-18:34/76	07:15 17:16	07:47 15:20-15:51/31 17:03
13	06:10 06:50-07:12/22 21:05	06:39 19:48-20:12/24 20:36	07:10 17:43-18:19/36 19:46	07:40 08:01-08:15/14 18:55 17:19-18:32/73	07:16 17:15	07:48 15:20-15:52/32 17:03
14	06:11 06:49-07:12/23 21:05	06:40 19:48-20:11/23 20:34	07:11 17:40-18:20/40 19:44	07:42 08:02-08:14/12 18:54 17:20-18:32/72	07:18 17:14	07:49 15:19-15:52/33 17:04
15	06:12 06:48-07:13/25 21:04	06:41 19:48-20:09/21 20:33	07:12 17:38-18:22/44 19:42	07:43 08:03-08:12/9 18:52 17:20-18:30/70	07:19 17:13	07:50 15:20-15:53/33 17:04
16	06:12 06:48-07:14/26 21:03	06:42 19:48-20:08/20 20:32	07:13 17:36-18:23/47 19:41 18:52-19:00/8	07:44 08:04-08:10/6 18:17-18:28/11 18:51 17:21-18:16/55	07:20 17:13	07:50 15:20-15:54/34 17:04
17	06:13 06:48-07:15/27 21:03	06:43 19:48-20:07/19 20:30	07:14 17:33-18:23/50 19:39 18:49-19:03/14	07:45 17:22-18:14/52 18:49 18:21-18:26/5	07:21 17:12	07:51 15:20-15:54/34 17:04
18	06:14 06:47-07:15/28 21:02	06:44 19:49-20:05/16 20:29	07:15 17:31-18:24/53 19:37 18:47-19:04/17	07:46 17:23-18:12/49 18:48	07:22 17:11	07:52 15:21-15:55/34 17:05
19	06:15 06:47-07:15/28 21:02	06:45 19:49-20:04/15 20:27	07:16 17:30-18:32/62 19:35 18:45-19:05/20	07:47 17:25-18:10/45 18:46	07:24 17:10	07:52 15:21-15:56/35 17:05
20	06:16 06:47-07:16/29 21:01	06:46 19:50-20:03/13 20:26	07:17 17:28-18:35/67 19:34 18:43-19:06/23	07:48 17:27-18:09/42 18:45	07:25 17:10	07:53 15:21-15:56/35 17:05
21	06:17 06:47-07:16/29 21:00	06:47 19:51-20:01/10 20:24	07:18 17:27-18:37/70 19:32 18:42-19:06/24	07:49 17:29-18:07/38 18:43	07:26 17:09	07:53 15:22-15:57/35 17:06
22	06:17 06:47-07:17/30 20:59	06:48 19:53-20:00/7 20:23	07:19 17:25-18:39/74 19:30 18:42-19:06/24	07:50 17:32-18:04/32 18:42	07:27 17:08	07:54 15:22-15:57/35 17:06
23	06:18 06:47-07:17/30 20:59	06:49 19:56-19:57/1 20:21	07:20 17:24-18:40/76 19:29 18:41-19:06/25	07:52 17:35-18:01/26 18:40	07:28 17:08	07:54 15:23-15:58/35 17:07
24	06:19 06:46-07:17/31 20:58	06:50 20:20	07:21 17:23-19:04/101 19:27	07:53 17:41-17:56/15 18:39	07:29 17:07	07:55 15:23-15:58/35 17:08
25	06:20 06:46-07:17/31 20:57	06:51 20:18	07:22 17:22-19:03/101 19:25	07:54 18:38	07:31 17:07	07:55 15:23-15:58/35 17:08
26	06:21 06:46-07:17/31 20:56	06:52 20:17	07:23 17:21-19:01/100 19:23	07:55 18:36	07:32 17:06	07:56 15:25-15:59/34 17:09
27	06:22 06:46-07:18/32 20:55	06:53 20:15	07:24 17:20-18:59/99 19:22	07:56 18:35	07:33 17:06	07:56 15:25-15:59/34 17:09
28	06:23 06:46-07:18/32 20:54	06:54 20:14	07:25 17:19-18:58/99 19:20	07:57 18:33	07:34 17:05	07:56 15:25-15:59/34 17:10
29	06:24 06:46-07:18/32 20:53	06:55 20:12	07:26 17:19-18:56/97 19:18	07:59 18:32	07:35 17:05	07:57 15:26-15:59/33 17:11
30	06:25 06:47-07:18/31 20:52	06:56 20:11	07:27 17:18-18:54/96 19:17	08:00 18:31	07:36 17:04	07:57 15:28-16:00/32 17:12
31	06:26 06:48-07:17/29 20:51	06:57 20:09		08:01 18:30		07:57 15:28-16:00/32 17:12
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	676	523	1539	1861	0	925

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T53 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (472)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:23-16:47/24	07:44 16:30-17:24/54	07:07	07:16 19:09-19:32/23	06:31 07:12-08:05/53	06:02
	17:13 15:17-16:11/54	17:48	18:22	19:56 07:35-08:05/30	20:27	20:57
2	07:57 16:23-16:48/25	07:43 16:31-17:25/54	07:06	07:15 19:10-19:32/22	06:29 07:13-08:05/52	06:01
	17:14 15:17-16:12/55	17:49	18:23	19:57 07:35-08:06/31	20:28	20:58
3	07:57 16:23-16:49/26	07:42 16:32-17:26/54	07:04	07:13 19:10-19:31/21	06:28 07:13-08:05/52	06:01
	17:15 15:18-16:12/54	17:50	18:24	19:58 07:34-08:05/31	20:29	20:58
4	07:58 16:23-16:50/27	07:41 16:34-17:28/54	07:03	07:11 19:10-19:29/19	06:27 07:14-08:04/50	06:01
	17:16 15:19-16:12/53	17:52	18:25	19:59 07:33-08:05/32	20:30	20:59
5	07:57 16:23-16:51/28	07:39 16:36-16:57/21	07:01	07:10 19:12-19:28/16	06:26 07:13-08:03/50	06:00
	17:17 15:19-16:12/53	17:53 16:59-17:29/30	18:27	20:00 07:33-08:05/32	20:31	21:00
6	07:57 16:23-16:52/29	07:38 16:37-16:55/18	07:00	07:08 19:14-19:25/11	06:24 07:14-08:02/48	06:00
	17:18 15:20-16:13/53	17:54 16:59-17:30/31	18:28	20:00 07:33-08:04/31	20:32	21:01
7	07:57 16:22-16:52/30	07:37 16:40-16:52/12	06:58	07:07 07:34-08:04/30	06:23 07:15-08:02/47	06:00
	17:19 15:20-16:12/52	17:55 17:00-17:31/31	18:29	20:02	20:33	21:01
8	07:57 16:23-16:53/30	07:36 17:01-17:32/31	07:56	07:05 07:34-08:02/28	06:22 07:15-08:01/46	05:59
	17:20 15:21-16:12/51	17:57	19:30	20:03	20:34	21:02
9	07:57 16:23-16:54/31	07:35 17:03-17:32/29	07:55	07:03 07:33-08:01/28	06:21 07:16-08:00/44	05:59
	17:21 15:23-16:13/50	17:58	19:31	20:04	20:35	21:02
10	07:57 16:23-16:55/32	07:34 17:05-17:32/27	07:53	07:02 07:30-08:00/30	06:20 07:17-07:59/42	05:59
	17:22 15:24-16:13/49	17:59	19:32	20:05 07:21-07:25/4	20:37	21:03
11	07:57 16:22-16:55/33	07:33 17:33-17:37/4	07:51	07:00 07:19-08:00/41	06:19 07:18-07:59/41	05:59
	17:23 15:24-16:12/48	18:00 17:06-17:31/25	19:33	20:06	20:38	21:04
12	07:56 16:23-16:56/33	07:31 17:07-17:38/31	07:50	06:58 07:18-08:02/44	06:17 07:18-07:58/40	05:59
	17:24 15:25-16:12/47	18:02	19:35	20:07	20:39	21:04
13	07:56 16:23-16:58/35	07:30 17:08-17:40/32	07:48	06:57 07:16-08:03/47	06:16 07:19-07:57/38	05:59
	17:25 15:27-16:12/45	18:03	19:36	20:08 19:43-19:47/4	20:40	21:05
14	07:56 16:23-16:58/35	07:29 17:10-17:42/32	07:47	06:55 07:14-08:04/50	06:15 07:20-07:55/35	05:59
	17:26 15:28-16:12/44	18:04	19:37	20:09 19:40-19:48/8	20:41	21:05
15	07:55 16:23-16:59/36	07:27 17:11-17:42/31	07:45	06:54 07:13-08:05/52	06:14 07:22-07:54/32	05:59
	17:27 15:29-16:12/43	18:05	19:38	20:10 19:38-19:49/11	20:42	21:06
16	07:55 16:23-16:59/36	07:26 17:26-17:44/18	07:43	06:52 07:11-08:05/54	06:13 07:23-07:53/30	05:59
	17:28 15:30-16:11/41	18:07 17:13-17:25/12	19:39	20:11 19:36-19:50/14	20:43	21:06
17	07:54 16:23-17:00/37	07:25 17:25-17:45/20	07:42	06:51 07:10-08:07/57	06:12 07:24-07:51/27	05:59
	17:30 15:32-16:11/39	18:08	19:40	20:12 19:36-19:51/15	20:44	21:06
18	07:54 16:23-17:00/37	07:23 17:25-17:46/21	07:40	06:49 07:08-08:06/58	06:12 07:26-07:49/23	05:59
	17:31 15:34-16:09/35	18:09	19:41	20:13 19:34-19:52/18	20:45	21:07
19	07:53 16:24-17:01/37	07:22 17:25-17:48/23	07:38	06:48 07:07-08:07/60	06:11 07:27-07:47/20	05:59
	17:32 15:36-16:09/33	18:10	19:42	20:14 19:34-19:53/19	20:46	21:07
20	07:53 16:24-17:01/37 17:05-17:08/3	07:21 17:24-17:48/24	07:37	06:46 07:06-08:07/61	06:10 07:31-07:45/14	05:59
	17:33 15:38-16:07/29	18:11	19:43	20:15 19:33-19:54/21	20:46	21:07
21	07:52 16:23-17:01/38 17:02-17:09/7	07:19 17:25-17:49/24	07:35	06:45 07:07-08:08/61	06:09 07:35-07:41/6	05:59
	17:34 15:41-16:06/25	18:13	19:44	20:16 19:33-19:55/22	20:47	21:08
22	07:52 16:24-17:11/47	07:18 17:25-17:48/23	07:33	06:43 07:07-08:07/60	06:08	05:59
	17:35 15:46-16:04/18	18:14	19:45	20:18 19:33-19:55/22	20:48	21:08
23	07:51 16:24-17:12/48	07:16 17:26-17:47/21	07:31 19:17-19:25/8	06:42 07:08-08:08/60	06:07	06:00
	17:37 15:54-15:59/5	18:15	19:47	20:19 19:33-19:56/23	20:49	21:08
24	07:50 16:25-17:13/48	07:15 17:26-17:46/20	07:30 19:15-19:26/11	06:40 07:09-08:08/59	06:07	06:00
	17:38	18:16	19:48	20:20 19:34-19:56/22	20:50	21:08
25	07:50 16:25-17:14/49	07:13 17:28-17:45/17	07:28 19:13-19:27/14	06:39 07:09-08:07/58	06:06	06:00
	17:39	18:17	19:49 07:47-07:57/10	20:21 19:34-19:54/20	20:51	21:08
26	07:49 16:25-17:15/50	07:12 17:29-17:43/14	07:26 19:12-19:28/16	06:37 07:12-08:07/55	06:05	06:00
	17:40	18:19	19:50 07:45-08:00/15	20:22 19:35-19:54/19	20:52	21:08
27	07:48 16:26-17:17/51	07:10 17:32-17:40/8	07:25 19:11-19:30/19	06:36 07:12-08:07/55	06:05	06:01
	17:42	18:20	19:51 07:44-08:03/19	20:23 19:35-19:52/17	20:53	21:09
28	07:47 16:27-17:18/51	07:09	07:23 19:10-19:30/20	06:35 07:12-08:07/55	06:04	06:01
	17:43	18:21	19:52 07:42-08:04/22	20:24 19:37-19:50/13	20:54	21:09
29	07:46 16:27-17:20/53		07:21 19:09-19:31/22	06:33 07:13-08:07/54	06:03	06:02
	17:44		19:53 07:40-08:04/24	20:25 19:39-19:48/9	20:54	21:09
30	07:45 16:28-17:21/53		07:20 19:09-19:33/24	06:32 07:13-08:06/53	06:03	06:02
	17:45		19:54 07:39-08:05/26	20:26	20:55	21:09
31	07:44 16:29-17:22/53		07:18 19:09-19:33/24		06:02	
	17:47		19:55 07:37-08:05/28		20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	2165	846	302	1790	790	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T53 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (472)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 07:29-08:09/40 20:50	06:58 07:18-07:59/41 20:07	07:28 19:15	07:02 16:33-17:01/28 17:28	07:37 16:04-16:37/33 17:04 15:06-15:54/48
2	06:03 21:08	06:28 07:28-08:10/42 20:49	06:59 07:28-07:58/30 20:06 07:19-07:23/4	07:29 19:13	07:03 16:32-17:02/30 17:27	07:38 16:05-16:37/32 17:04 15:06-15:55/49
3	06:04 21:08	06:29 07:26-08:09/43 20:48	07:00 07:31-07:59/28 20:04	07:30 19:12	07:04 16:31-17:02/31 17:26	07:39 16:07-16:38/31 17:04 15:07-15:57/50
4	06:04 21:08	06:30 07:25-08:10/45 20:47	07:01 07:31-08:00/29 20:02	07:31 19:10	07:06 16:09-16:22/13 17:25 16:30-17:01/31	07:40 16:08-16:38/30 17:03 15:06-15:57/51
5	06:05 21:08	06:31 07:25-08:11/46 20:46	07:02 07:30-08:00/30 20:01	07:32 19:08	07:07 16:06-16:25/19 17:24 16:29-17:00/31	07:41 16:08-16:38/30 17:03 15:06-15:58/52
6	06:05 21:08	06:32 07:24-08:12/48 20:45	07:03 19:10-19:20/10 19:57 07:29-08:00/31	07:33 19:07	07:08 16:05-16:28/23 17:22 16:29-16:59/30	07:42 16:09-16:38/29 17:03 15:06-15:59/53
7	06:06 21:07	06:33 07:23-08:12/49 20:43	07:04 19:07-19:23/16 19:56 07:29-08:00/31	07:34 19:05	07:09 16:04-16:58/54 17:21	07:43 16:09-16:37/28 17:03 15:06-15:58/52
8	06:07 21:07	06:34 07:23-08:13/50 20:42	07:05 19:05-19:24/19 19:54 07:28-08:00/32	07:35 19:03	07:10 16:02-16:56/54 17:20	07:44 16:10-16:37/27 17:03 15:06-15:59/53
9	06:07 21:07	06:35 07:22-08:13/51 20:41	07:06 19:04-19:25/21 19:52 07:28-08:00/32	07:36 19:02	07:12 16:02-16:56/54 17:19	07:45 16:11-16:37/26 17:03 15:06-16:00/54
10	06:08 21:06	06:36 07:22-08:13/51 20:40	07:07 19:03-19:25/22 19:51 07:28-07:59/31	07:37 19:00	07:13 16:01-16:54/53 17:18	07:46 16:12-16:37/25 17:03 15:06-16:01/55
11	06:09 21:06	06:37 07:21-08:14/53 20:38	07:08 19:02-19:25/23 19:49 07:28-07:58/30	07:38 18:59	07:14 16:00-16:53/53 17:17	07:47 16:13-16:37/24 17:03 15:07-16:01/54
12	06:09 21:06	06:38 07:21-08:14/53 20:37	07:09 19:01-19:25/24 19:47 07:29-07:58/29	07:39 18:57	07:15 15:59-16:52/53 17:16	07:47 16:14-16:38/24 17:03 15:07-16:02/55
13	06:10 21:05	06:39 07:21-08:14/53 20:36	07:10 19:01-19:24/23 19:46 07:30-07:57/27	07:40 18:55	07:16 15:59-16:52/53 17:15	07:48 16:15-16:38/23 17:03 15:08-16:03/55
14	06:11 21:05	06:40 07:20-08:14/54 20:34 19:46-19:57/11	07:11 19:00-19:23/23 19:44 07:31-07:55/24	07:42 18:54	07:18 15:59-16:50/51 17:14	07:49 16:15-16:37/22 17:04 15:07-16:03/56
15	06:12 21:04	06:41 07:20-08:14/54 20:33 19:44-19:59/15	07:12 18:59-19:20/21 19:42 07:32-07:54/22	07:43 18:03-18:14/11 18:52	07:19 15:58-16:49/51 17:13	07:50 16:16-16:37/21 17:04 15:08-16:04/56
16	06:12 21:03	06:42 07:20-08:14/54 20:32 19:43-20:00/17	07:13 18:59-19:18/19 19:41 07:33-07:52/19	07:44 18:01-18:16/15 18:51	07:20 15:59-16:49/50 17:13	07:50 16:17-16:38/21 17:04 15:08-16:04/56
17	06:13 21:03	06:43 07:18-08:14/56 20:30 19:41-20:01/20	07:14 19:00-19:17/17 19:39 07:34-07:50/16	07:45 17:59-18:17/18 18:49	07:21 15:59-16:48/49 17:12	07:51 16:18-16:37/19 17:04 15:08-16:04/56
18	06:14 21:02	06:44 07:16-08:14/58 20:29 19:40-20:01/21	07:15 19:00-19:15/15 19:37 07:35-07:47/12	07:46 17:57-18:18/21 18:48	07:22 15:59-16:47/48 17:11	07:52 16:19-16:38/19 17:05 15:09-16:05/56
19	06:15 21:02	06:45 07:14-08:14/60 20:27 19:40-20:02/22	07:16 19:01-19:13/12 19:35	07:47 17:56-18:18/22 18:46	07:24 15:58-16:46/48 17:10 15:28-15:33/5	07:52 16:20-16:39/19 17:05 15:10-16:06/56
20	06:16 21:01	06:46 07:13-08:13/60 20:26 19:39-20:02/23	07:17 19:03-19:11/8 19:34	07:48 17:56-18:19/23 18:45	07:25 15:59-16:46/47 17:10 15:21-15:39/18	07:53 16:20-16:39/19 17:06 15:10-16:06/56
21	06:17 21:00	06:47 07:12-08:13/61 20:24 19:39-20:01/22	07:18 19:06-19:10/4 19:32	07:49 17:55-18:19/24 18:43	07:26 15:59-16:37/38 16:38-16:45/7 17:09 15:17-15:41/24	07:53 16:21-16:39/18 17:06 15:10-16:07/57
22	06:17 20:59	06:48 07:11-08:12/61 20:23 19:38-20:00/22	07:19 19:30	07:50 17:55-18:19/24 18:42	07:27 16:00-16:37/37 16:41-16:44/3 17:08 15:14-15:43/29	07:54 16:21-16:39/18 17:06 15:10-16:07/57
23	06:18 07:43-07:54/11 20:59	06:49 07:11-08:12/61 20:21 19:37-19:57/20	07:20 19:29	07:52 17:54-18:17/23 18:40	07:28 16:00-16:37/37 17:08 15:12-15:45/33	07:54 16:22-16:40/18 17:07 15:11-16:08/57
24	06:19 07:39-07:56/17 20:58	06:50 07:11-08:11/60 20:20 19:37-19:56/19	07:21 19:27	07:53 17:54-18:15/21 18:39	07:29 16:00-16:37/37 17:07 15:11-15:46/35	07:55 16:22-16:41/19 17:08 15:12-16:08/56
25	06:20 07:37-07:59/22 20:57	06:51 07:12-08:10/58 20:18 19:37-19:54/17	07:22 19:25	07:54 17:55-18:15/20 18:38 17:46-17:52/6	07:31 16:01-16:38/37 17:07 15:11-15:49/38	07:55 16:22-16:41/19 17:08 15:12-16:08/56
26	06:21 07:35-08:01/26 20:56	06:52 07:12-08:08/56 20:17 19:38-19:53/15	07:23 19:23	07:55 17:56-18:13/17 18:36 17:42-17:55/13	07:32 16:02-16:38/36 17:06 15:09-15:50/41	07:56 16:23-16:42/19 17:09 15:13-16:09/56
27	06:22 07:34-08:02/28 20:55	06:53 07:13-08:07/54 20:15 19:38-19:51/13	07:24 19:22	07:56 17:40-18:12/32 18:35	07:33 16:02-16:38/36 17:06 15:08-15:51/43	07:56 16:23-16:43/20 17:09 15:13-16:09/56
28	06:23 07:33-08:04/31 20:54	06:54 07:14-08:06/52 20:14 19:39-19:50/11	07:25 19:20	07:57 17:38-18:10/32 18:33	07:34 16:03-16:38/35 17:05 15:08-15:52/44	07:56 16:22-16:43/21 17:10 15:14-16:10/56
29	06:24 07:32-08:05/33 20:53	06:55 07:15-08:05/50 20:12 19:41-19:48/7	07:26 19:18	07:59 17:38-18:09/31 18:32	07:35 16:03-16:38/35 17:05 15:07-15:52/45	07:57 16:22-16:44/22 17:11 15:14-16:10/56
30	06:25 07:31-08:06/35 20:52	06:56 07:16-08:03/47 20:11 19:44-19:47/3	07:27 19:17	08:00 17:37-18:08/31 18:31	07:36 16:04-16:38/34 17:04 15:07-15:53/46	07:57 16:23-16:46/23 17:12 15:15-16:11/56
31	06:26 07:30-08:08/38 20:51	06:57 07:17-08:01/44 20:09		08:01 18:04-18:06/2 18:30 17:36-18:01/25		07:57 16:23-16:46/23 17:12 15:16-16:11/55
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	241	1902	775	411	1727	2413

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T54 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (473)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:31-16:28/57 09:35-10:13/38 17:13 12:58-14:49/111	07:43 16:45-17:19/34 15:50-16:31/41 17:48 08:06-08:48/42	07:07 07:33-07:56/23 18:22 08:02-08:21/19	07:16 19:56	06:30 06:50-07:23/33 20:27	06:02 20:57
2	07:57 15:32-16:28/56 09:36-10:12/36 17:14 12:58-14:49/111	07:42 16:44-17:21/37 15:52-16:30/38 17:49 08:04-08:49/45	07:06 07:34-07:54/20 18:23 08:04-08:17/13	07:15 19:57	06:29 06:49-07:22/33 20:28	06:01 20:57
3	07:57 15:32-16:29/57 09:37-10:12/35 17:15 12:59-14:49/110	07:41 16:43-17:22/39 15:54-16:29/35 17:50 08:03-08:49/46	07:04 07:34-07:52/18 18:24	07:13 19:58	06:28 06:48-07:21/33 20:29	06:01 20:58
4	07:57 15:33-16:29/56 09:38-10:12/34 17:16 13:00-14:49/109	07:40 16:42-17:22/40 15:55-16:26/31 17:51 08:02-08:49/47	07:02 07:36-07:51/15 18:25	07:11 19:59	06:27 06:46-07:18/32 20:30	06:00 20:59
5	07:57 15:32-16:29/57 09:39-10:11/32 17:17 13:00-14:48/108	07:39 16:41-17:22/41 15:57-16:25/28 17:53 08:00-08:48/48	07:01 07:39-07:47/8 18:26	07:10 20:00	06:25 06:45-07:16/31 20:31	06:00 21:00
6	07:57 15:33-16:30/57 09:40-10:10/30 17:18 13:02-14:48/106	07:38 16:41-17:23/42 16:00-16:22/22 17:54 08:00-08:49/49	06:59 18:28	07:08 20:00	06:24 06:44-07:07/23 20:32	06:00 21:00
7	07:57 15:33-16:30/57 09:42-10:10/28 17:19 13:03-14:47/104	07:37 16:41-17:24/43 16:04-16:19/15 17:55 07:57-08:49/52	06:58 18:29	07:06 20:01	06:23 06:43-07:07/24 20:33	05:59 21:01
8	07:57 15:34-16:31/57 14:10-14:47/37 17:20 13:04-14:09/65 09:43-10:09/26	07:36 16:41-17:25/44 17:56 07:56-08:50/54	07:56 19:30	07:05 20:02	06:22 06:42-07:07/25 20:34	05:59 21:02
9	07:57 15:34-16:32/58 14:13-14:46/33 17:21 13:06-14:09/63 09:45-10:09/24	07:35 16:41-17:25/44 17:58 07:55-08:50/55	07:54 19:31	07:03 20:03	06:21 06:42-07:06/24 20:35	05:59 21:02
10	07:57 15:34-16:31/57 14:14-14:44/30 17:22 13:07-14:08/61 09:47-10:08/21	07:33 16:40-17:25/45 17:59 07:54-08:49/55	07:53 19:32	07:01 20:04	06:19 06:42-07:06/24 20:36	05:59 21:03
11	07:56 15:35-16:32/57 14:17-14:43/26 17:23 13:08-14:08/60 09:49-10:05/16	07:32 16:40-17:25/45 18:00 07:52-08:50/58	07:51 19:33	07:00 20:06	06:18 06:43-07:06/23 20:37	05:59 20:36-20:39/3 21:03
12	07:56 15:35-16:33/58 14:20-14:42/22 17:24 13:10-14:08/58 09:53-10:02/9	07:31 16:40-17:26/46 18:01 07:51-08:50/59	07:50 19:34	06:58 20:07	06:17 06:43-07:05/22 20:38	05:58 20:35-20:39/4 21:04
13	07:56 15:35-16:32/57 14:23-14:39/16 17:25 13:11-14:07/56	07:30 16:40-17:26/46 18:03 07:50-08:50/60	07:48 19:35	06:57 20:08	06:16 06:44-07:04/20 20:39	05:58 20:34-20:40/6 21:04
14	07:56 15:36-16:33/57 14:30-14:33/3 17:26 13:14-14:06/52	07:29 16:40-17:25/45 18:04 07:48-08:49/61	07:46 19:36	06:55 20:09	06:15 06:44-07:03/19 20:40	05:58 20:34-20:40/6 21:05
15	07:55 15:37-16:34/57 17:27 13:16-14:06/50	07:27 16:40-17:26/46 18:05 07:47-08:49/62	07:45 19:38	06:53 07:13-07:19/6 20:10	06:14 06:45-07:02/17 20:41	05:58 20:34-20:40/6 21:05
16	07:55 15:37-16:34/57 17:28 13:18-14:04/46	07:26 16:41-17:26/45 18:06 07:46-08:48/62	07:43 19:39	06:52 07:11-07:22/11 20:11	06:13 06:46-07:01/15 20:42	05:58 20:34-20:41/7 21:06
17	07:54 08:21-08:30/9 13:21-14:03/42 17:29 15:38-16:35/57	07:25 16:41-17:25/44 18:07 07:44-08:47/63	07:41 19:40	06:50 07:10-07:24/14 20:12	06:12 06:48-07:00/12 20:43	05:58 20:33-20:41/8 21:06
18	07:54 08:18-08:33/15 13:24-14:01/37 17:31 15:38-16:34/56	07:23 16:41-17:25/44 18:09 07:43-08:47/64	07:40 19:41	06:49 07:08-07:25/17 20:13	06:11 06:50-06:57/7 20:44	05:58 20:33-20:41/8 21:06
19	07:53 08:16-08:35/19 13:27-13:58/31 17:32 15:38-16:34/56	07:22 16:41-17:23/42 18:10 07:42-08:46/64	07:38 19:42	06:47 07:07-07:26/19 20:14	06:10 20:45	05:59 20:33-20:41/8 21:07
20	07:53 08:16-08:37/21 13:32-13:55/23 17:33 15:39-16:35/56	07:20 16:43-17:23/40 18:11 07:40-08:44/64	07:36 19:43	06:46 07:05-07:26/21 20:15	06:10 20:46	05:59 20:33-20:42/9 21:07
21	07:52 08:14-08:38/24 13:39-13:49/10 17:34 15:40-16:34/54	07:19 16:44-17:23/39 18:12 07:39-08:43/64	07:35 19:44	06:44 07:04-07:27/23 20:16	06:09 20:47	05:59 20:33-20:42/9 21:07
22	07:51 08:13-08:39/26 17:35 15:40-16:34/54	07:18 16:44-17:21/37 18:14 07:37-08:41/64	07:33 19:45	06:43 07:02-07:27/25 20:17	06:08 20:48	05:59 20:34-20:43/9 21:08
23	07:51 08:13-08:41/28 17:36 15:42-16:35/53	07:16 16:46-17:20/34 18:15 07:36-08:39/63	07:31 19:46	06:41 07:01-07:27/26 20:18	06:07 20:49	05:59 20:34-20:42/8 21:08
24	07:50 08:12-08:42/30 17:38 15:42-16:35/53	07:15 16:47-17:18/31 18:16 07:34-08:36/62	07:30 19:47	06:40 06:59-07:26/27 20:19	06:06 20:50	06:00 20:34-20:42/8 21:08
25	07:49 16:59-17:02/3 15:43-16:34/51 17:39 08:11-08:43/32	07:13 16:49-17:17/28 18:17 07:33-08:32/59	07:28 19:48	06:39 06:59-07:27/28 20:20	06:06 20:51	06:00 20:34-20:42/8 21:08
26	07:49 16:53-17:07/14 15:43-16:34/51 17:40 08:11-08:44/33	07:12 16:50-17:15/25 18:18 07:32-08:27/55	07:26 19:50	06:37 06:59-07:27/28 20:22	06:05 20:52	06:00 20:36-20:43/7 21:08
27	07:48 16:51-17:10/19 15:44-16:33/49 17:41 08:10-08:45/35	07:10 16:53-17:12/19 07:58-08:26/28 18:19 07:32-07:57/25	07:25 19:51	06:36 06:55-07:26/31 20:23	06:04 20:53	06:01 20:36-20:43/7 21:08
28	07:47 16:49-17:12/23 15:45-16:33/48 17:43 08:11-08:46/35	07:09 16:57-17:07/10 07:59-08:23/24 18:21 07:32-07:56/24	07:23 19:52	06:34 06:54-07:25/31 20:24	06:04 20:53	06:01 20:36-20:42/6 21:08
29	07:46 16:48-17:15/27 15:47-16:33/46 17:44 08:11-08:47/36		07:21 19:53	06:33 06:53-07:25/32 20:25	06:03 20:54	06:01 20:37-20:43/6 21:08
30	07:45 16:47-17:17/30 15:48-16:32/44 17:45 08:10-08:48/38		07:19 19:54	06:32 06:51-07:23/32 20:26	06:03 20:55	06:02 20:38-20:42/4 21:08
31	07:44 16:46-17:18/32 15:49-16:32/43 17:46 08:08-08:48/40		07:18 19:55		06:02 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	4161	2863	116	371	417	137

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T54 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (473)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:40-20:43/3 21:08	06:26 06:52-07:15/23 20:50	06:57 20:07	07:27 19:15	07:02 16:09-16:55/46 17:28 07:23-08:19/56	07:37 15:17-16:14/57 13:59-14:25/26 17:04 12:51-13:50/59 09:32-09:47/15
2	06:03 20:41-20:42/1 21:08	06:27 06:52-07:15/23 20:49	06:58 20:05	07:29 19:13	07:03 16:09-16:54/45 17:27 07:24-08:19/55	07:38 15:17-16:14/57 13:57-14:27/30 17:04 12:50-13:51/61 09:30-09:49/19
3	06:03 21:08	06:28 06:52-07:16/24 20:48	06:59 20:04	07:30 19:11	07:04 16:10-16:55/45 15:41-15:43/2 17:26 07:26-08:20/54	07:39 15:17-16:15/58 13:56-14:29/33 17:03 12:49-13:52/63 09:28-09:52/24
4	06:04 21:08	06:29 06:51-07:16/25 20:47	07:00 20:02	07:31 19:10	07:05 16:11-16:54/43 15:33-15:50/17 17:24 07:27-08:19/52	07:40 15:18-16:15/57 13:55-14:31/36 17:03 12:49-13:53/64 09:27-09:53/26
5	06:04 21:08	06:30 06:52-07:16/24 20:45	07:01 20:01	07:32 19:08	07:07 16:11-16:53/42 15:29-15:53/24 17:23 07:30-08:19/49	07:41 15:18-16:15/57 09:27-09:55/28 17:03 12:48-14:32/104
6	06:05 21:07	06:31 06:53-07:16/23 20:44	07:02 19:57	07:33 19:06	07:08 16:11-16:52/41 15:28-15:56/28 17:22 07:31-08:19/48	07:42 15:19-16:16/57 09:26-09:56/30 17:03 12:48-14:34/106
7	06:06 21:07	06:32 06:54-07:16/22 20:43 07:19-07:22/3	07:03 19:56	07:34 19:05	07:09 16:13-16:52/39 15:25-15:57/32 17:21 07:32-08:19/47	07:43 15:19-16:16/57 09:26-09:58/32 17:03 12:48-14:35/107
8	06:06 21:07	06:33 06:55-07:26/31 20:42	07:04 19:54	07:35 19:03	07:10 16:13-16:51/38 15:23-15:59/36 17:20 07:33-08:19/46	07:44 15:20-16:16/56 09:26-09:59/33 17:03 12:47-14:36/109
9	06:07 21:07	06:34 06:56-07:28/32 20:41	07:05 19:52	07:36 08:13-08:24/11 19:02	07:11 16:14-16:50/36 15:22-16:00/38 17:19 07:34-08:19/45	07:45 15:20-16:17/57 09:25-10:00/35 17:03 12:47-14:37/110
10	06:08 21:06	06:35 06:57-07:30/33 20:39	07:06 19:51	07:37 08:10-08:26/16 19:00	07:13 16:16-16:50/34 15:21-16:02/41 17:18 07:37-08:19/42	07:45 15:21-16:17/56 09:25-10:01/36 17:03 12:48-14:38/110
11	06:08 21:06	06:36 06:58-07:31/33 20:38	07:07 19:49	07:38 08:08-08:27/19 18:58 08:41-08:48/7	07:14 16:17-16:49/32 15:20-16:03/43 17:17 07:39-08:19/40	07:46 15:22-16:18/56 09:26-10:03/37 17:03 12:48-14:39/111
12	06:09 21:05	06:37 06:59-07:32/33 20:37	07:08 19:47	07:39 08:06-08:28/22 18:57 08:36-08:52/16	07:15 16:18-16:47/29 15:19-16:03/44 17:16 07:41-08:18/37	07:47 15:22-16:18/56 09:26-10:04/38 17:03 12:48-14:40/112
13	06:10 21:05	06:38 07:00-07:32/32 20:35	07:09 19:45	07:40 08:05-08:28/23 18:55 08:33-08:55/22	07:16 16:19-16:46/27 15:18-16:04/46 17:15 07:43-08:19/36	07:48 15:22-16:18/56 09:25-10:04/39 17:03 12:47-14:41/114
14	06:11 21:04	06:39 07:01-07:33/32 20:34	07:10 19:44	07:41 17:28-17:42/14 08:31-08:56/25 18:54 08:04-08:29/25	07:17 16:22-16:45/23 15:18-16:06/48 17:14 07:43-08:18/35	07:49 15:23-16:19/56 09:25-10:05/40 17:03 12:48-14:42/114
15	06:11 21:04	06:40 07:02-07:33/31 20:33	07:11 19:42	07:42 17:25-17:46/21 18:52 08:05-08:59/54	07:19 16:24-16:43/19 15:17-16:06/49 17:13 07:43-08:18/35	07:49 15:23-16:19/56 09:26-10:06/40 17:04 12:48-14:43/115
16	06:12 21:03	06:41 07:03-07:33/30 20:31	07:12 19:40	07:43 17:22-17:48/26 18:50 08:04-09:00/56	07:20 16:26-16:40/14 15:16-16:07/51 17:12 07:44-08:17/33	07:50 15:24-16:20/56 09:26-10:07/41 17:04 12:49-14:44/115
17	06:13 21:03	06:42 07:06-07:33/27 20:30	07:13 19:39	07:45 17:20-17:49/29 18:49 08:05-09:05/60	07:21 16:33-16:35/2 15:17-16:08/51 17:12 07:45-08:17/32	07:51 15:24-16:20/56 09:26-10:07/41 17:04 12:48-14:44/116
18	06:14 21:02	06:43 07:05-07:33/28 20:29	07:14 19:37	07:46 17:18-17:50/32 18:47 08:06-09:08/62	07:22 07:46-08:16/30 17:11 15:16-16:09/53	07:51 15:25-16:21/56 09:27-10:08/41 17:04 12:49-14:45/116
19	06:15 21:01	06:44 07:06-07:33/27 20:27	07:15 19:35	07:47 17:16-17:51/35 18:46 08:07-09:11/64	07:23 07:47-08:15/28 17:10 15:16-16:09/53	07:52 15:25-16:20/55 09:26-10:08/42 17:05 12:49-14:45/116
20	06:15 21:01	06:45 07:06-07:32/26 20:26	07:16 19:33	07:48 17:14-17:52/38 18:44 08:08-09:12/64	07:25 07:48-08:15/27 17:09 15:15-16:09/54	07:53 15:26-16:21/55 09:27-10:09/42 17:05 12:50-14:46/116
21	06:16 21:00	06:46 07:07-07:31/24 20:24	07:17 19:32	07:49 17:14-17:54/40 18:43 08:10-09:14/64	07:26 07:50-08:14/24 13:15-13:25/10 17:09 15:16-16:10/54	07:53 15:26-16:21/55 09:27-10:09/42 17:06 12:49-14:46/117
22	06:17 20:59	06:47 07:08-07:31/23 20:23	07:18 19:30	07:50 17:13-17:54/41 18:42 08:11-09:15/64	07:27 07:52-08:13/21 13:08-13:31/23 17:08 15:16-16:11/55	07:54 15:27-16:22/55 09:28-10:10/42 17:06 12:50-14:47/117
23	06:18 20:58	06:48 07:09-07:30/21 20:21	07:19 19:28	07:51 17:12-17:54/42 18:40 08:12-09:16/64	07:28 07:53-08:12/19 13:04-13:35/31 17:07 15:15-16:11/56	07:54 15:27-16:22/55 09:28-10:10/42 17:07 12:50-14:47/117
24	06:19 20:58	06:49 07:10-07:29/19 20:20	07:20 19:27	07:53 17:11-17:54/43 18:39 08:13-09:17/64	07:29 07:55-08:10/15 13:01-13:38/37 17:07 15:15-16:11/56	07:55 15:28-16:23/55 09:29-10:11/42 17:07 12:52-14:48/116
25	06:20 07:03-07:05/2 20:57	06:50 07:11-07:27/16 20:18	07:21 19:25	07:54 17:10-17:54/44 18:37 08:14-09:17/63	07:30 07:58-08:08/10 12:58-13:40/42 17:06 15:15-16:12/57	07:55 15:28-16:24/56 09:30-10:11/41 17:08 12:52-14:48/116
26	06:21 06:59-07:09/10 20:56	06:51 07:12-07:26/14 20:17	07:22 19:23	07:55 17:10-17:55/45 18:36 08:16-09:18/62	07:31 15:16-16:13/57 17:06 12:57-13:43/46	07:55 15:28-16:24/56 09:30-10:11/41 17:08 12:52-14:48/116
27	06:22 06:58-07:11/13 20:55	06:52 07:13-07:23/10 20:15	07:23 19:22	07:56 17:10-17:55/45 18:35 08:17-09:19/62	07:32 15:16-16:13/57 17:05 12:55-13:45/50	07:56 15:29-16:25/56 09:31-10:12/41 17:09 12:53-14:49/116
28	06:23 06:56-07:12/16 20:54	06:53 07:14-07:19/5 20:13	07:24 19:20	07:57 17:09-17:55/46 18:33 08:18-09:19/61	07:34 15:16-16:13/57 17:05 12:54-13:46/52	07:56 15:29-16:25/56 09:32-10:12/40 17:10 12:54-14:49/115
29	06:24 06:55-07:13/18 20:53	06:54 20:12	07:25 19:18	07:58 17:09-17:55/46 18:32 08:19-09:19/60	07:35 15:16-16:14/58 14:04-14:20/16 17:05 12:53-13:48/55	07:56 15:30-16:26/56 09:32-10:12/40 17:11 12:54-14:49/115
30	06:25 06:55-07:14/19 20:52	06:55 20:10	07:26 19:16	08:00 17:10-17:56/46 18:31 08:21-09:20/59	07:36 15:17-16:14/57 14:01-14:23/22 17:04 12:52-13:49/57 09:35-09:43/8	07:57 15:30-16:26/56 09:33-10:12/39 17:11 12:55-14:49/114
31	06:25 06:53-07:14/21 20:51	06:56 20:09	 18:29	08:01 17:10-17:55/45 08:22-09:19/57	 	07:57 15:30-16:26/56 09:33-10:12/39 17:12 12:56-14:48/112
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	103	694	0	1904	3194	6301

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T55 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (474)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-09:21/61	07:43 16:44-17:14/30 08:04-08:19/15	07:07	07:16	06:30 06:50-07:55/65	06:02 06:49-07:17/28
	17:13 15:43-16:36/53	17:48 08:29-08:56/27	18:22	19:56	20:27	20:57
2	07:57 08:20-09:21/61	07:42 16:45-17:14/29 08:31-08:55/24	07:06	07:15	06:29 06:49-07:55/66	06:01 06:50-07:17/27
	17:14 15:43-16:36/53	17:49 08:03-08:20/17	18:23	19:57	20:28	20:57
3	07:57 08:20-09:21/61	07:41 17:20-17:27/7 08:02-08:20/18	07:04	07:13	06:28 06:48-07:54/66	06:01 06:52-07:17/25
	17:15 15:44-16:36/52	17:50 16:46-17:13/27 08:32-08:54/22	18:24	19:58	20:29	20:58
4	07:57 08:20-09:21/61	07:40 17:17-17:27/10 08:01-08:21/20	07:02	07:11	06:27 06:46-07:53/67	06:00 06:52-07:16/24
	17:16 15:45-16:37/52	17:51 16:46-17:12/26 08:34-08:52/18	18:25	19:59	20:30	20:59
5	07:57 08:20-09:22/62	07:39 17:15-17:28/13 07:59-08:20/21	07:01	07:10	06:25 06:45-07:52/67	06:00 06:53-07:15/22
	17:17 15:44-16:36/52	17:53 16:47-17:11/24 08:36-08:49/13	18:26	20:00	20:31	21:00
6	07:57 08:19-09:21/62	07:38 17:14-17:30/16 07:58-08:21/23	06:59	07:08	06:24 06:45-07:51/66	06:00 06:54-07:15/21
	17:18 15:45-16:37/52	17:54 16:48-17:10/22	18:28	20:00	20:32	21:00
7	07:57 08:19-09:21/62	07:37 17:13-17:31/18 07:57-08:21/24	06:58	07:06	06:23 06:44-07:50/66	05:59 06:54-07:14/20
	17:19 15:46-16:37/51	17:55 16:50-17:09/19	18:29	20:01	20:33	21:01
8	07:57 08:19-09:21/62	07:36 17:13-17:33/20 07:56-08:21/25	07:56	07:05 07:33-07:46/13	06:22 06:44-07:49/65	05:59 06:55-07:14/19
	17:20 15:46-16:38/52	17:56 16:52-17:07/15	19:30	20:02	20:34	21:02
9	07:57 08:19-09:21/62	07:35 17:12-17:34/22 07:55-08:20/25	07:54	07:03 07:29-07:49/20	06:21 06:44-07:47/63	05:59 06:56-07:13/17
	17:21 15:47-16:38/51	17:58 16:56-17:05/9	19:31	20:03	20:35	21:02
10	07:57 16:48-16:55/7 15:47-16:38/51	07:34 17:11-17:35/24	07:53	07:01 07:25-07:51/26	06:19 06:43-07:46/63	05:59 06:57-07:13/16
	17:22 08:19-09:22/63	17:59 07:54-08:20/26	19:32	20:04	20:36	21:03
11	07:56 16:47-16:57/10 15:48-16:38/50	07:32 17:11-17:37/26	07:51	07:00 07:24-07:54/30	06:18 06:43-07:44/61	05:59 06:58-07:12/14
	17:23 08:19-09:21/62	18:00 07:54-08:18/24	19:33	20:06	20:37	21:03
12	07:56 16:46-16:58/12 15:49-16:39/50	07:31 17:11-17:38/27	07:50	06:58 07:21-07:55/34	06:17 06:43-07:23/40	05:59 07:00-07:12/12
	17:24 08:19-09:21/62	18:01 07:55-08:18/23	19:34	20:07	20:38 07:24-07:42/18	21:04
13	07:56 16:45-16:59/14 15:49-16:38/49	07:30 17:12-17:39/27	07:48	06:57 07:20-07:56/36	06:16 06:43-07:23/40	05:58 07:01-07:11/10
	17:25 08:20-09:21/61	18:03 07:55-08:18/23	19:35	20:08	20:39 07:27-07:38/11	21:04
14	07:56 16:44-17:00/16 15:50-16:39/49	07:29 17:11-17:38/27	07:46	06:55 07:18-07:57/39	06:15 06:43-07:23/40	05:58 07:02-07:10/8
	17:26 08:20-09:20/60	18:04 07:56-08:17/21	19:37	20:09	20:40	21:05
15	07:55 16:44-17:02/18 15:51-16:39/48	07:27 17:12-17:38/26	07:45	06:54 07:18-07:58/40	06:14 06:43-07:23/40	05:58 07:03-07:10/7
	17:27 08:20-09:19/59	18:05 07:57-08:16/19	19:38	20:10	20:41	21:05
16	07:55 16:43-17:02/19 15:52-16:39/47	07:26 17:12-17:38/26	07:43	06:52 07:16-07:58/42	06:13 06:43-07:22/39	05:58 07:04-07:09/5
	17:28 08:20-09:18/58	18:06 07:59-08:15/16	19:39	20:11	20:42	21:06
17	07:54 16:43-17:04/21 15:53-16:39/46	07:25 17:12-17:37/25	07:41	06:50 07:16-07:59/43	06:12 06:43-07:22/39	05:58
	17:29 08:21-08:58/37 09:00-09:17/17	18:08 08:00-08:12/12	19:40	20:12	20:43	21:06
18	07:54 16:43-17:05/22 15:54-16:39/45	07:23 17:14-17:37/23	07:40	06:49 07:14-07:59/45	06:11 06:43-07:22/39	05:59
	17:31 08:21-08:58/37 09:01-09:15/14	18:09	19:41	20:13	20:44	21:06
19	07:53 16:42-17:06/24 15:54-16:38/44	07:22 17:14-17:35/21	07:38	06:47 07:14-08:00/46	06:10 06:43-07:22/39	05:59
	17:32 08:21-08:58/37 09:05-09:12/7	18:10	19:42	20:14	20:45	21:07
20	07:53 16:42-17:08/26 15:56-16:38/42	07:20 17:16-17:34/18	07:36	06:46 07:13-07:59/46	06:10 06:43-07:21/38	05:59
	17:33 08:22-08:59/37	18:11	19:43	20:15	20:46	21:07
21	07:52 16:42-17:09/27 15:57-16:37/40	07:19 17:18-17:32/14	07:35	06:44 07:13-08:00/47	06:09 06:44-07:22/38	05:59
	17:34 08:22-08:59/37	18:12	19:44	20:16	20:47	21:07
22	07:51 16:41-17:10/29 15:57-16:36/39	07:18 17:21-17:28/7	07:33	06:43 07:12-07:59/47	06:08 06:44-07:21/37	05:59
	17:35 08:22-08:58/36	18:14	19:45	20:17	20:48	21:08
23	07:51 16:42-17:12/30 16:00-16:36/36	07:16	07:31	06:41 07:12-07:59/47	06:07 06:44-07:21/37	05:59
	17:36 08:23-08:59/36	18:15	19:46	20:18	20:49	21:08
24	07:50 16:42-17:13/31 16:01-16:35/34	07:15	07:30	06:40 07:11-07:58/47	06:06 06:45-07:21/36	06:00
	17:38 08:23-08:59/36	18:16	19:47	20:19	20:50	21:08
25	07:49 16:42-17:13/31 16:02-16:33/31	07:13	07:28	06:39 07:11-07:59/48	06:06 06:45-07:20/35	06:00
	17:39 08:23-08:59/36	18:17	19:48	20:20	20:51	21:08
26	07:49 16:42-17:13/31 16:04-16:31/27	07:12	07:26	06:37 07:12-07:59/47	06:05 06:45-07:19/34	06:00 07:07-07:10/3
	17:40 08:24-08:59/35	18:18	19:50	20:22	20:52	21:08
27	07:48 16:42-17:13/31 16:07-16:24/17	07:10	07:25	06:36 07:11-07:57/46	06:04 06:47-07:20/33	06:01 07:05-07:11/6
	17:41 08:24-08:58/34 08:08-08:11/3	18:19	19:51	20:23	20:53	21:08
28	07:47 16:42-17:13/31 16:10-16:21/11	07:09	07:23	06:34 06:57-07:10/13	06:04 06:47-07:19/32	06:01 07:05-07:13/8
	17:43 08:26-08:59/33 08:08-08:14/6	18:21	19:52	20:24 07:11-07:57/46	20:53	21:08
29	07:46 16:43-17:14/31 08:07-08:16/9		07:21	06:33 06:54-07:57/63	06:03 06:48-07:19/31	06:01 07:04-07:14/10
	17:44 08:26-08:59/33		19:53	20:25	20:54	21:08
30	07:45 16:43-17:14/31 08:06-08:17/11		07:20	06:32 06:52-07:56/64	06:03 06:48-07:18/30	06:02 07:03-07:14/11
	17:45 08:27-08:58/31		19:54	20:26	20:55	21:08
31	07:44 16:44-17:14/30 08:05-08:18/13		07:18		06:02 06:49-07:18/29	
	17:46 08:28-08:57/29		19:55		20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	3329	1054	0	975	1470	313

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T55 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (474)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 07:03-07:16/13 21:08	06:26 06:53-07:32/39 20:50 07:33-07:52/19	06:57 07:23-07:53/30 20:07	07:28 19:15	07:02 16:41-17:05/24 17:28 07:23-07:49/26	07:37 16:29-16:39/10 15:30-16:20/50 17:04 08:01-09:03/62
2	06:03 07:02-07:17/15 21:08	06:27 06:53-07:54/61 20:49	06:58 07:24-07:50/26 20:05	07:29 19:13	07:03 16:41-17:03/22 07:25-07:50/25 17:27 16:24-16:34/10	07:38 16:31-16:38/7 15:30-16:21/51 17:04 08:01-09:04/63
3	06:03 07:02-07:18/16 21:08	06:28 06:53-07:56/63 20:48	06:59 07:27-07:47/20 20:04	07:30 19:11	07:04 16:43-17:03/20 07:26-07:50/24 17:26 16:22-16:38/16	07:39 08:02-09:04/62 17:03 15:30-16:21/51
4	06:04 07:01-07:18/17 21:08	06:29 06:53-07:57/64 20:47	07:00 07:30-07:43/13 20:02	07:31 19:10	07:05 16:43-17:01/18 07:27-07:50/23 17:24 16:20-16:39/19	07:40 08:03-09:05/62 17:03 15:30-16:22/52
5	06:04 07:01-07:20/19 21:08	06:30 06:54-07:59/65 20:45	07:01 20:01	07:32 19:08	07:07 16:44-17:00/16 07:28-07:50/22 17:23 16:18-16:40/22 08:11-08:14/3	07:41 08:04-09:06/62 17:03 15:31-16:22/51
6	06:05 07:00-07:21/21 21:07	06:31 06:54-08:00/66 20:44	07:02 19:57	07:33 19:06	07:08 16:45-16:58/13 07:30-07:51/21 17:22 16:18-16:42/24 08:07-08:20/13	07:42 08:05-09:07/62 17:03 15:31-16:23/52
7	06:06 06:59-07:21/22 21:07	06:32 06:55-08:01/66 20:43	07:03 19:56	07:34 19:05	07:09 16:48-16:58/10 07:31-07:51/20 17:21 16:16-16:43/27 08:04-08:22/18	07:43 08:06-09:08/62 17:03 15:31-16:23/52
8	06:06 06:59-07:23/24 21:07	06:33 06:55-08:02/67 20:42	07:04 19:54	07:35 19:03	07:10 16:50-16:56/6 07:32-07:50/18 17:20 16:16-16:43/27 08:02-08:24/22	07:44 08:07-09:08/61 17:03 15:32-16:24/52
9	06:07 06:59-07:24/25 21:07	06:34 06:56-08:02/66 20:41	07:05 19:52	07:36 19:02	07:11 16:15-16:44/29 08:00-08:25/25 17:19 07:33-07:50/17	07:45 08:08-09:09/61 17:03 15:32-16:24/52
10	06:08 06:58-07:24/26 21:06	06:35 06:57-08:03/66 20:39	07:06 19:51	07:37 19:00	07:13 16:15-16:45/30 07:35-07:50/15 17:18 08:00-08:27/27	07:45 08:09-09:10/61 17:03 15:32-16:25/53
11	06:08 06:58-07:25/27 21:06	06:36 06:58-08:04/66 20:38	07:07 19:49	07:38 18:58	07:14 16:15-16:45/30 07:36-07:49/13 17:17 07:59-08:28/29	07:46 08:10-09:11/61 17:03 15:33-16:26/53
12	06:09 06:58-07:26/28 21:05	06:37 06:59-08:04/65 20:37	07:08 19:47	07:39 18:57	07:15 16:14-16:45/31 07:37-07:48/11 17:16 07:58-08:29/31	07:47 08:11-09:12/61 17:03 15:33-16:26/53
13	06:10 06:57-07:26/29 21:05	06:38 07:01-08:05/64 20:35	07:09 19:45	07:40 18:55	07:16 16:14-16:45/31 07:39-07:48/9 17:15 07:58-08:31/33	07:48 08:11-09:11/60 09:59-10:08/9 17:03 15:33-16:26/53
14	06:11 06:56-07:27/31 21:04	06:39 07:03-08:05/62 20:34	07:10 19:44	07:41 18:54	07:17 16:15-16:46/31 15:43-15:54/11 17:14 07:58-08:31/33 07:40-07:46/6	07:49 08:12-09:12/60 09:58-10:10/12 17:03 15:34-16:27/53
15	06:11 06:56-07:28/32 21:04	06:40 07:06-07:17/11 20:33 07:19-08:05/46	07:11 19:42	07:42 18:52	07:19 16:15-16:46/31 15:39-15:57/18 17:13 07:57-08:31/34 07:41-07:43/2	07:49 08:13-09:13/60 09:58-10:12/14 17:04 15:34-16:27/53
16	06:12 06:56-07:29/33 21:03	06:41 07:19-08:05/46 20:31	07:12 19:40	07:44 18:51	07:20 16:14-16:46/32 15:37-16:04/27 17:12 07:57-08:32/35	07:50 08:14-09:14/60 09:58-10:14/16 17:04 15:35-16:28/53
17	06:13 06:55-07:29/34 21:03	06:42 07:18-08:05/47 20:30	07:13 19:39	07:45 18:49	07:21 16:16-16:47/31 15:36-16:07/31 17:12 07:57-08:33/36	07:51 08:14-09:14/60 09:57-10:14/17 17:04 15:35-16:28/53
18	06:14 06:55-07:29/34 21:02	06:43 07:18-08:05/47 20:29	07:14 19:37	07:46 18:47	07:22 16:16-16:47/31 15:35-16:09/34 17:11 07:57-08:33/36	07:51 08:15-09:15/60 09:57-10:16/19 17:04 15:35-16:29/54
19	06:15 06:55-07:30/35 21:01	06:44 07:18-08:05/47 20:27	07:15 19:35	07:47 18:46	07:23 16:16-16:46/30 15:34-16:10/36 17:10 07:57-08:33/36	07:52 08:15-09:15/60 09:57-10:16/19 17:05 15:35-16:29/54
20	06:15 06:55-07:31/36 21:01	06:45 07:17-08:04/47 20:26	07:16 19:33	07:48 17:50-18:00/10 18:44	07:25 16:16-16:45/29 15:32-16:11/39 17:09 07:57-08:33/36	07:53 08:16-09:16/60 09:58-10:17/19 17:05 15:36-16:30/54
21	06:16 06:54-07:31/37 21:00	06:46 07:17-08:04/47 20:24	07:17 19:32	07:49 17:48-18:04/16 18:43	07:26 16:18-16:45/27 15:33-16:13/40 17:09 07:58-08:35/37	07:53 08:16-09:15/59 09:57-10:17/20 17:06 15:36-16:30/54
22	06:17 06:53-07:31/38 20:59	06:47 07:17-08:03/46 20:23	07:18 19:30	07:50 17:46-18:05/19 18:42	07:27 16:18-16:44/26 15:32-16:14/42 17:08 07:58-08:35/37	07:54 08:17-09:16/59 09:58-10:18/20 17:06 15:37-16:31/54
23	06:18 06:53-07:31/38 20:58	06:48 07:17-08:03/46 20:21	07:19 19:28	07:51 17:44-18:06/22 18:40	07:28 16:19-16:43/24 15:31-16:15/44 17:07 07:58-08:35/37 08:42-08:49/7	07:54 08:17-09:17/60 09:58-10:18/20 17:07 15:37-16:31/54
24	06:19 06:53-07:32/39 20:58	06:49 07:17-08:02/45 20:20	07:20 19:27	07:53 17:43-18:07/24 18:39 08:33-08:39/6	07:29 16:20-16:42/22 15:31-16:16/45 17:07 07:58-08:35/37 08:38-08:52/14	07:55 08:18-09:18/60 10:00-10:19/19 17:07 15:38-16:32/54
25	06:20 06:53-07:32/39 20:57	06:50 07:17-08:02/45 20:18	07:21 19:25	07:54 17:42-18:07/25 18:37 08:30-08:43/13	07:30 16:20-16:41/21 15:30-16:16/46 17:06 07:58-08:35/37 08:37-08:54/17	07:55 08:18-09:18/60 10:00-10:19/19 17:08 15:38-16:32/54
26	06:21 06:53-07:33/40 20:56	06:51 07:18-08:01/43 20:17	07:22 19:23	07:55 17:42-18:08/26 18:36 08:28-08:45/17	07:31 16:22-16:42/20 15:31-16:18/47 17:06 07:59-08:57/58	07:55 08:18-09:18/60 10:01-10:19/18 17:09 15:39-16:32/53
27	06:22 06:53-07:33/40 20:55	06:52 07:18-08:00/42 20:15	07:23 19:22	07:56 17:41-18:08/27 18:35 08:26-08:46/20	07:33 16:23-16:41/18 15:30-16:18/48 17:05 07:59-08:58/59	07:56 08:19-09:19/60 10:02-10:19/17 17:09 15:40-16:33/53
28	06:23 06:53-07:33/40 20:54	06:53 07:19-07:59/40 20:13	07:24 19:20	07:57 17:41-18:08/27 18:33 08:25-08:46/21	07:34 16:24-16:40/16 15:30-16:19/49 17:05 08:00-09:00/60	07:56 08:19-09:19/60 10:03-10:19/16 17:10 15:40-16:33/53
29	06:24 06:53-07:33/40 20:53	06:54 07:19-07:58/39 20:12	07:25 19:18	07:58 17:40-18:08/28 18:32 08:24-08:47/23	07:35 16:26-16:40/14 15:30-16:19/49 17:05 08:00-09:01/61	07:56 08:19-09:19/60 10:05-10:18/13 17:11 15:40-16:34/54
30	06:25 06:53-07:33/40 20:52 07:42-07:45/3	06:55 07:20-07:56/36 20:10	07:26 19:16	08:00 17:41-18:08/27 18:31 08:24-08:48/24	07:36 16:27-16:39/12 15:30-16:20/50 17:04 08:00-09:02/62	07:57 08:19-09:19/60 10:07-10:16/9 17:11 15:41-16:34/53
31	06:26 06:52-07:32/40 20:51 07:36-07:49/13	06:56 07:21-07:55/34 20:09		08:01 17:41-18:06/25 18:29 08:23-08:48/25		07:57 08:20-09:20/60 10:10-10:14/4 17:12 15:41-16:34/53
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	964	1653	89	425	2718	3833

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T56 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (475)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:24-16:47/23	07:43 16:38-17:20/42	07:07	07:16	06:30 06:53-07:32/39	06:02 18:55-19:17/22
	17:13 08:24-09:01/37	17:48 08:05-08:32/27	18:22	19:56	20:27 18:31-19:37/66	20:57
2	07:57 16:25-16:48/23	07:42 08:05-08:32/27	07:06	07:15	06:29 06:53-07:31/38	06:01 18:57-19:16/19
	17:14 08:24-09:02/38	17:49 16:39-17:20/41	18:23	19:57	20:28 18:31-19:37/66	20:57
3	07:57 16:25-16:49/24	07:41 08:06-08:32/26	07:04	07:13	06:28 06:53-07:30/37	06:01 18:59-19:15/16
	17:15 08:25-09:02/37	17:50 16:41-17:20/39	18:24	19:58	20:29 18:32-19:37/65	20:58
4	07:57 16:25-16:50/25	07:40 08:06-08:31/25	07:03	07:11	06:27 06:52-07:28/36	06:00 19:01-19:12/11
	17:16 08:25-09:02/37	17:51 16:42-17:20/38	18:25	19:59	20:30 18:31-19:36/65	20:59
5	07:57 16:25-16:51/26	07:39 08:07-08:31/24	07:01	07:10	06:25 06:53-07:26/33	06:00 19:06-19:07/1
	17:17 08:26-09:03/37	17:53 16:43-17:19/36	18:26	20:00	20:31 18:32-19:36/64	21:00
6	07:57 16:24-16:51/27	07:38 08:07-08:30/23	06:59	07:08 19:05-19:14/9	06:24 06:53-07:24/31	06:00
	17:18 08:25-09:02/37	17:54 16:45-17:19/34	18:28	20:00	20:32 18:32-19:36/64	21:00
7	07:57 16:25-16:52/27	07:37 08:08-08:29/21	06:58	07:06 18:58-19:20/22	06:23 06:54-07:23/29	05:59
	17:19 08:26-09:03/37	17:55 16:46-17:18/32	18:29	20:01	20:33 18:33-19:36/63	21:01
8	07:57 16:25-16:54/29	07:36 08:09-08:28/19	07:56	07:05 18:55-19:24/29	06:22 06:54-07:23/29	05:59
	17:20 08:26-09:03/37	17:56 16:48-17:18/30	19:30	20:02	20:34 18:33-19:35/62	21:02
9	07:57 16:25-16:55/30	07:35 08:11-08:27/16	07:55	07:03 18:51-19:26/35	06:21 06:55-07:22/27	05:59
	17:21 08:27-09:03/36	17:58 16:50-17:17/27	19:31	20:03	20:35 18:33-19:35/62	21:02
10	07:57 16:26-16:56/30	07:34 08:14-08:25/11	07:53	07:02 18:48-19:27/39	06:19 06:56-07:21/25	05:59
	17:22 08:28-09:04/36	17:59 16:52-17:15/23	19:32	20:05	20:36 18:34-19:35/61	21:03
11	07:57 16:25-16:57/32	07:32 16:54-17:13/19	07:51	07:00 18:46-19:29/43	06:18 06:57-07:20/23	05:59
	17:23 08:27-09:03/36	18:00	19:33	20:06	20:37 18:35-19:34/59	21:03
12	07:56 16:26-16:58/32	07:31 17:01-17:10/9	07:50	06:58 18:44-19:30/46	06:17 06:58-07:19/21	05:59
	17:24 08:28-09:03/35	18:01	19:34	20:07	20:38 18:35-19:34/59	21:04
13	07:56 16:25-16:59/34	07:30	07:48	06:57 07:17-07:27/10	06:16 06:59-07:17/18	05:58
	17:25 08:29-09:04/35	18:03	19:35	20:08 18:43-19:32/49	20:39 18:36-19:33/57	21:04
14	07:56 16:26-17:00/34	07:29	07:46	06:55 07:14-07:30/16	06:15 07:01-07:15/14	05:58
	17:26 08:29-09:03/34	18:04	19:37	20:09 18:41-19:33/52	20:40 18:36-19:32/56	21:05
15	07:55 16:27-17:02/35	07:27	07:45	06:54 07:13-07:32/19	06:14 07:04-07:13/9	05:58
	17:27 08:30-09:03/33	18:05	19:38	20:10 18:40-19:34/54	20:41 18:37-19:32/55	21:05
16	07:55 16:27-17:02/35	07:26	07:43	06:52 07:11-07:33/22	06:13 18:38-19:31/53	05:58
	17:28 08:30-09:03/33	18:06	19:39	20:11 18:38-19:34/56	20:42	21:06
17	07:54 16:28-17:04/36	07:25	07:41	06:50 07:10-07:34/24	06:12 18:38-19:30/52	05:58
	17:29 08:31-09:03/32	18:08	19:40	20:12 18:38-19:36/58	20:43	21:06
18	07:54 16:27-17:05/38	07:23	07:40	06:49 07:08-07:34/26	06:11 18:39-19:30/51	05:59
	17:31 08:32-09:03/31	18:09	19:41	20:13 18:36-19:36/60	20:44	21:07
19	07:53 16:27-17:06/39 08:32-09:02/30	07:22	07:38	06:47 07:07-07:35/28	06:11 18:39-19:29/50	05:59
	17:32 08:15-08:18/3	18:10	19:42	20:14 18:36-19:37/61	20:45	21:07
20	07:53 16:29-17:08/39 08:34-09:03/29	07:20	07:36	06:46 07:05-07:35/30	06:10 18:40-19:28/48	05:59
	17:33 08:14-08:21/7	18:11	19:43	20:15 18:35-19:37/62	20:46	21:07
21	07:52 16:29-17:09/40 08:34-09:02/28	07:19	07:35	06:44 07:04-07:36/32	06:09 18:42-19:28/46	05:59
	17:34 08:13-08:22/9	18:12	19:44	20:16 18:34-19:37/63	20:47	21:07
22	07:52 16:29-17:10/41 08:35-09:01/26	07:18	07:33	06:43 07:02-07:35/33	06:08 18:42-19:27/45	05:59
	17:35 08:13-08:25/12	18:14	19:45	20:17 18:33-19:37/64	20:48	21:08
23	07:51 16:30-17:12/42 08:37-09:01/24	07:16	07:31	06:42 07:01-07:36/35	06:07 18:43-19:26/43	05:59
	17:37 08:12-08:26/14	18:15	19:46	20:18 18:33-19:38/65	20:49	21:08
24	07:50 16:31-17:13/42 08:38-09:00/22	07:15	07:30	06:40 06:59-07:35/36	06:07 18:45-19:26/41	06:00
	17:38 08:11-08:27/16	18:16	19:47	20:19 18:32-19:37/65	20:50	21:08
25	07:49 16:31-17:14/43 08:40-08:59/19	07:13	07:28	06:39 06:58-07:35/37	06:06 18:46-19:24/38	06:00
	17:39 08:10-08:27/17	18:17	19:49	20:21 18:32-19:38/66	20:51	21:08
26	07:49 16:32-17:15/43 08:41-08:57/16	07:12	07:26	06:37 06:57-07:35/38	06:05 18:46-19:23/37	06:00
	17:40 08:09-08:28/19	18:18	19:50	20:22 18:32-19:38/66	20:52	21:08
27	07:48 16:33-17:16/43 08:45-08:55/10	07:10	07:25	06:36 06:55-07:34/39	06:04 18:48-19:23/35	06:01
	17:41 08:09-08:30/21	18:20	19:51	20:23 18:31-19:37/66	20:53	21:08
28	07:47 16:35-17:18/43	07:09	07:23	06:34 06:54-07:34/40	06:04 18:49-19:21/32	06:01
	17:43 08:08-08:30/22	18:21	19:52	20:24 18:31-19:38/67	20:53	21:08
29	07:46 16:36-17:19/43		07:21	06:33 06:53-07:34/41	06:03 18:51-19:21/30	06:01
	17:44 08:07-08:31/24		19:53	20:25 18:32-19:38/66	20:54	21:08
30	07:45 16:37-17:19/42		07:20	06:32 06:52-07:32/40	06:03 18:52-19:19/27	06:02
	17:45 08:06-08:31/25		19:54	20:26 18:31-19:37/66	20:55	21:08
31	07:44 16:38-17:20/42		07:18		06:02 18:54-19:19/25	
	17:46 08:05-08:31/26		19:55		20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	2139	589	0	1875	1986	69

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T56 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (475)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02	06:27 07:07-07:29/22	06:57 18:45-19:28/43	07:28	07:02 07:42-07:54/12	07:37 16:07-16:39/32
	21:08	20:50 18:45-19:43/58	20:07	19:15	17:28 16:20-16:45/25	17:04 08:09-08:45/36
2	06:03	06:27 07:06-07:30/24	06:58 18:47-19:26/39	07:29	07:03 07:41-07:57/16	07:38 16:08-16:38/30
	21:08	20:49 18:44-19:44/60	20:06	19:13	17:27 16:18-16:46/28	17:04 08:10-08:46/36
3	06:03	06:28 07:05-07:31/26	06:59 18:49-19:24/35	07:30	07:04 07:39-07:58/19	07:39 16:08-16:38/30
	21:08	20:48 18:43-19:44/61	20:04	19:11	17:26 16:17-16:47/30	17:03 08:10-08:46/36
4	06:04	06:29 07:04-07:32/28	07:00 18:51-19:21/30	07:31	07:06 07:38-07:59/21	07:40 16:09-16:38/29
	21:08	20:47 18:43-19:45/62	20:02	19:10	17:25 16:16-16:48/32	17:03 08:10-08:47/37
5	06:05	06:30 07:04-07:32/28	07:01 18:55-19:17/22	07:32	07:07 07:37-08:00/23	07:41 16:10-16:37/27
	21:08	20:46 18:42-19:45/63	20:01	19:08	17:23 16:15-16:48/33	17:03 08:11-08:48/37
6	06:05	06:31 07:03-07:33/30	07:02 19:01-19:10/9	07:33	07:08 07:37-08:01/24	07:42 16:10-16:37/27
	21:08	20:44 18:42-19:45/63	19:57	19:07	17:22 16:14-16:50/36	17:03 08:11-08:48/37
7	06:06	06:32 07:03-07:35/32	07:03	07:34	07:09 07:36-08:01/25	07:43 16:11-16:37/26
	21:07	20:43 18:42-19:45/63	19:56	19:05	17:21 16:12-16:50/38	17:03 08:12-08:49/37
8	06:06 19:10-19:18/8	06:33 07:02-07:36/34	07:04	07:35	07:10 07:36-08:01/25	07:44 16:12-16:37/25
	21:07	20:42 18:41-19:46/65	19:54	19:03	17:20 16:10-16:50/40	17:03 08:12-08:49/37
9	06:07 19:06-19:20/14	06:34 07:02-07:38/36	07:05	07:36	07:12 07:36-08:02/26	07:45 16:13-16:37/24
	21:07	20:41 18:41-19:46/65	19:52	19:02	17:19 16:09-16:50/41	17:03 08:13-08:50/37
10	06:08 19:05-19:22/17	06:35 07:02-07:39/37	07:06	07:37	07:13 16:09-16:51/42	07:45 16:14-16:37/23
	21:06	20:39 18:40-19:46/66	19:51	19:00	17:18 07:36-08:02/26	17:03 08:13-08:51/38
11	06:08 19:04-19:24/20	06:36 07:01-07:40/39	07:07	07:38	07:14 16:08-16:51/43	07:46 16:14-16:37/23
	21:06	20:38 18:40-19:46/66	19:49	18:58	17:17 07:36-08:02/26	17:03 08:14-08:51/37
12	06:09 19:02-19:26/24	06:37 07:01-07:40/39	07:08	07:39	07:15 16:08-16:50/42	07:47 16:15-16:38/23
	21:05	20:37 18:40-19:46/66	19:47	18:57	17:16 07:37-08:02/25	17:03 08:15-08:52/37
13	06:10 19:01-19:27/26	06:38 07:01-07:41/40	07:09	07:40	07:16 16:08-16:51/43	07:48 16:15-16:37/22
	21:05	20:36 18:40-19:46/66	19:46	18:55	17:15 07:39-08:03/24	17:03 08:15-08:53/38
14	06:11 19:00-19:29/29	06:39 07:01-07:41/40	07:10	07:41	07:17 16:07-16:50/43	07:49 16:16-16:37/21
	21:04	20:34 18:39-19:46/67	19:44	18:54	17:14 07:40-08:02/22	17:03 08:15-08:53/38
15	06:11 18:59-19:30/31	06:40 07:02-07:42/40	07:11	07:42	07:19 16:06-16:49/43 08:17-08:27/10	07:49 16:17-16:38/21
	21:04	20:33 18:39-19:45/66	19:42	18:52	17:13 07:41-08:02/21	17:04 08:16-08:53/37
16	06:12 18:58-19:32/34	06:41 07:03-07:42/39	07:12	07:44	07:20 16:05-16:48/43 08:14-08:30/16	07:50 16:18-16:38/20
	21:03	20:31 18:39-19:45/66	19:40	18:51	17:12 07:42-08:01/19	17:04 08:17-08:54/37
17	06:13 18:56-19:32/36	06:42 07:04-07:42/38	07:13	07:45	07:21 16:05-16:48/43 08:14-08:33/19	07:51 16:18-16:38/20
	21:03	20:30 18:39-19:45/66	19:39	18:49	17:12 07:44-08:01/17	17:04 08:17-08:54/37
18	06:14 18:55-19:33/38	06:43 07:05-07:42/37	07:14	07:46	07:22 16:05-16:47/42 08:12-08:34/22	07:51 16:19-16:39/20
	21:02	20:29 18:39-19:44/65	19:37	18:48	17:11 07:45-08:01/16	17:05 08:17-08:55/38
19	06:15 18:55-19:34/39	06:44 07:06-07:42/36	07:15	07:47	07:23 16:04-16:46/42 08:11-08:35/24	07:52 16:19-16:38/19
	21:01	20:27 18:39-19:44/65	19:35	18:46	17:10 07:46-08:00/14	17:05 08:18-08:56/38
20	06:16 18:54-19:36/42	06:45 07:07-07:42/35	07:16	07:48	07:25 16:04-16:45/41 08:10-08:36/26	07:53 16:20-16:39/19
	21:01	20:26 18:38-19:42/64	19:34	18:45	17:09 07:47-07:59/12	17:05 08:18-08:56/38
21	06:16 18:53-19:37/44	06:46 07:08-07:41/33	07:17	07:49	07:26 16:05-16:45/40 08:10-08:38/28	07:53 16:20-16:39/19
	21:00	20:24 18:38-19:42/64	19:32	18:43	17:09 07:49-07:58/9	17:06 08:19-08:57/38
22	06:17 18:52-19:37/45	06:47 07:08-07:40/32	07:18	07:50	07:27 16:05-16:44/39 08:10-08:39/29	07:54 16:21-16:40/19
	20:59	20:23 18:38-19:41/63	19:30	18:42	17:08 07:50-07:57/7	17:06 08:19-08:57/38
23	06:18 18:51-19:38/47	06:48 07:09-07:39/30	07:19	07:51	07:28 16:04-16:43/39 08:09-08:39/30	07:54 16:21-16:40/19
	20:58	20:21 18:39-19:40/61	19:28	18:40	17:08 07:51-07:54/3	17:07 08:19-08:57/38
24	06:19 18:50-19:39/49	06:49 07:10-07:38/28	07:20	07:53	07:29 16:04-16:42/38	07:55 16:22-16:41/19
	20:58	20:20 18:39-19:39/60	19:27	18:39	17:07 08:09-08:40/31	17:07 08:20-08:58/38
25	06:20 18:50-19:40/50	06:50 07:11-07:37/26	07:21	07:54	07:30 16:05-16:41/36	07:55 16:22-16:42/20
	20:57	20:18 18:39-19:38/59	19:25	18:37	17:06 08:10-08:41/31	17:08 08:20-08:58/38
26	06:21 18:49-19:40/51	06:51 07:12-07:36/24	07:22	07:55	07:31 16:06-16:42/36	07:56 16:22-16:42/20
	20:56	20:17 18:40-19:37/57	19:23	18:36	17:06 08:09-08:42/33	17:09 08:21-08:59/38
27	06:22 18:48-19:41/53	06:52 07:13-07:34/21	07:23	07:56	07:33 16:06-16:41/35	07:56 16:23-16:43/20
	20:55	20:15 18:40-19:36/56	19:22	18:35	17:05 08:09-08:42/33	17:09 08:22-08:59/37
28	06:23 07:17-07:21/4	06:53 07:14-07:33/19	07:24	07:57	07:34 16:06-16:40/34	07:56 16:23-16:44/21
	20:54 18:48-19:42/54	20:14 18:41-19:35/54	19:20	18:33	17:05 08:09-08:43/34	17:10 08:22-08:59/37
29	06:24 07:13-07:25/12	06:54 07:15-07:30/15	07:25	07:58	07:35 16:07-16:40/33	07:56 16:23-16:44/21
	20:53 18:47-19:43/56	20:12 18:42-19:34/52	19:18	18:32	17:05 08:09-08:44/35	17:11 08:22-08:59/37
30	06:25 07:11-07:27/16	06:55 07:17-07:27/10	07:27	08:00 17:30-17:41/11	07:36 16:07-16:39/32	07:57 16:23-16:45/22
	20:52 18:47-19:43/56	20:10 18:43-19:32/49	19:17	18:31	17:04 08:09-08:44/35	17:11 08:22-09:00/38
31	06:26 07:09-07:29/20	06:56 18:44-19:30/46		08:01 08:46-08:51/5		07:57 16:23-16:45/22
	20:51 18:45-19:43/58	20:09		18:29 17:23-17:43/20		17:12 08:23-09:01/38
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	973	2822	178	36	2000	1861

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T57 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (476)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	16:11-16:36/25	07:44		07:07	17:11-17:51/40	07:16	18:55-19:32/37	06:31		06:02	19:56-20:32/36
	17:13	15:57-16:10/13	17:48		18:22		19:56		20:27		20:57	
2	07:57	16:12-16:36/24	07:43		07:06	17:11-17:51/40	07:15	18:55-19:33/38	06:29		06:01	19:56-20:33/37
	17:14	15:58-16:10/12	17:49		18:23		19:57		20:28		20:58	
3	07:57	16:13-16:36/23	07:42		07:04	17:12-17:51/39	07:13	18:54-19:32/38	06:28		06:01	19:57-20:34/37
	17:15	16:00-16:09/9	17:50		18:24		19:58		20:29		20:58	
4	07:57	16:13-16:36/23	07:40		07:03	17:12-17:50/38	07:11	18:53-19:32/39	06:27		06:01	19:56-20:34/38
	17:16	16:03-16:07/4	17:52		18:25		19:59		20:30		20:59	
5	07:57	16:14-16:36/22	07:39		07:01	07:20-07:25/5	07:10	18:53-19:33/40	06:25		06:00	19:56-20:35/39
	17:17		17:53		18:27	17:12-17:49/37	20:00		20:31		21:00	
6	07:57	16:15-16:36/21	07:38		06:59	07:19-07:30/11	07:08	18:53-19:32/39	06:24		06:00	19:57-20:36/39
	17:18		17:54		18:28	17:13-17:48/35	20:00		20:32		21:00	
7	07:57	16:15-16:36/21	07:37		06:58	07:17-07:31/14	07:06	18:52-19:31/39	06:23		06:00	19:57-20:37/40
	17:19		17:55		18:29	17:13-17:47/34	20:01		20:33		21:01	
8	07:57	16:17-16:36/19	07:36		07:56	08:16-08:33/17	07:05	18:53-19:31/38	06:22		05:59	19:56-20:37/41
	17:20		17:57		19:30	18:14-18:46/32	20:03		20:34		21:02	
9	07:57	16:18-16:36/18	07:35		07:55	08:14-08:34/20	07:03	18:53-19:30/37	06:21		05:59	19:57-20:37/40
	17:21		17:58		19:31	18:15-18:44/29	20:04		20:35		21:02	
10	07:57	16:20-16:35/15	07:34		07:53	08:12-08:34/22	07:02	18:53-19:30/37	06:20		05:59	19:57-20:38/41
	17:22		17:59		19:32	18:16-18:42/26	20:05		20:36		21:03	
11	07:57	16:20-16:34/14	07:32		07:51	08:11-08:35/24	07:00	18:53-19:29/36	06:19		05:59	19:57-20:39/42
	17:23		18:00		19:33	18:19-18:41/22	20:06		20:38		21:04	
12	07:56	16:22-16:33/11	07:31		07:50	08:09-08:35/26	06:58	18:54-19:27/33	06:17		05:59	19:58-20:39/41
	17:24		18:02		19:34	18:21-18:37/16	20:07		20:39		21:04	
13	07:56	16:25-16:32/7	07:30		07:48	08:07-08:34/27	06:57	18:55-19:26/31	06:16		05:59	19:58-20:40/42
	17:25		18:03		19:36	18:25-18:32/7	20:08		20:40		21:05	
14	07:56		07:29		07:46	08:07-08:35/28	06:55	18:55-19:25/30	06:15		05:59	19:58-20:40/42
	17:26		18:04		19:37		20:09		20:41		21:05	
15	07:55		07:27	17:29-17:35/6	07:45	08:06-08:34/28	06:54	18:57-19:24/27	06:14		05:59	19:58-20:40/42
	17:27		18:05		19:38		20:10		20:42		21:05	
16	07:55		07:26	17:25-17:40/15	07:43	08:06-08:33/27	06:52	18:58-19:21/23	06:13		05:59	19:58-20:41/43
	17:28		18:06		19:39		20:11		20:43		21:06	
17	07:54		07:25	17:21-17:42/21	07:42	08:07-08:33/26	06:51	19:00-19:19/19	06:12	20:09-20:17/8	05:59	19:58-20:41/43
	17:30		18:08		19:40		20:12		20:44		21:06	
18	07:54		07:23	17:20-17:45/25	07:40	08:07-08:32/25	06:49	19:03-19:15/12	06:12	20:06-20:20/14	05:59	19:59-20:41/42
	17:31		18:09		19:41		20:13		20:45		21:07	
19	07:53		07:22	17:18-17:47/29	07:38	08:07-08:30/23	06:48		06:11	20:04-20:22/18	05:59	19:59-20:41/42
	17:32		18:10		19:42		20:14		20:45		21:07	
20	07:53		07:21	17:16-17:47/31	07:36	08:09-08:29/20	06:46		06:10	20:03-20:23/20	05:59	19:59-20:42/43
	17:33		18:11		19:43		20:15		20:46		21:07	
21	07:52		07:19	17:16-17:49/33	07:35	08:10-08:26/16	06:45		06:09	20:02-20:24/22	05:59	20:00-20:43/43
	17:34		18:13		19:44		20:16		20:47		21:08	
22	07:52		07:18	17:14-17:49/35	07:33	08:13-08:23/10	06:43		06:08	20:00-20:24/24	05:59	20:00-20:43/43
	17:35		18:14		19:45		20:17		20:48		21:08	
23	07:51		07:16	17:14-17:50/36	07:31		06:42		06:07	19:59-20:25/26	06:00	20:00-20:42/42
	17:37		18:15		19:46		20:19		20:49		21:08	
24	07:50		07:15	17:13-17:50/37	07:30	19:13-19:20/7	06:40		06:07	19:59-20:27/28	06:00	20:00-20:42/42
	17:38		18:16		19:48		20:20		20:50		21:08	
25	07:50		07:13	17:12-17:51/39	07:28	19:08-19:24/16	06:39		06:06	19:58-20:27/29	06:00	20:00-20:43/43
	17:39		18:17		19:49		20:21		20:51		21:08	
26	07:49		07:12	17:12-17:51/39	07:26	19:04-19:26/22	06:37		06:05	19:58-20:27/29	06:00	20:00-20:43/43
	17:40		18:18		19:50		20:22		20:52		21:08	
27	07:48		07:10	17:12-17:51/39	07:25	19:03-19:29/26	06:36		06:05	19:58-20:29/31	06:01	20:00-20:43/43
	17:42		18:20		19:51		20:23		20:53		21:08	
28	07:47		07:09	17:11-17:51/40	07:23	19:00-19:30/30	06:35		06:04	19:57-20:29/32	06:01	20:01-20:43/42
	17:43		18:21		19:52		20:24		20:54		21:09	
29	07:46				07:21	18:59-19:30/31	06:33		06:03	19:57-20:30/33	06:02	20:01-20:43/42
	17:44				19:53		20:25		20:54		21:09	
30	07:45				07:20	18:58-19:32/34	06:32		06:03	19:57-20:31/34	06:02	20:02-20:43/41
	17:45				19:54		20:26		20:55		21:09	
31	07:44				07:18	18:56-19:32/36			06:02	19:57-20:32/35		
	17:47				19:55				20:56			
Potential sun hours	297		297		370		399		448		452	
Sum of minutes with flicker	281		425		966		593		383		1234	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T57 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (476)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 20:01-20:43/42 21:08	06:27 20:50	06:58 18:52-19:28/36 20:07	07:28 07:48-08:14/26 19:15 18:01-18:14/13	07:02 17:28	07:37 16:02-16:16/14 17:04
2	06:03 20:02-20:43/41 21:08	06:28 20:49	06:59 18:51-19:28/37 20:06	07:29 07:49-08:14/25 19:13 17:58-18:18/20	07:03 17:27	07:38 16:02-16:17/15 17:04
3	06:04 20:02-20:43/41 21:08	06:29 20:48	07:00 18:51-19:28/37 20:04	07:30 07:50-08:13/23 19:12 17:56-18:20/24	07:04 17:26	07:39 16:01-16:19/18 17:04
4	06:04 20:03-20:43/40 21:08	06:30 20:47	07:01 18:50-19:28/38 20:02	07:31 07:51-08:12/21 19:10 17:54-18:21/27	07:06 17:25	07:40 16:02-16:21/19 17:03
5	06:05 20:02-20:42/40 21:08	06:31 20:46	07:02 18:49-19:28/39 20:01	07:32 07:52-08:10/18 19:08 17:52-18:22/30	07:07 17:24	07:41 16:02-16:22/20 17:03
6	06:05 20:03-20:42/39 21:08	06:32 20:45	07:03 18:49-19:28/39 19:57	07:33 07:53-08:09/16 19:07 17:50-18:23/33	07:08 17:22	07:42 16:00-16:21/21 17:03
7	06:06 20:03-20:41/38 21:07	06:33 20:43	07:04 18:48-19:28/40 19:56	07:34 07:54-08:07/13 19:05 17:49-18:24/35	07:09 17:21	07:43 16:00-16:22/22 17:03
8	06:07 20:03-20:42/39 21:07	06:34 20:42	07:05 18:48-19:27/39 19:54	07:35 07:55-08:03/8 19:03 17:48-18:24/36	07:10 17:20	07:44 16:01-16:23/22 17:03 15:50-15:54/4
9	06:07 20:04-20:42/38 21:07	06:35 20:41	07:06 18:48-19:27/39 19:52	07:36 17:47-18:24/37 19:02	07:12 17:19	07:45 16:01-16:24/23 17:03 15:48-15:57/9
10	06:08 20:04-20:41/37 21:06	06:36 20:40	07:07 18:48-19:26/38 19:51	07:37 17:46-18:24/38 19:00	07:13 17:18	07:46 16:01-16:25/24 17:03 15:47-15:59/12
11	06:09 20:04-20:41/37 21:06	06:37 20:38	07:08 18:48-19:25/37 19:49	07:38 17:45-18:24/39 18:59	07:14 17:17	07:46 16:01-16:26/25 17:03 15:47-16:00/13
12	06:09 20:05-20:40/35 21:06	06:38 20:37	07:09 18:48-19:24/36 19:47	07:39 17:44-18:24/40 18:57	07:15 17:16	07:47 15:47-16:27/40 17:03
13	06:10 20:05-20:39/34 21:05	06:39 20:36	07:10 18:49-19:23/34 19:46	07:40 17:44-18:24/40 18:55	07:16 17:15	07:48 15:47-16:27/40 17:03
14	06:11 20:05-20:39/34 21:05	06:40 20:34	07:11 18:50-19:22/32 19:44	07:42 17:45-18:24/39 18:54	07:18 17:14	07:49 15:46-16:27/41 17:04
15	06:12 20:06-20:39/33 21:04	06:41 20:33	07:12 18:49-19:19/30 19:42	07:43 17:44-18:24/40 18:52	07:19 17:13	07:50 15:46-16:28/42 17:04
16	06:12 20:07-20:38/31 21:03	06:42 20:32	07:13 18:51-19:17/26 19:41	07:44 17:44-18:23/39 18:51	07:20 17:13	07:50 15:47-16:29/42 17:04
17	06:13 20:07-20:37/30 21:03	06:43 20:30	07:13 18:52-19:15/23 19:39	07:45 17:44-18:22/38 18:49	07:21 17:12	07:51 15:46-16:29/43 17:04
18	06:14 20:07-20:37/30 21:02	06:44 20:29	07:14 18:54-19:12/18 19:37	07:46 17:44-18:21/37 18:48	07:22 17:11	07:52 15:47-16:30/43 17:05
19	06:15 20:08-20:36/28 21:02	06:45 20:27	07:15 18:58-19:08/10 19:35	07:47 17:45-18:20/35 18:46	07:24 17:10	07:52 15:48-16:31/43 17:05
20	06:16 20:09-20:36/27 21:01	06:46 20:26	07:16 19:34	07:48 17:46-18:20/34 18:45	07:25 17:10	07:53 15:47-16:31/44 17:05
21	06:17 20:10-20:35/25 21:00	06:47 20:24	07:18 07:59-08:07/8 19:32	07:49 17:47-18:19/32 18:43	07:26 17:09	07:53 15:48-16:32/44 17:06
22	06:17 20:12-20:35/23 20:59	06:48 20:23	07:19 07:56-08:10/14 19:30	07:50 17:47-18:18/31 18:42	07:27 17:08	07:54 15:48-16:32/44 17:06
23	06:18 20:12-20:33/21 20:59	06:49 20:21	07:20 07:53-08:12/19 19:29	07:52 17:48-18:16/28 18:40	07:28 17:08	07:54 15:49-16:33/44 17:07
24	06:19 20:13-20:32/19 20:58	06:50 20:20	07:21 07:51-08:13/22 19:27	07:53 17:50-18:14/24 18:39	07:29 17:07	07:55 15:50-16:33/43 17:08
25	06:20 20:15-20:31/16 20:57	06:51 19:05-19:19/14 20:18	07:22 07:50-08:14/24 19:25	07:54 17:53-18:12/19 18:38	07:30 17:07	07:55 15:50-16:33/43 17:08
26	06:21 20:18-20:29/11 20:56	06:52 19:02-19:21/19 20:17	07:23 07:49-08:14/25 19:23	07:55 17:55-18:09/14 18:36	07:32 17:06	07:56 15:51-16:34/43 17:09
27	06:22 20:55	06:53 19:00-19:23/23 20:15	07:24 07:48-08:14/26 19:22	07:56 18:35	07:33 17:06	07:56 15:52-16:34/42 17:09
28	06:23 20:54	06:54 18:58-19:25/27 20:14	07:25 07:47-08:14/27 19:20	07:57 18:33	07:34 17:05	07:56 15:52-16:34/42 17:10
29	06:24 20:53	06:55 18:56-19:26/30 20:12	07:26 07:46-08:14/28 19:18	07:59 18:32	07:35 16:06-16:12/6 17:05	07:57 15:53-16:34/41 17:11
30	06:25 20:52	06:56 18:55-19:26/31 20:11	07:27 07:47-08:15/28 19:17	08:00 18:31	07:36 16:04-16:14/10 17:04	07:57 15:55-16:34/39 17:12
31	06:26 20:51	06:57 18:53-19:27/34 20:09		08:01 18:30		07:57 15:55-16:35/40 17:12
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	829	178	849	972	16	1104

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T58 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (477)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June	
1	07:57	07:43		07:07	07:37-07:54/17	07:16	18:51-19:24/33	06:30	19:01-19:34/33 19:43-20:05/22	06:02	06:23-06:57/34
	17:13	17:48		18:22	17:46-17:59/13	19:56		20:27	07:07-07:21/14	20:57	
2	07:57	07:42		07:06	07:38-07:52/14	07:14	18:51-19:23/32	06:29	19:03-19:33/30 19:42-20:06/24	06:01	06:23-06:57/34
	17:14	17:49		18:23	17:46-18:01/15	19:57		20:28	07:11-07:18/7	20:57	
3	07:57	07:41		07:04	07:41-07:48/7	07:13	18:53-19:22/29	06:28	19:03-19:31/28	06:01	06:24-06:58/34
	17:15	17:50		18:24	17:44-18:02/18	19:58		20:29	19:41-20:06/25	20:58	
4	07:57	07:40		07:02	17:44-18:04/20	07:11	18:53-19:27/34	06:27	19:05-19:29/24	06:00	06:23-06:58/35
	17:16	17:51		18:25		19:59		20:30	19:41-20:07/26	20:59	
5	07:57	07:39		07:01	17:44-18:05/21	07:10	18:54-19:32/38	06:25	19:07-19:27/20	06:00	06:23-06:58/35
	17:17	17:53		18:26		20:00	07:29-07:35/6	20:31	19:41-20:08/27	21:00	
6	07:57	07:38		06:59	17:43-18:05/22	07:08	18:55-19:35/40	06:24	19:10-19:25/15	06:00	06:24-06:59/35
	17:18	17:54		18:28		20:00	07:27-07:37/10	20:32	19:41-20:10/29	21:00	
7	07:57	07:37		06:58	17:44-18:07/23	07:06	18:57-19:37/40	06:23	19:16-19:19/3	05:59	06:23-06:58/35
	17:19	17:55		18:29		20:01	07:25-07:38/13	20:33	19:41-20:10/29	21:01	
8	07:57	07:36		07:56	18:44-19:06/22	07:05	19:00-19:39/39	06:22	19:41-20:09/28	05:59	06:24-06:59/35
	17:20	17:56		19:30		20:02	07:24-07:39/15	20:34		21:02	
9	07:57	07:35		07:54	18:45-19:06/21	07:03	19:05-19:43/38	06:21	19:42-20:09/27	05:59	06:24-06:59/35
	17:21	17:58		19:31		20:03	07:22-07:39/17	20:35		21:02	
10	07:57	07:33		07:53	18:45-19:04/19	07:01	19:03-19:43/40	06:19	19:42-20:09/27	05:59	06:24-06:59/35
	17:22	17:59		19:32		20:04	07:20-07:39/19	20:36		21:03	
11	07:56	07:32		07:51	18:46-19:02/16	07:00	19:02-19:45/43	06:18	19:42-20:07/25	05:59	06:24-07:00/36
	17:23	18:00		19:33		20:06	07:19-07:39/20	20:37		21:03	
12	07:56	07:31		07:50	18:49-19:00/11	06:58	19:01-19:45/44	06:17	19:42-20:07/25	05:59	06:25-07:00/35
	17:24	18:01		19:34		20:07	07:17-07:39/22	20:38		21:04	
13	07:56	07:30		07:48		06:57	19:00-19:47/47	06:16	19:43-20:06/23	05:58	06:25-07:00/35
	17:25	18:03		19:35		20:08	07:16-07:39/23	20:39		21:04	
14	07:55	07:28		07:46		06:55	18:59-19:47/48	06:15	19:45-20:06/21	05:58	06:25-07:00/35
	17:26	18:04		19:36		20:09	07:14-07:38/24	20:40		21:05	
15	07:55	07:27		07:45		06:53	18:59-19:49/50	06:14	19:45-20:05/20	05:58	06:25-07:01/36
	17:27	18:05		19:38		20:10	07:13-07:38/25	20:41		21:05	
16	07:55	07:26	07:46-07:52/6	07:43		06:52	18:58-19:50/52	06:13	06:37-06:41/4	05:58	06:26-07:01/35
	17:28	18:06		19:39		20:11	07:11-07:37/26	20:42	19:47-20:04/17	21:06	
17	07:54	07:25	07:44-07:54/10	07:41		06:50	18:57-19:50/53	06:12	06:33-06:45/12	05:58	06:26-07:01/35
	17:29	18:07		19:40		20:12	07:10-07:37/27	20:43	19:48-20:03/15	21:06	
18	07:54	07:23	07:43-07:56/13	07:40	19:06-19:19/13	06:49	18:57-19:52/55	06:11	06:32-06:47/15	05:58	06:26-07:01/35
	17:31	18:09		19:41		20:13	07:08-07:35/27	20:44	19:49-20:01/12	21:06	
19	07:53	07:22	07:42-07:57/15	07:38	19:02-19:21/19	06:47	18:56-19:51/55	06:10	06:31-06:48/17	05:59	06:26-07:01/35
	17:32	18:10		19:42		20:14	07:07-07:35/28	20:45	19:52-19:58/6	21:07	
20	07:53	07:20	07:40-07:57/17	07:36	19:00-19:21/21	06:46	18:57-19:51/54	06:10	06:30-06:49/19	05:59	06:26-07:01/35
	17:33	18:11		19:43		20:15	07:05-07:33/28	20:46		21:07	
21	07:52	07:19	07:39-07:58/19	07:35	18:59-19:23/24	06:44	18:57-19:51/54	06:09	06:30-06:51/21	05:59	06:26-07:01/35
	17:34	18:12		19:44		20:16	07:04-07:32/28	20:47		21:07	
22	07:51	07:18	07:37-07:58/21	07:33	18:57-19:24/27	06:43	18:57-19:50/53	06:08	06:29-06:52/23	05:59	06:27-07:02/35
	17:35	18:14		19:45		20:17	07:02-07:30/28	20:48		21:08	
23	07:51	07:16	07:36-07:58/22	07:31	18:55-19:25/30	06:41	18:57-19:50/53	06:07	06:28-06:52/24	05:59	06:27-07:02/35
	17:36	18:15		19:46		20:18	07:02-07:29/27	20:49		21:08	
24	07:50	07:15	07:34-07:58/24	07:30	18:54-19:25/31	06:40	18:57-19:49/52	06:06	06:28-06:54/26	06:00	06:27-07:02/35
	17:38	18:16		19:47		20:19	07:02-07:28/26	20:50		21:08	
25	07:49	07:13	07:34-07:58/24	07:28	18:53-19:27/34	06:39	18:57-19:48/51 19:52-19:59/7	06:06	06:27-06:54/27	06:00	06:27-07:02/35
	17:39	18:17		19:48		20:20	07:02-07:28/26	20:51		21:08	
26	07:49	07:12	07:34-07:57/23	07:26	18:52-19:27/35	06:37	18:58-19:47/49 19:49-20:00/11	06:05	06:26-06:54/28	06:00	06:28-07:03/35
	17:40	18:18	17:53-17:56/3	19:49		20:21	07:03-07:28/25	20:52		21:08	
27	07:48	07:10	07:35-07:57/22	07:25	18:52-19:26/34	06:36	18:58-19:45/47 19:47-20:00/13	06:04	06:26-06:55/29	06:01	06:27-07:03/36
	17:41	18:19	17:50-17:58/8	19:51		20:23	07:03-07:26/23	20:53		21:08	
28	07:47	07:09	07:35-07:55/20	07:23	18:52-19:27/35	06:34	18:59-19:43/44 19:46-20:02/16	06:04	06:25-06:55/30	06:01	06:28-07:04/36
	17:43	18:21	17:48-17:59/11	19:52		20:24	07:04-07:26/22	20:53		21:08	
29	07:46			07:21	18:51-19:26/35	06:33	19:00-19:41/41 19:45-20:03/18	06:03	06:25-06:56/31	06:01	06:28-07:03/35
	17:44			19:53		20:25	07:05-07:25/20	20:54		21:08	
30	07:45			07:19	18:51-19:25/34	06:32	19:00-19:35/35 19:43-20:03/20	06:03	06:24-06:56/32	06:02	06:28-07:03/35
	17:45			19:54		20:26	07:05-07:22/17	20:55		21:08	
31	07:44			07:18	18:52-19:25/33			06:02	06:24-06:57/33		
	17:46			19:55				20:56			
Potential sun hours	297	297		370		399		448		452	
Sum of minutes with flicker	0	258		664		2000		973		1051	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T58 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (477)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October		November	December
1	06:02	06:29-07:04/35	06:26	19:53-20:18/25	06:57	19:01-19:44/43	07:27	18:29-18:37/8	07:02	07:37
	21:08		20:50		20:07	07:18-07:38/20	19:15		17:28	17:04
2	06:03	06:28-07:04/36	06:27	19:52-20:18/26	06:58	19:02-19:42/40	07:29	18:26-18:40/14	07:03	07:38
	21:08		20:49		20:05	07:19-07:38/19	19:13		17:27	17:04
3	06:03	06:29-07:04/35	06:28	19:52-20:19/27	06:59	19:03-19:41/38	07:30	18:23-18:41/18	07:04	07:39
	21:08		20:48		20:04	07:20-07:37/17	19:11		17:26	17:03
4	06:04	06:29-07:04/35	06:29	19:51-20:19/28	07:00	18:57-19:36/39	07:31	18:22-18:42/20	07:05	07:40
	21:08		20:47		20:02	07:21-07:36/15	19:10		17:24	17:03
5	06:04	06:29-07:04/35	06:30	19:51-20:19/28	07:01	18:54-19:34/40	07:32	18:21-18:42/21	07:07	07:41
	21:08		20:45		20:01	07:22-07:35/13	19:08		17:23	17:03
6	06:05	06:30-07:05/35	06:31	19:23-19:31/8	07:02	18:52-19:31/39	07:33	18:20-18:42/22	07:08	07:42
	21:07		20:44	19:51-20:19/28	19:57	07:23-07:33/10	19:06		17:22	17:03
7	06:06	06:30-07:04/34	06:32	19:19-19:35/16	07:03	18:50-19:28/38	07:34	18:20-18:43/23	07:09	07:43
	21:07		20:43	19:51-20:19/28	19:56	07:24-07:30/6	19:05		17:21	17:03
8	06:06	06:30-07:05/35	06:33	19:16-19:38/22	07:04	18:48-19:23/35	07:35	18:19-18:41/22	07:10	07:44
	21:07		20:42	19:51-20:18/27	19:54		19:03		17:20	17:03
9	06:07	06:30-07:04/34	06:34	19:14-19:39/25	07:05	18:46-19:15/29	07:36	18:19-18:39/20	07:11	07:45
	21:07		20:41	19:51-20:17/26	19:52		19:02		17:19	17:03
10	06:08	06:30-07:05/35	06:35	19:13-19:41/28	07:06	18:45-19:16/31	07:37	18:19-18:38/19	07:13	07:45
	21:06		20:39	19:51-20:15/24	19:51		19:00		17:18	17:03
11	06:08	06:31-07:05/34	06:36	19:11-19:42/31 19:51-20:14/23	07:07	18:44-19:16/32	07:38	08:14-08:24/10	07:14	07:46
	21:06		20:38	07:18-07:28/10	19:49		18:58	18:19-18:36/17	17:17	17:03
12	06:09	06:32-07:05/33	06:37	19:10-19:43/33 19:52-20:13/21	07:08	18:43-19:16/33	07:39	08:11-08:26/15	07:15	07:47
	21:05		20:37	07:16-07:30/14	19:47		18:57	18:19-18:34/15	17:16	17:03
13	06:10	06:32-07:05/33	06:38	19:09-19:44/35 19:52-20:12/20	07:09	18:42-19:16/34	07:40	08:09-08:27/18	07:16	07:48
	21:05		20:35	07:14-07:32/18	19:45		18:55	18:20-18:32/12	17:15	17:03
14	06:11	06:33-07:05/32	06:39	19:07-19:49/42 19:53-20:10/17	07:10	18:42-19:16/34	07:41	08:07-08:28/21	07:17	07:49
	21:04		20:34	07:12-07:33/21	19:44		18:54	18:21-18:31/10	17:14	17:03
15	06:11	06:34-07:05/31	06:40	19:06-19:51/45 19:54-20:09/15	07:11	18:41-19:16/35	07:42	08:07-08:29/22	07:19	07:49
	21:04		20:33	07:11-07:34/23	19:42		18:52	18:23-18:29/6	17:13	17:04
16	06:12	06:35-07:05/30	06:41	19:06-19:53/47 19:55-20:08/13	07:12	18:41-19:15/34	07:43	08:06-08:30/24	07:20	07:50
	21:03		20:31	07:10-07:34/24	19:40		18:50		17:12	17:04
17	06:13	06:35-07:04/29	06:42	19:05-19:54/49 19:57-20:07/10	07:13	18:41-19:15/34	07:45	08:06-08:29/23	07:21	07:51
	21:03		20:30	07:10-07:35/25	19:39		18:49		17:12	17:04
18	06:14	06:36-07:04/28	06:43	19:03-19:54/51 19:59-20:04/5	07:14	18:41-19:14/33	07:46	08:06-08:29/23	07:22	07:51
	21:02		20:29	07:09-07:35/26	19:37		18:47		17:11	17:04
19	06:15	06:37-07:04/27	06:44	19:02-19:54/52	07:15	18:41-19:13/32	07:47	08:07-08:29/22	07:23	07:52
	21:01		20:27	07:08-07:35/27	19:35		18:46		17:10	17:05
20	06:15	06:38-07:03/25	06:45	19:02-19:55/53	07:16	18:41-19:11/30	07:48	08:08-08:28/20	07:24	07:53
	21:01		20:26	07:07-07:34/27	19:33		18:44		17:09	17:05
21	06:16	06:39-07:03/24	06:46	19:01-19:55/54	07:17	18:42-19:10/28	07:49	08:10-08:29/19	07:26	07:53
	21:00		20:24	07:07-07:35/28	19:32		18:43		17:09	17:06
22	06:17	06:39-07:01/22	06:47	19:01-19:55/54	07:18	18:43-19:08/25	07:50	08:11-08:28/17	07:27	07:54
	20:59		20:23	07:08-07:36/28	19:30		18:42		17:08	17:06
23	06:18	06:40-07:00/20	06:48	19:01-19:55/54	07:19	18:44-19:06/22	07:51	08:12-08:26/14	07:28	07:54
	20:58		20:21	07:09-07:37/28	19:28		18:40		17:07	17:07
24	06:19	06:41-07:00/19	06:49	19:00-19:55/55	07:20	18:45-19:05/20	07:52	08:13-08:25/12	07:29	07:55
	20:57		20:20	07:10-07:38/28	19:27		18:39		17:07	17:07
25	06:20	06:42-06:58/16	06:50	19:00-19:54/54	07:21	18:47-19:02/15	07:54	08:14-08:23/9	07:30	07:55
	20:57	20:01-20:10/9	20:18	07:11-07:38/27	19:25		18:37		17:06	17:08
26	06:21	06:43-06:57/14	06:51	19:00-19:53/53	07:22	18:53-18:56/3	07:55	08:16-08:21/5	07:31	07:55
	20:56	19:59-20:12/13	20:17	07:12-07:38/26	19:23		18:36		17:06	17:09
27	06:22	06:45-06:54/9	06:52	19:00-19:51/51	07:23		07:56		07:32	07:56
	20:55	19:58-20:14/16	20:15	07:13-07:39/26	19:22		18:35		17:05	17:09
28	06:23	19:57-20:15/18	06:53	19:00-19:50/50	07:24		07:57		07:34	07:56
	20:54		20:13	07:14-07:39/25	19:20		18:33		17:05	17:10
29	06:24	19:56-20:16/20	06:54	19:00-19:48/48	07:25		07:58		07:35	07:56
	20:53		20:12	07:15-07:39/24	19:18		18:32		17:05	17:11
30	06:25	19:54-20:16/22	06:55	19:00-19:47/47	07:26		07:59		07:36	07:57
	20:52		20:10	07:16-07:39/23	19:16		18:31		17:04	17:11
31	06:25	19:53-20:17/24	06:56	19:01-19:45/44			08:01			07:57
	20:51		20:09	07:17-07:39/22			18:29			17:12
Potential sun hours	459		428		375		345		297	287
Sum of minutes with flicker	897		1992		916		521		0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T59 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (478)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	15:35-16:14/39	07:43		07:07	16:55-17:48/53	07:16	18:24-19:23/59	06:31	18:33-19:52/79	06:02	
	17:13		17:48		18:22		19:56		20:27		20:57	
2	07:57	15:36-16:14/38	07:42		07:06	16:54-17:48/54	07:15	18:26-19:25/59	06:29	18:35-19:52/77	06:01	
	17:14		17:49		18:23		19:57		20:28		20:58	
3	07:57	15:37-16:14/37	07:41		07:04	16:54-17:49/55	07:13	18:29-19:25/56	06:28	18:37-19:52/75	06:01	
	17:15		17:50		18:24		19:58		20:29		20:58	
4	07:57	15:38-16:14/36	07:40		07:03	16:53-17:54/61	07:11	18:31-19:26/55	06:27	18:38-19:52/74	06:01	
	17:16		17:52		18:25		19:59		20:30		20:59	
5	07:57	15:38-16:15/37	07:39		07:01	16:53-17:57/64	07:10	18:31-19:27/56	06:25	18:40-19:51/71	06:00	
	17:17		17:53		18:27		20:00		20:31		21:00	
6	07:57	15:39-16:15/36	07:38		06:59	16:53-18:00/67	07:08	18:29-19:27/58	06:24	18:42-19:51/69	06:00	
	17:18		17:54		18:28		20:00		20:32		21:00	
7	07:57	15:39-16:14/35	07:37		06:58	16:53-18:01/68	07:06	18:28-19:27/59	06:23	19:01-19:51/50	06:00	
	17:19		17:55		18:29		20:01		20:33	18:46-19:00/14	21:01	
8	07:57	15:41-16:14/33	07:36		07:56	17:52-19:02/70	07:05	18:28-19:28/60	06:22	19:01-19:50/49	05:59	
	17:20		17:57		19:30		20:03		20:34		21:02	
9	07:57	15:42-16:14/32	07:35		07:55	17:53-19:04/71	07:03	18:27-19:27/60	06:21	19:02-19:50/48	05:59	
	17:21		17:58		19:31		20:04		20:35		21:02	
10	07:57	15:43-16:14/31	07:34		07:53	17:53-19:05/72	07:02	18:27-19:28/61	06:20	19:02-19:50/48	05:59	
	17:22		17:59		19:32		20:05		20:36		21:03	
11	07:57	15:44-16:13/29	07:32		07:51	17:54-19:06/72	07:00	18:26-19:28/62	06:19	19:03-19:49/46	05:59	
	17:23		18:00		19:33		20:06		20:37		21:03	
12	07:56	15:45-16:13/28	07:31		07:50	17:54-19:06/72	06:58	18:25-19:27/62	06:17	19:03-19:49/46	05:59	
	17:24		18:02		19:34		20:07		20:39		21:04	
13	07:56	15:47-16:13/26	07:30		07:48	17:54-19:06/72	06:57	18:26-19:27/61	06:16	19:04-19:48/44	05:59	
	17:25		18:03		19:36		20:08		20:40		21:05	
14	07:56	15:48-16:12/24	07:29		07:46	17:55-19:07/72	06:55	18:25-19:36/71	06:15	19:04-19:48/44	05:59	
	17:26		18:04		19:37		20:09		20:41		21:05	
15	07:55	15:50-16:11/21	07:27		07:45	17:56-19:07/71	06:54	18:25-19:40/75	06:14	19:05-19:47/42	05:59	
	17:27		18:05		19:38		20:10		20:42		21:05	
16	07:55	15:52-16:09/17	07:26	17:15-17:31/16	07:43	17:56-19:07/71	06:52	18:25-19:42/77	06:13	19:06-19:46/40	05:59	06:21-06:22/1
	17:28		18:06		19:39		20:11		20:43		21:06	
17	07:54	15:55-16:08/13	07:25	17:10-17:34/24	07:41	17:58-19:08/70	06:51	18:25-19:45/80	06:12	19:06-19:45/39	05:59	06:21-06:23/2
	17:30		18:08		19:40		20:12		20:44		21:06	
18	07:54	16:00-16:03/3	07:23	17:08-17:37/29	07:40	17:59-19:07/68	06:49	18:25-19:46/81	06:12	19:07-19:44/37	05:59	06:21-06:23/2
	17:31		18:09		19:41		20:13		20:44		21:07	
19	07:53		07:22	17:06-17:39/33	07:38	18:00-19:07/67	06:48	18:26-19:47/81	06:11	19:08-19:44/36	05:59	06:21-06:23/2
	17:32		18:10		19:42		20:14		20:45		21:07	
20	07:53		07:21	17:04-17:40/36	07:36	18:01-19:06/65	06:46	18:25-19:48/83	06:10	19:09-19:43/34	05:59	06:21-06:23/2
	17:33		18:11		19:43		20:15		20:46		21:07	
21	07:52		07:19	17:03-17:42/39	07:35	18:04-19:06/62	06:45	18:26-19:49/83	06:09	19:10-19:42/32	05:59	06:22-06:24/2
	17:34		18:13		19:44		20:16		20:47		21:08	
22	07:52		07:18	17:01-17:43/42	07:33	18:07-19:05/58	06:43	18:26-19:49/83	06:08	19:11-19:41/30	05:59	06:22-06:24/2
	17:35		18:14		19:45		20:17		20:48		21:08	
23	07:51		07:16	17:00-17:45/45	07:31	18:12-19:04/52	06:42	18:27-19:50/83	06:07	19:12-19:40/28	06:00	06:22-06:24/2
	17:37		18:15		19:46		20:19		20:49		21:08	
24	07:50		07:15	16:58-17:45/47	07:30	18:17-19:04/47	06:40	18:28-19:51/83	06:07	19:14-19:39/25	06:00	06:22-06:24/2
	17:38		18:16		19:48		20:20		20:50		21:08	
25	07:50		07:13	16:58-17:46/48	07:28	18:17-19:08/51	06:39	18:28-19:51/83	06:06	19:15-19:37/22	06:00	06:23-06:25/2
	17:39		18:17		19:49		20:21		20:51		21:08	
26	07:49		07:12	16:56-17:46/50	07:26	18:17-19:12/55	06:37	18:29-19:52/83	06:05	19:17-19:36/19	06:00	06:23-06:24/1
	17:40		18:18		19:50		20:22		20:52		21:08	
27	07:48		07:10	16:56-17:47/51	07:25	18:18-19:16/58	06:36	18:29-19:51/82	06:05	19:19-19:34/15	06:01	06:23-06:24/1
	17:42		18:20		19:51		20:23		20:53		21:08	
28	07:47		07:09	16:55-17:47/52	07:23	18:19-19:18/59	06:35	18:30-19:52/82	06:04	19:22-19:31/9	06:01	
	17:43		18:21		19:52		20:24		20:54		21:08	
29	07:46				07:21	18:19-19:20/61	06:33	18:31-19:52/81	06:03		06:02	
	17:44				19:53		20:25		20:54		21:08	
30	07:45				07:20	18:21-19:22/61	06:32	18:32-19:51/79	06:03		06:02	
	17:45				19:54		20:26		20:55		21:08	
31	07:44				07:18	18:22-19:23/61			06:02			
	17:47				19:55				20:56			
Potential sun hours	297		297		370		399		448		452	
Sum of minutes with flicker	515		512		1960		2138		1242		21	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T59 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (478)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 19:14-20:00/46 20:50	06:58 18:25-19:27/62 20:07	07:28 17:33-18:45/72 19:15	07:02 17:28	07:37 15:26-15:55/29 17:04
2	06:03 21:08	06:28 19:12-19:59/47 20:49	06:59 18:25-19:26/61 20:06	07:29 17:32-18:44/72 19:13	07:03 17:27	07:38 15:25-15:56/31 17:04
3	06:04 21:08	06:29 19:12-20:00/48 20:48	07:00 18:25-19:25/60 20:04	07:30 17:32-18:44/72 19:12	07:04 17:26	07:39 15:25-15:57/32 17:04
4	06:04 21:08	06:30 19:11-20:00/49 20:47	07:01 18:25-19:25/60 20:02	07:31 17:31-18:42/71 19:10	07:06 17:25	07:40 15:25-15:58/33 17:03
5	06:05 21:08	06:31 19:11-20:00/49 20:46 19:00-19:06/6	07:02 18:25-19:24/59 20:01	07:32 17:30-18:41/71 19:08	07:07 17:24	07:41 15:25-15:59/34 17:03
6	06:05 21:08	06:32 18:54-20:00/66 20:44	07:03 18:25-19:23/58 19:57	07:33 17:29-18:39/70 19:07	07:08 17:22	07:42 15:24-16:00/36 17:03
7	06:06 21:07	06:33 18:51-20:01/70 20:43	07:04 18:26-19:22/56 19:56	07:34 17:29-18:37/68 19:05	07:09 17:21	07:43 15:25-16:01/36 17:03
8	06:07 21:07	06:34 18:49-20:01/72 20:42	07:05 18:26-19:21/55 19:54	07:35 17:28-18:34/66 19:03	07:10 17:20	07:44 15:25-16:01/36 17:03
9	06:07 21:07	06:35 18:47-20:01/74 20:41	07:06 18:23-19:20/57 19:52	07:36 17:28-18:31/63 19:02	07:12 17:19	07:45 15:25-16:02/37 17:03
10	06:08 21:06	06:36 18:45-20:01/76 20:40	07:07 18:20-19:18/58 19:51	07:37 17:28-18:26/58 19:00	07:13 17:18	07:46 15:25-16:03/38 17:03
11	06:09 21:06	06:37 18:43-20:01/78 20:38	07:08 18:17-19:17/60 19:49	07:38 17:28-18:22/54 18:59	07:14 17:17	07:46 15:25-16:04/39 17:03
12	06:09 21:06	06:38 18:41-20:00/79 20:37	07:09 18:15-19:15/60 19:47	07:39 17:27-18:21/54 18:57	07:15 17:16	07:47 15:26-16:05/39 17:03
13	06:10 21:05	06:39 18:40-20:00/80 20:36	07:10 18:13-19:13/60 19:46	07:40 17:27-18:21/54 18:55	07:16 17:15	07:48 15:26-16:06/40 17:03
14	06:11 21:05	06:40 18:39-20:00/81 20:34	07:10 18:11-19:11/60 19:44	07:41 17:29-18:21/52 18:54	07:18 17:14	07:49 15:26-16:06/40 17:04
15	06:12 19:33-19:38/5 21:04	06:41 18:37-19:59/82 20:33	07:11 18:08-19:08/60 19:42	07:43 17:29-18:20/51 18:52	07:19 17:13	07:50 15:26-16:06/40 17:04
16	06:12 19:30-19:42/12 21:03	06:42 18:36-19:59/83 20:32	07:12 18:07-19:05/58 19:41	07:44 17:29-18:19/50 18:51	07:20 17:13	07:50 15:27-16:07/40 17:04
17	06:13 19:27-19:44/17 21:03	06:43 18:35-19:58/83 20:30	07:13 18:06-19:02/56 19:39	07:45 17:29-18:17/48 18:49	07:21 17:12	07:51 15:27-16:07/40 17:04
18	06:14 19:26-19:46/20 21:02	06:44 18:34-19:58/84 20:29	07:14 18:04-18:57/53 19:37	07:46 17:30-18:16/46 18:48	07:22 17:11	07:52 15:27-16:08/41 17:05
19	06:15 19:24-19:48/24 21:02	06:45 18:33-19:57/84 20:27	07:15 18:03-18:50/47 19:35	07:47 17:31-18:15/44 18:46	07:24 17:10	07:52 15:28-16:09/41 17:05
20	06:16 19:23-19:49/26 21:01	06:46 18:32-19:56/84 20:26	07:16 18:02-18:51/49 19:34	07:48 17:33-18:14/41 18:45	07:25 17:10	07:53 15:28-16:09/41 17:05
21	06:17 19:22-19:51/29 21:00	06:47 18:31-19:55/84 20:24	07:17 17:53-18:51/58 19:32	07:49 17:34-18:12/38 18:43	07:26 17:09	07:53 15:29-16:10/41 17:06
22	06:17 19:21-19:52/31 20:59	06:48 18:31-19:54/83 20:23	07:18 17:50-18:51/61 19:30	07:50 17:35-18:10/35 18:42	07:27 17:08	07:54 15:29-16:10/41 17:06
23	06:18 19:19-19:52/33 20:59	06:49 18:30-19:51/81 20:21	07:20 17:47-18:50/63 19:29	07:52 17:36-18:08/32 18:40	07:28 17:08	07:54 15:29-16:10/41 17:07
24	06:19 19:19-19:53/34 20:58	06:50 18:28-19:50/82 20:20	07:21 17:44-18:50/66 19:27	07:53 17:38-18:06/28 18:39	07:29 15:38-15:39/1 17:07	07:55 15:30-16:11/41 17:08
25	06:20 19:18-19:55/37 20:57	06:51 18:28-19:48/80 20:18	07:22 17:42-18:50/68 19:25	07:54 17:42-18:04/22 18:38	07:30 15:33-15:46/13 17:07	07:55 15:30-16:11/41 17:08
26	06:21 19:17-19:55/38 20:56	06:52 18:27-19:46/79 20:17	07:23 17:40-18:49/69 19:23	07:55 17:46-17:59/13 18:36	07:32 15:31-15:48/17 17:06	07:56 15:32-16:12/40 17:09
27	06:22 19:17-19:56/39 20:55	06:53 18:27-19:44/77 20:15	07:24 17:38-18:49/71 19:22	07:56 18:35	07:33 15:29-15:50/21 17:06	07:56 15:32-16:12/40 17:09
28	06:23 19:16-19:57/41 20:54	06:54 18:26-19:41/75 20:14	07:25 17:37-18:48/71 19:20	07:57 18:33	07:34 15:28-15:52/24 17:05	07:56 15:32-16:12/40 17:10
29	06:24 19:15-19:58/43 20:53	06:55 18:26-19:37/71 20:12	07:26 17:35-18:47/72 19:18	07:59 18:32	07:35 15:27-15:53/26 17:05	07:57 15:33-16:12/39 17:11
30	06:25 19:15-19:59/44 20:52	06:56 18:26-19:27/61 20:10	07:27 17:34-18:46/72 19:17	08:00 18:31	07:36 15:26-15:54/28 17:04	07:57 15:33-16:13/40 17:12
31	06:26 19:14-19:59/45 20:51	06:57 18:25-19:27/62 20:09		08:01 18:30		07:57 15:35-16:14/39 17:12
Potential sun hours	459	428	375	345	297	287
Sum of minutes with flicker	518	2256	1820	1345	130	1186

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T6 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (425)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:58 08:23-09:11/48 17:13	07:44 16:59-17:23/24 17:47 08:39-09:19/40	07:07 17:04-17:27/23 18:22	07:16 19:56	06:30 20:27	06:01 20:57	06:02 21:09	06:26 20:50	06:57 20:07	07:28 19:15	07:02 16:28-17:04/36 17:28	07:37 08:12-08:59/47 17:03
2	07:58 08:24-09:11/47 17:14	07:43 16:59-17:24/25 17:49 08:40-09:18/38	07:06 17:06-17:24/18 18:23	07:14 19:57	06:29 20:28	06:01 20:58	06:02 21:09	06:27 20:49	06:58 20:06	07:29 19:13	07:03 16:29-17:02/33 17:27 08:22-08:36/14	07:38 08:12-08:59/47 17:03
3	07:58 08:24-09:12/48 17:14	07:42 16:59-17:26/27 17:50 08:41-09:18/37	07:04 17:10-17:20/10 18:24	07:13 19:58	06:27 20:29	06:00 20:59	06:03 21:09	06:28 20:48	06:59 20:04	07:30 19:11	07:05 16:29-17:01/32 17:25 08:19-08:39/20	07:39 08:12-09:00/48 17:03
4	07:58 08:25-09:13/48 17:15	07:41 16:59-17:27/28 17:51 08:42-09:17/35	07:03 18:25	07:11 19:59	06:26 20:31	06:00 21:00	06:03 21:09	06:29 20:47	07:00 20:02	07:31 19:10	07:06 16:29-17:00/31 17:24 08:17-08:42/25	07:40 08:12-09:00/48 17:03
5	07:58 08:25-09:13/48 17:16	07:40 16:59-17:29/30 17:52 08:44-09:15/31	07:01 18:26	07:10 20:00	06:25 20:32	06:00 21:00	06:04 21:08	06:30 20:46	07:01 20:01	07:32 19:08	07:07 16:29-16:59/30 17:23 08:15-08:44/29	07:41 08:12-09:00/48 17:03
6	07:58 08:26-09:14/48 17:17	07:39 16:59-17:29/30 17:54 08:46-09:14/28	06:59 18:28	07:08 20:00	06:24 20:33	05:59 21:01	06:05 21:08	06:31 20:45	07:02 19:57	07:33 19:06	07:08 16:29-16:58/29 17:22 08:13-08:45/32	07:42 08:12-09:00/48 17:02
7	07:58 08:27-09:15/48 17:18	07:37 17:00-17:31/31 17:55 08:48-09:12/24	06:58 18:29	07:06 20:02	06:23 20:34	05:59 21:02	06:05 21:08	06:32 20:44	07:03 19:56	07:34 19:05	07:09 16:29-16:57/28 17:21 08:12-08:47/35	07:43 08:13-09:00/47 17:02
8	07:58 08:28-09:16/48 17:19	07:36 16:59-17:31/32 17:56 08:49-09:09/20	07:56 19:30	07:05 20:03	06:21 20:35	05:59 21:02	06:06 21:08	06:33 20:42	07:04 19:54	07:35 19:03	07:11 16:30-16:56/26 17:20 08:12-08:49/37	07:44 08:13-09:01/48 17:02
9	07:58 08:29-09:16/47 17:20	07:35 16:59-17:33/34 17:57 08:53-09:05/12	07:55 19:31	07:03 20:04	06:20 20:36	05:58 21:03	06:06 21:07	06:34 20:41	07:05 19:52	07:36 19:02	07:12 16:30-16:55/25 17:19 08:11-08:49/38	07:45 08:13-09:01/48 17:02
10	07:57 08:29-09:16/47 17:21	07:34 16:58-17:34/36 17:59	07:53 19:32	07:01 20:05	06:19 20:37	05:58 21:03	06:07 21:07	06:35 20:40	07:06 19:51	07:37 19:00	07:13 16:30-16:54/24 17:18 08:10-08:50/40	07:46 08:14-09:01/47 17:02
11	07:57 08:30-09:17/47 17:22	07:33 16:58-17:35/37 18:00	07:51 19:33	07:00 20:06	06:18 20:38	05:58 21:04	06:08 21:06	06:36 20:39	07:07 19:49	07:38 17:41-17:56/15 18:58	07:14 16:31-16:52/21 17:17 08:10-08:52/42	07:47 08:14-09:02/48 17:02
12	07:57 08:31-09:18/47 17:23	07:31 16:57-17:35/38 18:01	07:50 19:34	06:58 20:07	06:17 20:39	05:58 21:05	06:09 21:06	06:37 20:37	07:08 19:47	07:39 17:38-17:59/21 18:57	07:16 16:32-16:52/20 17:16 08:09-08:52/43	07:48 08:14-09:01/47 17:03
13	07:56 08:30-09:18/48 17:24	07:30 16:56-17:36/40 18:02	07:48 19:35	06:57 20:08	06:16 20:40	05:58 21:05	06:09 21:06	06:38 20:36	07:09 19:46	07:40 17:36-18:01/25 18:55	07:17 16:33-16:51/18 17:15 08:08-08:53/45	07:49 08:14-09:02/48 17:03
14	07:56 08:31-09:19/48 17:26	07:29 16:56-17:36/40 18:04	07:46 19:37	06:55 20:09	06:15 20:41	05:58 21:06	06:10 21:05	06:39 20:35	07:10 19:44	07:42 17:34-18:03/29 18:54	07:18 16:34-16:49/15 17:14 08:08-08:53/45	07:49 08:15-09:02/47 17:03
15	07:56 08:30-09:19/49 17:27	07:28 16:55-17:36/41 18:05	07:45 19:38	06:53 20:10	06:14 20:42	05:58 21:06	06:11 21:04	06:40 20:33	07:11 19:42	07:43 17:32-18:04/32 18:52	07:19 16:36-16:49/13 17:13 08:08-08:54/46	07:50 08:16-09:03/47 17:03
16	07:55 08:31-09:20/49 17:28	07:26 16:56-17:37/41 18:06	07:43 19:39	06:52 20:11	06:13 20:43	05:58 21:06	06:12 21:04	06:41 20:32	07:12 19:40	07:44 17:31-18:04/33 18:50	07:20 16:37-16:48/11 17:12 08:08-08:55/47	07:51 08:16-09:02/46 17:03
17	07:55 08:31-09:20/49 17:29	07:25 16:56-17:37/41 18:07	07:41 19:40	06:50 20:12	06:12 20:44	05:58 21:07	06:12 21:03	06:42 20:30	07:13 19:39	07:45 17:29-18:05/36 18:49	07:22 16:39-16:47/8 17:11 08:07-08:55/48	07:51 08:16-09:03/47 17:04
18	07:54 08:32-09:21/49 17:30	07:24 16:55-17:37/42 18:09	07:40 19:41	06:49 20:13	06:11 20:45	05:58 21:07	06:13 21:03	06:43 20:29	07:14 19:37	07:46 17:28-18:05/37 18:47	07:23 16:44-16:46/2 17:10 08:08-08:56/48	07:52 08:17-09:04/47 17:04
19	07:54 08:32-09:21/49 17:31	07:22 16:56-17:37/41 18:10	07:38 19:42	06:47 20:14	06:10 20:46	05:58 21:07	06:14 21:02	06:44 20:28	07:15 19:35	07:47 17:28-18:07/39 18:46	07:24 08:08-08:56/48 17:10	07:53 08:17-09:04/47 17:04
20	07:53 08:32-09:21/49 17:32	07:21 16:55-17:36/41 18:11	07:36 19:43	06:46 20:15	06:09 20:47	05:58 21:08	06:15 21:01	06:45 20:26	07:16 19:34	07:48 17:27-18:07/40 18:44	07:25 08:08-08:56/48 17:09	07:53 08:18-09:04/46 17:05
21	07:53 08:33-09:22/49 17:34	07:19 16:56-17:36/40 18:12	07:35 19:44	06:44 20:17	06:08 20:48	05:58 21:08	06:16 21:01	06:46 20:25	07:17 19:32	07:49 17:26-18:07/41 18:43	07:26 08:08-08:57/49 17:08	07:54 08:18-09:04/46 17:05
22	07:52 08:33-09:21/48 17:35	07:18 16:56-17:35/39 18:13	07:33 19:45	06:43 20:18	06:08 20:49	05:59 21:08	06:17 21:00	06:47 20:23	07:18 19:30	07:51 17:26-18:07/41 18:41	07:27 08:08-08:57/49 17:08	07:54 08:19-09:05/46 17:06
23	07:51 08:33-09:21/48 17:36	07:16 16:57-17:35/38 18:15	07:31 19:46	06:41 20:19	06:07 20:50	05:59 21:08	06:18 20:59	06:48 20:22	07:19 19:28	07:52 17:25-18:06/41 18:40	07:29 08:09-08:58/49 17:07	07:55 08:19-09:05/46 17:06
24	07:51 17:10-17:12/2 17:37 08:34-09:22/48	07:15 16:58-17:35/37 18:16	07:30 19:48	06:40 20:20	06:06 20:51	05:59 21:09	06:19 20:58	06:49 20:20	07:20 19:27	07:53 17:26-18:07/41 18:39	07:30 08:09-08:58/49 17:06	07:55 08:20-09:06/46 17:07
25	07:50 17:06-17:14/8 17:39 08:34-09:22/48	07:13 16:58-17:33/35 18:17	07:28 19:49	06:38 20:21	06:05 20:51	05:59 21:09	06:19 20:57	06:50 20:19	07:21 19:25	07:54 17:26-18:07/41 18:37	07:31 08:09-08:58/49 17:06	07:56 08:20-09:07/47 17:07
26	07:49 17:04-17:15/11 17:40 08:35-09:22/47	07:12 16:59-17:32/33 18:18	07:26 19:50	06:37 20:22	06:05 20:52	06:00 21:09	06:20 20:56	06:51 20:17	07:22 19:23	07:55 17:25-18:06/41 18:36	07:32 08:09-08:58/49 17:05	07:56 08:20-09:07/47 17:08
27	07:48 17:03-17:16/13 17:41 08:35-09:21/46	07:10 17:00-17:31/31 18:19	07:25 19:51	06:36 20:23	06:04 20:53	06:00 21:09	06:21 20:55	06:52 20:15	07:23 19:22	07:56 17:25-18:06/41 18:34	07:33 08:09-08:58/49 17:05	07:56 08:21-09:08/47 17:09
28	07:47 17:02-17:17/15 17:42 08:36-09:21/45	07:09 17:01-17:29/28 18:21	07:23 19:52	06:34 20:24	06:03 20:54	06:00 21:09	06:22 20:55	06:53 20:14	07:25 19:20	07:58 17:26-18:06/40 18:33	07:34 08:11-08:59/48 17:05	07:57 08:22-09:08/46 17:09
29	07:47 17:01-17:19/18 17:44 08:36-09:21/45		07:21 19:53	06:33 20:25	06:03 20:55	06:01 21:09	06:23 20:54	06:54 20:12	07:26 19:18	07:59 17:26-18:05/39 18:32	07:35 08:11-08:59/48 17:04	07:57 08:22-09:09/47 17:10
30	07:46 17:00-17:20/20 17:45 08:37-09:20/43		07:20 19:54	06:31 20:26	06:02 20:56	06:01 21:09	06:24 20:53	06:55 20:11	07:27 19:17	08:00 17:26-18:05/39 18:30	07:36 08:12-08:59/47 17:04	07:57 08:22-09:09/47 17:11
31	07:45 17:00-17:21/21 17:46 08:38-09:20/42		07:18 19:55		06:02 20:57		06:25 20:52	06:56 20:09		08:01 17:27-18:04/37 18:29		07:57 08:23-09:10/47 17:12
Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Sum of minutes with flicker	1578	1245	51	0	0	0	0	0	0	749	1618	1458

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T60 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (479)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	08:21-08:58/37	07:43	16:30-17:07/37	07:07	16:48-17:49/61	07:16	18:54-19:29/35	06:30	06:51-07:44/53	06:02	06:52-07:17/25
	17:13		17:48	08:04-08:47/43	18:22	07:27-08:08/41	19:56	07:35-07:52/17	20:27		20:56	19:38-20:24/46
2	07:57	08:21-08:58/37	07:42	16:31-17:07/36	07:05	16:49-17:49/60	07:14	18:52-19:30/38	06:29	06:49-07:43/54	06:01	06:53-07:17/24
	17:14		17:49	08:03-08:47/44	18:23	07:26-08:09/43	19:57	07:33-07:52/19	20:28		20:57	19:38-20:25/47
3	07:57	08:21-08:58/37	07:41	16:32-17:07/35	07:04	16:50-17:49/59	07:13	18:52-19:32/40	06:28	06:49-07:42/53	06:01	06:53-07:16/23
	17:15	16:36-16:43/7	17:50	08:01-08:45/44	18:24	07:24-08:08/44	19:58	07:32-07:53/21	20:29		20:58	19:38-20:25/47
4	07:57	08:20-08:59/39	07:40	16:33-17:07/34	07:02	16:51-17:49/58	07:11	18:50-19:32/42	06:26	06:47-07:40/53	06:00	06:55-07:15/20
	17:16	16:34-16:45/11	17:51	08:01-08:44/43	18:25	07:24-08:08/44	19:59	07:30-07:52/22	20:30		20:59	19:38-20:25/47
5	07:57	08:19-08:59/40	07:39	16:34-17:06/32	07:01	16:52-17:48/56	07:09	18:49-19:32/43	06:25	06:46-07:38/52	06:00	06:56-07:15/19
	17:17	16:34-16:47/13	17:53	08:01-08:43/42	18:26	07:23-08:07/44	20:00	07:28-07:52/24	20:31		20:59	19:39-20:26/47
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	17:18	16:33-16:49/16	17:54	08:01-08:41/40	18:27	07:21-08:06/45	20:00	07:27-07:52/25	20:32		21:00	19:38-20:25/47
7	07:57	08:19-08:59/40	07:37	16:36-17:22/46	06:58	16:55-17:46/51	07:06	18:47-19:33/46	06:23	06:45-07:32/47	05:59	06:57-07:13/16
	17:19	16:32-16:51/19	17:55	08:01-08:39/38	18:29	07:22-08:06/44	20:01	07:27-07:51/24	20:33		21:01	19:39-20:26/47
8	07:57	08:19-08:59/40	07:36	16:38-17:25/47	07:56	17:56-18:45/49	07:05	18:46-19:33/47	06:22	06:45-07:32/47	05:59	06:59-07:12/13
	17:20	16:32-16:52/20	17:56	08:01-08:34/33	19:30	08:21-09:05/44	20:02	07:28-07:50/22	20:34		21:01	19:39-20:26/47
9	07:57	08:19-08:59/40	07:35	16:40-17:27/47	07:54	17:59-18:44/45	07:03	18:46-19:33/47	06:20	06:45-07:32/47	05:59	07:00-07:12/12
	17:21	16:32-16:54/22	17:58	08:01-08:34/33	19:31	08:21-09:05/44	20:03	07:25-07:49/24	20:35		21:02	19:39-20:26/47
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	17:22	16:31-16:54/23	17:59	08:01-08:33/32	19:32	08:21-09:03/42	20:04	07:22-07:47/25	20:36	19:56-20:03/7	21:03	19:40-20:27/47
11	07:56	08:18-08:59/41	07:32	16:44-17:30/46	07:51	18:14-18:40/26	07:00	18:45-19:33/48	06:18	06:44-07:31/47	05:59	07:04-07:09/5
	17:23	16:31-16:56/25	18:00	08:01-08:33/32	19:33	08:20-09:01/41	20:05	07:20-07:48/28	20:37	19:51-20:07/16	21:03	19:40-20:27/47
12	07:56	08:18-09:00/42	07:31	16:53-17:31/38	07:49	18:16-18:38/22	06:58	18:45-19:33/48	06:17	06:44-07:31/47	05:58	19:40-20:27/47
	17:24	16:30-16:57/27	18:01	08:02-08:33/31	19:34	08:21-09:00/39	20:06	07:18-07:49/31	20:38	19:49-20:10/21	21:04	
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	17:25	16:30-16:58/28	18:03	08:03-08:33/30	19:35	08:21-08:58/37	20:08	07:17-07:50/33	20:39	19:47-20:12/25	21:04	
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	17:26	16:30-16:59/29	18:04	08:03-08:31/28	19:36		20:09	07:16-07:50/34	20:40	19:45-20:13/28	21:05	
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	17:27	16:29-17:00/31	18:05	08:04-08:31/27	19:37		20:10	07:15-07:52/37	20:41	19:45-20:15/30	21:05	
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17	07:54	08:15-09:00/45	07:24	16:49-17:42/53	07:41	08:23-08:51/28	06:50	18:45-19:30/45	06:12	06:44-07:27/43	05:58	19:41-20:28/47
	17:29	16:28-17:02/34	18:07	08:06-08:28/22	19:40		20:12	07:13-07:51/38	20:43	19:43-20:17/34	21:06	
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	17:30	16:29-17:03/34	18:09	08:08-08:26/18	19:41		20:13	07:12-07:52/40	20:44	19:42-20:18/36	21:06	
19	07:53	08:14-09:00/46	07:22	16:48-17:45/57 08:11-08:23/12	07:38	08:26-08:47/21	06:47	18:45-19:28/43	06:10	06:44-07:25/41	05:59	19:41-20:28/47
	17:32	16:28-17:03/35	18:10	07:45-07:56/11	19:42		20:14	07:11-07:51/40	20:45	19:41-20:19/38	21:07	
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	17:33	16:29-17:05/36	18:11	07:42-08:00/18	19:43		20:15	07:11-07:52/41	20:46	19:40-20:19/39	21:07	
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22	07:51	08:14-08:59/45	07:17	16:47-17:48/61	07:33		06:43	18:48-19:25/37	06:08	06:46-07:23/37	05:59	19:42-20:28/46
	17:35	16:28-17:05/37	18:13	07:38-08:04/26	19:45		20:17	07:04-07:51/47	20:48	19:40-20:21/41	21:07	
23	07:51	08:15-09:00/45	07:16	16:48-17:48/60	07:31		06:41	18:49-19:25/36	06:07	06:46-07:21/35	05:59	19:43-20:29/46
	17:36	16:28-17:06/38	18:15	07:36-08:05/29	19:46		20:18	07:02-07:51/49	20:49	19:39-20:21/42	21:08	
24	07:50	08:15-08:59/44	07:15	16:47-17:49/62	07:29		06:40	18:50-19:22/32	06:06	06:47-07:21/34	06:00	19:42-20:29/47
	17:38	16:29-17:07/38	18:16	07:35-08:06/31	19:47		20:19	07:00-07:50/50	20:50	19:38-20:21/43	21:08	
25	07:49	08:14-08:58/44	07:13	16:48-17:50/62	07:28		06:38	18:51-19:21/30	06:06	06:47-07:21/34	06:00	19:42-20:29/47
	17:39	16:29-17:07/38	18:17	07:34-08:07/33	19:48		20:20	06:59-07:50/51	20:51	19:39-20:22/43	21:08	
26	07:48	08:09-08:56/47	07:12	16:47-17:50/63	07:26		06:37	18:52-19:19/27	06:05	06:47-07:20/33	06:00	19:43-20:30/47
	17:40	16:29-17:07/38	18:18	07:33-08:07/34	19:49		20:21	06:58-07:50/52	20:52	19:38-20:22/44	21:08	
27	07:48	08:08-08:55/47	07:10	16:47-17:49/62	07:24		06:36	06:56-07:48/52	06:04	06:49-07:20/31	06:01	19:43-20:30/47
	17:41	16:29-17:07/38	18:19	07:31-08:08/37	19:50		20:22	18:55-19:17/22	20:52	19:39-20:23/44	21:08	
28	07:47	08:07-08:52/45	07:09	16:48-17:50/62	07:23	19:05-19:22/17	06:34	06:55-07:48/53	06:04	06:49-07:19/30	06:01	19:43-20:30/47
	17:43	16:29-17:07/38	18:21	07:29-08:08/39	19:52	07:42-07:46/4	20:23	18:58-19:14/16	20:53	19:38-20:23/45	21:08	
29	07:46	16:29-17:08/39			07:21	19:01-19:24/23	06:33	06:54-07:47/53	06:03	06:50-07:19/29	06:01	19:44-20:31/47
	17:44	08:06-08:47/41			19:53	07:40-07:48/8	20:25	19:02-19:08/6	20:54	19:39-20:24/45	21:08	
30	07:45	16:29-17:08/39			07:19	18:58-19:26/28	06:32	06:52-07:45/53	06:03	06:50-07:18/28	06:02	19:43-20:30/47
	17:45	08:06-08:48/42			19:54	07:38-07:50/12	20:26		20:55	19:38-20:24/46	21:08	
31	07:44	16:30-17:07/37			07:18	18:57-19:29/32			06:02	06:52-07:18/26		
	17:46	08:05-08:48/43			19:55	07:37-07:51/14			20:56	19:39-20:25/46		
Potential sun hours	297		297		370		399		448		452	
Sum of minutes with flicker		2176		2280		1478		2221		2084		1589

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T60 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (479)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 07:09-07:12/3	06:26 06:54-07:40/46	06:57 18:44-19:32/48	07:27 17:56-18:15/19	07:02 16:10-16:58/48	07:37 08:00-08:41/41
	21:08 19:44-20:31/47	20:50 20:00-20:20/20	20:07 07:19-07:47/28	19:15 08:00-08:38/38	17:28 07:30-08:03/33	17:04 16:13-16:38/25
2	06:03 07:07-07:14/7	06:27 06:54-07:41/47	06:58 18:44-19:32/48	07:28 17:53-18:17/24	07:03 16:08-16:56/48	07:38 08:01-08:41/40
	21:08 19:44-20:31/47	20:49 20:03-20:17/14	20:05 07:21-07:46/25	19:13 07:59-08:39/40	17:27 07:30-08:03/33	17:04 16:14-16:37/23
3	06:03 07:06-07:16/10	06:28 06:54-07:41/47	06:59 18:44-19:31/47	07:29 17:42-18:19/37	07:04 16:06-16:53/47	07:39 08:02-08:42/40
	21:08 19:44-20:32/48	20:48	20:04 07:23-07:47/24	19:11 07:58-08:40/42	17:26 07:31-08:04/33	17:03 16:15-16:37/22
4	06:04 07:04-07:17/13	06:29 06:54-07:41/47	07:00 18:44-19:31/47	07:30 17:37-18:20/43	07:05 16:06-16:52/46	07:40 08:03-08:43/40
	21:08 19:44-20:31/47	20:46	20:02 07:25-07:48/23	19:10 07:58-08:41/43	17:24 07:31-08:09/38	17:03 16:16-16:36/20
5	06:04 07:04-07:19/15	06:30 06:55-07:41/46	07:01 18:44-19:30/46	07:32 17:34-18:21/47	07:06 16:04-16:48/44	07:41 08:04-08:44/40
	21:07 19:45-20:32/47	20:45	20:00 07:24-07:48/24	19:08 07:57-08:41/44	17:23 07:30-08:11/41	17:03 16:17-16:36/19
6	06:05 07:04-07:20/16	06:31 06:55-07:42/47	07:02 18:44-19:29/45	07:33 17:31-18:21/50	07:08 16:03-16:36/33	07:42 08:05-08:45/40
	21:07 19:44-20:31/47	20:44	19:57 07:23-07:48/25	19:06 07:57-08:42/45	17:22 07:31-08:13/42	17:03 16:19-16:35/16
7	06:06 07:02-07:21/19	06:32 06:56-07:46/50	07:03 18:45-19:28/43	07:34 17:29-18:22/53	07:09 16:03-16:37/34	07:43 08:06-08:46/40
	21:07 19:45-20:32/47	20:43	19:55 07:24-07:48/24	19:05 07:58-08:43/45	17:21 07:32-08:15/43	17:03 16:20-16:34/14
8	06:06 07:02-07:22/20	06:33 06:56-07:48/52	07:04 18:44-19:26/42	07:35 17:28-18:23/55	07:10 16:03-16:38/35	07:43 08:08-08:47/39
	21:07 19:46-20:32/46	20:42	19:54 07:25-07:47/22	19:03 07:58-08:43/45	17:20 07:32-08:16/44	17:03 16:22-16:34/12
9	06:07 07:01-07:22/21	06:34 06:57-07:50/53	07:05 18:45-19:25/40	07:36 17:26-18:23/57	07:11 16:02-16:38/36	07:44 08:10-08:47/37
	21:06 19:45-20:32/47	20:40	19:52 07:26-07:47/21	19:01 07:58-08:43/45	17:19 07:33-08:17/44	17:03 16:25-16:32/7
10	06:08 07:01-07:24/23	06:35 06:58-07:51/53	07:06 18:45-19:23/38	07:37 17:25-18:23/58	07:12 16:01-16:38/37	07:45 08:11-08:48/37
	21:06 19:46-20:32/46	20:39	19:50 07:26-07:45/19	19:00 07:58-08:43/45	17:18 07:35-08:18/43	17:03
11	06:08 07:00-07:25/25	06:36 06:58-07:52/54	07:07 18:46-19:22/36	07:38 17:24-18:23/59	07:14 16:02-16:39/37	07:46 08:12-08:49/37
	21:06 19:46-20:33/47	20:38	19:49 07:27-07:44/17	18:58 07:59-08:42/43	17:17 07:36-08:19/43	17:03
12	06:09 06:59-07:25/26	06:37 07:00-07:53/53	07:08 18:48-19:20/32	07:39 17:22-18:23/61	07:15 16:01-16:39/38	07:47 08:11-08:49/38
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	21:00 19:49-20:32/43	20:25 07:08-07:56/48	19:33	18:44 08:09-08:34/25	17:09 16:03-16:40/37	17:05
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	20:59 19:50-20:30/40	20:23 07:13-07:56/43	19:30	18:41 08:13-08:30/17	17:08 16:05-16:41/36	17:06
23	06:18 06:55-07:34/39	06:48 18:50-19:32/42	07:19 08:14-08:27/13	07:51 17:18-18:15/57 08:40-08:55/15	07:28 07:51-08:37/46	07:54 08:17-08:55/38
	20:58 19:50-20:30/40	20:21 07:15-07:55/40	19:28	18:40 08:17-08:25/8	17:07 16:05-16:40/35	17:07
24	06:19 06:55-07:35/40	06:49 18:49-19:32/43	07:20 08:10-08:30/20	07:52 17:18-18:13/55	07:29 07:52-08:38/46	07:54 08:18-08:56/38
	20:57 19:51-20:29/38	20:20 07:15-07:55/40	19:27	18:39 08:38-08:57/19	17:07 16:06-16:40/34	17:07
25	06:20 06:55-07:36/41	06:50 18:48-19:33/45	07:21 08:08-08:32/24	07:54 17:19-18:11/52	07:30 07:53-08:38/45	07:55 08:18-08:56/38
	20:56 19:52-20:29/37	20:18 07:15-07:55/40	19:25	18:37 08:36-08:58/22	17:06 16:06-16:40/34	17:08
26	06:21 06:55-07:37/42	06:51 18:47-19:33/46	07:22 08:06-08:33/27	07:55 17:19-18:08/49	07:31 07:54-08:38/44	07:55 08:18-08:56/38
	20:56 19:53-20:28/35	20:16 07:15-07:54/39	19:23	18:36 08:35-09:00/25	17:06 16:07-16:39/32	17:08
27	06:22 06:55-07:38/43	06:52 18:47-19:33/46	07:23 08:04-08:34/30	07:56 17:20-18:04/44	07:32 07:56-08:40/44	07:56 08:19-08:57/38
	20:55 19:54-20:28/34	20:15 07:16-07:53/37	19:21	18:34 08:34-09:01/27	17:05 16:09-16:40/31	17:09
28	06:23 06:55-07:39/44	06:53 18:46-19:33/47	07:24 08:03-08:35/32	07:57 17:21-18:02/41	07:33 07:57-08:40/43	07:56 08:20-08:57/37
	20:54 19:55-20:27/32	20:13 07:16-07:52/36	19:20	18:33 08:32-09:01/29	17:05 16:10-16:39/29	17:10
29	06:24 06:55-07:40/45	06:54 18:46-19:33/47	07:25 08:02-08:35/33	07:58 17:21-18:01/40	07:35 07:58-08:40/42	07:56 08:20-08:57/37
	20:53 19:55-20:25/30	20:12 07:17-07:51/34	19:18	18:32 08:31-09:02/31	17:04 16:11-16:39/28	17:11
30	06:24 06:54-07:39/45	06:55 18:45-19:33/48	07:26 18:00-18:12/12	07:59 17:22-18:00/38 08:32-09:03/31	07:36 07:59-08:41/42	07:56 08:20-08:58/38
	20:52 19:57-20:23/26	20:10 07:17-07:50/33	19:16 08:00-08:36/36	18:31 17:18-17:21/3	17:04 16:11-16:38/27	17:11
31	06:25 06:54-07:40/46	06:56 18:45-19:33/48		08:01 17:13-17:59/46		07:57 08:20-08:58/38
	20:51 19:58-20:22/24	20:09 07:18-07:49/31		18:29 08:31-09:03/32		17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	2204	2126	1108	2666	2390	1345

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T61 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (480)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:41-09:41/60 17:13	07:43 08:14-09:58/104 17:48	07:07 07:34-08:48/74 18:22 16:54-18:01/67	07:16 08:10-09:41/91 19:56	06:31 07:13-08:28/75 20:27	06:02 07:21-08:17/56 20:57 06:24-06:50/26
2	07:57 08:41-09:42/61 17:14	07:42 08:13-09:58/105 17:49	07:06 07:32-08:46/74 18:23 16:54-18:01/67	07:15 08:12-09:41/89 19:57	06:29 07:13-08:28/75 20:28	06:01 07:22-08:17/55 20:57 06:23-06:50/27
3	07:57 08:42-09:42/60 17:15	07:41 08:12-09:58/106 17:50	07:04 07:30-08:47/77 18:24 16:54-18:02/68	07:13 08:13-09:39/86 19:58	06:28 07:13-08:28/75 20:29	06:01 07:23-08:17/54 20:58 06:23-06:51/28
4	07:57 08:42-09:43/61 17:16	07:40 08:11-09:58/107 17:52	07:03 07:27-08:48/81 18:25 16:55-18:03/68	07:11 08:15-09:37/82 19:59	06:27 07:13-08:28/75 20:30	06:01 07:23-08:16/53 20:59 06:22-06:50/28
5	07:57 08:42-09:44/62 17:17	07:39 08:09-09:57/108 17:53	07:01 07:25-08:49/84 18:27 16:55-18:03/68	07:10 08:19-09:37/78 20:00	06:25 07:12-08:27/75 20:31	06:00 07:24-08:16/52 21:00 06:22-06:51/29
6	07:57 08:41-09:44/63 17:18	07:38 08:08-09:57/109 17:54	06:59 07:24-08:50/86 18:28 16:57-18:03/66	07:08 08:31-09:35/64 20:00	06:24 07:12-08:27/75 20:32	06:00 07:25-08:16/51 21:00 06:22-06:51/29
7	07:57 08:41-09:45/64 17:19	07:37 08:08-09:57/109 17:55	06:58 07:23-08:50/87 18:29 16:57-18:03/66	07:06 08:31-09:33/62 20:01	06:23 07:13-08:27/74 20:33	06:00 07:26-08:16/50 21:01 06:22-06:52/30
8	07:57 08:42-09:46/64 17:20	07:36 08:07-09:57/110 17:57	07:56 08:21-09:51/90 19:30 17:58-19:02/64	07:05 08:33-09:31/58 20:02 07:52-08:02/10	06:22 07:13-08:27/74 20:34	05:59 07:25-08:15/50 21:02 06:21-06:51/30
9	07:57 08:42-09:47/65 17:21	07:35 08:06-09:56/110 17:58	07:55 08:21-09:52/91 19:31 18:00-19:02/62	07:03 08:33-09:29/56 20:04 07:45-08:08/23	06:21 07:13-08:27/74 20:35	05:59 07:26-08:15/49 21:02 06:21-06:52/31
10	07:57 08:42-09:48/66 17:22	07:34 08:05-09:56/111 17:59 17:11-17:27/16	07:53 08:18-09:52/94 19:32 18:01-19:02/61	07:02 08:35-09:28/53 20:05 07:41-08:12/31	06:20 07:13-08:27/74 20:36	05:59 07:27-08:15/48 21:03 06:21-06:52/31
11	07:57 08:41-09:48/67 17:23	07:32 08:02-09:55/113 18:00 17:07-17:29/22	07:51 08:17-09:53/96 19:33 18:02-19:01/59	07:00 08:36-09:25/49 20:06 07:37-08:14/37	06:19 07:13-08:26/73 20:37	05:59 07:27-08:15/48 21:03 06:21-06:52/31
12	07:56 08:42-09:49/67 17:24	07:31 08:01-09:54/113 18:02 17:05-17:32/27	07:50 08:15-09:53/98 19:34 18:06-19:01/55	06:58 08:37-09:22/45 20:07 07:34-08:16/42	06:17 07:13-08:26/73 20:38	05:59 07:28-08:15/47 21:04 06:21-06:53/32
13	07:56 08:42-09:50/68 17:25	07:30 08:00-09:54/114 18:03 17:04-17:34/30	07:48 08:13-09:53/100 18:09-18:21/12 19:36 18:22-19:00/38	06:57 08:39-09:21/42 20:08 07:32-08:19/47	06:16 07:13-08:26/73 20:39	05:59 07:28-08:15/47 21:04 06:22-06:53/31
14	07:56 08:42-09:50/68 17:26	07:29 07:58-09:52/114 18:04 17:01-17:35/34	07:46 08:13-09:53/100 19:37 18:23-19:00/37	06:55 08:41-09:17/36 20:09 07:30-08:20/50	06:15 07:13-08:25/72 20:40	05:59 07:29-08:15/46 21:05 06:22-06:53/31
15	07:55 08:42-09:51/69 17:27	07:27 07:57-09:51/114 18:05 17:00-17:37/37	07:45 08:11-09:53/102 19:38 18:24-18:59/35	06:54 08:44-09:15/31 20:10 07:29-08:21/52	06:14 07:14-08:25/71 20:41	05:59 07:29-08:15/46 21:05 06:22-06:53/31
16	07:55 08:42-09:52/70 17:28	07:26 07:57-09:51/114 18:06 17:00-17:38/38	07:43 08:10-09:53/103 19:39 18:24-18:57/33	06:52 08:47-09:10/23 20:11 07:26-08:22/56	06:13 07:14-08:24/70 20:42	05:59 07:30-08:15/45 21:06 06:22-06:54/32
17	07:54 08:42-09:53/71 17:30	07:25 07:47-09:49/122 18:08 16:58-17:38/40	07:41 08:10-09:53/103 19:40 18:24-18:56/32	06:51 08:52-09:05/13 20:12 07:25-08:24/59	06:12 07:14-08:24/70 20:43	05:59 07:30-08:15/45 21:06 06:22-06:54/32
18	07:54 08:42-09:53/71 17:31	07:23 07:44-09:48/124 18:09 16:57-17:40/43	07:40 08:09-09:53/104 19:41 18:26-18:55/29	06:49 07:23-08:24/61 20:13	06:12 07:14-08:23/69 20:44 06:33-06:34/1	05:59 07:30-08:15/45 21:07 06:22-06:54/32
19	07:53 08:41-09:53/72 17:32	07:22 07:42-09:46/124 18:10 16:57-17:41/44	07:38 08:08-09:52/104 19:42 18:27-18:52/25	06:48 07:23-08:25/62 20:14	06:11 07:14-08:23/69 20:45 06:31-06:39/8	05:59 07:30-08:15/45 21:07 06:23-06:54/31
20	07:53 08:42-09:54/72 17:33	07:21 07:40-09:44/124 18:11 16:56-17:41/45	07:36 08:07-09:51/104 19:43 18:29-18:50/21	06:46 07:21-08:25/64 20:15	06:10 07:16-08:23/67 20:46 06:31-06:41/10	05:59 07:31-08:15/44 21:07 06:23-06:54/31
21	07:52 08:42-09:55/73 17:34	07:19 08:57-09:42/45 16:56-17:42/46 18:13 07:39-08:56/77	07:35 08:07-09:51/104 19:44 18:32-18:47/15	06:45 07:20-08:26/66 20:16	06:09 07:16-08:22/66 20:47 06:30-06:43/13	05:59 07:32-08:16/44 21:07 06:24-06:55/31
22	07:52 08:41-09:55/74 17:35	07:18 07:37-08:55/78 16:55-17:42/47 18:14 08:58-09:40/42	07:33 08:06-09:51/105 19:45 18:38-18:40/2	06:43 07:19-08:26/67 20:17	06:08 07:16-08:22/66 20:48 06:29-06:44/15	05:59 07:32-08:16/44 21:08 06:24-06:55/31
23	07:51 08:42-09:56/74 17:37	07:16 07:36-08:55/79 16:55-17:42/47 18:15 09:00-09:38/38	07:31 08:06-09:50/104 19:46	06:42 07:18-08:27/69 20:18	06:07 07:16-08:21/65 20:49 06:28-06:44/16	06:00 07:32-08:16/44 21:08 06:24-06:55/31
24	07:50 08:42-09:56/74 17:38	07:15 07:35-08:53/78 09:02-09:34/32 18:16 17:45-17:53/8 16:54-17:42/48	07:30 08:06-09:50/104 19:48	06:40 07:18-08:28/70 20:19	06:07 07:17-08:21/64 20:50 06:28-06:46/18	06:00 07:31-08:16/45 21:08 06:23-06:55/32
25	07:49 08:42-09:56/74 17:39	07:13 07:35-08:53/78 09:06-09:31/25 18:17 16:54-17:55/61	07:28 08:06-09:49/103 19:49	06:39 07:17-08:27/70 20:21	06:06 07:17-08:20/63 20:51 06:27-06:46/19	06:00 07:32-08:17/45 21:08 06:24-06:56/32
26	07:49 08:42-09:57/75 17:40	07:12 07:34-08:51/77 09:10-09:25/15 18:18 16:54-17:56/62	07:26 08:06-09:48/102 19:50	06:37 07:16-08:28/72 20:22	06:05 07:19-08:21/62 20:52 06:27-06:48/21	06:00 07:32-08:17/45 21:08 06:24-06:56/32
27	07:48 08:42-09:57/75 17:42	07:10 07:34-08:51/77 18:20 16:54-17:58/64	07:25 08:07-09:47/100 19:51	06:36 07:15-08:28/73 20:23	06:05 07:19-08:20/61 20:53 06:26-06:48/22	06:01 07:32-08:17/45 21:08 06:24-06:55/31
28	07:47 08:43-09:58/75 17:43 08:25-08:34/9	07:09 07:34-08:49/75 18:21 16:54-17:59/65	07:23 08:07-09:46/99 19:52	06:35 07:15-08:28/73 20:24	06:04 07:19-08:19/60 20:53 06:25-06:48/23	06:01 07:32-08:18/46 21:08 06:25-06:56/31
29	07:46 08:43-09:58/75 17:44 08:21-08:38/17		07:21 08:07-09:45/98 19:53	06:33 07:15-08:28/73 20:25	06:03 07:20-08:19/59 20:54 06:25-06:49/24	06:02 07:32-08:18/46 21:08 06:25-06:56/31
30	07:45 08:43-09:58/75 17:45 08:18-08:41/23		07:20 08:08-09:44/96 19:54	06:32 07:14-08:28/74 20:26	06:03 07:20-08:18/58 20:55 06:24-06:49/25	06:02 07:32-08:19/47 21:08 06:25-06:57/32
31	07:44 08:16-09:58/102 17:47		07:18 08:09-09:43/94 19:55		06:02 07:21-08:18/57 20:56 06:24-06:50/26	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	2216	3895	4011	2259	2375	2344

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T61 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (480)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 07:32-08:19/47 21:08 06:25-06:57/32	06:27 07:24-08:37/73 20:50	06:58 08:35-09:24/49 20:07 07:36-08:13/37	07:28 07:53-09:32/99 19:15 17:46-18:40/54	07:02 07:34-09:25/111 17:28 16:41-16:55/14	07:37 08:23-09:30/67 17:04
2	06:03 07:32-08:20/48 21:08 06:26-06:57/31	06:28 07:23-08:36/73 20:49	06:59 08:33-09:26/53 20:06 07:39-08:10/31	07:29 07:54-09:31/97 19:13 17:42-18:40/58	07:03 07:36-09:26/110 17:27	07:38 08:24-09:30/66 17:04
3	06:04 07:31-08:20/49 21:08 06:26-06:57/31	06:29 07:22-08:36/74 20:48	07:00 08:31-09:27/56 20:04 07:43-08:06/23	07:30 07:56-09:31/95 19:12 17:39-18:39/60	07:04 07:37-09:27/110 17:26	07:39 08:25-09:30/65 17:04
4	06:04 07:32-08:21/49 21:08 06:27-06:58/31	06:30 07:22-08:37/75 20:47	07:01 08:30-09:28/58 20:02 07:49-07:59/10	07:31 07:58-09:30/92 19:10 17:38-18:40/62	07:06 07:38-09:27/109 17:25	07:40 08:26-09:30/64 17:03
5	06:05 07:31-08:21/50 21:08 06:27-06:57/30	06:31 07:22-08:37/75 20:46	07:02 08:28-09:30/62 20:01	07:32 07:58-09:29/91 19:08 17:36-18:40/64	07:07 07:38-09:27/109 17:24	07:41 08:26-09:30/64 17:03
6	06:05 07:31-08:22/51 21:08 06:28-06:58/30	06:32 07:22-08:37/75 20:44	07:03 08:27-09:31/64 19:57	07:33 07:59-09:27/88 19:07 17:34-18:39/65	07:08 07:40-09:28/108 17:22	07:42 08:27-09:30/63 17:03
7	06:06 07:30-08:22/52 21:07 06:28-06:57/29	06:33 07:22-08:37/75 20:43	07:04 08:14-09:32/78 19:56	07:34 07:59-09:26/87 19:05 17:33-18:39/66	07:09 07:41-09:28/107 17:21	07:43 08:28-09:30/62 17:03
8	06:07 07:30-08:23/53 21:07 06:29-06:58/29	06:34 07:22-08:37/75 20:42	07:05 08:10-09:32/82 19:54	07:35 08:00-09:25/85 19:03 17:31-18:39/68	07:10 07:42-09:28/106 17:20	07:44 08:29-09:30/61 17:03
9	06:07 07:30-08:24/54 21:07 06:30-06:58/28	06:35 07:22-08:37/75 20:41	07:05 08:07-09:33/86 19:52	07:36 08:01-09:23/82 19:02 17:30-18:38/68	07:12 07:43-09:28/105 17:19	07:45 08:30-09:30/60 17:03
10	06:08 07:29-08:24/55 21:06 06:30-06:57/27	06:36 07:22-08:37/75 20:39	07:06 08:05-09:34/89 19:51	07:37 08:03-09:22/79 19:00 17:29-18:37/68	07:13 07:45-09:29/104 17:18	07:45 08:30-09:31/61 17:03
11	06:09 07:30-08:25/55 21:06 06:31-06:58/27	06:37 07:22-08:37/75 20:38	07:07 08:03-09:35/92 19:49	07:38 08:04-09:20/76 18:59 17:28-18:36/68	07:14 07:47-09:29/102 17:17	07:46 08:31-09:31/60 17:03
12	06:09 07:29-08:26/57 21:05 06:32-06:58/26	06:38 07:22-08:37/75 20:37	07:08 08:01-09:35/94 19:47	07:39 08:07-09:20/73 18:57 17:27-18:34/67	07:15 08:14-09:29/75 17:16 07:49-08:12/23	07:47 08:32-09:31/59 17:03
13	06:10 07:28-08:26/58 21:05 06:32-06:57/25	06:39 07:22-08:36/74 20:36	07:09 08:00-09:36/96 19:46	07:40 08:06-09:21/75 18:55 17:27-18:32/65	07:16 08:15-09:30/75 17:15 07:53-08:10/17	07:48 08:32-09:31/59 17:03
14	06:11 07:28-08:27/59 21:04 06:33-06:57/24	06:40 07:22-08:36/74 20:34	07:10 07:58-09:36/98 19:44	07:41 08:07-09:23/76 18:54 17:27-18:31/64	07:18 08:15-09:30/75 17:14 07:57-08:06/9	07:49 08:33-09:31/58 17:04
15	06:12 07:28-08:28/60 21:04 06:34-06:57/23	06:41 07:23-08:36/73 20:33	07:11 07:57-09:35/98 19:42	07:43 08:07-09:24/77 18:52 17:26-18:30/64	07:19 08:15-09:30/75 17:13	07:49 08:34-09:32/58 17:04
16	06:12 07:28-08:29/61 21:03 06:35-06:57/22	06:42 07:23-08:35/72 20:31	07:12 07:55-09:36/101 19:40	07:44 08:07-09:24/77 09:40-10:00/20 18:51 17:26-18:28/62	07:20 08:15-09:30/75 17:13	07:50 08:35-09:32/57 17:04
17	06:13 07:27-08:29/62 21:03 06:36-06:57/21	06:43 07:23-08:35/72 20:30	07:13 07:54-09:36/102 19:39	07:45 08:07-09:25/78 09:36-10:04/28 18:49 17:26-18:26/60	07:21 08:16-09:30/74 17:12	07:51 08:35-09:32/57 17:04
18	06:14 07:27-08:30/63 21:02 06:36-06:56/20	06:44 07:23-08:34/71 20:29	07:14 07:54-09:36/102 19:37	07:46 08:07-09:25/78 09:33-10:07/34 18:48 18:19-18:22/3 17:25-18:13/48	07:22 08:16-09:30/74 17:11	07:51 08:36-09:33/57 17:05
19	06:15 07:27-08:30/63 21:01 06:37-06:56/19	06:45 07:24-08:33/69 20:27	07:15 07:53-09:36/103 19:35	07:47 08:07-09:25/78 17:25-18:13/48 18:46 09:30-10:09/39	07:23 08:16-09:30/74 17:10	07:52 08:36-09:32/56 17:05
20	06:16 07:27-08:31/64 21:01 06:38-06:55/17	06:46 07:24-08:33/69 20:26	07:16 07:52-09:36/104 19:34	07:48 09:29-10:12/43 17:25-18:12/47 18:45 08:09-09:26/77	07:25 08:16-09:30/74 17:10	07:53 08:37-09:33/56 17:05
21	06:17 07:27-08:32/65 21:00 06:39-06:55/16	06:47 07:25-08:32/67 20:24	07:17 07:52-09:36/104 19:32	07:49 08:10-10:14/124 18:43 17:26-18:12/46	07:26 08:18-09:31/73 17:09	07:53 08:38-09:34/56 17:06
22	06:17 07:26-08:33/67 20:59 06:40-06:54/14	06:48 07:25-08:31/66 20:23	07:18 07:51-09:36/105 19:30 18:18-18:31/13	07:50 08:11-10:15/124 18:42 17:27-18:11/44	07:27 08:18-09:30/72 17:08	07:54 08:38-09:34/56 17:06
23	06:18 07:25-08:32/67 20:58 06:41-06:53/12	06:49 07:26-08:30/64 20:21	07:19 07:51-09:36/105 19:28 18:14-18:33/19	07:51 08:12-10:16/124 18:40 17:27-18:10/43	07:28 08:18-09:30/72 17:08	07:54 08:38-09:34/56 17:07
24	06:19 07:25-08:33/68 20:58 06:41-06:50/9	06:50 07:26-08:28/62 20:20	07:20 07:51-09:35/104 19:27 18:11-18:35/24	07:53 08:14-10:18/124 18:39 17:27-18:09/42	07:29 08:19-09:30/71 17:07	07:55 08:39-09:35/56 17:08
25	06:20 07:25-08:33/68 20:57 06:42-06:48/6	06:51 07:26-08:27/61 20:18	07:21 07:51-09:35/104 19:25 18:09-18:37/28	07:54 08:26-10:20/114 08:19-08:24/5 18:37 17:28-18:08/40	07:30 08:19-09:30/71 17:07	07:55 08:39-09:36/57 17:08
26	06:21 07:25-08:34/69 20:56	06:52 08:53-09:07/14 20:17 07:27-08:25/58	07:22 07:51-09:35/104 19:23 18:07-18:38/31	07:55 08:27-10:21/114 18:36 17:30-18:08/38	07:31 08:21-09:31/70 17:06	07:56 08:39-09:36/57 17:09
27	06:22 07:25-08:35/70 20:55	06:53 08:48-09:12/24 20:15 07:28-08:24/56	07:24 07:51-09:34/103 19:22 18:06-18:38/32	07:56 08:27-10:21/114 18:35 17:30-18:06/36	07:33 08:21-09:30/69 17:06	07:56 08:40-09:37/57 17:09
28	06:23 07:24-08:35/71 20:54	06:54 08:45-09:16/31 20:14 07:30-08:22/52	07:25 07:51-09:34/103 19:20 18:04-18:39/35	07:57 08:28-10:22/114 18:33 17:31-18:04/33	07:34 08:22-09:30/68 17:05	07:56 08:40-09:37/57 17:10
29	06:24 07:24-08:36/72 20:53	06:55 08:42-09:18/36 20:12 07:31-08:20/49	07:26 07:52-09:33/101 19:18 18:03-18:39/36	07:58 08:30-10:23/113 18:32 17:33-18:02/29	07:35 08:22-09:30/68 17:05	07:56 08:40-09:38/58 17:11
30	06:25 07:24-08:36/72 20:52	06:56 08:39-09:21/42 20:10 07:32-08:18/46	07:27 07:52-09:32/100 17:52-17:58/6 19:17 18:02-18:40/38	08:00 08:31-10:24/113 18:31 17:35-18:01/26	07:36 08:23-09:30/67 17:04	07:57 08:40-09:38/58 17:12
31	06:26 07:24-08:36/72 20:51	06:57 08:37-09:23/46 20:09 07:34-08:16/42		08:01 08:32-10:25/113 18:30 17:38-17:58/20		07:57 08:41-09:40/59 17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	2450	2285	3063	4746	2616	1837

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T62 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (481)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:27-09:04/37	07:43 16:22-17:01/39	07:07 07:30-08:14/44	07:16 07:37-08:12/35	06:30 06:55-07:34/39	06:02 06:23-06:30/7
	17:13 16:19-16:44/25	17:48	18:22 17:08-17:52/44	19:56 19:00-19:32/32	20:27	20:56
2	07:57 08:28-09:04/36	07:42 16:23-17:01/38	07:05 07:30-08:14/44	07:14 07:35-08:12/37	06:29 06:55-07:35/40	06:01 06:23-06:32/9
	17:14 16:19-16:45/26	17:49 08:05-08:18/13	18:23 17:08-17:53/45	19:57 18:58-19:33/35	20:28	20:57 20:24-20:32/8
3	07:57 08:28-09:04/36	07:41 16:24-17:00/36	07:04 07:29-08:13/44	07:13 07:35-08:13/38	06:28 06:55-07:35/40	06:01 06:23-06:33/10
	17:15 16:19-16:46/27	17:50 08:02-08:20/18	18:24 17:07-17:52/45	19:58 18:57-19:34/37	20:29	20:58 20:22-20:33/11
4	07:57 08:29-09:04/35	07:40 16:25-17:00/35	07:02 07:29-08:13/44	07:11 07:34-08:13/39	06:26 06:54-07:34/40	06:00 06:22-06:34/12
	17:16 16:19-16:47/28	17:51 08:01-08:23/22	18:25 17:07-17:53/46	19:59 18:56-19:34/38	20:30	20:59 20:21-20:34/13
5	07:57 08:30-09:04/34	07:39 16:26-16:59/33	07:01 07:29-08:11/42	07:09 07:33-08:12/39	06:25 06:55-07:34/39	06:00 06:22-06:35/13
	17:17 16:19-16:48/29	17:53 07:59-08:24/25	18:26 17:07-17:52/45	20:00 18:54-19:34/40	20:31	20:59 20:21-20:35/14
6	07:57 08:30-09:04/34	07:38 16:27-16:58/31	06:59 07:28-08:09/41	07:08 07:33-08:13/40	06:24 06:55-07:33/38	06:00 06:22-06:36/14
	17:18 16:19-16:49/30	17:54 07:58-08:26/28	18:27 17:06-17:52/46	20:00 18:54-19:35/41	20:32	21:00 20:19-20:35/16
7	07:57 08:31-09:04/33	07:37 16:29-16:57/28	06:58 07:29-08:09/40	07:06 07:32-08:12/40	06:23 06:55-07:33/38	05:59 06:21-06:36/15
	17:19 16:19-16:50/31	17:55 07:58-08:27/29	18:29 17:07-17:52/45	20:01 18:53-19:35/42	20:33	21:01 20:19-20:36/17
8	07:57 08:32-09:04/32	07:36 16:31-16:56/25	07:56 08:29-09:06/37	07:05 07:33-08:12/39	06:22 06:56-07:33/37	05:59 06:21-06:37/16
	17:20 16:19-16:51/32	17:56 07:57-08:28/31	19:30 18:06-18:51/45	20:02 18:52-19:34/42	20:34	21:01 20:19-20:36/17
9	07:57 08:33-09:04/31	07:35 16:32-16:53/21	07:54 08:30-09:05/35	07:03 07:32-08:11/39	06:20 06:56-07:32/36	05:59 06:21-06:37/16
	17:21 16:19-16:52/33	17:58 07:56-08:29/33	19:31 18:07-18:51/44	20:03 18:53-19:35/42	20:35	21:02 20:19-20:37/18
10	07:56 08:33-09:03/30	07:33 16:35-16:51/16	07:53 08:30-09:03/33	07:01 07:32-08:10/38	06:19 06:57-07:32/35	05:59 06:21-06:38/17
	17:22 16:18-16:52/34	17:59 07:55-08:29/34	19:32 18:07-18:50/43	20:04 18:52-19:34/42	20:36	21:03 20:19-20:38/19
11	07:56 08:34-09:03/29	07:32 16:40-16:47/7	07:51 08:30-09:02/32	07:00 07:33-08:10/37	06:18 06:57-07:31/34	05:59 06:21-06:39/18
	17:23 16:18-16:53/35	18:00 07:55-08:30/35	19:33 18:07-18:49/42	20:05 18:52-19:34/42	20:37	21:03 20:19-20:38/19
12	07:56 08:35-09:03/28	07:31 07:55-08:31/36	07:49 08:32-09:01/29	06:58 07:32-08:09/37	06:17 06:58-07:30/32	05:58 06:21-06:39/18
	17:24 16:19-16:55/36	18:01	19:34 18:08-18:49/41	20:06 18:52-19:34/42	20:38	21:04 20:19-20:39/20
13	07:56 08:35-09:02/27	07:30 07:55-08:31/36	07:48 08:32-08:59/27	06:57 07:33-08:08/35	06:16 06:59-07:29/30	05:58 06:21-06:40/19
	17:25 16:18-16:55/37	18:03	19:35 18:09-18:47/38	20:08 18:52-19:34/42	20:39	21:04 20:19-20:39/20
14	07:55 08:37-09:02/25	07:28 07:54-08:31/37	07:46 08:34-08:56/22	06:55 07:33-08:07/34	06:15 06:59-07:29/30	05:58 06:21-06:40/19
	17:26 16:18-16:56/38	18:04	19:36 18:09-18:45/36	20:09 18:52-19:33/41	20:40	21:05 20:19-20:40/21
15	07:55 08:37-09:02/25	07:27 07:50-08:31/41	07:44 08:36-08:54/18	06:53 07:35-08:06/31	06:14 07:00-07:27/27	05:58 06:21-06:40/19
	17:27 16:18-16:56/38	18:05	19:37 18:11-18:45/34	20:10 18:52-19:31/39	20:41	21:05 20:19-20:40/21
16	07:55 08:39-09:02/23	07:26 07:46-08:31/45	07:43 08:40-08:50/10	06:52 07:35-08:04/29	06:13 07:01-07:26/25	05:58 06:21-06:41/20
	17:28 16:18-16:57/39	18:06	19:39 18:12-18:42/30	20:11 18:53-19:31/38	20:42	21:05 20:19-20:41/22
17	07:54 08:39-09:01/22	07:24 07:44-08:31/47	07:41 18:14-18:40/26	06:50 07:36-08:02/26	06:12 07:03-07:25/22	05:58 06:21-06:41/20
	17:29 16:18-16:58/40	18:07	19:40	20:12 18:53-19:30/37	20:43	21:06 20:19-20:41/22
18	07:54 08:41-09:00/19	07:23 07:43-08:31/48	07:40 18:16-18:38/22	06:49 07:12-07:23/11 18:54-19:29/35	06:11 07:04-07:23/19	05:58 06:21-06:41/20
	17:30 16:18-16:59/41	18:09 17:29-17:35/6	19:41	20:13 07:38-08:00/22	20:44	21:06 20:19-20:41/22
19	07:53 08:43-08:59/16	07:22 07:41-08:30/49	07:38 18:19-18:34/15	06:47 07:08-07:25/17 18:54-19:27/33	06:10 07:05-07:21/16	05:59 06:21-06:41/20
	17:32 16:18-16:59/41	18:10 17:23-17:40/17	19:42	20:14 07:39-07:57/18	20:45	21:07 20:19-20:41/22
20	07:52 08:45-08:58/13	07:20 07:40-08:29/49	07:36	06:46 07:06-07:28/22 18:56-19:26/30	06:10 07:08-07:19/11	05:59 06:21-06:41/20
	17:33 16:19-17:00/41	18:11 17:20-17:43/23	19:43	20:15 07:43-07:54/11	20:46	21:07 20:19-20:41/22
21	07:52 08:48-08:55/7	07:19 07:39-08:28/49	07:34	06:44 07:04-07:30/26	06:09	05:59 06:21-06:41/20
	17:34 16:19-17:00/41	18:12 17:17-17:44/27	19:44	20:16 18:57-19:24/27	20:47	21:07 20:19-20:41/22
22	07:51 16:18-17:00/42	07:17 07:37-08:27/50	07:33	06:43 07:02-07:31/29	06:08	05:59 06:22-06:42/20
	17:35	18:13 17:16-17:47/31	19:45	20:17 18:59-19:22/23	20:48	21:07 20:19-20:41/22
23	07:51 16:18-17:01/43	07:16 07:36-08:27/51	07:31	06:41 07:01-07:32/31	06:07	05:59 06:22-06:42/20
	17:36	18:15 17:14-17:47/33	19:46	20:18 19:01-19:20/19	20:49	21:08 20:20-20:42/22
24	07:50 16:19-17:02/43	07:14 07:34-08:25/51	07:29	06:40 06:59-07:32/33	06:06	06:00 06:22-06:42/20
	17:38	18:16 17:13-17:49/36	19:47	20:19 19:04-19:16/12	20:50	21:08 20:20-20:42/22
25	07:49 16:19-17:02/43	07:13 07:33-08:23/50	07:28	06:38 06:59-07:33/34	06:06	06:00 06:22-06:42/20
	17:39	18:17 17:11-17:50/39	19:48	20:20	20:51	21:08 20:20-20:42/22
26	07:48 16:20-17:02/42	07:12 07:33-08:21/48	07:26 07:49-08:03/14	06:37 06:58-07:34/36	06:05	06:00 06:23-06:43/20
	17:40	18:18 17:10-17:51/41	19:49	20:21	20:52	21:08 20:21-20:43/22
27	07:48 16:20-17:02/42	07:10 07:32-08:18/46	07:24 07:45-08:06/21	06:36 06:57-07:34/37	06:04	06:01 06:23-06:42/19
	17:41	18:19 17:09-17:51/42	19:50	20:22	20:52	21:08 20:21-20:42/21
28	07:47 16:20-17:02/42	07:09 07:31-08:15/44	07:23 07:43-08:08/25	06:34 06:56-07:34/38	06:04	06:01 06:24-06:43/19
	17:43	18:21 17:09-17:52/43	19:52 19:10-19:26/16	20:23	20:53	21:08 20:21-20:42/21
29	07:46 16:20-17:02/42		07:21 07:41-08:10/29	06:33 06:56-07:35/39	06:03	06:01 06:24-06:43/19
	17:44		19:53 19:06-19:28/22	20:25	20:54	21:08 20:22-20:43/21
30	07:45 16:21-17:02/41		07:19 07:39-08:10/31	06:32 06:55-07:34/39	06:03	06:02 06:24-06:42/18
	17:45		19:54 19:03-19:30/27	20:26	20:55	21:08 20:22-20:42/20
31	07:44 16:22-17:01/39		07:18 07:38-08:12/34		06:02 06:24-06:27/3	
	17:46		19:55 19:02-19:32/30		20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1713	1692	1523	1907	631	1076

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T62 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (481)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-06:43/18 21:08 20:23-20:43/20	06:26 07:07-07:40/33 20:50	06:57 07:31-08:09/38 20:07 18:51-19:33/42	07:27 08:11-08:39/28 19:15 17:47-18:27/40	07:02 16:04-16:21/17 17:28 07:25-07:59/34	07:37 08:16-08:45/29 17:04 16:00-16:36/36
2	06:03 06:25-06:42/17 21:08 20:23-20:42/19	06:27 07:07-07:41/34 20:49	06:58 07:31-08:09/38 20:05 18:51-19:33/42	07:28 08:09-08:40/31 19:13 17:46-18:27/41	07:03 16:02-16:24/22 17:27 07:25-07:58/33	07:38 08:16-08:46/30 17:04 16:01-16:35/34
3	06:03 06:26-06:43/17 21:08 20:24-20:42/18	06:28 07:06-07:42/36 20:48	06:59 07:30-08:09/39 20:04 18:51-19:33/42	07:29 08:08-08:40/32 19:11 17:45-18:28/43	07:04 15:59-16:25/26 17:26 07:27-07:58/31	07:39 08:16-08:47/31 17:03 16:02-16:35/33
4	06:04 06:26-06:42/16 21:08 20:24-20:42/18	06:29 07:06-07:42/36 20:46	07:00 07:30-08:09/39 20:02 18:50-19:32/42	07:30 08:07-08:41/34 19:10 17:44-18:28/44	07:05 15:59-16:27/28 17:24 07:28-07:57/29	07:40 08:16-08:48/32 17:03 16:03-16:35/32
5	06:04 06:27-06:42/15 21:07 20:25-20:42/17	06:30 07:05-07:42/37 20:45	07:01 07:29-08:09/40 20:00 18:50-19:32/42	07:32 08:06-08:42/36 19:08 17:43-18:28/45	07:06 15:57-16:28/31 17:23 07:28-07:56/28	07:41 08:16-08:49/33 17:03 16:04-16:35/31
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Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	513	1507	1379	2220	1554	2075

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T63 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (482)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:41-09:24/43 17:13	07:43 16:07-17:06/59 17:48 08:28-09:20/52	07:07 16:08-17:08/60 18:22 08:10-09:36/86	07:16 18:05-19:12/67 19:56	06:31 06:58-07:44/46 20:27	06:02 19:22-20:19/57 20:57
2	07:57 08:41-09:24/43 17:14	07:42 16:06-17:07/61 17:49 08:27-09:22/55	07:06 16:09-17:06/57 18:23 08:10-09:35/85	07:15 18:05-19:12/67 19:57	06:29 06:58-07:44/46 20:28	06:01 19:23-20:19/56 20:57
3	07:57 08:42-09:24/42 17:15	07:41 16:06-17:08/62 17:50 08:26-09:23/57	07:04 16:09-17:05/56 18:24 08:10-09:35/85	07:13 18:05-19:12/67 19:58	06:28 06:58-07:44/46 20:29	06:01 19:23-20:20/57 20:58
4	07:57 08:43-09:24/41 17:16	07:40 16:05-17:09/64 17:52 08:25-09:25/60	07:03 16:11-17:04/53 18:25 08:10-09:33/83	07:11 18:04-19:11/67 19:59	06:27 06:58-07:44/46 20:30	06:01 19:22-20:20/58 20:59
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6	07:57 08:44-09:24/40 17:18	07:38 16:04-17:10/66 17:54 08:22-09:27/65	06:59 16:14-17:01/47 07:19-07:25/6 18:28 08:11-09:32/81	07:08 18:05-19:10/65 20:00	06:24 06:57-07:43/46 20:32	06:00 19:23-20:21/58 21:00
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31	07:44 16:08-17:05/57 17:47 08:30-09:18/48		07:18 18:06-19:12/66 19:55		06:02 19:23-20:19/56 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1300	4018	3592	1842	1783	1802

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T63 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (482)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 19:27-20:27/60 21:08	06:27 07:09-07:52/43 20:50	06:58 18:05-19:06/61 20:07	07:28 18:37-18:52/15 08:51-10:03/72 19:15 18:16-18:29/13 07:47-08:11/24	07:02 15:32-16:41/69 17:28 07:48-09:01/73	07:37 08:41-09:04/23 17:04 08:36-08:40/4
2	06:03 19:28-20:28/60 21:08	06:28 07:08-07:52/44 20:49	06:59 18:04-19:06/62 20:06	07:29 18:38-18:51/13 08:50-10:04/74 19:13 17:08-17:22/14 07:49-08:11/22	07:03 15:32-16:41/69 17:27 07:49-09:00/71	07:38 08:33-09:05/32 17:04
3	06:04 19:27-20:27/60 21:08	06:29 07:08-07:52/44 20:48	07:00 18:03-19:06/63 20:04	07:30 18:39-18:49/10 08:50-10:05/75 19:12 17:02-17:26/24 07:50-08:10/20	07:04 15:33-16:41/68 17:26 07:50-08:59/69	07:39 08:32-09:06/34 17:04
4	06:04 19:28-20:28/60 21:08	06:30 07:07-07:52/45 20:47	07:01 18:02-19:06/64 20:02	07:31 18:41-18:47/6 08:49-10:06/77 19:10 16:59-17:30/31 07:51-08:09/18	07:06 15:33-16:40/67 17:25 07:51-08:58/67	07:40 08:31-09:08/37 17:03
5	06:05 19:28-20:27/59 21:08	06:31 07:07-07:53/46 20:46	07:02 18:01-19:06/65 20:01	07:32 16:56-17:32/36 07:52-08:07/15 19:08 08:48-10:07/79	07:07 15:33-16:39/66 17:24 07:52-08:57/65	07:41 08:31-09:09/38 17:03
6	06:05 19:29-20:28/59 21:07	06:32 07:07-07:53/46 20:44	07:03 18:01-19:06/65 19:57	07:33 16:53-17:34/41 07:53-08:05/12 19:07 08:47-10:07/80	07:08 15:35-16:40/65 17:22 07:54-08:56/62	07:42 08:31-09:10/39 17:03
7	06:06 19:29-20:27/58 21:07	06:33 07:07-07:53/46 20:43	07:04 18:00-19:06/66 19:56	07:34 16:51-17:36/45 07:54-08:02/8 19:05 08:46-10:07/81	07:09 15:35-16:39/64 17:21 07:55-08:55/60	07:43 08:30-09:10/40 17:03
8	06:07 19:29-20:27/58 21:07	06:34 07:06-07:53/47 20:42	07:04 17:59-19:06/67 19:54	07:35 16:49-17:37/48 19:03 08:46-10:08/82	07:10 15:36-16:38/62 17:20 07:56-08:53/57	07:44 08:30-09:11/41 17:03
9	06:07 19:30-20:28/58 21:07	06:35 07:06-07:53/47 20:41	07:05 17:59-19:06/67 19:52	07:36 16:47-17:38/51 19:02 08:45-10:08/83	07:12 15:36-16:37/61 17:19 07:57-08:51/54	07:45 08:30-09:12/42 17:03
10	06:08 19:30-20:27/57 21:06	06:36 07:06-07:53/47 20:39	07:06 17:58-19:05/67 19:51	07:37 16:45-17:39/54 19:00 08:44-10:08/84	07:13 15:38-16:37/59 17:18 07:59-08:51/52	07:45 08:31-09:13/42 17:03
11	06:09 19:31-20:27/56 21:06	06:37 07:06-07:53/47 20:38	07:07 17:58-19:05/67 19:49	07:38 16:43-17:39/56 18:59 08:44-10:08/84	07:14 15:39-16:36/57 17:17 08:01-08:49/48	07:46 08:31-09:14/43 17:03
12	06:09 19:31-20:27/56 21:05	06:38 07:06-07:52/46 20:37	07:08 17:58-19:05/67 19:47	07:39 16:41-17:40/59 18:57 08:43-10:08/85	07:15 15:39-16:35/56 17:16 08:03-08:47/44	07:47 08:31-09:15/44 17:03
13	06:10 19:31-20:26/55 21:05	06:39 07:06-07:52/46 20:36	07:09 17:58-19:04/66 19:46	07:40 16:40-17:41/61 18:55 08:43-10:08/85	07:16 15:41-16:35/54 17:15 08:06-08:46/40	07:48 08:31-09:15/44 17:03
14	06:11 19:32-20:26/54 21:04	06:40 07:07-07:52/45 20:34	07:10 17:56-19:02/66 19:44	07:41 16:40-17:42/62 18:54 08:43-10:09/86	07:17 15:42-16:34/52 17:14 08:08-08:43/35	07:49 08:31-09:16/45 17:04
15	06:12 19:33-20:26/53 21:04	06:41 07:07-07:51/44 20:33	07:11 17:56-19:02/66 19:42	07:43 16:38-17:42/64 18:52 08:43-10:09/86	07:19 15:43-16:32/49 17:13 08:10-08:40/30	07:49 08:32-09:17/45 17:04
16	06:12 07:26-07:33/7 21:03 19:33-20:26/53	06:42 07:07-07:51/44 20:31	07:12 17:56-19:01/65 19:40	07:44 16:37-17:42/65 18:51 08:43-10:09/86	07:20 15:44-16:31/47 17:13 08:13-08:37/24	07:50 08:32-09:17/45 17:04
17	06:13 07:23-07:36/13 21:03 19:33-20:25/52	06:43 07:08-07:50/42 20:30 18:39-18:43/4	07:13 17:56-19:00/64 19:39	07:45 16:36-17:43/67 18:49 08:42-10:08/86	07:21 15:46-16:31/45 17:12 08:19-08:33/14	07:51 08:32-09:17/45 17:04
18	06:14 07:21-07:38/17 21:02 19:34-20:24/50	06:44 07:08-07:49/41 20:29 18:32-18:50/18	07:14 17:57-18:59/62 19:37 09:22-09:37/15	07:46 16:35-17:43/68 18:48 08:42-10:08/86	07:22 15:48-16:29/41 17:11	07:51 08:33-09:18/45 17:05
19	06:15 07:19-07:40/21 21:01 19:35-20:24/49	06:45 07:09-07:48/39 20:27 18:28-18:53/25	07:15 17:57-18:58/61 19:35 09:16-09:42/26	07:47 16:34-17:43/69 18:46 08:42-10:08/86	07:23 15:49-16:28/39 17:10	07:52 08:32-09:18/46 17:05
20	06:16 07:18-07:41/23 21:01 19:36-20:24/48	06:46 07:09-07:47/38 20:26 18:25-18:55/30	07:16 17:57-18:57/60 19:34 09:13-09:46/33	07:48 16:33-17:43/70 18:45 08:43-10:08/85	07:25 15:51-16:26/35 17:10	07:53 08:33-09:19/46 17:05
21	06:17 07:17-07:43/26 21:00 19:37-20:23/46	06:47 07:10-07:46/36 20:24 18:22-18:57/35	07:17 17:58-18:59/61 07:57-08:05/8 19:32 09:09-09:48/39	07:49 16:34-17:44/70 18:43 08:43-10:08/85	07:26 15:54-16:25/31 17:09	07:53 08:34-09:20/46 17:06
22	06:17 07:16-07:44/28 20:59 19:38-20:22/44	06:48 07:11-07:45/34 20:23 18:20-18:59/39	07:18 17:58-19:00/62 07:53-08:08/15 19:30 09:07-09:51/44	07:50 16:33-17:44/71 18:42 08:43-10:07/84	07:27 15:56-16:23/27 17:08	07:54 08:34-09:20/46 17:06
23	06:18 07:14-07:45/31 20:58 19:38-20:21/43	06:49 07:12-07:43/31 20:21 18:17-18:59/42	07:19 17:59-19:01/62 07:51-08:09/18 19:28 09:04-09:53/49	07:51 16:32-17:43/71 18:40 08:43-10:07/84	07:28 15:58-16:21/23 17:08	07:54 08:34-09:20/46 17:07
24	06:19 07:14-07:46/32 20:58 19:40-20:20/40	06:50 07:13-07:40/27 20:20 18:15-19:00/45	07:20 18:00-19:01/61 07:49-08:11/22 19:27 09:02-09:55/53	07:53 16:32-17:43/71 18:39 08:43-10:06/83	07:29 16:01-16:18/17 17:07	07:55 08:35-09:21/46 17:08
25	06:20 07:13-07:47/34 20:57 19:41-20:19/38	06:51 07:14-07:38/24 20:18 18:14-19:02/48	07:21 18:01-19:01/60 07:48-08:11/23 19:25 09:00-09:56/56	07:54 16:31-17:43/72 18:37 08:44-10:06/82	07:30 16:07-16:13/6 17:07	07:55 08:36-09:21/45 17:08
26	06:21 07:12-07:48/36 20:56 19:42-20:18/36	06:52 07:17-07:35/18 20:17 18:12-19:02/50	07:22 18:02-19:01/59 07:47-08:12/25 19:23 08:59-09:58/59	07:55 16:32-17:43/71 18:36 08:44-10:05/81	07:31 17:06	07:55 08:37-09:21/44 17:09
27	06:22 07:12-07:49/37 20:55 19:44-20:16/32	06:53 07:21-07:30/9 20:15 18:11-19:03/52	07:24 18:04-18:59/55 07:46-08:12/26 19:22 08:57-09:59/62	07:56 16:32-17:43/71 18:35 08:44-10:05/81	07:33 08:46-08:57/11 17:06	07:56 08:37-09:22/45 17:09
28	06:23 07:11-07:49/38 20:54 19:46-20:14/28	06:54 18:09-19:04/55 20:14	07:25 18:06-18:58/52 07:45-08:12/27 19:20 08:55-10:00/65	07:57 16:31-17:43/72 18:33 08:45-10:04/79	07:34 08:44-08:59/15 17:05	07:56 08:37-09:23/46 17:10
29	06:24 07:11-07:50/39 20:53 19:48-20:12/24	06:55 18:08-19:05/57 20:12	07:26 18:08-18:56/48 07:45-08:12/27 19:18 08:54-10:01/67	07:58 16:31-17:42/71 18:32 08:45-10:03/78	07:35 08:43-09:01/18 17:05	07:56 08:38-09:23/45 17:11
30	06:25 07:10-07:51/41 20:52 19:51-20:10/19	06:56 18:07-19:05/58 20:10	07:27 18:37-18:54/17 08:53-10:02/69 19:17 18:11-18:35/24 07:46-08:11/25	08:00 16:32-17:43/71 18:31 08:47-10:03/76	07:36 08:42-09:03/21 17:04	07:57 08:38-09:23/45 17:12
31	06:26 07:10-07:51/41 20:51 19:56-20:05/9	06:57 18:06-19:05/59 20:09		08:01 16:32-17:42/70 18:30 08:47-10:02/75		07:57 08:40-09:24/44 17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1938	1683	2705	4472	2159	1318

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T64 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (483)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:10-16:36/26 17:14	07:43 17:10-17:24/14 17:48	07:07 07:31-07:56/25 18:22 17:16-17:39/23	07:16 19:17-19:34/17 19:56	06:31 19:37-20:04/27 20:27	06:02 06:35-07:03/28 20:57
2	07:57 16:11-16:37/26 17:14	07:42 17:09-17:25/16 17:49	07:06 07:31-07:54/23 18:23 17:17-17:36/19	07:15 19:15-19:36/21 19:57	06:29 19:37-20:06/29 20:28	06:02 06:35-07:02/27 20:58
3	07:57 16:12-16:37/25 17:15	07:41 17:08-17:27/19 17:50	07:04 07:33-07:54/21 18:24 17:21-17:34/13	07:13 19:13-19:37/24 19:58	06:28 19:37-20:07/30 20:29	06:01 06:36-07:02/26 20:58
4	07:57 16:13-16:37/24 17:16	07:40 17:07-17:28/21 17:52	07:03 07:33-07:52/19 18:25	07:11 19:12-19:37/25 19:59	06:27 19:36-20:08/32 20:30	06:01 06:37-07:02/25 20:59
5	07:57 16:14-16:37/23 17:17	07:39 17:05-17:29/24 17:53	07:01 07:35-07:49/14 18:27	07:10 19:11-19:39/28 20:00	06:26 06:46-06:49/3 20:31 19:35-20:07/32	06:00 06:37-07:01/24 21:00
6	07:57 16:14-16:36/22 17:18	07:38 17:05-17:30/25 17:54	06:59 07:38-07:46/8 18:28	07:08 19:10-19:40/30 20:00	06:24 06:44-06:54/10 20:32 19:35-20:08/33	06:00 06:38-07:01/23 21:00
7	07:57 16:15-16:36/21 17:19	07:37 17:04-17:32/28 17:55	06:58 18:29	07:07 19:09-19:40/31 20:01	06:23 06:43-06:56/13 20:33 19:35-20:08/33	06:00 06:39-07:01/22 21:01
8	07:57 16:16-16:36/20 17:20	07:36 17:04-17:33/29 17:57	07:56 19:30	07:05 19:09-19:41/32 20:03	06:22 06:42-06:58/16 20:34 19:35-20:08/33	06:00 06:40-07:01/21 21:02
9	07:57 16:18-16:36/18 17:21	07:35 17:04-17:35/31 17:58 07:55-07:59/4	07:55 19:31	07:03 19:08-19:40/32 20:04	06:21 06:41-06:59/18 20:35 19:35-20:08/33	05:59 06:39-07:00/21 21:02
10	07:57 16:20-16:36/16 17:22	07:34 17:04-17:36/32 17:59 07:54-08:02/8	07:53 08:12-08:20/8 19:32	07:02 19:09-19:41/32 20:05	06:20 06:40-07:00/20 20:36 19:36-20:07/31	05:59 06:40-07:00/20 21:03
11	07:57 16:21-16:35/14 17:23	07:32 17:04-17:37/33 18:00 07:52-08:03/11	07:51 08:11-08:23/12 19:33	07:00 19:08-19:40/32 20:06	06:19 06:39-07:01/22 20:37 19:36-20:07/31	05:59 06:41-07:00/19 21:03
12	07:56 16:23-16:34/11 17:24	07:31 17:04-17:38/34 18:02 07:51-08:05/14	07:50 08:09-08:25/16 19:35	06:58 19:08-19:39/31 20:07	06:18 06:38-07:01/23 20:38 19:36-20:07/31	05:59 06:41-07:00/19 21:04
13	07:56 16:25-16:33/8 17:25	07:30 17:05-17:40/35 18:03 07:50-08:07/17	07:48 08:07-08:26/19 19:36	06:57 19:08-19:39/31 20:08	06:17 06:37-07:02/25 20:39 19:37-20:06/29	05:59 06:42-06:59/17 21:04
14	07:56 17:26	07:29 17:04-17:41/37 18:04 07:49-08:08/19	07:46 08:06-08:27/21 19:37	06:55 19:08-19:37/29 20:09	06:15 06:36-07:02/26 20:40 19:37-20:06/29	05:59 06:43-06:59/16 21:05
15	07:55 17:27	07:27 17:05-17:42/37 18:05 07:47-08:08/21	07:45 08:04-08:27/23 19:38	06:54 19:09-19:37/28 20:10	06:14 06:35-07:03/28 20:41 19:37-20:05/28	05:59 06:43-06:59/16 21:05
16	07:55 17:29	07:26 17:06-17:44/38 18:07 07:46-08:08/22	07:43 08:02-08:27/25 19:39	06:52 19:10-19:35/25 20:11	06:14 06:34-07:03/29 20:42 19:38-20:05/27	05:59 06:44-06:59/15 21:06
17	07:54 17:30	07:25 17:06-17:44/38 18:08 07:44-08:08/24	07:42 08:01-08:28/27 19:40	06:51 19:11-19:34/23 20:12	06:13 06:33-07:03/30 20:43 19:39-20:04/25	05:59 06:44-06:59/15 21:06
18	07:54 17:31	07:23 17:08-17:45/37 18:09 07:43-08:08/25	07:40 07:59-08:28/29 19:41	06:49 19:12-19:32/20 20:13	06:12 06:32-07:03/31 20:44 19:39-20:03/24	05:59 06:44-06:59/15 21:07
19	07:53 17:32	07:22 17:09-17:46/37 18:10 07:42-08:09/27	07:38 07:58-08:27/29 19:42	06:48 19:14-19:30/16 20:14	06:11 06:32-07:04/32 20:45 19:40-20:02/22	05:59 06:45-06:59/14 21:07
20	07:53 17:33	07:21 17:09-17:45/36 18:11 07:40-08:08/28	07:36 07:59-08:27/28 19:43	06:46 19:16-19:26/10 20:15	06:10 06:32-07:04/32 20:46 19:42-20:01/19	05:59 06:46-07:00/14 21:07
21	07:52 17:34	07:19 17:11-17:45/34 18:13 07:39-08:08/29	07:35 07:58-08:26/28 19:44	06:45 20:16	06:09 06:31-07:04/33 20:47 19:43-20:00/17	05:59 06:46-07:00/14 21:07
22	07:52 17:36	07:18 07:37-08:07/30 18:14 17:11-17:45/34	07:33 07:58-08:25/27 19:45	06:43 20:17	06:08 06:31-07:03/32 20:48 19:45-19:58/13	05:59 06:46-07:00/14 21:08
23	07:51 17:37	07:16 07:36-08:06/30 18:15 17:11-17:45/34	07:31 07:59-08:25/26 19:46	06:42 20:18	06:07 06:32-07:04/32 20:49 19:47-19:56/9	06:00 06:46-07:00/14 21:08
24	07:50 17:38	07:15 07:34-08:05/31 18:16 17:11-17:44/33	07:30 08:00-08:23/23 19:48	06:40 20:20	06:07 06:32-07:04/32 20:50	06:00 06:46-07:01/15 21:08
25	07:49 17:39	07:13 07:33-08:03/30 18:17 17:12-17:44/32	07:28 08:00-08:21/21 19:49	06:39 19:48-19:58/10 20:21	06:06 06:32-07:03/31 20:51	06:00 06:46-07:01/15 21:08
26	07:49 17:40	07:12 07:31-08:01/30 18:19 17:12-17:42/30	07:26 08:01-08:19/18 19:50	06:37 19:45-20:00/15 20:22	06:05 06:33-07:04/31 20:52	06:01 06:46-07:01/15 21:08
27	07:48 17:42	07:10 07:31-08:00/29 18:20 17:13-17:42/29	07:25 08:04-08:17/13 19:51	06:36 19:42-20:00/18 20:23	06:05 06:33-07:03/30 20:53	06:01 06:46-07:02/16 21:08
28	07:47 17:43	07:09 07:30-07:57/27 18:21 17:14-17:40/26	07:23 08:09-08:11/2 19:52	06:35 19:41-20:02/21 20:24	06:04 06:34-07:03/29 20:54	06:01 06:46-07:02/16 21:08
29	07:46 17:44		07:21 19:53	06:33 19:40-20:03/23 20:25	06:04 06:34-07:03/29 20:54	06:02 06:45-07:02/17 21:08
30	07:45 17:15-17:21/6 17:45		07:20 19:26-19:30/4 19:54	06:32 19:39-20:04/25 20:26	06:03 06:35-07:03/28 20:55	06:02 06:46-07:03/17 21:08
31	07:44 17:12-17:23/11 17:47		07:18 19:20-19:34/14 19:55		06:02 06:34-07:02/28 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	271	1309	578	629	1310	550

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T64 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (483)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 06:45-07:04/19 21:08	06:27 06:49-07:12/23 20:50 19:47-20:18/31	06:58 19:07-19:39/32 20:07	07:28 07:48-08:05/17 19:15	07:02 16:33-17:05/32 17:28 07:23-07:31/8	07:37 16:03-16:17/14 17:04
2	06:03 06:45-07:05/20 21:08	06:28 06:50-07:11/21 20:49 19:46-20:18/32	06:59 19:06-19:39/33 20:06	07:29 07:49-08:03/14 19:13	07:03 16:34-17:04/30 17:27 07:25-07:28/3	07:38 16:02-16:18/16 17:04
3	06:04 06:45-07:05/20 21:08	06:29 06:51-07:10/19 20:48 19:45-20:17/32	07:00 19:06-19:38/32 20:04	07:30 07:50-08:00/10 19:12	07:04 16:34-17:03/29 17:26	07:39 16:01-16:19/18 17:04
4	06:04 06:45-07:06/21 21:08	06:30 06:51-07:08/17 20:47 19:45-20:17/32	07:01 19:06-19:38/32 20:02	07:31 19:10	07:06 16:34-17:01/27 17:25	07:40 16:01-16:20/19 17:04
5	06:05 06:44-07:06/22 21:08	06:31 06:52-07:07/15 20:46 19:45-20:17/32	07:02 19:06-19:37/31 20:01	07:32 19:08	07:07 16:35-17:00/25 17:24	07:41 16:00-16:21/21 17:03
6	06:05 06:44-07:07/23 21:08	06:32 06:53-07:05/12 20:44 19:45-20:17/32	07:03 19:06-19:36/30 19:57	07:33 19:07	07:08 16:36-16:59/23 17:22	07:42 16:00-16:22/22 17:03
7	06:06 06:44-07:08/24 21:07	06:33 06:54-07:02/8 20:43 19:45-20:17/32	07:04 19:06-19:34/28 19:56	07:34 19:05	07:09 16:37-16:58/21 17:21	07:43 16:00-16:23/23 17:03
8	06:07 06:44-07:08/24 21:07	06:34 19:45-20:17/32 20:42	07:05 19:07-19:32/25 19:54	07:35 08:12-08:24/12 19:03	07:10 16:38-16:56/18 17:20	07:44 16:00-16:24/24 17:03
9	06:07 06:44-07:09/25 21:07	06:35 19:45-20:16/31 20:41	07:06 19:07-19:31/24 19:52	07:36 08:09-08:26/17 19:02	07:12 16:39-16:55/16 17:19	07:45 16:00-16:25/25 17:03
10	06:08 06:43-07:09/26 21:06	06:36 19:45-20:15/30 20:40	07:07 19:08-19:29/21 19:51	07:37 08:07-08:27/20 19:00 17:57-18:05/8	07:13 16:41-16:55/14 17:18	07:46 16:00-16:26/26 17:03
11	06:09 06:43-07:10/27 21:06	06:37 19:46-20:14/28 20:38	07:08 19:10-19:28/18 19:49	07:38 08:06-08:28/22 18:59 17:52-18:09/17	07:14 16:43-16:53/10 17:17	07:46 16:00-16:26/26 17:03
12	06:09 06:43-07:10/27 21:05	06:38 19:46-20:13/27 20:37	07:09 19:12-19:26/14 19:47	07:39 08:04-08:28/24 18:57 17:50-18:11/21	07:15 16:46-16:52/6 17:16	07:47 16:01-16:27/26 17:03
13	06:10 06:43-07:11/28 21:05	06:39 19:47-20:12/25 20:36	07:10 19:16-19:22/6 19:46	07:40 08:04-08:29/25 18:55 17:48-18:12/24	07:16 17:15	07:48 16:00-16:27/27 17:03
14	06:11 06:42-07:11/29 21:04	06:40 19:48-20:10/22 20:34	07:11 19:44	07:41 08:04-08:31/27 18:54 17:47-18:14/27	07:18 17:14	07:49 16:01-16:28/27 17:04
15	06:12 06:42-07:12/30 21:04	06:41 19:49-20:09/20 20:33	07:12 19:42	07:43 08:03-08:33/30 18:52 17:46-18:15/29	07:19 17:14	07:49 16:01-16:29/28 17:04
16	06:12 06:42-07:12/30 21:03	06:42 19:50-20:08/18 20:31	07:13 07:54-08:06/12 19:41	07:44 08:04-08:34/30 18:51 17:44-18:15/31	07:20 17:13	07:50 16:02-16:30/28 17:04
17	06:13 06:42-07:13/31 21:03	06:43 19:52-20:06/14 20:30	07:14 07:51-08:08/17 19:39	07:45 08:05-08:35/30 18:49 17:43-18:15/32	07:21 17:12	07:51 16:02-16:30/28 17:04
18	06:14 06:41-07:12/31 21:02	06:44 19:55-20:04/9 20:29	07:15 07:49-08:09/20 19:37	07:46 08:06-08:36/30 18:48 17:42-18:15/33	07:22 17:11	07:52 16:03-16:30/27 17:05
19	06:15 06:41-07:13/32 21:01	06:45 20:27	07:16 07:46-08:09/23 19:35	07:47 08:07-08:37/30 18:46 17:42-18:15/33	07:23 17:10	07:52 16:02-16:30/28 17:05
20	06:16 06:42-07:13/31 21:01 19:59-20:05/6	06:46 20:26	07:17 07:45-08:10/25 19:34	07:48 17:42-18:16/34 18:45 08:09-08:38/29	07:25 17:10	07:53 16:03-16:31/28 17:06
21	06:17 06:42-07:14/32 21:00 19:56-20:08/12	06:47 20:24	07:18 07:44-08:11/27 19:32	07:49 17:41-18:16/35 18:43 08:10-08:39/29	07:26 17:09	07:53 16:03-16:31/28 17:06
22	06:18 06:42-07:14/32 20:59 19:54-20:10/16	06:48 20:23	07:19 07:43-08:11/28 19:30	07:50 17:39-18:16/37 18:42 08:11-08:39/28	07:27 17:08	07:54 16:04-16:32/28 17:07
23	06:18 06:42-07:14/32 20:58 19:53-20:11/18	06:49 19:21-19:32/11 20:21	07:20 07:42-08:11/29 19:29	07:52 17:38-18:15/37 18:40 08:12-08:38/26	07:28 17:08	07:54 16:04-16:32/28 17:07
24	06:19 06:41-07:13/32 20:58 19:51-20:12/21	06:50 19:17-19:33/16 20:20	07:21 07:42-08:11/29 19:27	07:53 17:37-18:14/37 18:39 08:13-08:38/25	07:29 17:07	07:55 16:05-16:33/28 17:08
25	06:20 06:42-07:14/32 20:57 19:50-20:13/23	06:51 19:14-19:35/21 20:18	07:22 07:41-08:10/29 19:25	07:54 17:37-18:15/38 18:38 08:15-08:39/24	07:30 17:07	07:55 16:05-16:33/28 17:08
26	06:21 06:43-07:14/31 20:56 19:50-20:14/24	06:52 19:13-19:36/23 20:17	07:23 07:42-08:10/28 19:23	07:55 17:36-18:13/37 18:36 08:16-08:38/22	07:32 17:06	07:56 16:06-16:33/27 17:09
27	06:22 06:44-07:13/29 20:55 19:49-20:15/26	06:53 19:11-19:37/26 20:15	07:24 07:43-08:09/26 19:22	07:56 17:35-18:12/37 18:35 08:17-08:37/20	07:33 17:06	07:56 16:07-16:35/28 17:10
28	06:23 06:45-07:13/28 20:54 19:48-20:15/27	06:54 19:10-19:38/28 20:14	07:25 07:44-08:08/24 19:20	07:57 17:34-18:10/36 18:34 08:18-08:36/18	07:34 17:05	07:56 16:07-16:35/28 17:10
29	06:24 06:46-07:13/27 20:53 19:48-20:16/28	06:55 19:09-19:38/29 20:12	07:26 07:45-08:07/22 19:18	07:58 17:33-18:08/35 18:32 08:20-08:36/16	07:35 16:06-16:13/7 17:05	07:56 16:08-16:35/27 17:11
30	06:25 06:47-07:13/26 20:52 19:47-20:17/30	06:56 19:08-19:39/31 20:10	07:27 07:47-08:07/20 19:17	08:00 17:34-18:08/34 18:31 08:21-08:35/14	07:36 16:04-16:15/11 17:05	07:57 16:08-16:35/27 17:12
31	06:26 06:48-07:12/24 20:51 19:47-20:17/30	06:57 19:08-19:39/31 20:09		08:01 17:33-18:06/33 18:30 08:22-08:33/11		07:57 16:09-16:35/26 17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1106	810	685	1285	280	784

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T65 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (484)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-09:15/55 17:13	07:43 16:28-17:11/43 17:48 08:31-08:54/23	07:07 16:28-17:51/83 18:22	07:16 19:56	06:31 07:15-07:57/42 20:27	06:02 20:57
2	07:57 08:20-09:15/55 17:14	07:42 16:27-17:13/46 17:49 08:33-08:52/19	07:06 16:29-17:52/83 18:23 07:34-07:47/13	07:15 19:57	06:29 07:16-07:56/40 20:28	06:01 20:57
3	07:57 08:20-09:15/55 17:15	07:41 16:26-17:14/48 17:50 08:35-08:50/15	07:04 16:30-17:52/82 18:24 07:31-07:51/20	07:13 19:58	06:28 07:17-07:55/38 20:29	06:01 20:58
4	07:57 08:20-09:15/55 17:16 16:37-16:42/5	07:40 16:25-17:14/49 17:52 08:39-08:47/8	07:03 16:32-17:54/82 18:25 07:27-07:53/26	07:11 19:59	06:27 07:18-07:55/37 20:30	06:01 20:59
5	07:57 08:20-09:15/55 17:17 16:34-16:44/10	07:39 16:24-17:15/51 17:53	07:01 16:33-17:54/81 18:27 07:25-07:55/30	07:10 20:00	06:25 07:18-07:53/35 20:31	06:00 21:00
6	07:57 08:19-09:14/55 17:18 16:33-16:46/13	07:38 16:24-17:16/52 17:54	06:59 16:36-17:04/28 07:23-07:57/34 18:28 17:05-17:55/50	07:08 20:00	06:24 07:19-07:52/33 20:32	06:00 21:00
7	07:57 08:19-09:13/54 17:19 16:32-16:48/16	07:37 16:23-17:17/54 17:55	06:58 16:39-17:00/21 07:21-07:58/37 18:29 17:04-17:55/51	07:06 07:34-07:50/16 20:01	06:23 07:20-07:50/30 20:33	06:00 21:01
8	07:57 08:19-09:13/54 17:20 16:32-16:50/18	07:36 16:23-17:18/55 17:57	07:56 17:44-17:54/10 08:19-08:58/39 19:30 18:03-18:55/52	07:05 07:31-07:54/23 20:02	06:22 07:22-07:49/27 20:34	05:59 21:02
9	07:57 08:19-09:13/54 17:21 16:31-16:52/21	07:35 16:23-17:19/56 17:58	07:55 18:03-18:56/53 19:31 08:19-09:00/41	07:03 07:28-07:55/27 20:03	06:21 07:23-07:47/24 20:35	05:59 21:02
10	07:57 08:19-09:13/54 17:22 16:30-16:53/23	07:34 16:21-17:18/57 17:59	07:53 18:02-18:56/54 19:32 08:17-09:00/43	07:02 07:26-07:57/31 20:05	06:20 07:25-07:45/20 20:36	05:59 21:03
11	07:56 08:19-09:12/53 17:23 16:29-16:54/25	07:32 16:21-17:19/58 18:00	07:51 18:01-18:55/54 19:33 08:17-09:01/44	07:00 07:24-07:58/34 20:06	06:19 07:28-07:42/14 20:37	05:59 21:03
12	07:56 08:19-09:12/53 17:24 16:29-16:56/27	07:31 16:21-17:20/59 18:02	07:50 18:01-18:56/55 19:34 08:16-09:01/45	06:58 07:22-07:59/37 20:07	06:17 07:34-07:37/3 20:38	05:59 21:04
13	07:56 08:19-09:11/52 17:25 16:28-16:57/29	07:30 16:22-17:20/58 18:03	07:48 18:01-18:55/54 19:36 08:15-09:01/46	06:57 07:21-08:00/39 20:08	06:16 20:39	05:59 21:04
14	07:56 08:19-09:11/52 17:26 16:28-16:58/30	07:29 16:21-17:20/59 18:04	07:46 18:00-18:55/55 19:37 08:15-09:01/46	06:55 07:19-08:01/42 20:09	06:15 20:40	05:59 21:05
15	07:55 08:20-09:11/51 17:27 16:28-17:00/32	07:27 16:21-17:20/59 18:05	07:45 18:01-18:55/54 19:38 08:14-09:01/47	06:54 07:19-08:02/43 20:10	06:14 20:41	05:59 21:05
16	07:55 08:20-09:09/49 17:28 16:28-17:00/32	07:26 16:21-17:21/60 18:06	07:43 18:01-18:54/53 19:39 08:13-09:00/47	06:52 07:17-08:01/44 20:11	06:13 20:42	05:59 21:06
17	07:54 08:21-09:09/48 17:30 16:28-17:02/34	07:25 16:21-17:20/59 18:08	07:41 18:00-18:53/53 19:40 08:14-09:01/47	06:51 07:17-08:02/45 20:12	06:12 20:43	05:59 21:06
18	07:54 08:20-09:07/47 17:31 16:27-17:02/35	07:23 16:21-17:20/59 18:09	07:40 18:01-18:53/52 19:41 08:13-09:00/47	06:49 07:16-08:02/46 20:13	06:12 20:44	05:59 21:06
19	07:53 08:20-09:04/44 17:32 16:26-17:03/37	07:22 16:22-17:21/59 18:10	07:38 18:01-18:52/51 19:42 08:13-08:59/46	06:48 07:16-08:02/46 20:14	06:11 20:45	05:59 21:07
20	07:53 08:21-08:58/37 17:33 16:27-17:04/37	07:20 16:21-17:20/59 18:11	07:36 18:01-18:51/50 19:43 08:12-08:58/46	06:46 07:15-08:02/47 20:15	06:10 20:46	05:59 21:07
21	07:52 08:21-08:57/36 17:34 16:26-17:05/39	07:19 16:22-17:20/58 18:13	07:35 18:03-18:50/47 19:44 08:13-08:58/45	06:45 07:15-08:02/47 20:16	06:09 20:47	05:59 21:07
22	07:51 08:22-08:57/35 17:36 16:26-17:05/39	07:18 16:22-17:19/57 18:14	07:33 18:03-18:49/46 19:45 08:13-08:57/44	06:43 07:14-08:01/47 20:17	06:08 20:48	05:59 21:08
23	07:51 08:23-08:58/35 17:37 16:27-17:07/40	07:16 16:23-17:19/56 18:15	07:31 18:03-18:47/44 19:46 08:13-08:55/42	06:42 07:14-08:02/48 20:18	06:07 20:49	06:00 21:08
24	07:50 16:26-17:07/41 17:38 08:23-08:58/35	07:15 16:23-17:18/55 18:16 17:24-17:38/14	07:30 18:05-18:47/42 19:47 08:14-08:55/41	06:40 07:14-08:02/48 20:19	06:07 20:50	06:00 21:08
25	07:49 16:26-17:07/41 17:39 08:23-08:57/34	07:13 16:24-17:18/54 18:17 17:20-17:43/23	07:28 18:06-18:45/39 19:49 08:15-08:53/38	06:39 07:14-08:01/47 20:21	06:06 20:51	06:00 21:08
26	07:49 16:26-17:08/42 17:40 08:24-08:57/33	07:12 16:24-17:16/52 18:18 17:17-17:45/28	07:26 18:07-18:42/35 19:50 08:15-08:51/36	06:37 07:14-08:01/47 20:22	06:05 20:52	06:01 21:08
27	07:48 16:26-17:08/42 17:42 08:25-08:57/32	07:10 16:26-17:48/82 18:20	07:25 18:09-18:41/32 19:51 08:17-08:50/33	06:36 07:14-07:59/45 20:23	06:05 20:53	06:01 21:08
28	07:47 16:26-17:08/42 17:43 08:26-08:57/31	07:09 16:26-17:49/83 18:21	07:23 18:11-18:38/27 19:52 08:18-08:48/30	06:35 07:14-07:59/45 20:24	06:04 20:53	06:01 21:08
29	07:46 16:27-17:09/42 17:44 08:27-08:56/29		07:21 18:14-18:34/20 19:53 08:19-08:45/26	06:33 07:15-07:59/44 20:25	06:03 20:54	06:02 21:08
30	07:45 16:27-17:09/42 17:45 08:28-08:56/28		07:20 18:19-18:30/11 19:54 08:22-08:43/21	06:32 07:15-07:58/43 20:26	06:03 20:55	06:02 21:08
31	07:44 16:27-17:10/43 17:47 08:29-08:55/26		07:18 08:25-08:39/14 19:55		06:02 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	2263	1727	2718	981	343	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T65 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (484)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 07:41-07:50/9 20:50	06:58 07:23-07:57/34 20:07	07:28 17:40-18:34/54 19:15 07:54-08:40/46	07:02 15:51-16:48/57 17:28	07:37 08:01-08:54/53 17:04 16:11-16:37/26
2	06:03 21:08	06:28 07:38-07:54/16 20:49	06:59 07:24-07:55/31 20:06	07:29 17:40-18:34/54 19:13 07:54-08:39/45	07:03 15:52-16:47/55 17:27	07:38 08:01-08:55/54 17:04 16:13-16:36/23
3	06:04 21:08	06:29 07:34-07:55/21 20:48	07:00 07:26-07:53/27 20:04	07:30 17:39-18:33/54 19:12 07:56-08:39/43	07:04 15:53-16:48/55 17:26	07:39 08:02-08:56/54 17:04 16:14-16:35/21
4	06:04 21:08	06:30 07:32-07:57/25 20:47	07:01 07:28-07:51/23 20:02	07:31 17:40-18:34/54 19:10 07:56-08:38/42	07:06 15:53-16:47/54 17:25	07:40 08:03-08:57/54 17:03 16:16-16:34/18
5	06:05 21:08	06:31 07:31-07:59/28 20:46	07:02 07:31-07:47/16 20:01	07:32 17:40-18:33/53 19:08 07:57-08:36/39	07:07 15:54-16:46/52 17:24	07:41 08:04-08:58/54 17:03 16:17-16:34/17
6	06:05 21:07	06:32 07:29-08:00/31 20:44	07:03 19:57	07:33 17:18-17:35/17 07:57-08:35/38 19:07 17:40-18:32/52	07:08 15:55-16:46/51 17:22	07:42 08:05-09:00/55 17:03 16:19-16:33/14
7	06:06 21:07	06:33 07:28-08:02/34 20:43	07:04 19:56	07:34 17:14-17:38/24 07:58-08:33/35 19:05 17:40-18:31/51	07:09 15:56-16:45/49 17:21 08:08-08:17/9	07:43 08:06-09:01/55 17:03 16:21-16:31/10
8	06:07 21:07	06:34 07:27-08:03/36 20:42	07:05 19:54	07:35 17:10-17:40/30 07:59-08:31/32 19:03 17:41-18:30/49	07:10 15:56-16:44/48 17:20 08:05-08:20/15	07:44 08:07-09:02/55 17:03 16:24-16:29/5
9	06:07 21:07	06:35 07:26-08:04/38 20:41	07:05 19:52	07:36 17:08-18:29/81 19:02 08:01-08:29/28	07:11 15:57-16:42/45 17:19 08:02-08:22/20	07:45 08:08-09:03/55 17:03
10	06:08 21:06	06:36 07:25-08:04/39 20:39	07:06 19:51	07:37 17:05-18:27/82 19:00 08:03-08:27/24	07:13 15:59-16:42/43 17:18 08:02-08:25/23	07:45 08:09-09:04/55 17:03
11	06:09 21:06	06:37 07:24-08:05/41 20:38	07:07 19:49	07:38 17:03-18:26/83 18:59 08:06-08:23/17	07:14 15:58-16:41/43 17:17 08:00-08:26/26	07:46 08:10-09:05/55 17:03
12	06:09 21:05	06:38 07:24-08:06/42 20:37	07:08 08:18-08:30/12 19:47	07:39 17:01-18:24/83 18:57 08:11-08:17/6	07:15 15:58-16:40/42 17:16 07:59-08:27/28	07:47 08:11-09:06/55 17:03
13	06:10 21:05	06:39 07:23-08:06/43 20:36	07:09 18:11-18:20/9 19:46 08:14-08:34/20	07:40 17:00-18:23/83 18:55	07:16 15:59-16:41/42 17:15 07:59-08:28/29	07:48 08:11-09:06/55 17:03
14	06:11 21:04	06:40 07:22-08:07/45 20:34	07:10 18:04-18:24/20 19:44 08:11-08:36/25	07:41 16:58-18:21/83 18:54	07:17 15:59-16:41/42 17:14 07:58-08:29/31	07:49 08:12-09:07/55 17:04
15	06:12 21:04	06:41 07:22-08:07/45 20:33	07:11 18:01-18:27/26 19:42 08:07-08:37/30	07:42 16:58-18:19/81 18:52	07:19 15:59-16:41/42 17:13 07:57-08:30/33	07:49 08:13-09:07/54 17:04
16	06:12 21:03	06:42 07:21-08:07/46 20:31	07:12 17:58-18:29/31 19:40 08:05-08:38/33	07:44 16:56-17:49/53 18:51 17:50-18:16/26	07:20 15:59-16:41/42 17:13 07:57-08:30/33	07:50 08:14-09:08/54 17:04
17	06:13 21:03	06:43 07:21-08:07/46 20:30	07:13 17:56-18:30/34 19:39 08:04-08:39/35	07:45 16:55-17:49/54 18:49 17:53-18:13/20	07:21 16:00-16:41/41 17:12 07:57-08:31/34	07:51 08:14-09:08/54 17:04
18	06:14 21:02	06:44 07:20-08:08/48 20:29	07:14 17:54-18:32/38 19:37 08:02-08:40/38	07:46 16:54-17:49/55 18:48 17:58-18:07/9	07:22 16:00-16:41/41 17:11 07:57-08:32/35	07:51 08:15-09:09/54 17:05
19	06:15 21:01	06:45 07:20-08:08/48 20:27	07:15 17:52-18:33/41 19:35 08:01-08:41/40	07:47 16:53-17:50/57 18:46	07:23 07:57-08:32/35 17:10 16:01-16:41/40	07:52 08:15-09:09/54 17:05
20	06:16 21:01	06:46 07:20-08:07/47 20:26	07:16 17:50-18:33/43 19:34 08:00-08:42/42	07:48 16:52-17:50/58 18:45	07:25 07:57-08:32/35 17:10 16:01-16:40/39	07:53 08:16-09:10/54 17:06
21	06:17 21:00	06:47 07:20-08:07/47 20:24	07:17 17:49-18:34/45 19:32 07:59-08:42/43	07:49 16:53-17:51/58 18:43	07:26 07:57-08:33/36 17:09 16:02-16:41/39	07:53 08:16-09:10/54 17:06
22	06:17 20:59	06:48 07:20-08:07/47 20:23	07:18 17:47-18:35/48 19:30 07:58-08:42/44	07:50 16:52-17:50/58 18:42	07:27 07:57-08:34/37 17:08 16:03-16:40/37	07:54 08:17-09:11/54 17:06
23	06:18 20:58	06:49 07:20-08:07/47 20:21	07:19 17:46-18:35/49 19:28 07:57-08:42/45	07:51 16:51-17:50/59 18:40	07:28 07:57-08:40/43 17:08 16:03-16:40/37	07:54 08:17-09:11/54 17:07
24	06:19 20:58	06:50 07:19-08:05/46 20:20	07:20 17:45-18:35/50 19:27 07:56-08:42/46	07:53 16:51-17:50/59 18:39	07:29 07:58-08:44/46 17:07 16:04-16:39/35	07:55 08:18-09:12/54 17:08
25	06:20 20:57	06:51 07:19-08:05/46 20:18	07:21 17:44-18:35/51 19:25 07:56-08:42/46	07:54 16:50-17:50/60 18:38	07:30 07:58-08:46/48 17:07 16:05-16:39/34	07:55 08:18-09:12/54 17:08
26	06:21 20:56	06:52 07:19-08:04/45 20:17	07:22 17:43-18:35/52 19:23 07:55-08:42/47	07:55 16:51-17:50/59 18:36	07:31 07:59-08:48/49 17:06 16:07-16:39/32	07:55 08:18-09:12/54 17:09
27	06:22 20:55	06:53 07:19-08:03/44 20:15	07:24 17:42-18:35/53 19:22 07:55-08:42/47	07:56 16:51-17:50/59 18:35	07:33 07:59-08:50/51 17:06 16:07-16:39/32	07:56 08:19-09:13/54 17:09
28	06:23 20:54	06:54 07:20-08:02/42 20:14	07:25 17:41-18:35/54 19:20 07:54-08:42/48	07:57 16:50-17:50/60 18:33	07:34 08:00-08:51/51 17:05 16:08-16:38/30	07:56 08:19-09:13/54 17:10
29	06:24 20:53	06:55 07:20-08:01/41 20:12	07:26 17:41-18:35/54 19:18 07:54-08:41/47	07:58 16:50-17:49/59 18:32	07:35 08:00-08:52/52 17:05 16:09-16:38/29	07:56 08:19-09:13/54 17:11
30	06:25 20:52	06:56 07:21-08:00/39 20:10	07:27 17:40-18:35/55 19:17 07:54-08:40/46	08:00 16:51-17:49/58 18:31	07:36 08:00-08:53/53 17:04 16:10-16:37/27	07:57 08:19-09:14/55 17:12
31	06:26 20:51	06:57 07:22-07:59/37 20:09		08:01 16:51-17:49/58 18:30		07:57 08:19-09:14/55 17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	0	1209	1618	2442	2107	1818

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T66 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (485)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	08:48-10:02/74	07:43	09:00-10:07/67	07:07	17:03-17:36/33	07:16	19:07-19:30/23	06:30	19:31-19:40/9	06:02	19:46-20:32/46
	17:13	15:55-16:41/46	17:48		18:22		19:56		20:27		20:56	
2	07:57	08:48-10:02/74	07:42	09:01-10:07/66	07:05	17:05-17:35/30	07:15	19:04-19:32/28	06:29		06:01	19:46-20:33/47
	17:14	15:56-16:42/46	17:49		18:23		19:57		20:28		20:57	
3	07:57	08:49-10:03/74	07:41	09:01-10:05/64	07:04	17:05-17:33/28	07:13	19:03-19:34/31	06:28		06:01	19:47-20:33/46
	17:15	15:57-16:42/45	17:50		18:24		19:58		20:29		20:58	
4	07:57	08:49-10:03/74	07:40	09:01-10:04/63	07:02	17:08-17:32/24	07:11	19:01-19:34/33	06:27		06:00	19:46-20:33/47
	17:16	15:59-16:43/44	17:51		18:25		19:59		20:30		20:59	
5	07:57	08:49-10:04/75	07:39	09:02-10:04/62	07:01	17:09-17:29/20	07:10	18:59-19:35/36	06:25		06:00	19:47-20:34/47
	17:17	16:01-16:43/42	17:53		18:26		20:00		20:31		20:59	
6	07:57	08:50-10:04/74	07:38	09:03-10:03/60	06:59	17:12-17:25/13	07:08	18:59-19:36/37	06:24		06:00	19:47-20:35/48
	17:18	16:07-16:44/37	17:54		18:28		20:00		20:32		21:00	
7	07:57	08:50-10:05/75	07:37	09:05-10:02/57	06:58		07:06	18:57-19:36/39	06:23		06:00	19:47-20:35/48
	17:19	16:07-16:45/38	17:55	17:16-17:25/9	18:29		20:01		20:33		21:01	
8	07:57	08:51-10:05/74	07:36	09:06-10:01/55	07:56		07:05	18:57-19:37/40	06:22		05:59	19:47-20:35/48
	17:20	16:08-16:45/37	17:56	17:12-17:29/17	19:30		20:02		20:34		21:01	
9	07:57	08:51-10:06/75	07:35	09:07-10:00/53	07:54		07:03	18:56-19:37/41	06:21	20:02-20:07/5	05:59	19:48-20:36/48
	17:21	16:08-16:46/38	17:58	17:10-17:32/22	19:31		20:03		20:35		21:02	
10	07:57	08:51-10:05/74	07:33	09:08-09:58/50	07:53		07:01	18:55-19:37/42	06:19	19:58-20:11/13	05:59	19:48-20:36/48
	17:22	16:08-16:46/38	17:59	17:08-17:33/25	19:32		20:04		20:36		21:03	
11	07:56	08:51-10:06/75	07:32	09:09-09:57/48	07:51		07:00	18:55-19:44/49	06:18	19:55-20:14/19	05:59	19:49-20:37/48
	17:23	16:09-16:46/37	18:00	17:06-17:35/29	19:33		20:05		20:37		21:03	
12	07:56	08:52-10:06/74	07:31	09:11-09:55/44	07:50		06:58	18:54-19:45/51	06:17	19:54-20:15/21	05:59	19:49-20:38/49
	17:24	16:10-16:47/37	18:01	17:06-17:37/31	19:34		20:07		20:38		21:04	
13	07:56	08:52-10:06/74	07:30	09:13-09:53/40	07:48		06:57	18:54-19:47/53	06:16	19:52-20:17/25	05:59	19:49-20:38/49
	17:25	16:09-16:47/38	18:03	17:04-17:37/33	19:35		20:08		20:39		21:04	
14	07:55	08:52-10:06/74	07:28	09:15-09:50/35	07:46		06:55	18:54-19:47/53	06:15	19:51-20:17/26	05:58	19:50-20:39/49
	17:26	16:10-16:47/37	18:04	17:03-17:38/35	19:36		20:09		20:40		21:05	
15	07:55	08:52-10:06/74	07:27	09:17-09:48/31	07:45		06:54	18:54-19:49/55	06:14	19:50-20:18/28	05:58	19:50-20:39/49
	17:27	16:10-16:47/37	18:05	17:03-17:39/36	19:38		20:10		20:41		21:05	
16	07:55	08:53-10:07/74	07:26	09:21-09:44/23	07:43		06:52	18:54-19:50/56	06:13	19:49-20:19/30	05:58	19:50-20:40/50
	17:28	16:11-16:48/37	18:06	17:01-17:39/38	19:39		20:11		20:42		21:06	
17	07:54	08:53-10:07/74	07:24	09:25-09:38/13	07:41		06:50	18:53-19:50/57	06:12	19:48-20:20/32	05:59	19:50-20:40/50
	17:29	16:11-16:47/36	18:08	17:01-17:40/39	19:40		20:12		20:43		21:06	
18	07:54	08:54-10:07/73	07:23	17:01-17:41/40	07:40		06:49	18:54-19:52/58	06:11	19:47-20:21/34	05:59	19:51-20:41/50
	17:31	16:13-16:48/35	18:09		19:41		20:13		20:44		21:06	
19	07:53	08:54-10:07/73	07:22	17:00-17:41/41	07:38		06:47	18:55-19:51/56	06:11	19:47-20:21/34	05:59	19:51-20:41/50
	17:32	16:13-16:48/35	18:10		19:42		20:14		20:45		21:07	
20	07:53	08:55-10:08/73	07:20	17:01-17:41/40	07:36		06:46	18:55-19:52/57	06:10	19:46-20:21/35	05:59	19:51-20:41/50
	17:33	16:14-16:48/34	18:11		19:43		20:15		20:46		21:07	
21	07:52	08:55-10:08/73	07:19	17:00-17:41/41	07:35		06:44	18:56-19:52/56	06:09	19:46-20:23/37	05:59	19:51-20:41/50
	17:34	16:15-16:48/33	18:12		19:44		20:16		20:47		21:07	
22	07:51	08:55-10:08/73	07:17	17:00-17:41/41	07:33		06:43	18:56-19:51/55	06:08	19:46-20:23/37	05:59	19:52-20:42/50
	17:35	16:15-16:47/32	18:14		19:45		20:17		20:48		21:07	
23	07:51	08:55-10:08/73	07:16	17:01-17:41/40	07:31		06:41	18:58-19:51/53	06:07	19:45-20:23/38	05:59	19:52-20:42/50
	17:37	16:16-16:46/30	18:15		19:46		20:18		20:49		21:08	
24	07:50	08:56-10:09/73	07:15	17:00-17:40/40	07:30		06:40	18:58-19:50/52	06:07	19:46-20:24/38	06:00	19:52-20:42/50
	17:38	16:18-16:47/29	18:16		19:47		20:19		20:50		21:08	
25	07:49	08:56-10:08/72	07:13	17:01-17:40/39	07:28		06:39	19:00-19:49/49	06:06	19:46-20:25/39	06:00	19:51-20:41/50
	17:39	16:19-16:46/27	18:17		19:48		20:20		20:51		21:08	
26	07:48	08:56-10:08/72	07:12	17:01-17:39/38	07:26		06:37	19:02-19:49/47	06:05	19:45-20:26/41	06:00	19:52-20:42/50
	17:40	16:20-16:45/25	18:18		19:49		20:21		20:52		21:08	
27	07:48	08:57-10:08/71	07:10	17:02-17:39/37	07:25		06:36	19:24-19:47/23	06:04	19:46-20:28/42	06:01	19:52-20:42/50
	17:41	16:22-16:44/22	18:19		19:51		20:22	19:03-19:21/18	20:52		21:08	
28	07:47	08:57-10:08/71	07:09	17:02-17:38/36	07:23		06:34	19:25-19:46/21	06:04	19:45-20:29/44	06:01	19:53-20:42/49
	17:43	16:23-16:42/19	18:21		19:52		20:24	19:07-19:18/11	20:53		21:08	
29	07:46	08:57-10:07/70			07:21		06:33	19:27-19:45/18	06:03	19:46-20:30/44	06:02	19:53-20:42/49
	17:44	16:26-16:40/14			19:53		20:25		20:54		21:08	
30	07:45	08:59-10:08/69			07:19	19:16-19:22/6	06:32	19:28-19:43/15	06:03	19:46-20:30/44	06:02	19:52-20:41/49
	17:45	16:30-16:37/7			19:54		20:26		20:55		21:08	
31	07:44	09:00-10:08/68			07:18	19:11-19:28/17			06:02	19:46-20:31/45		
	17:46				19:55				20:56			
Potential sun hours	297		297		370		399		448		452	
Sum of minutes with flicker		3278		1578		171		1313		760		1464

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T66 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (485)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:53-20:41/48 21:08	06:27 20:04-20:24/20 20:50	06:57 18:54-19:43/49 20:07	07:27 19:15	07:02 08:37-09:28/51 17:28 16:38-17:03/25	07:37 08:33-09:48/75 17:04 15:51-16:28/37
2	06:03 19:53-20:40/47 21:08	06:27 20:06-20:22/16 20:49	06:58 18:54-19:36/42 20:05	07:28 19:13	07:03 08:36-09:29/53 17:27 16:39-17:01/22	07:38 08:34-09:48/74 17:04 15:51-16:29/38
3	06:03 19:53-20:41/48 21:08	06:28 20:09-20:20/11 20:48	06:59 18:54-19:35/41 20:04	07:30 19:11	07:04 08:35-09:31/56 17:26 16:43-16:59/16	07:39 08:34-09:49/75 17:03 15:51-16:29/38
4	06:04 19:53-20:40/47 21:08	06:29 20:46	07:00 18:54-19:34/40 20:02	07:31 19:10	07:05 08:34-09:32/58 17:25 16:47-16:54/7	07:40 08:35-09:49/74 17:03 15:52-16:29/37
5	06:05 19:53-20:41/48 21:07	06:30 20:45	07:01 18:54-19:33/39 20:00	07:32 19:08	07:07 08:33-09:33/60 17:23	07:41 08:35-09:50/75 17:03 15:52-16:30/38
6	06:05 19:54-20:41/47 21:07	06:31 20:44	07:02 18:55-19:32/37 19:57	07:33 19:06	07:08 08:32-09:34/62 17:22	07:42 08:36-09:50/74 17:03 15:53-16:30/37
7	06:06 19:53-20:40/47 21:07	06:32 20:43	07:03 18:55-19:31/36 19:55	07:34 17:52-17:58/6 19:05	07:09 08:32-09:35/63 17:21	07:43 08:36-09:51/75 17:03 15:49-16:30/41
8	06:06 19:54-20:41/47 21:07	06:33 20:42	07:04 18:56-19:30/34 19:54	07:35 17:47-18:03/16 19:03	07:10 08:31-09:36/65 17:20	07:43 08:37-09:51/74 17:03 15:47-16:31/44
9	06:07 19:53-20:40/47 21:06	06:34 20:41	07:05 18:56-19:27/31 19:52	07:36 17:44-18:05/21 19:02	07:11 08:31-09:37/66 17:19	07:44 08:38-09:52/74 17:03 15:46-16:31/45
10	06:08 19:54-20:40/46 21:06	06:35 20:39	07:06 18:57-19:25/28 19:50	07:37 17:41-18:07/26 19:00	07:13 08:31-09:38/67 17:18	07:45 08:38-09:52/74 17:03 15:46-16:32/46
11	06:08 19:54-20:40/46 21:06	06:36 20:38	07:07 18:59-19:23/24 19:49	07:38 17:39-18:08/29 18:58	07:14 08:30-09:38/68 17:17	07:46 08:39-09:53/74 17:03 15:46-16:32/46
12	06:09 19:54-20:40/46 21:05	06:37 19:38-19:50/12 20:37	07:08 19:02-19:19/17 19:47	07:39 17:37-18:09/32 18:57	07:15 08:30-09:39/69 17:16 16:01-16:09/8	07:47 08:39-09:53/74 17:03 15:45-16:32/47
13	06:10 19:54-20:39/45 21:05	06:38 19:36-19:52/16 20:35	07:09 19:06-19:14/8 19:45	07:40 17:36-18:10/34 18:55	07:16 08:29-09:39/70 17:15 15:58-16:12/14	07:48 08:40-09:53/73 17:03 15:45-16:32/47
14	06:11 19:54-20:39/45 21:04	06:39 19:34-19:53/19 20:34	07:10 19:44	07:41 17:35-18:10/35 18:54	07:17 08:30-09:41/71 17:14 15:56-16:15/19	07:48 08:40-09:54/74 17:03 15:45-16:33/48
15	06:11 19:55-20:38/43 21:04	06:40 19:33-19:54/21 20:33 19:14-19:27/13	07:11 19:42	07:42 17:33-18:11/38 18:52	07:18 08:30-09:41/71 17:13 15:54-16:17/23	07:49 08:41-09:55/74 17:04 15:45-16:34/49
16	06:12 19:55-20:38/43 21:03	06:41 19:32-19:55/23 20:31 19:11-19:30/19	07:12 19:40	07:43 17:33-18:12/39 18:51	07:20 08:29-09:41/72 17:12 15:53-16:18/25	07:50 08:41-09:55/74 17:04 15:45-16:33/48
17	06:13 19:54-20:36/42 21:02	06:42 19:08-19:56/48 20:30	07:13 19:39	07:45 17:33-18:12/39 18:49	07:21 08:29-09:41/72 17:12 15:52-16:19/27	07:51 08:42-09:56/74 17:04 15:45-16:34/49
18	06:14 19:55-20:35/40 21:02	06:43 19:06-19:55/49 20:28	07:14 19:37	07:46 17:32-18:12/40 18:47	07:22 08:30-09:42/72 17:11 15:52-16:21/29	07:51 08:43-09:56/73 17:05 15:46-16:35/49
19	06:15 19:55-20:34/39 21:01	06:44 19:04-19:56/52 20:27	07:15 19:35	07:47 17:31-18:12/41 18:46	07:23 08:30-09:43/73 17:10 15:51-16:21/30	07:52 08:43-09:56/73 17:05 15:46-16:35/49
20	06:16 19:56-20:33/37 21:00	06:45 19:02-19:56/54 20:26	07:16 19:33	07:48 17:31-18:12/41 18:44	07:24 08:30-09:43/73 17:09 15:50-16:22/32	07:52 08:44-09:57/73 17:05 15:47-16:36/49
21	06:16 19:56-20:33/37 21:00	06:46 19:01-19:56/55 20:24	07:17 19:32	07:49 17:30-18:11/41 18:43	07:26 08:30-09:43/73 17:09 15:50-16:23/33	07:53 08:44-09:57/73 17:06 15:46-16:36/50
22	06:17 19:56-20:32/36 20:59	06:47 19:00-19:56/56 20:23	07:18 19:30	07:50 17:31-18:12/41 18:42	07:27 08:31-09:44/73 17:08 15:50-16:24/34	07:54 08:45-09:58/73 17:06 15:47-16:37/50
23	06:18 19:56-20:32/36 20:58	06:48 18:59-19:56/57 20:21	07:19 19:28	07:51 17:31-18:11/40 18:40	07:28 08:31-09:44/73 17:08 15:50-16:25/35	07:54 08:45-09:58/73 17:07 15:48-16:37/49
24	06:19 19:57-20:32/35 20:57	06:49 18:58-19:55/57 20:20	07:20 19:27	07:52 17:31-18:11/40 18:39	07:29 08:31-09:44/73 17:07 15:50-16:25/35	07:54 08:46-09:59/73 17:07 15:49-16:38/49
25	06:20 19:57-20:31/34 20:57	06:50 18:57-19:54/57 20:18	07:21 19:25	07:54 09:53-10:10/17 18:37 17:31-18:10/39	07:30 08:31-09:45/74 17:06 15:49-16:25/36	07:55 08:46-09:59/73 17:08 15:49-16:38/49
26	06:21 19:58-20:31/33 20:56	06:51 18:56-19:53/57 20:16	07:22 19:23	07:55 09:50-10:15/25 18:36 17:32-18:10/38	07:31 08:31-09:45/74 17:06 15:49-16:26/37	07:55 08:46-09:59/73 17:09 15:49-16:38/49
27	06:22 19:59-20:30/31 20:55	06:52 18:56-19:51/55 20:15	07:23 19:21	07:56 09:46-10:18/32 18:35 17:33-18:09/36	07:32 08:32-09:46/74 17:05 15:50-16:27/37	07:56 08:47-10:01/74 17:09 15:50-16:38/48
28	06:23 20:00-20:29/29 20:54	06:53 18:55-19:50/55 20:13	07:24 19:20	07:57 09:44-10:20/36 18:33 17:33-18:08/35	07:33 08:32-09:46/74 17:05 15:50-16:27/37	07:56 08:47-10:01/74 17:10 15:51-16:40/49
29	06:24 20:01-20:29/28 20:53	06:54 18:55-19:48/53 20:12	07:25 19:18	07:58 09:41-10:22/41 18:32 17:34-18:07/33	07:35 08:33-09:47/74 17:05 15:50-16:28/38	07:56 08:47-10:01/74 17:11 15:52-16:40/48
30	06:25 20:02-20:28/26 20:52	06:55 18:54-19:47/53 20:10	07:26 19:16	07:59 09:40-10:25/45 18:31 17:35-18:05/30	07:36 08:33-09:47/74 17:04 15:51-16:28/37	07:56 08:47-10:01/74 17:11 15:52-16:40/48
31	06:26 20:02-20:26/24 20:51	06:56 18:54-19:45/51 20:09		08:01 09:39-10:27/48 18:29 17:37-18:05/28		07:57 08:48-10:02/74 17:12 15:53-16:41/48
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1247	979	426	1082	2684	3707

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T67 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (504)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:19-08:35/16 17:13	07:43 17:48	07:07 07:27-07:50/23 18:22	07:16 07:35-08:13/38 19:56	06:30 19:45-20:04/19 20:27 06:50-07:21/31	06:02 20:57
2	07:57 08:19-08:35/16 17:14	07:42 17:49	07:06 07:25-07:50/25 18:23	07:15 07:34-08:12/38 19:57	06:29 19:47-20:06/19 20:28 06:49-07:21/32	06:01 20:57
3	07:57 08:19-08:36/17 17:15	07:41 17:50	07:04 07:23-07:50/27 18:24	07:13 07:32-08:08/36 19:58	06:28 19:48-20:07/19 20:29 06:48-07:20/32	06:01 20:58
4	07:57 08:19-08:37/18 17:16	07:40 08:00-08:01/1 17:51	07:02 07:22-07:50/28 18:25	07:11 07:30-07:57/27 19:59 07:58-08:03/5	06:27 19:47-20:07/20 20:30 06:48-07:19/31	06:01 20:59
5	07:57 08:19-08:37/18 17:17	07:39 07:59-08:05/6 17:53	07:01 07:20-07:49/29 18:26	07:10 07:29-07:57/28 20:00	06:25 19:47-20:08/21 20:31 06:48-07:18/30	06:00 20:59
6	07:57 08:19-08:38/19 17:18	07:38 07:58-08:07/9 17:54	06:59 07:19-07:49/30 18:28	07:08 07:29-07:56/27 20:00 19:36-19:40/4	06:24 19:48-20:09/21 20:32 06:49-07:18/29	06:00 21:00
7	07:57 08:19-08:39/20 17:19	07:37 07:57-08:09/12 17:55	06:58 07:17-07:48/31 18:29	07:06 07:29-07:54/25 20:01 19:33-19:40/7	06:23 19:49-20:09/20 20:33 06:50-07:17/27	06:00 21:01
8	07:57 08:19-08:40/21 17:20	07:36 07:56-08:10/14 17:56	07:56 08:15-08:47/32 19:30	07:05 07:30-07:54/24 20:02 19:32-19:42/10	06:22 19:50-20:08/18 20:34 06:51-07:15/24	05:59 21:01
9	07:57 08:19-08:40/21 17:21	07:35 07:55-08:12/17 17:58	07:54 08:14-08:47/33 19:31	07:03 07:31-07:52/21 20:03 19:31-19:42/11	06:21 19:51-20:06/15 20:35 06:52-07:14/22	05:59 21:02
10	07:57 08:18-08:40/22 17:22	07:33 07:53-08:12/19 17:59	07:53 08:12-08:45/33 19:32	07:01 07:32-07:49/17 20:04 19:30-19:43/13	06:20 19:53-20:05/12 20:36 06:53-07:12/19	05:59 21:03
11	07:56 08:18-08:41/23 17:23	07:32 07:52-08:13/21 18:00	07:51 08:10-08:43/33 19:33	07:00 07:35-07:47/12 20:05 19:29-19:45/16	06:18 19:56-20:02/6 20:37 06:55-07:10/15	05:59 21:03
12	07:56 08:18-08:42/24 17:24	07:31 07:51-08:13/22 18:01 17:35-17:38/3	07:50 08:09-08:41/32 19:34	06:58 19:29-19:45/16 20:07 07:17-07:22/5	06:17 06:57-07:08/11 20:38	05:59 21:04
13	07:56 08:17-08:42/25 17:25	07:30 07:50-08:14/24 18:03 17:32-17:39/7	07:48 08:07-08:37/30 19:35 19:12-19:14/2	06:57 07:16-07:25/9 20:08 19:29-19:47/18	06:16 20:39	05:59 21:04
14	07:55 08:17-08:42/25 17:26	07:28 07:48-08:13/25 18:04 17:32-17:41/9	07:46 08:05-08:36/31 19:36 19:09-19:15/6	06:55 07:14-07:26/12 20:09 19:28-19:47/19	06:15 20:40	05:59 21:05
15	07:55 08:16-08:42/26 17:27	07:27 07:47-08:14/27 18:05 17:31-17:42/11	07:45 08:04-08:36/32 19:38 19:08-19:17/9	06:54 07:13-07:27/14 20:10 19:29-19:49/20	06:14 20:41	05:58 21:05
16	07:55 08:16-08:43/27 17:28	07:26 07:46-08:14/28 18:06 17:30-17:43/13	07:43 08:02-08:35/33 19:39 19:06-19:17/11	06:52 07:11-07:27/16 20:11 19:29-19:50/21	06:13 20:42	05:58 21:06
17	07:54 08:15-08:43/28 17:29	07:24 07:44-08:13/29 18:08 17:30-17:45/15	07:41 08:00-08:33/33 19:40 19:04-19:18/14	06:50 07:10-07:28/18 20:12 19:29-19:50/21	06:12 20:43	05:59 21:06
18	07:54 08:15-08:43/28 17:31	07:23 07:44-08:13/29 18:09 17:30-17:46/16	07:40 07:59-08:32/33 19:41 19:04-19:20/16	06:49 07:08-07:28/20 20:13 19:31-19:52/21	06:11 20:44	05:59 21:06
19	07:53 08:14-08:43/29 17:32	07:22 07:44-08:12/28 18:10 17:29-17:47/18	07:38 07:57-08:29/32 19:42 19:03-19:21/18	06:47 07:07-07:29/22 20:14 19:32-19:53/21	06:11 20:45	05:59 21:07
20	07:53 08:14-08:44/30 17:33	07:20 07:45-08:12/27 18:11 17:29-17:49/20	07:36 07:55-08:26/31 19:43 19:03-19:21/18	06:46 07:05-07:28/23 20:15 19:32-19:53/21	06:10 20:46	05:59 21:07
21	07:52 08:13-08:43/30 17:34	07:19 07:46-08:11/25 18:12 17:29-17:50/21	07:35 07:54-08:22/28 19:44 19:03-19:23/20	06:44 07:04-07:29/25 20:16 19:33-19:55/22	06:09 20:47	05:59 21:07
22	07:51 08:14-08:43/29 17:35	07:17 07:47-08:09/22 17:30-17:51/21 18:14 07:37-07:43/6	07:33 07:52-08:22/30 19:45 19:03-19:24/21	06:43 07:02-07:28/26 20:17 19:33-19:55/22	06:08 20:48	05:59 21:07
23	07:51 08:15-08:43/28 17:37	07:16 07:48-08:08/20 17:31-17:52/21 18:15 07:36-07:45/9	07:31 07:50-08:21/31 19:46 19:03-19:25/22	06:41 19:34-19:57/23 20:18 07:01-07:28/27	06:07 20:49	06:00 21:08
24	07:50 08:15-08:42/27 17:38	07:15 07:50-08:06/16 17:31-17:51/20 18:16 07:34-07:46/12	07:30 07:49-08:22/33 19:47 19:03-19:25/22	06:40 19:35-19:57/22 20:19 06:59-07:27/28	06:07 20:50	06:00 21:08
25	07:49 08:16-08:42/26 17:39	07:13 07:53-08:03/10 17:33-17:50/17 18:17 07:33-07:48/15	07:28 07:47-08:21/34 19:48 19:04-19:24/20	06:39 19:37-19:59/22 20:20 06:58-07:27/29	06:06 20:51	06:00 21:08
26	07:48 08:17-08:41/24 17:40	07:12 07:31-07:48/17 18:18 17:35-17:47/12	07:26 07:45-08:20/35 19:49 19:05-19:22/17	06:37 19:38-20:00/22 20:21 06:57-07:26/29	06:05 20:52	06:00 21:08
27	07:48 08:18-08:40/22 17:41	07:10 07:30-07:50/20 18:19 17:39-17:44/5	07:25 07:44-08:20/36 19:51 19:06-19:19/13	06:36 19:38-20:00/22 20:23 06:55-07:25/30	06:05 20:52	06:01 21:08
28	07:47 08:19-08:39/20 17:43	07:09 07:28-07:49/21 18:21	07:23 07:42-08:19/37 19:52 19:11-19:16/5	06:34 19:39-20:02/23 20:24 06:54-07:24/30	06:04 20:53	06:01 21:08
29	07:46 08:21-08:39/18 17:44		07:21 07:40-08:18/38 19:53	06:33 19:41-20:03/22 20:25 06:53-07:23/30	06:03 20:54	06:02 21:08
30	07:45 08:23-08:38/15 17:45		07:20 07:39-08:17/38 19:54	06:32 19:42-20:03/21 20:26 06:51-07:21/30	06:03 20:55	06:02 21:08
31	07:44 08:26-08:35/9 17:46		07:18 07:37-08:15/38 19:55		06:02 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	701	760	1223	1181	493	0

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T67 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (504)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:08	06:27 07:06-07:19/13 20:50	06:57 07:34-07:46/12 20:07 19:28-19:44/16	07:27 07:47-08:19/32 19:15	07:02 07:23-07:41/18 17:28	07:37 08:00-08:23/23 17:04
2	06:03 21:08	06:28 20:04-20:13/9 20:49 07:04-07:21/17	06:58 07:31-07:48/17 20:05 19:28-19:42/14	07:29 07:48-08:20/32 19:13	07:03 07:24-07:40/16 17:27	07:38 08:01-08:23/22 17:04
3	06:03 21:08	06:28 20:02-20:15/13 20:48 07:02-07:23/21	06:59 07:29-07:50/21 20:04 19:29-19:40/11	07:30 07:49-08:22/33 19:11	07:04 07:26-07:40/14 17:26	07:39 08:02-08:24/22 17:03
4	06:04 21:08	06:29 20:00-20:17/17 20:47 07:01-07:24/23	07:00 07:27-07:51/24 20:02 19:29-19:39/10	07:31 07:50-08:23/33 19:10	07:05 07:27-07:38/11 17:25	07:40 08:03-08:24/21 17:03
5	06:05 21:08	06:30 19:59-20:18/19 20:45 07:00-07:26/26	07:01 07:26-07:51/25 20:01 19:30-19:37/7	07:32 07:52-08:24/32 19:08	07:07 07:28-07:37/9 17:23	07:41 08:04-08:24/20 17:03
6	06:05 21:07	06:31 19:58-20:18/20 20:44 06:59-07:27/28	07:02 07:25-07:52/27 19:57 19:31-19:36/5	07:33 07:53-08:25/32 19:06	07:08 07:29-07:34/5 17:22	07:42 08:05-08:24/19 17:03
7	06:06 21:07	06:32 19:58-20:19/21 20:43 06:58-07:27/29	07:03 07:24-07:52/28 19:56	07:34 07:54-08:25/31 19:05	07:09 17:21	07:43 08:06-08:24/18 17:03
8	06:06 21:07	06:33 19:57-20:18/21 20:42 06:58-07:28/30	07:04 07:25-07:52/27 19:54 07:53-07:57/4	07:35 07:55-08:25/30 19:03	07:10 17:20	07:44 08:07-08:25/18 17:03
9	06:07 21:06	06:34 19:56-20:16/20 20:41 06:57-07:29/32	07:05 07:26-08:02/36 19:52	07:36 07:56-08:25/29 19:02	07:11 17:19	07:44 08:08-08:25/17 17:03
10	06:08 21:06	06:35 19:56-20:15/19 20:39 06:57-07:29/32	07:06 07:27-08:05/38 19:50	07:37 07:57-08:24/27 19:00	07:13 17:18	07:45 08:09-08:25/16 17:03
11	06:08 21:06	06:36 19:56-20:14/18 20:38 06:58-07:30/32	07:07 07:28-08:06/38 19:49	07:38 07:58-08:24/26 18:58	07:14 07:57-08:06/9 17:17	07:46 08:10-08:26/16 17:03
12	06:09 21:05	06:37 19:53-20:13/20 20:37 06:59-07:30/31	07:08 07:28-08:06/38 19:47	07:39 07:59-08:23/24 18:57	07:15 07:54-08:09/15 17:16	07:47 08:10-08:26/16 17:03
13	06:10 21:05	06:38 19:50-20:12/22 20:35 07:00-07:30/30	07:09 07:29-08:07/38 19:45	07:40 08:00-08:23/23 18:55	07:16 07:52-08:10/18 17:15	07:48 08:11-08:26/15 17:03
14	06:11 21:04	06:39 19:48-20:10/22 20:34 07:01-07:31/30	07:10 07:30-08:08/38 19:44	07:41 08:01-08:22/21 18:54	07:17 07:52-08:12/20 17:14	07:48 08:12-08:26/14 17:03
15	06:11 21:04	06:40 19:46-20:09/23 20:33 07:02-07:32/30	07:11 07:31-08:08/37 19:42	07:42 08:03-08:22/19 18:52 18:08-18:17/9	07:18 07:51-08:13/22 17:13	07:49 08:13-08:27/14 17:04
16	06:12 21:03	06:41 19:45-20:08/23 20:31 07:03-07:33/30	07:12 07:32-08:08/36 19:40 18:56-19:08/12	07:43 08:04-08:21/17 18:51 18:06-18:20/14	07:20 07:50-08:14/24 17:12	07:50 08:13-08:26/13 17:04
17	06:13 21:02	06:42 19:44-20:06/22 20:30 07:04-07:33/29	07:13 07:33-08:09/36 19:39 18:53-19:10/17	07:45 08:23-08:36/13 18:04-18:22/18 18:49 08:05-08:19/14	07:21 07:50-08:16/26 17:12	07:51 08:14-08:27/13 17:04
18	06:14 21:02	06:43 19:43-20:05/22 20:28 07:05-07:33/28	07:14 07:34-08:08/34 19:37 18:52-19:11/19	07:46 08:21-08:38/17 18:03-18:23/20 18:47 08:06-08:17/11	07:22 07:49-08:16/27 17:11	07:51 08:15-08:28/13 17:05
19	06:15 21:01	06:44 19:40-20:03/23 20:27 07:06-07:34/28	07:15 07:35-08:08/33 19:35 18:50-19:12/22	07:47 08:18-08:39/21 18:01-18:23/22 18:46 08:07-08:15/8	07:23 07:49-08:17/28 17:10	07:52 08:15-08:28/13 17:05
20	06:16 21:00	06:45 19:39-20:01/22 20:26 07:07-07:34/27	07:16 07:36-08:08/32 19:33 18:49-19:11/22	07:48 08:17-08:40/23 18:00-18:21/21 18:45 08:08-08:12/4	07:24 07:49-08:18/29 17:09	07:52 08:16-08:28/12 17:05
21	06:16 21:00	06:46 07:08-07:34/26 20:24 19:38-20:00/22	07:17 07:37-08:07/30 19:32 18:48-19:10/22	07:49 08:16-08:42/26 18:43 18:00-18:20/20	07:26 07:48-08:18/30 17:09	07:53 08:16-08:28/12 17:06
22	06:17 20:59	06:47 07:08-07:32/24 20:23 19:37-19:59/22	07:18 07:38-08:07/29 19:30 18:47-19:08/21	07:50 08:15-08:43/28 18:42 18:00-18:19/19	07:27 07:50-08:20/30 17:08	07:54 08:17-08:29/12 17:06
23	06:18 20:58	06:48 07:09-07:32/23 20:21 19:36-19:57/21	07:19 07:39-08:09/30 19:28 18:47-19:06/19	07:51 08:14-08:43/29 18:40 18:00-18:17/17	07:28 07:51-08:20/29 17:08	07:54 08:17-08:29/12 17:07
24	06:19 20:57	06:49 07:10-07:32/22 20:20 19:35-19:56/21	07:20 07:40-08:12/32 19:27 18:47-19:05/18	07:52 08:14-08:43/29 18:39 17:59-18:16/17	07:29 07:52-08:20/28 17:07	07:54 08:18-08:30/12 17:07
25	06:20 20:57	06:50 07:11-07:31/20 20:18 19:33-19:54/21	07:21 07:41-08:14/33 19:25 18:47-19:03/16	07:54 08:14-08:43/29 18:37 17:59-18:14/15	07:30 07:53-08:21/28 17:06	07:55 08:18-08:31/13 17:08
26	06:21 20:56	06:51 07:12-07:30/18 20:17 19:32-19:53/21	07:22 07:42-08:15/33 19:23 18:47-19:01/14	07:55 08:16-08:44/28 18:36 18:01-18:13/12	07:31 07:54-08:21/27 17:06	07:55 08:18-08:31/13 17:09
27	06:22 20:55	06:52 07:13-07:29/16 20:15 19:31-19:51/20	07:23 07:43-08:16/33 19:22 18:47-18:59/12	07:56 08:17-08:44/27 18:35 18:01-18:12/11	07:32 07:56-08:22/26 17:05	07:56 08:19-08:32/13 17:09
28	06:23 20:54	06:53 07:14-07:28/14 20:13 19:30-19:50/20	07:24 07:44-08:16/32 19:20 18:48-18:58/10	07:57 08:18-08:43/25 18:33 18:02-18:10/8	07:33 07:57-08:23/26 17:05	07:56 08:19-08:33/14 17:10
29	06:24 20:53	06:54 07:15-07:26/11 20:12 19:29-19:48/19	07:25 07:45-08:17/32 19:18 18:49-18:56/7	07:58 08:19-08:43/24 18:32 18:02-18:09/7	07:35 07:58-08:23/25 17:05	07:56 08:19-08:33/14 17:11
30	06:25 20:52	06:55 07:16-07:25/9 20:10 19:29-19:47/18	07:26 07:46-08:17/31 19:16 18:51-18:54/3	07:59 08:21-08:43/22 18:31 18:04-18:07/3	07:36 07:59-08:23/24 17:04	07:56 08:19-08:33/14 17:11
31	06:26 07:10-07:16/6 20:51	06:56 19:29-19:45/16 20:09 07:17-07:22/5		08:01 08:22-08:42/20 18:29		07:57 08:19-08:34/15 17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	6	1331	1231	1072	564	479

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T68 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (486)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:27-09:39/72	07:43 08:21-09:28/67	07:07 07:42-07:54/12	07:16 08:24-08:52/28	06:30 07:03-08:14/71	06:02 19:41-20:30/49
	17:13 15:55-16:38/43	17:48	18:22 08:12-09:16/64	19:56	20:27	20:57 07:05-08:07/62
2	07:57 08:28-09:39/71	07:42 08:21-09:27/66	07:06 07:37-07:58/21	07:15 08:27-08:50/23	06:29 07:03-08:14/71	06:01 19:42-20:31/49
	17:14 15:56-16:38/42	17:49	18:23 08:12-09:15/63	19:57	20:28	20:57 07:06-08:07/61
3	07:57 08:28-09:39/71	07:41 08:19-09:26/67	07:04 07:33-08:01/28	07:13 08:29-08:45/16	06:28 07:03-08:14/71	06:01 19:43-20:33/50
	17:15 15:57-16:39/42	17:50	18:24 08:12-09:13/61	19:58 07:51-07:57/6	20:29	20:58 07:07-08:07/60
4	07:57 08:28-09:38/70	07:40 08:18-09:24/66	07:02 07:31-08:03/32	07:11 07:44-08:03/19	06:27 07:01-08:14/73	06:01 19:42-20:33/51
	17:16 15:58-16:39/41	17:51	18:25 08:13-09:12/59	19:59	20:30	20:59 07:07-08:06/59
5	07:57 08:28-09:38/70	07:39 08:17-09:23/66	07:01 07:29-08:05/36	07:10 07:40-08:07/27	06:25 07:01-08:14/73	06:00 19:43-20:34/51
	17:17 15:59-16:40/41	17:53	18:26 08:13-09:11/58	20:00	20:31	20:59 07:08-08:06/58
6	07:57 08:29-09:37/68	07:38 08:17-09:22/65	06:59 07:28-08:07/39	07:08 07:37-08:09/32	06:24 19:57-20:04/7	06:00 19:43-20:35/52
	17:18 16:00-16:40/40	17:54	18:28 08:15-09:10/55	20:00	20:32 07:01-08:14/73	21:00 07:08-08:06/58
7	07:57 09:26-09:35/9 16:01-16:41/40	07:37 08:16-09:20/64	06:58 07:26-08:07/41	07:06 07:34-08:11/37	06:23 19:53-20:08/15	06:00 19:43-20:35/52
	17:19 08:29-09:25/56	17:55	18:29 08:15-09:08/53	20:01	20:33 07:01-08:14/73	21:01 07:09-08:06/57
8	07:57 08:28-09:25/57	07:36 08:16-09:18/62	07:56 08:24-09:08/44	07:05 07:33-08:13/40	06:22 19:51-20:10/19	05:59 19:43-20:35/52
	17:20 16:03-16:41/38	17:56	19:30 09:16-10:06/50	20:02	20:34 07:01-08:14/73	21:01 07:09-08:05/56
9	07:57 08:27-09:26/59	07:35 08:15-09:18/63	07:54 08:23-09:09/46	07:03 07:31-08:14/43	06:21 19:49-20:12/23	05:59 19:44-20:36/52
	17:21 16:05-16:41/36	17:58	19:31 09:18-10:04/46	20:03	20:35 07:00-08:14/74	21:02 07:09-08:05/56
10	07:57 08:26-09:26/60	07:33 08:14-09:17/63	07:53 08:22-09:10/48	07:01 07:29-08:14/45	06:20 19:47-20:14/27	05:59 19:44-20:37/53
	17:22 16:06-16:41/35	17:59	19:32 09:19-10:02/43	20:04	20:36 07:00-08:14/74	21:03 07:10-08:05/55
11	07:56 08:26-09:27/61	07:32 08:13-09:18/65	07:51 08:20-09:10/50	07:00 07:28-08:16/48	06:18 19:46-20:15/29	05:59 19:45-20:37/52
	17:23 16:08-16:41/33	18:00	19:33 09:20-09:59/39	20:06	20:37 07:00-08:14/74	21:03 07:10-08:05/55
12	07:56 08:25-09:28/63	07:31 08:13-09:19/66	07:50 08:20-09:11/51	06:58 07:25-08:16/51	06:17 19:45-20:16/31	05:59 19:45-20:38/53
	17:24 16:09-16:42/33	18:01	19:34 09:23-09:57/34	20:07	20:38 07:00-08:13/73	21:04 07:11-08:05/54
13	07:56 08:24-09:28/64	07:30 08:13-09:19/66	07:48 08:19-09:11/52	06:57 07:24-08:17/53	06:16 19:44-20:17/33	05:59 19:46-20:38/52
	17:25 16:10-16:41/31	18:03	19:35 09:25-09:54/29	20:08	20:39 07:00-08:13/73	21:04 07:11-08:05/54
14	07:55 08:24-09:28/64	07:28 08:12-09:19/67	07:46 08:18-09:10/52	06:55 07:23-08:17/54	06:15 19:43-20:17/34	05:59 19:46-20:39/53
	17:26 16:11-16:42/31	18:04	19:37 09:28-09:49/21	20:09	20:40 07:00-08:13/73	21:05 07:12-08:05/53
15	07:55 08:23-09:28/65	07:27 08:12-09:20/68	07:45 08:18-09:11/53	06:54 07:22-08:18/56	06:14 19:43-20:18/35	05:59 19:46-20:39/53
	17:27 16:11-16:41/30	18:05	19:38 09:34-09:43/9	20:10	20:41 07:00-08:13/73	21:05 07:12-08:05/53
16	07:55 08:23-09:29/66	07:26 08:12-09:20/68	07:43 08:17-09:10/53	06:52 07:20-08:18/58	06:13 19:42-20:18/36	05:59 19:47-20:39/52
	17:28 16:12-16:41/29	18:06	19:39	20:11	20:42 07:00-08:12/72	21:06 07:13-08:05/52
17	07:54 08:22-09:29/67	07:24 08:11-09:20/69	07:41 08:17-09:10/53	06:50 07:20-08:18/58	06:12 19:42-20:19/37	05:59 19:47-20:40/53
	17:30 16:13-16:41/28	18:08	19:40	20:12	20:43 07:00-08:12/72	21:06 07:13-08:05/52
18	07:54 08:22-09:30/68	07:23 08:11-09:20/69	07:40 08:17-09:10/53	06:49 07:18-08:18/60	06:11 19:41-20:19/38	05:59 19:47-20:40/53
	17:31 16:15-16:41/26	18:09	19:41	20:13	20:44 07:00-08:11/71	21:06 07:13-08:05/52
19	07:53 08:22-09:30/68	07:22 08:10-09:20/70	07:38 08:16-09:09/53	06:47 07:18-08:18/60	06:11 19:41-20:19/38	05:59 19:47-20:40/53
	17:32 16:15-16:40/25	18:10	19:42	20:14	20:45 07:00-08:11/71	21:07 07:13-08:05/52
20	07:53 08:22-09:31/69	07:20 08:10-09:20/70	07:36 08:16-09:09/53	06:46 07:17-08:18/61	06:10 19:41-20:20/39	05:59 19:47-20:40/53
	17:33 16:17-16:40/23	18:11	19:43	20:15	20:46 07:01-08:11/70	21:07 07:13-08:05/52
21	07:52 08:21-09:30/69	07:19 08:11-09:20/69	07:35 08:16-09:09/53	06:44 07:15-08:18/63	06:09 19:41-20:20/39	05:59 19:47-20:40/53
	17:34 16:19-16:39/20	18:12	19:44	20:16	20:47 07:01-08:11/70	21:07 07:14-08:06/52
22	07:51 08:21-09:30/69	07:18 08:10-09:20/70	07:33 08:16-09:08/52	06:43 07:13-08:17/64	06:08 19:40-20:20/40	05:59 19:48-20:41/53
	17:35 16:20-16:37/17	18:14	19:45	20:17	20:48 07:01-08:10/69	21:07 07:14-08:06/52
23	07:51 08:21-09:31/70	07:16 08:11-09:20/69	07:31 08:16-09:06/50	06:42 07:12-08:18/66	06:07 19:40-20:20/40	06:00 19:48-20:41/53
	17:37 16:22-16:35/13	18:15	19:46	20:18	20:49 07:01-08:10/69	21:08 07:14-08:06/52
24	07:50 08:21-09:31/70	07:15 08:10-09:19/69	07:30 08:17-09:06/49	06:40 07:10-08:17/67	06:07 19:41-20:21/40	06:00 19:48-20:41/53
	17:38 16:27-16:32/5	18:16	19:47	20:19	20:50 07:02-08:10/68	21:08 07:14-08:06/52
25	07:49 08:20-09:31/71	07:13 08:11-09:19/68	07:28 08:17-09:05/48	06:39 07:09-08:17/68	06:06 19:40-20:21/41	06:00 19:49-20:42/53
	17:39	18:17	19:48	20:20	20:51 07:02-08:09/67	21:08 07:15-08:07/52
26	07:48 08:20-09:30/70	07:12 08:10-09:18/68	07:26 08:17-09:03/46	06:37 07:08-08:17/69	06:05 19:40-20:21/41	06:00 19:49-20:42/53
	17:40	18:18	19:50	20:21	20:52 07:02-08:09/67	21:08 07:15-08:07/52
27	07:48 08:20-09:30/70	07:10 08:11-09:17/66	07:25 08:18-09:02/44	06:36 07:06-08:16/70	06:05 19:41-20:21/40	06:01 19:48-20:41/53
	17:41	18:19	19:51	20:23	20:52 07:03-08:09/66	21:08 07:14-08:07/53
28	07:47 08:20-09:29/69	07:09 08:11-09:16/65	07:23 08:19-09:01/42	06:34 07:06-08:15/69	06:04 19:40-20:23/43	06:01 19:49-20:42/53
	17:43	18:21	19:52	20:24	20:53 07:03-08:08/65	21:08 07:15-08:08/53
29	07:46 08:21-09:30/69		07:21 08:19-08:59/40	06:33 07:05-08:15/70	06:03 19:41-20:26/45	06:02 19:49-20:42/53
	17:44		19:53	20:25	20:54 07:04-08:08/64	21:08 07:15-08:08/53
30	07:45 08:21-09:29/68		07:20 08:21-08:57/36	06:32 07:04-08:14/70	06:03 19:41-20:27/46	06:02 19:49-20:42/53
	17:45		19:54	20:26	20:55 07:04-08:07/63	21:08 07:15-08:09/54
31	07:44 08:21-09:29/68		07:18 08:22-08:55/33		06:02 19:42-20:29/47	
	17:46		19:55		20:56 07:05-08:08/63	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	2823	1871	2047	1551	3082	3204

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T68 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (486)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 19:49-20:42/53	06:27 19:55-20:25/30	06:57 07:27-08:15/48	07:27 07:58-08:49/51	07:02 07:44-08:47/63	07:37 08:08-09:09/61
	21:08 07:15-08:09/54	20:50 07:10-08:23/73	20:07	19:15 09:02-09:35/33	17:28	17:04 15:50-16:23/33
2	06:03 19:49-20:41/52	06:28 19:56-20:24/28	06:58 07:28-08:13/45	07:29 07:59-08:49/50	07:03 07:44-08:47/63	07:38 08:09-09:09/60
	21:08 07:15-08:10/55	20:49 07:10-08:23/73	20:05	19:13 08:59-09:37/38	17:27	17:04 15:49-16:24/35
3	06:04 19:49-20:41/52	06:29 19:58-20:23/25	06:59 07:29-08:12/43	07:30 07:59-08:48/49	07:04 07:45-08:48/63	07:39 08:10-09:09/59
	21:08 07:15-08:10/55	20:48 07:10-08:23/73	20:04	19:11 08:57-09:39/42	17:26	17:04 15:48-16:24/36
4	06:04 19:50-20:42/52	06:29 19:59-20:21/22	07:00 07:30-08:10/40	07:31 07:59-08:46/47	07:05 07:46-08:50/64	07:40 08:12-09:10/58
	21:08 07:15-08:11/56	20:47 07:10-08:24/74	20:02	19:10 08:55-09:40/45	17:25	17:03 15:47-16:25/38
5	06:05 19:49-20:41/52	06:30 20:01-20:19/18	07:01 07:31-08:08/37	07:32 08:01-08:46/45	07:07 07:47-08:52/65	07:41 09:11-09:20/9 15:47-16:26/39
	21:08 07:14-08:11/57	20:45 07:10-08:24/74	20:01	19:08 08:54-09:43/49	17:23	17:03 08:14-09:10/56
6	06:05 19:50-20:41/51	06:31 20:04-20:17/13	07:02 07:33-08:05/32	07:33 08:02-08:45/43	07:08 07:47-08:53/66	07:42 08:15-09:23/68
	21:07 07:15-08:12/57	20:44 07:10-08:24/74	19:57	19:06 08:52-09:44/52	17:22	17:03 15:46-16:26/40
7	06:06 19:49-20:40/51	06:32 07:11-08:23/72	07:03 07:35-08:03/28	07:34 08:03-08:43/40	07:09 07:49-08:55/66	07:43 08:15-09:25/70
	21:07 07:14-08:12/58	20:43	19:56	19:05 08:51-09:45/54	17:21	17:03 15:46-16:27/41
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	21:07 07:14-08:13/59	20:42	19:54	19:03 08:50-09:46/56	17:20	17:03 15:46-16:27/41
9	06:07 19:50-20:40/50	06:34 07:11-08:23/72	07:05 08:24-08:39/15	07:36 08:05-08:39/34	07:11 07:51-08:57/66	07:44 08:17-09:28/71
	21:06 07:14-08:14/60	20:41	19:52 07:44-07:53/9	19:02 08:48-09:47/59	17:19	17:03 15:46-16:28/42
10	06:08 19:49-20:39/50	06:35 07:11-08:23/72	07:06 08:20-08:43/23	07:37 08:07-08:37/30	07:13 07:52-08:59/67	07:45 08:18-09:29/71
	21:06 07:13-08:14/61	20:39	19:51	19:00 08:47-09:47/60	17:18	17:03 15:46-16:28/42
11	06:09 19:50-20:38/48	06:36 07:12-08:23/71	07:07 08:17-08:45/28	07:38 08:09-08:34/25	07:14 07:52-09:00/68	07:46 08:18-09:30/72
	21:06 07:14-08:15/61	20:38	19:49	18:58 08:46-09:48/62	17:17	17:03 15:46-16:29/43
12	06:09 19:50-20:38/48	06:37 07:12-08:22/70	07:08 08:14-08:46/32	07:39 08:12-08:30/18	07:15 07:52-09:00/68	07:47 08:18-09:31/73
	21:05 07:14-08:16/62	20:37	19:47	18:57 08:45-09:48/63	17:16	17:03 15:46-16:29/43
13	06:10 19:49-20:36/47	06:38 07:13-08:23/70	07:09 08:12-08:47/35	07:40 08:20-08:22/2	07:16 07:52-09:01/69	07:48 08:19-09:32/73
	21:05 07:13-08:15/62	20:35	19:45	18:55 08:44-09:49/65	17:15	17:03 15:46-16:29/43
14	06:11 19:49-20:35/46	06:39 07:13-08:23/70	07:10 08:10-08:49/39	07:41 08:43-09:49/66	07:17 07:53-09:02/69	07:49 08:20-09:33/73
	21:04 07:13-08:16/63	20:34	19:44	18:54	17:14	17:03 15:47-16:30/43
15	06:12 19:50-20:34/44	06:40 07:14-08:23/69	07:11 08:08-08:50/42	07:42 08:43-09:50/67	07:19 07:53-09:03/70	07:49 08:21-09:34/73
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16	06:12 19:50-20:31/41	06:41 07:14-08:23/69	07:12 08:07-08:51/44	07:43 08:43-09:50/67	07:20 07:53-09:03/70	07:50 08:21-09:34/73
	21:03 07:13-08:18/65	20:31	19:40	18:51	17:13	17:04 15:47-16:31/44
17	06:13 19:49-20:30/41	06:42 07:15-08:23/68	07:13 08:06-08:51/45	07:45 08:42-09:50/68	07:21 07:54-09:05/71	07:51 08:22-09:35/73
	21:03 07:12-08:18/66	20:30	19:39	18:49	17:12	17:04 15:47-16:31/44
18	06:14 19:50-20:30/40	06:43 07:16-08:23/67	07:14 08:04-08:52/48	07:46 08:42-09:50/68	07:22 07:55-09:05/70	07:51 08:23-09:36/73
	21:02 07:12-08:18/66	20:28	19:37	18:48	17:11 16:01-16:06/5	17:05 15:48-16:32/44
19	06:15 19:50-20:31/41	06:44 07:17-08:23/66	07:15 08:03-08:52/49	07:47 08:41-09:50/69	07:23 07:55-09:05/70	07:52 08:23-09:36/73
	21:01 07:12-08:19/67	20:27	19:35	18:46	17:10 15:57-16:10/13	17:05 15:48-16:32/44
20	06:16 19:50-20:31/41	06:45 07:18-08:23/65	07:16 08:02-08:53/51	07:48 08:41-09:50/69	07:24 07:56-09:05/69	07:52 08:24-09:37/73
	21:01 07:12-08:20/68	20:26	19:33	18:45	17:09 15:55-16:12/17	17:05 15:49-16:33/44
21	06:16 19:51-20:31/40	06:46 07:19-08:23/64	07:17 08:02-08:53/51	07:49 08:41-09:51/70	07:26 07:56-09:05/69	07:53 08:24-09:37/73
	21:00 07:12-08:20/68	20:24	19:32	18:43	17:09 15:54-16:14/20	17:06 15:49-16:33/44
22	06:17 19:50-20:30/40	06:47 07:19-08:22/63	07:18 08:01-08:53/52	07:50 08:41-09:51/70	07:27 07:58-09:07/69	07:54 08:25-09:38/73
	20:59 07:12-08:21/69	20:23	19:30	18:42	17:08 15:53-16:16/23	17:06 15:50-16:34/44
23	06:18 19:50-20:30/40	06:48 07:21-08:22/61	07:19 08:00-08:53/53	07:51 08:41-09:50/69	07:28 07:59-09:07/68	07:54 08:25-09:38/73
	20:58 07:11-08:21/70	20:21	19:28	18:40	17:08 15:52-16:17/25	17:07 15:50-16:34/44
24	06:19 19:51-20:30/39	06:49 07:21-08:21/60	07:20 08:00-08:53/53	07:52 08:41-09:50/69	07:29 07:59-09:07/68	07:55 08:26-09:39/73
	20:57 07:11-08:21/70	20:20	19:27	18:39	17:07 15:52-16:18/26	17:07 15:51-16:35/44
25	06:20 19:51-20:30/39	06:50 07:21-08:21/60	07:21 07:59-08:53/54	07:54 08:40-09:49/69	07:30 08:00-09:07/67	07:55 08:26-09:39/73
	20:57 07:11-08:22/71	20:18	19:25	18:37	17:06 15:51-16:19/28	17:08 15:51-16:35/44
26	06:21 19:52-20:30/38	06:51 07:22-08:20/58	07:22 07:59-08:52/53	07:55 08:41-09:50/69	07:31 08:01-09:07/66	07:55 08:26-09:39/73
	20:56 07:11-08:22/71	20:17	19:23	18:36	17:06 15:51-16:19/28	17:09 15:51-16:35/44
27	06:22 19:52-20:29/37	06:52 07:22-08:20/58	07:23 07:59-08:52/53	07:56 08:41-09:49/68	07:32 08:03-09:08/65	07:56 08:27-09:40/73
	20:55 07:11-08:23/72	20:15	19:22	18:35	17:06 15:51-16:21/30	17:09 15:53-16:36/43
28	06:23 19:53-20:29/36	06:53 07:23-08:19/56	07:24 07:58-08:51/53	07:57 08:42-09:49/67	07:33 08:04-09:08/64	07:56 08:27-09:40/73
	20:54 07:11-08:23/72	20:13	19:20	18:33	17:05 15:51-16:22/31	17:10 15:53-16:37/44
29	06:24 19:54-20:28/34	06:54 07:24-08:18/54	07:25 07:58-08:51/53	07:58 08:42-09:48/66	07:35 08:05-09:09/64	07:56 08:27-09:40/73
	20:53 07:11-08:23/72	20:12	19:18 09:10-09:28/18	18:32	17:05 15:51-16:22/31	17:11 15:53-16:37/44
30	06:25 19:54-20:28/34	06:55 07:24-08:17/53	07:26 07:58-08:50/52	07:59 08:43-09:48/65	07:36 08:06-09:09/63	07:56 08:27-09:40/73
	20:52 07:11-08:24/73	20:10	19:16 09:05-09:32/27	18:31	17:04 15:50-16:23/33	17:11 15:54-16:37/43
31	06:26 19:54-20:26/32	06:56 07:25-08:16/51		08:01 08:43-09:47/64		07:57 08:27-09:40/73
	20:51 07:11-08:24/73	20:09		18:29		17:12 15:55-16:38/43
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	3357	2188	1326	2369	2316	3489

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T69 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (487)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 14:56-16:09/73 17:13 08:23-08:57/34	07:43 15:47-17:09/82 17:48	07:07 15:52-16:56/64 18:22	07:16 17:43-19:20/97 19:56 07:36-07:53/17	06:31 17:57-19:13/76 20:27	06:02 20:57
2	07:57 14:57-16:09/72 17:14 08:24-08:57/33	07:42 15:47-17:09/82 17:49	07:06 15:53-16:55/62 18:23	07:15 17:43-19:21/98 19:57 07:34-07:56/22	06:29 17:59-19:13/74 20:28	06:01 20:57
3	07:57 14:58-16:09/71 17:15 08:24-08:57/33	07:41 15:46-17:08/82 17:50	07:04 15:54-16:53/59 18:24	07:13 17:43-19:21/98 19:58 07:32-07:57/25	06:28 18:00-19:12/72 20:29	06:01 20:58
4	07:57 14:59-16:09/70 17:16 08:24-08:57/33	07:40 15:45-17:09/84 17:52	07:02 15:55-16:52/57 18:25	07:11 17:42-19:22/100 19:59 07:30-07:57/27	06:27 18:01-19:10/69 20:30	06:01 20:59
5	07:57 15:00-16:10/70 17:17 08:24-08:57/33	07:39 15:45-17:09/84 17:53	07:01 15:57-16:50/53 18:26	07:10 17:43-19:23/100 20:00 07:29-07:59/30	06:25 18:03-19:09/66 20:31	06:00 21:00
6	07:57 15:01-16:10/69 17:18 08:25-08:57/32	07:38 15:45-17:09/84 17:54	06:59 15:59-16:49/50 18:28	07:08 17:42-19:23/101 20:00 07:27-07:59/32	06:24 18:04-19:08/64 20:32	06:00 21:00
7	07:57 15:02-16:11/69 17:19 08:25-08:57/32	07:37 15:45-17:10/85 17:55	06:58 16:00-16:47/47 18:29	07:06 17:42-19:23/101 20:01 07:25-07:59/34	06:23 18:06-19:07/61 20:33	06:00 21:01
8	07:57 15:04-16:11/67 17:20 08:26-08:58/32	07:36 15:45-17:10/85 17:57	07:56 17:02-17:44/42 19:30	07:05 17:42-19:24/102 20:02 07:25-08:00/35	06:22 18:09-19:05/56 20:34	05:59 21:01
9	07:57 15:06-16:20/74 17:21 08:27-08:59/32	07:35 15:45-17:10/85 17:58	07:54 17:05-17:43/38 19:31	07:03 17:42-19:23/101 20:03 07:24-08:00/36	06:21 18:11-19:04/53 20:35	05:59 21:02
10	07:57 15:07-16:24/77 16:30-16:39/9 17:22 08:26-08:58/32	07:33 15:44-17:09/85 17:59	07:53 17:07-17:39/32 19:32 18:22-18:39/17	07:02 17:42-19:23/101 20:04 07:24-08:00/36	06:20 18:14-19:02/48 20:36	05:59 21:03
11	07:56 15:09-16:27/78 16:28-16:43/15 17:23 08:27-08:59/32	07:32 15:44-17:09/85 18:00	07:51 17:11-17:35/24 19:33 18:15-18:44/29	07:00 17:43-19:24/101 20:06 07:23-08:00/37	06:18 18:18-19:00/42 20:37	05:59 21:03
12	07:56 15:11-16:46/95 17:24 08:28-08:59/31	07:31 15:44-17:09/85 18:01	07:50 17:17-17:30/13 19:34 18:12-18:48/36	06:58 17:42-19:23/101 20:07 07:22-07:59/37	06:17 18:31-18:58/27 20:38	05:59 21:04
13	07:56 15:13-16:47/94 17:25 08:28-08:59/31	07:30 15:44-17:09/85 18:03	07:48 18:08-18:50/42 19:35	06:57 17:43-19:24/101 20:08 07:23-07:59/36	06:16 18:34-18:56/22 20:39	05:59 21:04
14	07:55 15:17-16:50/93 17:26 08:29-08:59/30	07:29 15:44-17:08/84 18:04	07:46 18:05-18:52/47 19:37	06:55 17:43-19:23/100 20:09 07:22-07:58/36	06:15 18:37-18:52/15 20:40	05:59 21:05
15	07:55 15:23-16:51/88 17:27 08:30-09:00/30	07:27 15:44-17:07/83 18:05	07:45 18:03-18:55/52 19:38	06:54 17:44-19:23/99 20:10 07:23-07:58/35	06:14 20:41	05:59 21:05
16	07:55 15:25-16:53/88 17:28 08:30-08:59/29	07:26 15:45-17:07/82 18:06	07:43 18:01-18:56/55 19:39	06:52 17:44-19:23/99 20:11 07:23-07:57/34	06:13 20:42	05:59 21:06
17	07:54 15:25-16:54/89 17:30 08:32-09:00/28	07:25 15:44-17:05/81 18:08	07:41 17:58-18:57/59 19:40	06:51 17:45-19:23/98 20:12 07:23-07:56/33	06:12 20:43	05:59 21:06
18	07:54 15:27-16:56/89 17:31 08:32-08:59/27	07:23 15:45-17:05/80 18:09	07:40 17:57-18:59/62 19:41	06:49 17:45-19:22/97 20:13 07:23-07:55/32	06:12 20:44	05:59 21:06
19	07:53 15:28-16:57/89 17:32 08:33-08:58/25	07:22 15:45-17:03/78 18:10	07:38 17:55-19:00/65 19:42	06:47 17:46-19:22/96 20:14 07:25-07:54/29	06:11 20:45	05:59 21:07
20	07:53 15:30-16:59/89 17:33 08:34-08:58/24	07:20 15:45-17:02/77 18:11	07:36 17:53-19:03/70 19:43	06:46 17:47-19:21/94 20:15 07:25-07:52/27	06:10 20:46	05:59 21:07
21	07:52 15:31-16:59/88 17:34 08:35-08:57/22	07:19 15:46-17:02/76 18:12	07:35 17:53-19:07/74 19:44	06:45 17:48-19:21/93 20:16 07:26-07:51/25	06:09 20:47	05:59 21:07
22	07:51 15:32-17:00/88 17:35 08:36-08:56/20	07:18 15:46-17:01/75 18:14	07:33 17:51-19:09/78 19:45	06:43 17:48-19:20/92 20:17 07:27-07:49/22	06:08 20:48	05:59 21:07
23	07:51 15:35-17:02/87 17:37 08:39-08:56/17	07:16 15:47-17:01/74 18:15	07:31 17:50-19:10/80 19:46	06:42 17:50-19:20/90 20:18 07:30-07:47/17	06:07 20:49	06:00 21:08
24	07:50 15:36-17:03/87 17:38 08:41-08:54/13	07:15 15:47-17:00/73 18:16	07:30 17:49-19:13/84 19:47	06:40 17:50-19:19/89 20:19 07:33-07:44/11	06:07 20:50	06:00 21:08
25	07:49 15:38-17:03/85 17:39 08:44-08:51/7	07:13 15:48-17:00/72 18:17	07:28 17:48-19:14/86 19:48	06:39 17:51-19:18/87 20:20	06:06 20:51	06:00 21:08
26	07:49 15:41-17:04/83 17:40	07:12 15:49-16:58/69 18:18	07:26 17:47-19:15/88 19:50	06:37 17:53-19:18/85 20:22	06:05 20:52	06:00 21:08
27	07:48 15:44-17:05/81 17:42	07:10 15:50-16:58/68 18:20	07:25 17:47-19:16/89 19:51	06:36 17:53-19:17/84 20:23	06:05 20:52	06:01 21:08
28	07:47 15:48-17:05/77 17:43	07:09 15:51-16:57/66 18:21	07:23 17:46-19:17/91 19:52	06:35 17:54-19:16/82 20:24	06:04 20:53	06:01 21:08
29	07:46 15:49-17:07/78 17:44		07:21 17:45-19:17/92 19:53	06:33 17:55-19:16/81 20:25	06:03 20:54	06:02 21:08
30	07:45 15:48-17:08/80 17:45		07:20 17:45-19:18/93 19:54	06:32 17:56-19:14/78 20:26	06:03 20:55	06:02 21:08
31	07:44 15:47-17:08/81 17:47		07:18 17:44-19:19/95 19:55 07:40-07:49/9		06:02 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	3235	2231	2034	3551	745	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T69 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (487)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 18:40-19:09/29 20:50 18:32-18:38/6	06:57 17:41-19:23/102 20:07 07:22-07:59/37	07:28 17:49-18:28/39 19:15	07:02 15:14-16:39/85 17:28	07:37 14:51-16:09/78 16:10-16:25/15 17:04 08:09-08:41/32
2	06:03 21:08	06:28 18:26-19:11/45 20:49	06:58 17:41-19:22/101 20:05 07:22-07:58/36	07:29 16:51-17:12/21 19:13 17:52-18:24/32	07:03 15:13-16:39/86 17:27	07:38 14:50-16:07/77 16:13-16:23/10 17:04 08:09-08:41/32
3	06:04 21:08	06:29 18:23-19:13/50 20:48	06:59 17:40-19:21/101 20:04 07:22-07:58/36	07:30 16:47-17:16/29 19:12 17:56-18:19/23	07:04 15:14-16:40/86 17:26	07:39 14:49-16:04/75 17:04 08:10-08:42/32
4	06:04 21:08	06:30 18:20-19:14/54 20:47	07:00 17:39-19:21/102 20:02 07:22-07:57/35	07:31 16:43-17:18/35 19:10	07:05 15:14-16:39/85 17:25	07:40 14:48-15:55/67 17:03 08:10-08:42/32
5	06:05 21:08	06:31 18:17-19:15/58 20:45	07:01 17:39-19:20/101 20:01 07:22-07:56/34	07:32 16:41-17:21/40 19:08	07:07 15:15-16:39/84 17:23	07:41 14:48-15:56/68 17:03 08:10-08:43/33
6	06:05 21:07	06:32 18:15-19:17/62 20:44	07:02 17:38-19:19/101 19:57 07:23-07:55/32	07:33 16:38-17:23/45 19:07	07:08 15:15-16:39/84 17:22	07:42 14:47-15:56/69 17:03 08:11-08:43/32
7	06:06 21:07	06:33 18:13-19:18/65 20:43	07:03 17:38-19:18/100 19:56 07:24-07:54/30	07:34 16:35-17:24/49 19:05	07:09 15:16-16:40/84 17:21	07:43 14:47-15:57/70 17:03 08:11-08:44/33
8	06:07 21:07	06:33 18:12-19:19/67 20:42	07:04 17:37-19:17/100 19:54 07:25-07:53/28	07:35 16:33-17:25/52 19:03	07:10 15:16-16:39/83 17:20	07:44 14:47-15:57/70 17:03 08:12-08:44/32
9	06:07 21:06	06:34 18:10-19:20/70 20:41	07:05 17:37-19:16/99 19:52 07:26-07:51/25	07:36 16:31-17:26/55 19:02	07:11 15:17-16:39/82 17:19	07:44 14:47-15:58/71 17:03 08:12-08:45/33
10	06:08 21:06	06:35 18:08-19:21/73 20:39	07:06 17:36-19:14/98 19:51 07:27-07:49/22	07:37 16:29-17:27/58 19:00	07:13 15:18-16:39/81 17:18	07:45 14:47-15:59/72 17:03 08:13-08:46/33
11	06:09 21:06	06:36 18:07-19:22/75 20:38	07:07 17:36-19:13/97 19:49 07:29-07:46/17	07:38 16:27-17:28/61 18:58	07:14 15:18-16:39/81 17:17	07:46 14:47-16:00/73 17:03 08:13-08:47/34
12	06:09 21:05	06:37 18:05-19:22/77 20:37	07:08 17:35-19:10/95 19:47 07:32-07:42/10	07:39 16:26-17:29/63 18:57	07:15 15:19-16:38/79 17:16	07:47 14:46-15:59/73 17:03 08:14-08:47/33
13	06:10 21:05	06:38 18:04-19:23/79 20:35	07:09 17:35-19:09/94 19:45	07:40 16:24-17:29/65 18:55	07:16 15:19-16:38/79 17:15	07:48 14:46-16:00/74 17:03 08:14-08:47/33
14	06:11 21:04	06:39 18:03-19:24/81 20:34	07:10 17:35-19:08/93 19:44	07:41 16:23-17:30/67 18:54	07:17 15:21-16:38/77 17:14	07:49 14:47-16:01/74 17:04 08:14-08:48/34
15	06:12 21:04	06:40 18:02-19:24/82 20:33	07:11 17:35-19:06/91 19:42	07:42 16:22-17:31/69 18:52	07:19 15:17-16:38/81 17:13	07:49 14:47-16:02/75 17:04 08:15-08:49/34
16	06:12 21:03	06:41 18:00-19:25/85 20:31	07:12 17:35-19:05/90 19:40	07:44 16:21-17:31/70 18:51	07:20 15:14-16:37/83 17:13	07:50 14:47-16:01/74 17:04 08:15-08:49/34
17	06:13 21:03	06:42 17:59-19:25/86 20:30	07:13 17:35-19:03/88 19:39	07:45 16:20-17:31/71 18:49	07:21 15:12-16:36/84 17:12 08:18-08:25/7	07:51 14:47-16:02/75 17:04 08:16-08:49/33
18	06:14 21:02	06:43 17:58-19:25/87 20:29	07:14 17:35-19:01/86 19:37	07:46 16:19-17:32/73 18:48	07:22 15:10-16:37/87 17:11 08:15-08:28/13	07:51 14:48-16:03/75 17:05 08:17-08:50/33
19	06:15 21:01	06:44 17:57-19:26/89 20:27 07:38-07:50/12	07:15 17:35-18:59/84 19:35	07:47 16:18-17:32/74 18:46	07:23 15:09-16:36/87 17:10 08:13-08:30/17	07:52 14:48-16:03/75 17:05 08:17-08:50/33
20	06:16 21:01	06:45 17:55-19:26/91 20:26 07:35-07:53/18	07:16 17:36-18:57/81 19:34	07:48 16:17-17:32/75 18:45	07:24 15:07-16:35/88 17:10 08:11-08:31/20	07:53 14:49-16:04/75 17:05 08:17-08:51/34
21	06:16 21:00	06:46 17:54-19:26/92 20:24 07:33-07:55/22	07:17 17:36-18:55/79 19:32	07:49 16:17-17:33/76 18:43	07:26 15:06-16:34/88 17:09 08:11-08:33/22	07:53 14:49-16:04/75 17:06 08:17-08:51/34
22	06:17 20:59	06:47 17:52-19:25/93 20:23 07:31-07:56/25	07:18 17:37-18:52/75 19:30	07:50 16:16-17:33/77 18:42	07:27 15:06-16:35/89 17:08 08:11-08:34/23	07:54 14:50-16:05/75 17:06 08:18-08:52/34
23	06:18 20:58	06:48 17:50-19:25/95 20:21 07:29-07:56/27	07:19 17:37-18:49/72 19:28	07:51 16:15-17:34/79 18:40	07:28 15:05-16:34/89 17:08 08:10-08:35/25	07:54 14:50-16:05/75 17:07 08:18-08:52/34
24	06:19 20:57	06:49 17:49-19:25/96 20:20 07:27-07:57/30	07:20 17:38-18:44/66 19:27	07:53 16:14-17:35/81 18:39	07:29 15:04-16:33/89 17:07 08:09-08:36/27	07:55 14:51-16:06/75 17:08 08:20-08:53/33
25	06:20 20:57	06:50 17:48-19:25/97 20:18 07:26-07:58/32	07:21 17:39-18:42/63 19:25	07:54 16:14-17:35/81 18:37	07:30 15:04-16:32/88 17:07 08:09-08:37/28	07:55 14:51-16:06/75 17:08 08:20-08:53/33
26	06:21 20:56	06:51 17:47-19:25/98 20:17 07:25-07:58/33	07:22 17:40-18:40/60 19:23	07:55 16:14-17:37/83 18:36	07:31 15:03-16:31/88 17:06 08:10-08:38/28	07:55 14:51-16:06/75 17:09 08:20-08:53/33
27	06:22 20:55	06:52 17:46-19:25/99 20:15 07:24-07:59/35	07:23 17:42-18:38/56 19:22	07:56 16:14-17:37/83 18:35	07:32 15:03-16:31/88 17:06 08:09-08:39/30	07:56 14:53-16:07/74 17:09 08:21-08:55/34
28	06:23 20:54	06:53 17:45-19:24/99 20:13 07:24-07:59/35	07:24 17:43-18:36/53 19:20	07:57 16:14-17:37/83 18:33	07:34 14:57-16:30/93 17:05 08:09-08:39/30	07:56 14:53-16:07/74 17:10 08:21-08:55/34
29	06:24 18:51-19:00/9 20:53	06:54 17:44-19:24/100 20:12 07:23-07:59/36	07:25 17:45-18:34/49 19:18	07:58 16:13-17:38/85 18:32	07:35 14:54-16:28/94 17:05 08:09-08:40/31	07:56 14:54-16:08/74 17:11 08:21-08:55/34
30	06:25 18:46-19:05/19 20:52	06:55 17:43-19:24/101 20:10 07:23-07:59/36	07:27 17:47-18:31/44 19:17	07:59 16:14-17:39/85 18:31	07:36 14:52-16:27/95 17:04 08:09-08:40/31	07:57 14:54-16:08/74 17:12 08:22-08:55/33
31	06:26 18:43-19:08/25 20:51	06:56 17:42-19:23/101 20:09 07:22-07:59/37		08:01 16:14-17:39/85 18:29		07:57 14:55-16:08/73 17:12 08:22-08:55/33
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	53	2860	2863	2064	2899	3332

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T7 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (426)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:58 08:36-09:31/55 17:13	07:44 08:46-09:39/53 17:47	07:07 18:22	07:16 19:56	06:30 20:27	06:01 20:57	06:02 06:24-06:46/22 21:09	06:26 20:50	06:57 20:07	07:28 19:15	07:02 08:27-09:00/33 17:28	07:37 08:21-09:19/58 17:03
2	07:58 08:36-09:31/55 17:14	07:43 08:47-09:39/52 17:49	07:06 18:23	07:14 19:57	06:29 20:28	06:01 20:58	06:02 06:25-06:47/22 21:09	06:27 20:49	06:58 20:06	07:29 19:13	07:03 08:25-09:01/36 17:27	07:38 08:21-09:19/58 17:03
3	07:58 08:36-09:32/56 17:14	07:42 08:48-09:38/50 17:50	07:04 18:24	07:13 19:58	06:27 20:29	06:00 20:59	06:03 06:25-06:46/21 21:09	06:28 20:48	06:59 20:04	07:30 19:11	07:05 08:23-09:03/40 17:25	07:39 08:22-09:20/58 17:03
4	07:58 08:36-09:33/57 17:15	07:41 08:49-09:38/49 17:51	07:03 18:25	07:11 19:59	06:26 20:30	06:00 06:26-06:35/9 21:00	06:03 06:27-06:46/19 21:09	06:29 20:47	07:00 20:02	07:31 19:10	07:06 08:22-09:04/42 17:24	07:40 08:22-09:20/58 17:03
5	07:58 08:37-09:33/56 17:16	07:40 08:50-09:37/47 17:52	07:01 18:26	07:09 20:00	06:25 20:32	05:59 06:24-06:36/12 21:00	06:04 06:28-06:46/18 21:08	06:30 20:46	07:01 20:01	07:32 19:08	07:07 08:21-09:06/45 17:23	07:41 08:23-09:20/57 17:03
6	07:58 08:37-09:34/57 17:17	07:39 08:52-09:36/44 17:54	06:59 18:27	07:08 20:00	06:24 20:33	05:59 06:23-06:38/15 21:01	06:05 06:29-06:44/15 21:08	06:31 20:45	07:02 19:57	07:33 19:06	07:08 08:20-09:07/47 17:22	07:42 08:23-09:20/57 17:02
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13	07:56 08:39-09:38/59 17:24	07:30 09:07-09:20/13 18:02	07:48 19:35	06:56 20:08	06:16 20:40	05:58 06:20-06:43/23 21:05	06:09 21:05	06:38 20:36	07:09 19:46	07:40 18:55	07:17 08:16-09:13/57 17:15	07:48 08:27-09:22/55 17:03
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Potential sun hours	297	297	370	399	449	453	460	429	375	345	297	287
Sum of minutes with flicker	1796	507	0	0	0	599	148	0	0	68	1619	1707

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T70 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (505)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March		April		May		June	
1	07:57	07:43	07:07		07:16	07:35-07:51/16	06:31	20:01-20:04/3	06:02	06:24-06:54/30
	17:14	17:48	18:22		19:56		20:27		20:57	
2	07:57	07:42	07:06		07:15	07:34-07:52/18	06:29	19:58-20:06/8	06:02	06:23-06:54/31
	17:14	17:49	18:23		19:57		20:28		20:57	
3	07:57	07:41	07:04		07:13	07:32-07:52/20	06:28	19:57-20:07/10	06:01	06:23-06:55/32
	17:15	17:50	18:24		19:58		20:29		20:58	
4	07:57	07:40	07:03		07:11	07:30-07:51/21	06:27	19:56-20:08/12	06:01	06:23-06:56/33
	17:16	17:52	18:25		19:59		20:30		20:59	
5	07:57	07:39	07:01		07:10	07:29-07:52/23	06:26	19:54-20:08/14	06:00	06:22-06:55/33
	17:17	17:53	18:27		20:00		20:31		21:00	
6	07:57	07:38	06:59		07:08	07:27-07:51/24	06:24	19:53-20:09/16	06:00	06:22-06:56/34
	17:18	17:54	18:28		20:00		20:32		21:00	
7	07:57	07:37	06:58	07:17-07:18/1	07:07	07:26-07:51/25	06:23	19:53-20:10/17	06:00	06:22-06:56/34
	17:19	17:55	18:29		20:01		20:33		21:01	
8	07:57	07:36	07:56	08:16-08:22/6	07:05	07:24-07:50/26	06:22	19:52-20:12/20	06:00	06:22-06:57/35
	17:20	17:57	19:30		20:02		20:34		21:02	
9	07:57	07:35	07:55	08:14-08:23/9	07:03	07:22-07:49/27	06:21	19:52-20:13/21	05:59	06:21-06:56/35
	17:21	17:58	19:31		20:04		20:35	06:41-06:43/2	21:02	
10	07:57	07:34	07:53	08:12-08:24/12	07:02	07:21-07:49/28	06:20	19:52-20:14/22	05:59	06:21-06:57/36
	17:22	17:59	19:32		20:05		20:36	06:40-06:45/5	21:03	
11	07:56	07:32	07:51	08:11-08:26/15	07:00	07:19-07:47/28	06:19	19:51-20:15/24	05:59	06:21-06:57/36
	17:23	18:00	19:33		20:06		20:37	06:39-06:47/8	21:03	
12	07:56	07:31	07:50	08:09-08:26/17	06:58	07:18-07:46/28	06:18	19:51-20:16/25	05:59	06:21-06:57/36
	17:24	18:02	19:34		20:07		20:38	06:38-06:48/10	21:04	
13	07:56	07:30	07:48	08:07-08:26/19	06:57	07:16-07:44/28	06:16	19:51-20:17/26	05:59	06:21-06:58/37
	17:25	18:03	19:36		20:08		20:39	06:37-06:49/12	21:04	
14	07:56	07:29	07:46	08:06-08:26/20	06:55	07:14-07:41/27	06:15	19:51-20:17/26	05:59	06:21-06:58/37
	17:26	18:04	19:37		20:09		20:40	06:36-06:50/14	21:05	
15	07:55	07:27	07:45	08:04-08:26/22	06:54	07:13-07:37/24	06:14	19:51-20:18/27	05:59	06:21-06:58/37
	17:27	18:05	19:38		20:10		20:41	06:35-06:50/15	21:05	
16	07:55	07:26	07:43	08:02-08:25/23	06:52	07:11-07:31/20	06:13	19:51-20:19/28	05:59	06:21-06:58/37
	17:29	18:07	19:39		20:11		20:42	06:34-06:51/17	21:06	
17	07:54	07:25	07:41	08:01-08:25/24	06:51	07:10-07:32/22	06:13	19:51-20:20/29	05:59	06:21-06:58/37
	17:30	18:08	19:40		20:12		20:43	06:33-06:51/18	21:06	
18	07:54	07:23	07:40	07:59-08:24/25	06:49	07:08-07:31/23	06:12	19:52-20:20/28	05:59	06:21-06:58/37
	17:31	18:09	19:41		20:13		20:44	06:32-06:51/19	21:06	
19	07:53	07:22	07:38	07:57-08:23/26	06:48	07:07-07:30/23	06:11	19:52-20:20/28	05:59	06:21-06:58/37
	17:32	18:10	19:42		20:14		20:45	06:32-06:52/20	21:07	
20	07:53	07:21	07:36	07:56-08:22/26	06:46	07:05-07:29/24	06:10	19:53-20:20/27	05:59	06:22-07:00/38
	17:33	18:11	19:43		20:15		20:46	06:31-06:52/21	21:07	
21	07:52	07:19	07:35	07:54-08:21/27	06:45	07:06-07:29/23	06:09	19:53-20:19/26	05:59	06:22-07:00/38
	17:34	18:13	19:44		20:16		20:47	06:30-06:52/22	21:07	
22	07:51	07:18	07:33	07:52-08:18/26	06:43	07:06-07:27/21	06:08	19:54-20:19/25	05:59	06:22-07:00/38
	17:36	18:14	19:45		20:17		20:48	06:29-06:52/23	21:08	
23	07:51	07:16	07:31	07:50-08:16/26	06:42	07:07-07:26/19	06:07	19:54-20:18/24	06:00	06:22-07:00/38
	17:37	18:15	19:46		20:18		20:49	06:29-06:53/24	21:08	
24	07:50	07:15	07:30	07:49-08:16/27	06:40	07:09-07:25/16	06:07	19:56-20:18/22	06:00	06:22-06:59/37
	17:38	18:16	19:48		20:19		20:50	06:28-06:52/24	21:08	
25	07:49	07:13	07:28	07:48-08:15/27	06:39	07:11-07:21/10	06:06	19:56-20:17/21	06:00	06:23-07:00/37
	17:39	18:17	19:49		20:21		20:51	06:27-06:52/25	21:08	
26	07:49	07:12	07:26	07:48-08:13/25	06:37		06:05	19:58-20:17/19	06:01	06:23-07:00/37
	17:40	18:18	19:50		20:22		20:52	06:27-06:52/25	21:08	
27	07:48	07:10	07:25	07:49-08:13/24	06:36		06:05	19:58-20:16/18	06:01	06:24-07:01/37
	17:42	18:20	19:51		20:23		20:53	06:26-06:52/26	21:08	
28	07:47	07:09	07:23	07:50-08:11/21	06:35		06:04	19:59-20:14/15	06:01	06:24-07:01/37
	17:43	18:21	19:52	07:42-07:45/3	20:24		20:53	06:25-06:52/27	21:08	
29	07:46		07:21	07:51-08:08/17	06:33		06:04	20:01-20:14/13	06:02	06:24-07:01/37
	17:44		19:53	07:40-07:48/8	20:25		20:54	06:25-06:53/28	21:08	
30	07:45		07:20	07:54-08:06/12	06:32		06:03	06:24-06:53/29	06:02	06:25-07:01/36
	17:45		19:54	07:39-07:50/11	20:26		20:55	20:02-20:12/10	21:08	
31	07:44		07:18	07:37-07:50/13			06:02	06:24-06:54/30		
	17:47		19:55				20:56	20:05-20:09/4		
Potential sun hours	297	297	370		399		448		452	
Sum of minutes with flicker	0	0	512		564		1052		1074	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T70 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (505)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 06:25-07:01/36	06:27 20:02-20:26/24	06:58 07:18-07:46/28	07:28 07:47-08:05/18	07:02	07:37
	21:08	20:50 06:49-06:58/9	20:07	19:15	17:28	17:04
2	06:03 06:26-07:02/36	06:28 20:01-20:24/23	06:59 07:19-07:47/28	07:29 07:49-08:04/15	07:03	07:38
	21:08	20:49 06:50-06:57/7	20:06	19:13	17:27	17:04
3	06:04 06:26-07:01/35	06:29 20:01-20:23/22	07:00 07:20-07:47/27	07:30 07:50-08:03/13	07:04	07:39
	21:08	20:48 06:51-06:55/4	20:04	19:12	17:26	17:04
4	06:04 06:27-07:02/35	06:30 20:02-20:22/20	07:01 07:21-07:47/26	07:31 07:51-08:02/11	07:06	07:40
	21:08	20:47 06:51-06:52/1	20:02	19:10	17:25	17:04
5	06:05 06:27-07:01/34	06:31 20:02-20:21/19	07:02 07:22-07:47/25	07:32 07:52-08:00/8	07:07	07:41
	21:08	20:46	20:01	19:08	17:24	17:03
6	06:05 06:28-07:02/34	06:32 20:02-20:20/18	07:03 07:23-07:47/24	07:33 07:53-07:57/4	07:08	07:42
	21:07	20:44	19:57	19:07	17:22	17:03
7	06:06 06:29-07:02/33	06:33 20:03-20:19/16	07:04 07:24-07:47/23	07:34	07:09	07:43
	21:07	20:43	19:56	19:05	17:21	17:03
8	06:07 06:29-07:02/33	06:34 20:04-20:18/14	07:05 07:25-07:47/22	07:35	07:10	07:44
	21:07	20:42	19:54	19:03	17:20	17:03
9	06:07 06:30-07:02/32	06:35 20:05-20:16/11	07:06 07:26-07:46/20	07:36	07:12	07:45
	21:07	20:41	19:52	19:02	17:19	17:03
10	06:08 06:30-07:02/32	06:36 20:06-20:15/9	07:07 07:27-07:45/18	07:37	07:13	07:45
	21:06	20:39	19:51	19:00	17:18	17:03
11	06:09 06:31-07:02/31	06:37 20:08-20:14/6	07:08 07:28-07:44/16	07:38	07:14	07:46
	21:06	20:38	19:49	18:59	17:17	17:03
12	06:09 06:32-07:02/30	06:38 20:10-20:13/3	07:09 07:29-07:43/14	07:39	07:15	07:47
	21:05	20:37	19:47	18:57	17:16	17:03
13	06:10 06:33-07:02/29	06:39	07:10 07:45-07:57/12	07:40	07:16	07:48
	21:05 20:11-20:19/8	20:36	19:46 07:30-07:41/11	18:55	17:15	17:03
14	06:11 06:33-07:01/28	06:40	07:11 07:42-07:59/17	07:41	07:17	07:49
	21:04 20:10-20:21/11	20:34	19:44 07:31-07:39/8	18:54	17:14	17:04
15	06:12 20:09-20:23/14	06:41	07:11 07:40-08:01/21	07:43	07:19	07:49
	21:04 06:34-07:01/27	20:33	19:42 07:32-07:36/4	18:52	17:14	17:04
16	06:12 20:08-20:24/16	06:42	07:12 07:39-08:02/23	07:44	07:20	07:50
	21:03 06:35-07:01/26	20:31	19:40	18:51	17:13	17:04
17	06:13 20:07-20:26/19	06:43 07:21-07:25/4	07:13 07:36-08:01/25	07:45	07:21	07:51
	21:03 06:36-07:02/26	20:30	19:39	18:49	17:12	17:04
18	06:14 20:06-20:26/20	06:44 07:17-07:29/12	07:14 07:35-08:02/27	07:46	07:22	07:51
	21:02 06:36-07:01/25	20:29	19:37	18:48	17:11	17:05
19	06:15 20:05-20:27/22	06:45 07:15-07:31/16	07:15 07:35-08:02/27	07:47	07:23	07:52
	21:01 06:37-07:02/25	20:27	19:35	18:46	17:10	17:05
20	06:16 20:05-20:28/23	06:46 07:13-07:32/19	07:16 07:36-08:02/26	07:48	07:25	07:53
	21:01 06:38-07:02/24	20:26	19:34	18:45	17:10	17:06
21	06:17 20:04-20:29/25	06:47 07:12-07:33/21	07:17 07:37-08:03/26	07:49	07:26	07:53
	21:00 06:39-07:02/23	20:24	19:32	18:43	17:09	17:06
22	06:17 20:04-20:30/26	06:48 07:10-07:34/24	07:18 07:38-08:05/27	07:50	07:27	07:54
	20:59 06:40-07:02/22	20:23	19:30	18:42	17:08	17:07
23	06:18 20:03-20:29/26	06:49 07:10-07:34/24	07:19 07:39-08:06/27	07:51	07:28	07:54
	20:58 06:41-07:03/22	20:21	19:29	18:40	17:08	17:07
24	06:19 20:02-20:30/28	06:50 07:11-07:34/23	07:21 07:40-08:06/26	07:53	07:29	07:55
	20:58 06:41-07:02/21	20:20	19:27	18:39	17:07	17:08
25	06:20 20:02-20:30/28	06:51 07:12-07:34/22	07:22 07:41-08:07/26	07:54	07:30	07:55
	20:57 06:42-07:02/20	20:18	19:25	18:38	17:07	17:08
26	06:21 20:02-20:31/29	06:52 07:12-07:33/21	07:23 07:42-08:07/25	07:55	07:31	07:55
	20:56 06:43-07:01/18	20:17	19:23	18:36	17:06	17:09
27	06:22 20:02-20:30/28	06:53 07:13-07:33/20	07:24 07:43-08:07/24	07:56	07:33	07:56
	20:55 06:44-07:01/17	20:15	19:22	18:35	17:06	17:10
28	06:23 20:02-20:29/27	06:54 07:14-07:39/25	07:25 07:44-08:06/22	07:57	07:34	07:56
	20:54 06:45-07:01/16	20:14	19:20	18:33	17:05	17:10
29	06:24 20:02-20:28/26	06:55 07:15-07:42/27	07:26 07:45-08:06/21	07:58	07:35	07:56
	20:53 06:46-07:01/15	20:12	19:18	18:32	17:05	17:11
30	06:25 20:02-20:28/26	06:56 07:16-07:44/28	07:27 07:46-08:05/19	08:00	07:36	07:57
	20:52 06:47-07:00/13	20:10	19:17	18:31	17:05	17:12
31	06:26 20:02-20:27/25	06:57 07:17-07:45/28		08:01		07:57
	20:51 06:48-06:59/11	20:09		18:30		17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1236	520	715	69	0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T71 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (488)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:36-09:35/59 17:13	07:43 17:48	07:07 17:05-17:50/45 18:22	07:16 07:45-09:08/83 19:56 18:31-19:14/43	06:30 18:59-19:35/36 06:50-07:16/26 20:27 19:51-20:04/13	06:02 06:25-07:30/65 20:57 19:58-20:32/34
2	07:57 08:36-09:36/60 17:14	07:42 17:49	07:06 17:05-17:51/46 18:23	07:15 07:44-09:07/83 19:57 18:31-19:13/42	06:29 19:00-19:34/34 06:49-07:14/25 20:28 19:49-20:06/17	06:01 06:26-07:31/65 20:57 19:59-20:33/34
3	07:57 08:37-09:36/59 17:15	07:41 17:50	07:04 17:05-17:50/45 18:24	07:13 07:43-09:06/83 19:58 18:32-19:12/40	06:28 19:01-19:33/32 06:50-07:12/22 20:29 19:48-20:07/19	06:01 06:26-07:32/66 20:58 19:59-20:34/35
4	07:57 08:37-09:36/59 17:16	07:40 17:51	07:02 17:05-17:50/45 18:25	07:11 19:17-19:28/11 18:32-19:11/39 19:59 07:42-09:05/83	06:27 19:02-19:31/29 06:50-07:12/22 20:30 19:46-20:07/21	06:01 06:26-07:32/66 20:59 19:59-20:34/35
5	07:57 08:38-09:36/58 17:17	07:39 17:53	07:01 17:05-17:49/44 18:26	07:10 19:13-19:33/20 18:34-19:10/36 20:00 07:42-09:05/83	06:25 19:03-19:30/27 06:50-07:10/20 20:31 19:45-20:08/23	06:00 06:26-07:32/66 20:59 19:59-20:35/36
6	07:57 08:39-09:37/58 17:18	07:38 17:54	06:59 17:06-17:49/43 18:28	07:08 19:10-19:35/25 18:34-19:08/34 20:00 07:41-09:04/83	06:24 19:05-19:28/23 06:51-07:09/18 20:32 19:45-20:09/24	06:00 06:27-07:33/66 21:00 20:00-20:36/36
7	07:57 08:39-09:37/58 17:19	07:37 17:55	06:58 17:06-17:48/42 18:29	07:06 19:07-19:37/30 18:35-19:06/31 20:01 07:40-09:02/82	06:23 19:08-19:25/17 06:52-07:08/16 20:33 19:44-20:10/26	06:00 06:27-07:34/67 21:01 19:59-20:36/37
8	07:57 08:40-09:37/57 17:20	07:36 17:56	07:56 18:06-18:47/41 19:30 08:39-08:46/7	07:05 18:37-19:39/62 20:02 07:40-09:02/82	06:22 19:11-19:22/11 06:54-07:07/13 20:34 19:44-20:12/28	05:59 06:27-07:33/66 21:01 19:59-20:36/37
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Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1278	694	2695	3585	2348	3155

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T71 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (488)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 06:32-07:39/67	06:27 19:53-20:25/32	06:57 19:00-19:40/40 18:45-18:53/8	07:27 17:49-18:21/32 18:35-18:39/4	07:02 16:48-17:02/14	07:37 08:24-09:19/55
	21:08 20:04-20:43/39	20:50	20:07 07:38-08:56/78	19:15 08:00-08:41/41	17:28	17:04
2	06:03 06:32-07:39/67	06:28 19:53-20:24/31	06:58 19:00-19:39/39 18:40-18:57/17	07:29 17:47-18:22/35	07:03	07:38 08:24-09:20/56
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	20:52 19:54-20:28/34	20:10 07:39-08:54/75	19:16 07:59-08:44/45	18:31	17:04	17:12
31	06:26 19:53-20:26/33	06:56 18:59-19:41/42		08:01 17:45-18:05/20		07:57 08:35-09:35/60
	20:51 06:51-06:58/7	20:09 07:38-08:55/77		18:29		17:12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	2873	2807	3559	1364	657	1842

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T72 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (489)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March	April	May		June	
1	07:58	08:43-08:52/9	07:44	08:04-08:18/14	07:07	07:16	06:30		06:01	06:44-06:58/14
	17:13		17:47		18:22	19:56	20:27		20:57	
2	07:58	08:45-08:51/6	07:43	08:03-08:19/16	07:06	07:14	06:29		06:01	06:45-06:56/11
	17:14		17:49		18:23	19:57	20:28		20:58	
3	07:58		07:42	08:02-08:20/18	07:04	07:13	06:27	06:47-06:55/8	06:00	06:47-06:55/8
	17:14		17:50		18:24	19:58	20:29		20:59	
4	07:58		07:41	08:01-08:21/20	07:03	07:11	06:26	06:46-06:57/11	06:00	06:49-06:53/4
	17:15		17:51		18:25	19:59	20:30		21:00	
5	07:58		07:40	08:00-08:22/22	07:01	07:09	06:25	06:45-06:59/14	06:00	
	17:16		17:52		18:26	20:00	20:32		21:00	
6	07:58		07:39	07:59-08:22/23	06:59	07:08	06:24	06:44-07:01/17	05:59	
	17:17		17:54		18:27	20:00	20:33		21:01	
7	07:58		07:37	07:58-08:23/25	06:58	07:06	06:23	06:43-07:02/19	05:59	
	17:18		17:55		18:29	20:01	20:34		21:02	
8	07:58		07:36	07:56-08:22/26	07:56	07:05	06:21	06:42-07:03/21	05:59	
	17:19		17:56		19:30	20:03	20:35		21:02	
9	07:57		07:35	07:56-08:22/26	07:55	07:03	06:20	06:40-07:02/22	05:58	
	17:20		17:57		19:31	20:04	20:36		21:03	
10	07:57		07:34	07:57-08:22/25	07:53	07:01	06:19	06:39-07:03/24	05:58	
	17:21		17:59		19:32	20:05	20:37		21:03	
11	07:57		07:33	07:57-08:22/25	07:51	07:00	06:18	06:38-07:03/25	05:58	
	17:22		18:00		19:33	20:06	20:38		21:04	
12	07:57		07:31	07:57-08:21/24	07:50	06:58	06:17	06:37-07:04/27	05:58	
	17:23		18:01		19:34	20:07	20:39		21:05	
13	07:56		07:30	07:58-08:21/23	07:48	06:57	06:16	06:36-07:04/28	05:58	
	17:24		18:02		19:35	20:08	20:40		21:05	
14	07:56		07:29	07:59-08:20/21	07:46	06:55	06:15	06:35-07:04/29	05:58	
	17:26		18:04		19:37	20:09	20:41		21:05	
15	07:56		07:28	08:00-08:18/18	07:45	06:53	06:14	06:34-07:04/30	05:58	
	17:27		18:05		19:38	20:10	20:42		21:06	
16	07:55		07:26	08:02-08:17/15	07:43	06:52	06:13	06:34-07:04/30	05:58	
	17:28		18:06		19:39	20:11	20:43		21:06	
17	07:55		07:25	08:05-08:15/10	07:41	06:50	06:12	06:35-07:05/30	05:58	
	17:29		18:07		19:40	20:12	20:44		21:07	
18	07:54		07:24		07:40	06:49	06:11	06:35-07:04/29	05:58	
	17:30		18:09		19:41	20:13	20:45		21:07	
19	07:54		07:22		07:38	06:47	06:10	06:35-07:04/29	05:58	
	17:31		18:10		19:42	20:14	20:46		21:07	
20	07:53		07:21		07:36	06:46	06:09	06:35-07:04/29	05:58	
	17:32		18:11		19:43	20:15	20:47		21:08	
21	07:53		07:19		07:35	06:44	06:08	06:35-07:03/28	05:58	
	17:34		18:12		19:44	20:17	20:48		21:08	
22	07:52		07:18		07:33	06:43	06:07	06:37-07:04/27	05:59	
	17:35		18:13		19:45	20:18	20:49		21:08	
23	07:51		07:16		07:31	06:41	06:07	06:37-07:03/26	05:59	
	17:36		18:15		19:46	20:19	20:50		21:08	
24	07:51		07:15		07:30	06:40	06:06	06:37-07:02/25	05:59	
	17:37		18:16		19:47	20:20	20:51		21:09	
25	07:50		07:13		07:28	06:38	06:05	06:38-07:03/25	05:59	
	17:39		18:17		19:49	20:21	20:51		21:09	
26	07:49		07:12		07:26	06:37	06:05	06:38-07:02/24	06:00	
	17:40		18:18		19:50	20:22	20:52		21:09	
27	07:48		07:10		07:25	06:35	06:04	06:39-07:01/22	06:00	
	17:41		18:19		19:51	20:23	20:53		21:09	
28	07:47		07:09		07:23	06:34	06:03	06:40-07:01/21	06:00	
	17:42		18:21		19:52	20:24	20:54		21:09	
29	07:47	08:07-08:12/5			07:21	06:33	06:03	06:40-07:00/20	06:01	
	17:44				19:53	20:25	20:55		21:09	
30	07:46	08:06-08:15/9			07:19	06:31	06:02	06:42-07:00/18	06:01	
	17:45				19:54	20:26	20:56		21:09	
31	07:45	08:05-08:16/11			07:18		06:02	06:42-06:58/16		
	17:46				19:55		20:57			
Potential sun hours	297		297		370	399	449		453	
Sum of minutes with flicker	40		351		0	0	674		37	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T72 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (489)

Assumptions for shadow calculations

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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 21:09	06:26 06:48-07:14/26 20:50	06:57 20:07	07:28 19:15	07:02 07:26-07:52/26 17:28	07:37 17:03
2	06:02 21:09	06:27 06:49-07:14/25 20:49	06:58 20:06	07:29 19:13	07:03 07:26-07:52/26 17:27	07:38 17:03
3	06:03 21:09	06:28 06:50-07:13/23 20:48	06:59 20:04	07:30 19:11	07:05 07:26-07:52/26 17:25	07:39 17:03
4	06:03 21:09	06:29 06:51-07:13/22 20:47	07:00 20:02	07:31 19:10	07:06 07:28-07:52/24 17:24	07:40 17:03
5	06:04 21:08	06:30 06:52-07:12/20 20:46	07:01 20:01	07:32 19:08	07:07 07:29-07:52/23 17:23	07:41 17:03
6	06:05 21:08	06:31 06:53-07:11/18 20:45	07:02 19:57	07:33 19:06	07:08 07:30-07:51/21 17:22	07:42 17:02
7	06:05 21:08	06:32 06:54-07:10/16 20:44	07:03 19:56	07:34 19:05	07:09 07:31-07:51/20 17:21	07:43 17:02
8	06:06 21:08	06:33 06:55-07:08/13 20:42	07:04 19:54	07:35 19:03	07:11 07:33-07:51/18 17:20	07:44 17:02
9	06:06 06:55-07:02/7 21:07	06:34 06:56-07:06/10 20:41	07:05 19:52	07:36 19:02	07:12 07:34-07:50/16 17:19	07:45 17:02
10	06:07 06:53-07:04/11 21:07	06:35 06:57-07:03/6 20:40	07:06 19:51	07:37 19:00	07:13 07:35-07:49/14 17:18	07:46 08:35-08:41/6 17:02
11	06:08 06:52-07:05/13 21:06	06:36 20:39	07:07 19:49	07:38 18:58	07:14 07:37-07:48/11 17:17	07:47 08:34-08:43/9 17:02
12	06:09 06:51-07:06/15 21:06	06:37 20:37	07:08 19:47	07:39 18:57	07:15 07:38-07:46/8 17:16	07:48 08:33-08:44/11 17:02
13	06:09 06:51-07:07/16 21:05	06:38 20:36	07:09 19:46	07:40 18:55	07:17 07:39-07:44/5 17:15	07:49 08:33-08:45/12 17:03
14	06:10 06:50-07:09/19 21:05	06:39 20:35	07:10 19:44	07:42 18:53	07:18 17:14	07:49 08:33-08:46/13 17:03
15	06:11 06:49-07:09/20 21:04	06:40 20:33	07:11 19:42	07:43 18:52	07:19 17:13	07:50 08:34-08:47/13 17:03
16	06:12 06:48-07:10/22 21:04	06:41 20:32	07:12 19:40	07:44 18:50	07:20 17:12	07:51 08:33-08:47/14 17:03
17	06:12 06:48-07:11/23 21:03	06:42 20:30	07:13 19:39	07:45 18:49	07:21 17:11	07:51 08:34-08:48/14 17:04
18	06:13 06:48-07:12/24 21:03	06:43 20:29	07:14 19:37	07:46 18:47	07:23 17:10	07:52 08:34-08:50/16 17:04
19	06:14 06:48-07:12/24 21:02	06:44 20:27	07:15 19:35	07:47 18:46	07:24 17:10	07:53 08:34-08:50/16 17:04
20	06:15 06:46-07:12/26 21:01	06:45 20:26	07:16 19:34	07:48 18:44	07:25 17:09	07:53 08:35-08:51/16 17:05
21	06:16 06:46-07:13/27 21:00	06:46 20:25	07:17 19:32	07:49 18:43	07:26 17:08	07:54 08:35-08:51/16 17:05
22	06:17 06:46-07:13/27 21:00	06:47 20:23	07:18 19:30	07:51 18:41	07:27 17:08	07:54 08:36-08:52/16 17:06
23	06:18 06:46-07:14/28 20:59	06:48 20:22	07:19 19:28	07:52 18:40	07:29 17:07	07:55 08:36-08:52/16 17:06
24	06:19 06:46-07:14/28 20:58	06:49 20:20	07:20 19:27	07:53 18:39	07:30 17:06	07:55 08:37-08:53/16 17:07
25	06:19 06:46-07:15/29 20:57	06:50 20:18	07:21 19:25	07:54 08:34-08:45/11 18:37	07:31 17:06	07:56 08:37-08:53/16 17:07
26	06:20 06:46-07:15/29 20:56	06:51 20:17	07:22 19:23	07:55 08:31-08:47/16 18:36	07:32 17:05	07:56 08:37-08:53/16 17:08
27	06:21 06:45-07:14/29 20:55	06:52 20:15	07:23 19:22	07:56 08:29-08:48/19 18:34	07:33 17:05	07:56 08:39-08:53/14 17:09
28	06:22 06:45-07:14/29 20:54	06:53 20:14	07:24 19:20	07:58 08:29-08:50/21 18:33	07:34 17:04	07:57 08:39-08:53/14 17:09
29	06:23 06:45-07:14/29 20:54	06:54 20:12	07:26 19:18	07:59 08:28-08:51/23 18:32	07:35 17:04	07:57 08:40-08:53/13 17:10
30	06:24 06:46-07:14/28 20:53	06:55 20:11	07:27 19:16	08:00 08:27-08:51/24 18:30	07:36 17:04	07:57 08:41-08:53/12 17:11
31	06:25 06:47-07:14/27 20:51	06:56 20:09		08:01 08:26-08:51/25 18:29		07:57 08:42-08:53/11 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	530	179	0	139	238	300

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T73 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (490)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:20-08:58/38 17:13	07:44 08:04-08:37/33 17:47	07:07 07:27-07:48/21 18:22	07:16 19:56	06:30 20:27	06:01 06:23-07:02/39 20:57
2	07:58 08:20-08:58/38 17:14	07:43 08:03-08:37/34 17:49	07:06 07:25-07:49/24 18:23	07:15 19:57	06:29 20:28	06:01 06:23-07:03/40 20:58
3	07:58 08:20-08:58/38 17:15	07:42 08:02-08:36/34 17:50	07:04 07:24-07:50/26 18:24	07:13 19:58	06:28 20:29	06:00 06:22-07:02/40 20:59
4	07:58 08:20-08:58/38 17:15	07:41 08:01-08:36/35 17:51	07:03 07:22-07:50/28 18:25	07:11 19:59	06:26 20:31	06:00 06:22-07:02/40 21:00
5	07:58 08:20-08:57/37 17:16	07:40 08:00-08:35/35 17:52 17:24-17:26/2	07:01 07:21-07:52/31 18:26	07:10 20:01	06:25 20:32	06:00 06:22-07:03/41 21:00
6	07:58 08:20-08:55/35 17:17	07:39 07:59-08:35/36 17:54 17:19-17:30/11	07:00 07:19-07:51/32 18:28	07:08 20:01	06:24 20:33	05:59 06:21-07:02/41 21:01
7	07:58 08:20-08:51/31 17:18	07:38 07:59-08:34/35 17:55 17:17-17:32/15	06:58 07:19-07:51/32 18:29	07:06 20:02	06:23 20:34	05:59 06:21-07:02/41 21:02
8	07:58 08:20-08:52/32 17:19	07:36 07:59-08:33/34 17:56 17:14-17:32/18	07:56 08:17-08:52/35 19:30	07:05 20:03	06:21 20:35	05:59 06:21-07:02/41 21:02
9	07:58 08:20-08:52/32 17:20	07:35 07:59-08:31/32 17:57 17:13-17:34/21	07:55 08:14-08:51/37 19:31	07:03 20:04	06:20 20:36	05:59 06:21-07:03/42 21:03
10	07:57 08:19-08:52/33 17:21	07:34 07:59-08:30/31 17:59 17:13-17:35/22	07:53 08:12-08:50/38 19:32	07:01 20:05	06:19 06:39-06:50/11 20:37	05:58 06:21-07:03/42 21:03
11	07:57 08:19-08:52/33 17:22	07:33 08:00-08:29/29 18:00 17:12-17:37/25	07:51 08:11-08:50/39 19:33	07:00 20:06	06:18 06:38-06:53/15 20:38	05:58 06:20-07:02/42 21:04
12	07:57 08:19-08:53/34 17:23	07:32 08:01-08:28/27 18:01 17:11-17:38/27	07:50 08:09-08:49/40 19:34	06:58 20:07	06:17 06:37-06:54/17 20:39	05:58 06:20-07:02/42 21:05
13	07:57 08:19-08:52/33 17:25	07:30 08:01-08:26/25 18:02 17:10-17:39/29	07:48 08:07-08:48/41 19:36	06:57 20:08	06:16 06:36-06:56/20 20:40	05:58 06:20-07:02/42 21:05
14	07:56 08:20-08:53/33 17:26	07:29 08:02-08:25/23 18:04 17:10-17:41/31	07:46 08:06-08:47/41 19:37	06:55 20:09	06:15 06:35-06:57/22 20:41	05:58 06:20-07:02/42 21:06
15	07:56 08:17-08:52/35 17:27	07:28 08:04-08:24/20 18:05 17:09-17:41/32	07:45 08:04-08:46/42 19:38	06:53 20:10	06:14 06:35-06:58/23 20:42	05:58 06:20-07:02/42 21:06
16	07:55 08:17-08:52/35 17:28	07:26 08:05-08:22/17 18:06 17:10-17:41/31	07:43 08:03-08:43/40 19:39	06:52 20:11	06:13 06:34-06:59/25 20:43	05:58 06:20-07:02/42 21:06
17	07:55 08:16-08:52/36 17:29	07:25 08:07-08:20/13 18:07 17:10-17:42/32	07:41 08:03-08:42/39 19:40	06:50 20:12	06:12 06:33-07:00/27 20:44	05:58 06:20-07:02/42 21:07
18	07:54 08:16-08:52/36 17:30	07:24 08:11-08:15/4 18:09 17:09-17:41/32	07:40 08:03-08:38/35 19:41	06:49 20:13	06:11 06:32-07:00/28 20:45	05:58 06:21-07:03/42 21:07
19	07:54 08:15-08:51/36 17:31	07:22 07:10-17:41/31 18:10	07:38 08:02-08:34/32 19:42	06:47 20:14	06:10 06:31-07:00/29 20:46	05:58 06:21-07:03/42 21:08
20	07:53 08:15-08:52/37 17:33	07:21 07:10-17:40/30 18:11	07:36 08:03-08:34/31 19:43	06:46 20:16	06:09 06:30-07:00/30 20:47	05:58 06:21-07:03/42 21:08
21	07:53 08:14-08:51/37 17:34	07:19 07:11-17:40/29 18:12	07:35 08:03-08:33/30 19:44	06:44 20:17	06:08 06:29-07:00/31 20:48	05:58 06:21-07:03/42 21:08
22	07:52 08:13-08:51/38 17:35	07:18 07:12-17:40/28 18:13	07:33 08:02-08:32/30 19:45	06:43 20:18	06:08 06:29-07:02/33 20:49	05:59 06:21-07:03/42 21:08
23	07:51 08:12-08:51/39 17:36	07:16 07:12-17:38/26 18:15	07:31 08:03-08:31/28 19:46	06:41 20:19	06:07 06:28-07:01/33 20:50	05:59 06:22-07:04/42 21:09
24	07:51 08:12-08:51/39 17:37	07:15 07:14-17:37/23 18:16	07:30 08:04-08:30/26 19:48	06:40 20:20	06:06 06:27-07:01/34 20:51	05:59 06:22-07:04/42 21:09
25	07:50 08:11-08:50/39 17:39	07:14 07:15-17:35/20 18:17 07:33-07:36/3	07:28 08:05-08:28/23 19:49	06:38 20:21	06:05 06:27-07:02/35 20:51	06:00 06:22-07:04/42 21:09
26	07:49 08:10-08:50/40 17:40	07:12 07:17-17:33/16 18:18 07:32-07:40/8	07:26 08:06-08:26/20 19:50	06:37 20:22	06:05 06:26-07:02/36 20:52	06:00 06:22-07:04/42 21:09
27	07:48 08:09-08:49/40 17:41	07:11 07:20-17:29/9 18:19 07:30-07:44/14	07:25 08:09-08:24/15 19:51	06:36 20:23	06:04 06:25-07:02/37 20:53	06:00 06:23-07:05/42 21:09
28	07:47 08:08-08:48/40 17:42	07:09 07:29-07:47/18 18:21	07:23 08:12-08:19/7 19:52	06:34 20:24	06:03 06:25-07:02/37 20:54	06:01 06:23-07:05/42 21:09
29	07:47 08:07-08:46/39 17:44		07:21 19:53	06:33 20:25	06:03 06:24-07:02/38 20:55	06:01 06:24-07:06/42 21:09
30	07:46 08:06-08:44/38 17:45		07:20 19:54	06:32 20:26	06:02 06:24-07:02/38 20:56	06:01 06:24-07:06/42 21:09
31	07:45 08:05-08:37/32 17:46		07:18 19:55		06:02 06:23-07:02/39 20:57	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1121	1080	863	0	638	1247

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T73 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (490)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-07:07/42 21:09	06:26 06:48-07:04/16 20:51	06:57 20:07	07:28 07:48-08:28/40 19:15	07:02 07:29-08:00/31 17:28 16:43-17:05/22	07:37 08:01-08:34/33 17:04
2	06:02 06:25-07:07/42 21:09	06:27 06:49-07:03/14 20:49	06:58 20:06	07:29 07:49-08:29/40 19:13	07:04 07:29-08:01/32 17:27 16:43-17:03/20	07:39 08:02-08:35/33 17:03
3	06:03 06:26-07:08/42 21:09	06:28 06:51-07:00/9 20:48	06:59 20:04	07:30 07:50-08:29/39 19:12	07:05 07:28-08:02/34 17:26 16:45-17:02/17	07:40 08:03-08:35/32 17:03
4	06:03 06:26-07:07/41 21:09	06:29 20:47	07:00 20:03	07:31 07:51-08:29/38 19:10	07:06 07:29-08:04/35 17:24 16:46-17:00/14	07:41 08:04-08:36/32 17:03
5	06:04 06:27-07:08/41 21:08	06:30 20:46	07:01 20:01	07:32 07:52-08:28/36 19:08	07:07 07:29-08:05/36 17:23 16:49-17:00/11	07:42 08:05-08:36/31 17:03
6	06:05 06:27-07:08/41 21:08	06:31 20:45	07:02 19:58	07:33 07:55-08:28/33 19:07	07:08 07:30-08:05/35 17:22	07:42 08:06-08:41/35 17:03
7	06:05 06:28-07:09/41 21:08	06:32 20:44	07:03 19:56	07:34 07:55-08:27/32 19:05	07:10 07:31-08:06/35 17:21	07:43 08:07-08:44/37 17:02
8	06:06 06:29-07:09/40 21:08	06:33 20:42	07:04 19:54	07:35 07:55-08:26/31 19:03	07:11 07:33-08:07/34 17:20	07:44 08:08-08:45/37 17:02
9	06:07 06:29-07:09/40 21:07	06:34 20:41	07:05 19:53	07:36 07:56-08:26/30 19:02	07:12 07:34-08:08/34 17:19	07:45 08:09-08:47/38 17:02
10	06:07 06:30-07:10/40 21:07	06:35 20:40	07:06 19:51	07:37 07:57-08:24/27 19:00	07:13 07:35-08:08/33 17:18	07:46 08:10-08:48/38 17:02
11	06:08 06:31-07:10/39 21:06	06:36 20:39	07:07 19:49	07:38 07:58-08:23/25 18:58	07:14 07:37-08:09/32 17:17	07:47 08:11-08:49/38 17:03
12	06:09 06:31-07:10/39 21:06	06:37 20:37	07:08 19:47	07:39 08:00-08:23/23 18:57	07:16 07:38-08:16/38 17:16	07:48 08:11-08:50/39 17:03
13	06:09 06:32-07:11/39 21:06	06:38 20:36	07:09 19:46	07:41 08:01-08:21/20 18:55	07:17 07:39-08:18/39 17:15	07:49 08:12-08:51/39 17:03
14	06:10 06:33-07:11/38 21:05	06:39 20:35	07:10 19:44	07:42 08:02-08:18/16 18:54	07:18 07:40-08:20/40 17:14	07:49 08:13-08:52/39 17:03
15	06:11 06:33-07:10/37 21:05	06:40 20:33	07:11 08:05-08:07/2 19:42	07:43 17:51-18:03/12 18:52 08:03-08:15/12	07:19 07:42-08:22/40 17:13	07:50 08:14-08:53/39 17:03
16	06:12 06:34-07:11/37 21:04	06:41 20:32	07:12 07:57-08:11/14 19:41	07:44 17:48-18:06/18 18:50 08:04-08:10/6	07:20 07:43-08:23/40 17:12	07:51 08:14-08:53/39 17:03
17	06:13 06:35-07:11/36 21:03	06:42 20:30	07:13 07:55-08:13/18 19:39	07:45 17:46-18:07/21 18:49	07:22 07:44-08:23/39 17:11	07:51 08:15-08:54/39 17:04
18	06:13 06:36-07:12/36 21:03	06:43 20:29	07:14 07:52-08:15/23 19:37	07:46 17:44-18:08/24 18:47	07:23 07:46-08:25/39 17:11	07:52 08:16-08:55/39 17:04
19	06:14 06:37-07:12/35 21:02	06:44 20:28	07:15 07:51-08:16/25 19:35	07:47 17:43-18:10/27 18:46	07:24 07:47-08:26/39 17:10	07:53 08:16-08:55/39 17:04
20	06:15 06:38-07:11/33 21:01	06:45 20:26	07:16 07:49-08:17/28 19:34	07:48 17:42-18:10/28 18:44	07:25 07:48-08:26/38 17:09	07:53 08:17-08:56/39 17:05
21	06:16 06:38-07:11/33 21:01	06:46 20:25	07:17 07:48-08:17/29 19:32	07:49 17:41-18:11/30 18:43	07:26 07:49-08:26/37 17:08	07:54 08:17-08:56/39 17:05
22	06:17 06:39-07:11/32 21:00	06:47 20:23	07:18 07:47-08:18/31 19:30	07:51 17:40-18:11/31 18:41	07:27 07:51-08:28/37 17:08	07:54 08:18-08:57/39 17:06
23	06:18 06:40-07:11/31 20:59	06:48 20:22	07:19 07:46-08:18/32 19:29	07:52 17:40-18:11/31 18:40	07:29 07:52-08:28/36 17:07	07:55 08:18-08:57/39 17:06
24	06:19 06:41-07:11/30 20:58	06:49 20:20	07:20 07:46-08:18/32 19:27	07:53 08:40-08:47/7 18:39 17:40-18:12/32	07:30 07:53-08:29/36 17:07	07:55 08:19-08:58/39 17:07
25	06:20 06:42-07:11/29 20:57	06:50 20:19	07:22 07:45-08:20/35 19:25	07:54 08:36-08:51/15 18:37 17:40-18:11/31	07:31 07:54-08:30/36 17:06	07:56 08:19-08:58/39 17:08
26	06:20 06:43-07:10/27 20:56	06:51 20:17	07:23 07:45-08:23/38 19:23	07:55 08:34-08:52/18 18:36 17:39-18:11/32	07:32 07:55-08:31/36 17:06	07:56 08:19-08:58/39 17:08
27	06:21 06:44-07:10/26 20:56	06:52 20:15	07:24 07:44-08:24/40 19:22	07:56 08:32-08:53/21 18:34 17:39-18:10/31	07:33 07:57-08:32/35 17:05	07:56 08:20-08:59/39 17:09
28	06:22 06:45-07:09/24 20:55	06:53 20:14	07:25 07:45-08:27/42 19:20	07:58 08:32-08:55/23 18:33 17:40-18:10/30	07:34 08:00-08:33/33 17:05	07:57 08:20-08:59/39 17:09
29	06:23 06:45-07:08/23 20:54	06:54 20:12	07:26 07:46-08:27/41 19:18	07:59 08:31-08:56/25 18:32 17:40-18:09/29	07:35 08:00-08:33/33 17:04	07:57 08:20-08:59/39 17:10
30	06:24 06:46-07:07/21 20:53	06:55 20:11	07:27 07:47-08:28/41 19:17	08:00 08:30-08:57/27 18:30 17:40-18:07/27	07:36 08:00-08:34/34 17:04	07:57 08:20-08:59/39 17:11
31	06:25 06:47-07:06/19 20:52	06:56 20:09		08:01 08:29-08:58/29 18:29 17:41-18:05/24		07:58 08:20-08:59/39 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1074	39	471	1071	1160	1164

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T74 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (491)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:43-09:00/17 17:13	07:44 16:52-17:08/16 17:47 08:04-08:49/45	07:07 18:22	07:16 19:56	06:30 06:50-07:43/53 20:27	06:01 06:23-06:48/25 20:57 20:28-20:33/5
2	07:58 08:44-09:00/16 17:14	07:43 16:54-17:07/13 17:49 08:03-08:49/46	07:06 18:23	07:15 19:57	06:29 06:49-07:42/53 20:28	06:01 06:23-06:49/26 20:58 20:27-20:34/7
3	07:58 08:45-09:00/15 17:15	07:42 16:57-17:04/7 17:50 08:02-08:49/47	07:04 18:24	07:13 19:58	06:28 06:48-07:39/51 20:29	06:00 06:22-06:49/27 20:59 20:26-20:34/8
4	07:58 08:47-09:00/13 17:15	07:41 08:02-08:49/47 17:51	07:03 18:25	07:11 19:59	06:26 06:48-07:39/51 20:31	06:00 06:22-06:50/28 21:00 20:25-20:35/10
5	07:58 08:49-08:59/10 17:16	07:40 08:02-08:48/46 17:52	07:01 18:26	07:10 20:01	06:25 06:48-07:38/50 20:32	06:00 06:22-06:51/29 21:00 20:25-20:36/11
6	07:58 08:52-08:57/5 17:17 16:49-16:51/2	07:39 08:02-08:47/45 17:54	07:00 18:28	07:08 07:35-07:40/5 20:01	06:24 06:48-07:37/49 20:33	05:59 06:21-06:50/29 21:01 20:24-20:36/12
7	07:58 16:48-16:52/4 17:18 08:24-08:26/2	07:38 08:02-08:46/44 17:55	06:58 18:29	07:06 07:29-07:45/16 20:02	06:23 06:47-07:36/49 20:34	05:59 06:21-06:51/30 21:02 20:23-20:37/14
8	07:58 16:47-16:53/6 17:19 08:21-08:30/9	07:36 08:02-08:45/43 17:56	07:56 19:30	07:05 07:26-07:48/22 20:03	06:21 06:48-07:34/46 20:35	05:59 06:21-06:52/31 21:02 20:23-20:38/15
9	07:58 16:46-16:54/8 17:20 08:20-08:33/13	07:35 08:01-08:43/42 17:57	07:55 19:31	07:03 07:24-07:49/25 20:04	06:20 06:48-07:33/45 20:36	05:59 06:21-06:52/31 21:03 20:22-20:38/16
10	07:57 16:46-16:55/9 17:21 08:19-08:34/15	07:34 08:01-08:41/40 17:59	07:53 19:32	07:01 07:21-07:50/29 20:05	06:19 06:47-07:30/43 20:37	05:58 06:21-06:53/32 21:03 20:21-20:38/17
11	07:57 16:46-16:56/10 17:22 08:19-08:36/17	07:33 08:02-08:37/35 18:00	07:51 19:33	07:00 07:20-07:52/32 20:06	06:18 06:47-07:27/40 20:38	05:58 06:20-06:52/32 21:04 20:21-20:39/18
12	07:57 16:46-16:58/12 17:23 08:19-08:38/19	07:32 08:02-08:37/35 18:01	07:50 19:34	06:58 07:19-07:52/33 20:07	06:17 06:47-07:21/34 20:39	05:58 06:20-06:53/33 21:05 20:21-20:39/18
13	07:57 16:45-16:58/13 17:25 08:18-08:38/20	07:30 08:02-08:36/34 18:02	07:48 19:36	06:57 07:18-07:53/35 20:08	06:16 06:47-07:21/34 20:40	05:58 06:20-06:53/33 21:05 20:21-20:40/19
14	07:56 16:45-17:00/15 17:26 08:18-08:40/22	07:29 08:03-08:36/33 18:04	07:46 19:37	06:55 07:16-07:53/37 20:09	06:15 06:48-07:20/32 20:41	05:58 06:20-06:53/33 21:06 20:21-20:40/19
15	07:56 16:44-17:01/17 17:27 08:17-08:41/24	07:28 08:04-08:35/31 18:05	07:45 19:38	06:53 07:14-07:54/40 20:10	06:14 06:49-07:21/32 20:42	05:58 06:20-06:54/34 21:06 20:20-20:40/20
16	07:55 16:45-17:02/17 17:28 08:17-08:42/25	07:26 08:04-08:34/30 18:06	07:43 19:39	06:52 07:12-07:54/42 20:11	06:13 06:50-07:20/30 20:43	05:58 06:20-06:54/34 21:06 20:20-20:41/21
17	07:55 16:44-17:03/19 17:29 08:16-08:43/27	07:25 08:05-08:33/28 18:07	07:41 19:40	06:50 07:11-07:54/43 20:12	06:12 06:50-07:19/29 20:44	05:58 06:20-06:54/34 21:07 20:20-20:41/21
18	07:54 16:45-17:05/20 17:30 08:16-08:44/28	07:24 08:06-08:31/25 18:09	07:40 19:41	06:49 07:10-07:54/44 20:13	06:11 06:51-07:18/27 20:45	05:58 06:21-06:55/34 21:07 20:20-20:41/21
19	07:54 16:44-17:06/22 17:31 08:15-08:45/30	07:22 08:08-08:30/22 18:10	07:38 19:42	06:47 07:09-07:54/45 20:14	06:10 06:51-07:17/26 20:46	05:58 06:21-06:55/34 21:08 20:21-20:42/21
20	07:53 16:44-17:07/23 17:33 08:14-08:45/31	07:21 08:10-08:28/18 18:11	07:36 19:43	06:46 07:08-07:53/45 20:16	06:09 06:52-07:16/24 20:47	05:58 06:21-06:55/34 21:08 20:21-20:43/22
21	07:53 16:45-17:09/24 17:34 08:14-08:47/33	07:19 08:13-08:24/11 18:12	07:35 19:44	06:44 07:07-07:53/46 20:17	06:08 06:53-07:15/22 20:48	05:59 06:21-06:56/35 21:08 20:21-20:43/22
22	07:52 16:45-17:10/25 17:35 08:13-08:47/34	07:18 18:13	07:33 19:45	06:43 07:06-07:52/46 20:18	06:08 06:55-07:15/20 20:49	05:59 06:21-06:55/34 21:08 20:21-20:43/22
23	07:51 16:45-17:11/26 17:36 08:12-08:47/35	07:16 18:15	07:31 19:46	06:41 07:06-07:52/46 20:19	06:07 06:56-07:14/18 20:50	05:59 06:22-06:56/34 21:09 20:21-20:42/21
24	07:51 16:46-17:12/26 17:37 08:12-08:49/37	07:15 18:16	07:30 19:48	06:40 07:03-07:51/48 20:20	06:06 06:57-07:12/15 20:51 06:31-06:35/4	05:59 06:22-06:56/34 21:09 20:22-20:43/21
25	07:50 16:46-17:12/26 17:39 08:11-08:49/38	07:14 18:17	07:28 19:49	06:38 06:59-07:50/51 20:21	06:05 06:59-07:11/12 20:51 06:28-06:40/12	06:00 06:22-06:56/34 21:09 20:22-20:43/21
26	07:49 16:47-17:12/25 17:40 08:10-08:49/39	07:12 18:18	07:26 19:50	06:37 06:57-07:50/53 20:22	06:05 07:02-07:07/5 20:52 06:26-06:41/15	06:00 06:22-06:56/34 21:09 20:22-20:43/21
27	07:48 16:47-17:12/25 17:41 08:09-08:49/40	07:11 18:19	07:25 19:51	06:36 06:55-07:48/53 20:23	06:04 06:25-06:42/17 20:53	06:00 06:23-06:57/34 21:09 20:23-20:44/21
28	07:48 16:48-17:11/23 17:42 08:08-08:50/42	07:09 18:21	07:23 19:52	06:34 06:54-07:48/54 20:24	06:03 06:25-06:44/19 20:54	06:01 06:23-06:57/34 21:09 20:23-20:43/20
29	07:47 16:48-17:11/23 17:44 08:07-08:50/43		07:21 19:53	06:33 06:53-07:47/54 20:25	06:03 06:24-06:45/21 20:55	06:01 06:24-06:57/33 21:09 20:25-20:44/19
30	07:46 16:49-17:10/21 17:45 08:06-08:50/44		07:20 19:54	06:32 06:51-07:45/54 20:26	06:02 06:24-06:46/22 20:56	06:01 06:24-06:57/33 21:09 20:25-20:43/18
31	07:45 16:50-17:09/19 17:46 08:05-08:50/45		07:18 19:55		06:02 06:23-06:47/24 20:57 20:31-20:32/1	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1248	783	0	998	1025	1483

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T74 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (491)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-06:57/32 21:09 20:26-20:44/18	06:26 06:58-07:32/34 20:51	06:57 07:19-07:51/32 20:07	07:28 19:15	07:02 07:31-08:11/40 17:28	07:37 16:28-16:39/11 17:04 08:01-08:18/17
2	06:02 06:25-06:57/32 21:09 20:26-20:43/17	06:27 06:57-07:39/42 20:49	06:58 07:20-07:49/29 20:06	07:29 19:13	07:04 07:31-08:13/42 17:27	07:39 16:29-16:38/9 17:03 08:02-08:17/15
3	06:03 06:26-06:58/32 21:09 20:27-20:44/17	06:28 06:57-07:41/44 20:48	06:59 07:22-07:47/25 20:04	07:30 19:12	07:05 07:31-08:14/43 17:26	07:40 16:30-16:38/8 17:03 08:03-08:16/13
4	06:04 06:26-06:57/31 21:09 20:27-20:43/16	06:29 06:57-07:43/46 20:47	07:00 07:23-07:45/22 20:03	07:31 19:10	07:06 07:31-08:16/45 17:24	07:41 16:31-16:37/6 17:03 08:05-08:15/10
5	06:04 06:27-06:57/30 21:08 20:29-20:43/14	06:30 06:57-07:45/48 20:46	07:01 07:26-07:42/16 20:01	07:32 19:08	07:07 07:31-08:17/46 17:23	07:42 16:33-16:37/4 17:03 08:09-08:12/3
6	06:05 06:27-06:57/30 21:08 20:29-20:42/13	06:31 06:57-07:46/49 20:45	07:02 07:30-07:37/7 19:58	07:33 19:07	07:08 07:32-08:18/46 17:22	07:42 08:38-08:43/5 17:03 16:35-16:37/2
7	06:05 06:28-06:57/29 21:08 20:31-20:42/11	06:32 06:57-07:47/50 20:44	07:03 19:56	07:34 19:05	07:10 07:32-08:18/46 17:21	07:43 08:37-08:46/9 17:02
8	06:06 06:29-06:57/28 21:08 20:31-20:41/10	06:33 06:57-07:48/51 20:42	07:04 19:54	07:35 19:03	07:11 16:27-16:35/8 17:20 07:33-08:20/47	07:44 08:35-08:48/13 17:02
9	06:07 06:29-06:56/27 21:07 20:33-20:42/9	06:34 06:58-07:49/51 20:41	07:05 19:53	07:36 19:02	07:12 16:25-16:38/13 17:19 07:34-08:20/46	07:45 08:35-08:49/14 17:02
10	06:07 06:30-06:56/26 21:07 20:34-20:42/8	06:35 06:58-07:49/51 20:40	07:06 19:51	07:37 19:00	07:13 16:23-16:39/16 17:18 07:35-08:20/45	07:46 08:34-08:50/16 17:02
11	06:08 06:31-06:56/25 21:06 20:35-20:40/5	06:36 06:58-07:51/53 20:39	07:07 19:49	07:38 18:58	07:14 16:22-16:41/19 17:17 07:37-08:22/45	07:47 08:34-08:51/17 17:03
12	06:09 06:31-06:55/24 21:06 20:37-20:40/3	06:37 06:59-07:52/53 20:37	07:08 19:47	07:39 18:57	07:16 16:21-16:42/21 17:16 07:38-08:22/44	07:48 08:33-08:52/19 17:03
13	06:09 06:32-06:55/23 21:06	06:38 07:00-07:54/54 20:36	07:09 19:46	07:41 18:55	07:17 16:20-16:43/23 17:15 07:39-08:22/43	07:49 08:33-08:53/20 17:03
14	06:10 06:33-06:55/22 21:05	06:39 07:01-07:55/54 20:35	07:10 19:44	07:42 18:54	07:18 16:19-16:43/24 17:14 07:40-08:21/41	07:49 08:34-08:54/20 17:03
15	06:11 06:34-06:54/20 21:05	06:40 07:02-07:56/54 20:33	07:11 19:42	07:43 18:52	07:19 16:20-16:45/25 17:13 07:42-08:22/40	07:50 08:34-08:55/21 17:03
16	06:12 06:34-06:52/18 21:04	06:41 07:03-07:56/53 20:32	07:12 19:41	07:44 18:51	07:20 16:19-16:45/26 17:12 07:43-08:22/39	07:51 08:34-08:55/21 17:03
17	06:13 06:35-06:51/16 21:03	06:42 07:04-07:57/53 20:30	07:13 19:39	07:45 18:49	07:22 16:19-16:45/26 17:11 07:44-08:22/38	07:51 08:34-08:56/22 17:04
18	06:13 07:10-07:19/9 21:03 06:37-06:50/13	06:43 07:06-07:57/51 20:29	07:14 19:37	07:46 18:47	07:23 16:19-16:45/26 17:11 07:46-08:23/37	07:52 08:35-08:57/22 17:04
19	06:14 07:08-07:21/13 21:02 06:39-06:48/9	06:44 07:10-07:57/47 20:28	07:15 19:35	07:47 18:46	07:24 16:20-16:46/26 17:10 07:47-08:22/35	07:53 08:35-08:57/22 17:04
20	06:15 07:07-07:23/16 21:01	06:45 07:11-07:57/46 20:26	07:16 19:34	07:48 08:48-08:51/3 18:44	07:25 16:20-16:45/25 17:09 07:48-08:22/34	07:53 08:35-08:58/23 17:05
21	06:16 07:05-07:24/19 21:01	06:46 07:11-07:57/46 20:25	07:17 19:32	07:49 08:42-08:56/14 18:43	07:26 16:20-16:44/24 17:08 07:49-08:22/33	07:54 08:35-08:58/23 17:05
22	06:17 07:04-07:25/21 21:00	06:47 07:11-07:57/46 20:23	07:18 19:30	07:51 08:39-08:58/19 18:42	07:27 16:20-16:43/23 17:08 07:51-08:22/31	07:54 08:36-08:59/23 17:06
23	06:18 07:03-07:26/23 20:59	06:48 07:11-07:57/46 20:22	07:19 19:29	07:52 08:38-09:01/23 18:40	07:29 16:21-16:43/22 17:07 07:52-08:22/30	07:55 08:36-08:59/23 17:06
24	06:19 07:02-07:27/25 20:58	06:49 07:12-07:57/45 20:20	07:20 19:27	07:53 08:36-09:02/26 18:39	07:30 16:22-16:42/20 17:07 07:53-08:21/28	07:55 08:38-09:00/22 17:07
25	06:20 07:02-07:28/26 20:57	06:50 07:12-07:56/44 20:19	07:22 19:25	07:54 08:35-09:03/28 18:37	07:31 16:22-16:41/19 17:06 07:54-08:21/27	07:56 08:38-09:00/22 17:08
26	06:20 07:01-07:29/28 20:56	06:51 07:13-07:56/43 20:17	07:23 19:23	07:55 08:33-09:04/31 18:36	07:32 16:23-16:40/17 17:06 07:55-08:20/25	07:56 08:38-09:00/22 17:08
27	06:21 07:00-07:30/30 20:56	06:52 07:14-07:56/42 20:15	07:24 19:22	07:56 08:32-09:04/32 18:34	07:33 16:23-16:40/17 17:05 07:57-08:21/24	07:56 08:39-09:01/22 17:09
28	06:22 07:00-07:31/31 20:55	06:53 07:15-07:55/40 20:14	07:25 19:20	07:58 08:32-09:06/34 18:33	07:34 16:25-16:40/15 17:05 07:58-08:20/22	07:57 08:40-09:01/21 17:09
29	06:23 06:59-07:30/31 20:54	06:54 07:17-07:54/37 20:12	07:26 19:18	07:59 08:32-09:06/34 18:32	07:35 16:26-16:40/14 17:04 07:59-08:20/21	07:57 08:40-09:01/21 17:10
30	06:24 06:58-07:31/33 20:53	06:55 07:18-07:53/35 20:11	07:27 19:17	08:00 08:31-09:06/35 18:31	07:36 16:27-16:39/12 17:04 08:00-08:19/19	07:57 08:41-09:01/20 17:11
31	06:25 06:58-07:31/33 20:52	06:56 07:19-07:52/33 20:09		08:01 08:30-09:06/36 18:29		07:58 08:42-09:01/19 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	946	1441	131	315	1563	600

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T75 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (492)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:20-09:04/44	07:44 08:04-08:48/44	07:07	07:16 07:44-08:15/31	06:30 06:50-07:05/15	06:01 06:28-06:52/24
	17:13 16:02-16:36/34	17:47 16:38-17:16/38	18:22	19:56 18:39-19:19/40	20:27 18:22-19:25/63	20:57 20:05-20:33/28
2	07:58 08:20-09:04/44	07:43 08:03-08:47/44	07:06	07:15 07:34-08:15/41	06:29 06:49-07:06/17	06:01 06:29-06:53/24
	17:14 16:02-16:37/35	17:49 16:39-17:16/37	18:23	19:57 18:38-19:21/43	20:28 18:23-19:24/61	20:58 20:05-20:34/29
3	07:58 08:20-09:05/45	07:42 08:02-08:44/42	07:04	07:13 07:32-08:14/42	06:28 06:48-07:07/19	06:00 06:29-06:52/23
	17:15 16:03-16:37/34	17:50 16:39-17:17/38	18:24	19:58 18:35-19:22/47	20:29 18:22-19:23/61	20:59 20:04-20:34/30
4	07:58 08:20-09:05/45	07:41 08:01-08:44/43	07:03	07:11 07:30-08:12/42	06:26 06:46-07:07/21	06:00 06:30-06:52/22
	17:16 16:03-16:37/34	17:51 16:39-17:17/38	18:25	19:59 18:33-19:23/50	20:30 18:23-19:22/59	20:59 20:04-20:35/31
5	07:58 08:20-09:06/46	07:40 08:00-08:44/44	07:01	07:10 07:29-08:11/42	06:25 06:45-07:08/23	06:00 06:31-06:52/21
	17:16 16:04-16:38/34	17:52 16:40-17:17/37	18:26	20:00 18:32-19:25/53	20:31 18:24-19:22/58	21:00 20:05-20:36/31
6	07:58 08:20-09:06/46	07:38 07:59-08:43/44	06:59	07:08 07:27-08:09/42	06:24 06:44-07:09/25	05:59 06:30-06:51/21
	17:17 16:05-16:38/33	17:54 16:41-17:16/35	18:28	20:00 18:30-19:26/56	20:33 18:25-19:21/56	21:01 20:04-20:36/32
7	07:58 08:20-09:07/47	07:37 07:58-08:42/44 16:40-17:15/35	06:58	07:06 07:25-08:06/41	06:23 06:43-07:09/26	05:59 06:31-06:51/20
	17:18 16:05-16:39/34	17:55 17:25-17:31/6	18:29	20:01 18:28-19:26/58	20:34 18:26-19:20/54	21:01 20:04-20:36/32
8	07:58 08:20-09:07/47	07:36 07:56-08:40/44 16:41-17:15/34	07:56	07:05 07:24-08:03/39	06:22 06:42-07:09/27	05:59 06:32-06:51/19
	17:19 16:06-16:39/33	17:56 17:21-17:32/11	19:30	20:03 18:27-19:27/60	20:35 18:27-19:20/53	21:02 20:04-20:37/33
9	07:57 08:19-09:07/48	07:35 07:55-08:39/44 16:42-17:14/32	07:55	07:03 18:26-19:28/62	06:20 06:41-07:10/29	05:59 06:33-06:51/18
	17:20 16:06-16:38/32	17:58 17:20-17:34/14	19:31	20:04 07:22-07:52/30	20:36 18:28-19:19/51	21:03 20:04-20:38/34
10	07:57 08:19-09:07/48	07:34 07:54-08:37/43 16:44-17:14/30	07:53	07:01 18:25-19:28/63	06:19 06:40-07:10/30	05:58 06:33-06:51/18
	17:21 16:07-16:39/32	17:59 17:18-17:36/18	19:32	20:05 07:21-07:52/31	20:37 18:28-19:17/49	21:03 20:05-20:39/34
11	07:57 08:19-09:08/49	07:33 07:53-08:32/39 16:45-17:13/28	07:51	07:00 18:24-19:29/65	06:18 06:38-07:09/31	05:58 06:34-06:51/17
	17:22 16:08-16:39/31	18:00 17:17-17:37/20	19:33	20:06 07:21-07:52/31	20:38 18:29-19:16/47	21:04 20:04-20:38/34
12	07:57 08:18-09:08/50	07:31 07:51-08:25/34 16:46-17:11/25	07:50	06:58 18:23-19:29/66	06:17 06:37-07:09/32	05:58 06:34-06:50/16
	17:24 16:08-16:38/30	18:01 17:16-17:38/22	19:34	20:07 07:20-07:51/31	20:39 18:30-19:15/45	21:04 20:04-20:39/35
13	07:56 08:18-09:08/50 16:51-16:53/2	07:30 07:50-08:23/33 16:48-17:10/22	07:48	06:57 18:23-19:29/66	06:16 06:36-07:08/32	05:58 06:34-06:50/16
	17:25 16:10-16:39/29	18:03 17:15-17:39/24	19:35	20:08 07:21-07:51/30	20:40 18:32-19:13/41	21:05 20:04-20:39/35
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	17:26 16:11-16:39/28	18:04 17:15-17:41/26	19:37	20:09 07:20-07:50/30	20:41 18:33-19:12/39	21:05 20:04-20:40/36
15	07:56 08:17-09:08/51 16:45-17:00/15	07:28 07:47-08:18/31 16:53-17:04/11	07:45	06:53 18:22-19:30/68	06:14 06:35-07:09/34	05:58 06:35-06:50/15
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16	07:55 08:17-09:09/52 16:44-17:03/19	07:26 07:46-08:17/31	07:43	06:52 18:21-19:29/68	06:13 06:34-07:08/34	05:58 06:36-06:50/14
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17	07:55 08:16-09:08/52 16:43-17:03/20	07:25 07:45-08:15/30	07:41	06:50 18:20-19:29/69	06:12 06:33-07:08/35	05:58 06:37-06:51/14
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18	07:54 08:16-09:08/52 16:42-17:04/22	07:23 07:43-08:11/28	07:40	06:49 18:20-19:29/69	06:11 06:32-07:07/35	05:58 06:37-06:51/14
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	17:35 16:25-16:30/5	18:13 17:14-17:42/28	19:45	20:18 07:29-07:37/8	20:49	21:08 20:06-20:42/36
23	07:51 08:12-09:05/53	07:16 17:16-17:42/26	07:31 07:50-08:16/26	06:41 18:20-19:29/69	06:07 06:28-07:03/35	05:59 06:39-06:52/13
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	17:40 16:39-17:14/35	18:18 07:45-07:57/12	19:50	20:22	20:52 20:09-20:28/19	21:09 20:06-20:43/37
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	17:41 16:39-17:14/35	18:19 07:47-07:53/6	19:51	20:23	20:53 06:27-06:53/26	21:09 20:07-20:43/36
28	07:47 08:08-08:56/48	07:09	07:23 07:45-08:18/33	06:34 18:21-19:27/66	06:04 06:27-06:53/26	06:01 06:38-06:53/15
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	17:45 16:38-17:16/38		19:54 18:46-19:14/28	20:26 18:21-19:25/64	20:56 20:06-20:31/25	21:09 20:08-20:43/35
31	07:45 08:05-08:50/45		07:18 07:44-08:16/32		06:02 06:29-06:53/24	
	17:46 16:38-17:16/38		19:55 18:42-19:17/35		20:56 20:05-20:32/27	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	2641	1804	436	2576	1992	1533

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T75 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (492)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:38-06:55/17	06:26 06:48-07:19/31	06:57 18:23-19:28/65	07:28	07:02 07:24-08:07/43 16:13-16:44/31	07:37 08:01-08:50/49
	21:09 20:09-20:44/35	20:50 18:41-19:26/45	20:07 07:20-07:51/31	19:15	17:28 16:47-17:04/17	17:04 15:50-16:21/31
2	06:03 06:38-06:55/17	06:27 06:49-07:19/30	06:58 18:24-19:27/63	07:29	07:03 07:25-08:09/44 16:12-16:44/32	07:38 08:02-08:50/48
	21:09 20:09-20:43/34	20:49 18:39-19:27/48	20:06 07:20-07:50/30	19:13	17:27 16:50-17:04/14	17:03 15:50-16:22/32
3	06:03 06:38-06:56/18	06:28 06:50-07:19/29	06:59 18:24-19:26/62	07:30	07:05 07:26-08:10/44 16:11-16:45/34	07:39 08:03-08:51/48
	21:09 20:09-20:43/34	20:48 18:38-19:28/50	20:04 07:20-07:50/30	19:11	17:26 16:52-17:02/10	17:03 15:50-16:22/32
4	06:04 06:37-06:56/19	06:29 06:51-07:19/28	07:00 07:50-08:00/10 07:21-07:49/28	07:31	07:06 07:27-08:11/44 16:10-16:45/35	07:40 08:04-08:51/47
	21:08 20:09-20:43/34	20:47 18:37-19:29/52	20:02 18:24-19:24/60	19:10	17:24 16:56-17:00/4	17:03 15:50-16:23/33
5	06:04 06:38-06:57/19	06:30 06:52-07:19/27	07:01 07:22-08:03/41	07:32	07:07 07:29-08:13/44	07:41 08:05-08:52/47
	21:08 20:10-20:43/33	20:46 18:36-19:30/54	20:01 18:25-19:23/58	19:08	17:23 16:10-16:46/36	17:03 15:51-16:24/33
6	06:05 06:37-06:57/20	06:31 06:53-07:19/26	07:02 07:23-08:05/42	07:33	07:08 07:30-08:14/44	07:42 08:06-08:52/46
	21:08 20:10-20:42/32	20:45 18:35-19:30/55	19:57 18:26-19:22/56	19:07	17:22 16:10-16:46/36	17:03 15:51-16:24/33
7	06:05 06:37-06:58/21	06:32 06:54-07:18/24	07:03 07:24-08:06/42	07:34	07:09 07:31-08:14/43	07:43 08:07-08:53/46
	21:08 20:11-20:42/31	20:44 18:34-19:31/57	19:56 18:27-19:20/53	19:05	17:21 16:09-16:46/37	17:03 15:51-16:25/34
8	06:06 06:37-06:59/22	06:33 06:55-07:18/23	07:04 07:25-08:07/42	07:35	07:11 07:33-08:16/43	07:44 08:08-08:53/45
	21:07 20:12-20:42/30	20:42 18:33-19:32/59	19:54 18:28-19:18/50	19:03	17:20 16:09-16:46/37	17:03 15:51-16:25/34
9	06:07 06:36-06:59/23	06:34 06:56-07:17/21	07:05 07:26-08:08/42	07:36	07:12 07:34-08:18/44	07:45 08:09-08:54/45
	21:07 20:11-20:41/30	20:41 18:33-19:32/59	19:52 18:29-19:17/48	19:02	17:19 16:10-16:47/37	17:03 15:52-16:26/34
10	06:07 06:37-07:00/23	06:35 06:57-07:16/19	07:06 07:27-08:08/41	07:37	07:13 07:35-08:19/44	07:46 08:10-08:54/44
	21:07 20:12-20:41/29	20:40 18:32-19:33/61	19:51 18:30-19:14/44	19:00	17:18 16:09-16:47/38	17:03 15:51-16:26/35
11	06:08 06:37-07:01/24	06:36 06:58-07:15/17	07:07 07:37-08:08/31	07:38	07:14 07:36-08:21/45	07:47 08:10-08:54/44
	21:06 20:13-20:41/28	20:38 18:31-19:33/62	19:49 18:32-19:12/40	18:58	17:17 16:09-16:47/38	17:03 15:52-16:26/34
12	06:09 06:36-07:00/24	06:37 06:59-07:13/14	07:08 07:36-08:09/33	07:39	07:15 07:38-08:24/46	07:48 08:11-08:55/44
	21:06 20:13-20:40/27	20:37 18:30-19:34/64	19:47 18:33-19:08/35	18:57	17:16 16:10-16:48/38	17:03 15:52-16:27/35
13	06:10 06:36-07:01/25	06:38 07:00-07:11/11	07:09 07:36-08:08/32	07:40	07:17 07:39-08:26/47	07:48 08:12-08:55/43
	21:05 20:14-20:40/26	20:36 18:30-19:34/64	19:46 18:36-19:05/29	18:55	17:15 16:10-16:47/37	17:03 15:53-16:28/35
14	06:10 06:36-07:02/26	06:39 07:01-07:08/7	07:10 07:35-08:08/33	07:42 17:57-18:05/8	07:18 07:40-08:28/48	07:49 08:13-08:56/43
	21:05 20:15-20:40/25	20:34 18:29-19:34/65	19:44 18:40-19:00/20	18:54	17:14 16:10-16:47/37	17:03 15:54-16:28/34
15	06:11 06:37-07:02/25	06:40 18:28-19:34/66	07:11 07:34-08:07/33	07:43 17:53-18:08/15	07:19 07:42-08:32/50	07:50 08:13-08:56/43 15:53-16:28/35
	21:04 20:15-20:38/23	20:33	19:42 18:49-18:50/1	18:52 08:18-08:27/9	17:13 16:11-16:46/35	17:03 15:51-15:52/1
16	06:12 06:36-07:02/26	06:41 18:28-19:35/67	07:12 07:34-08:06/32	07:44 17:51-18:10/19	07:20 07:43-08:34/51	07:51 08:14-08:56/42
	21:04 20:16-20:38/22	20:32	19:40	18:50 08:15-08:29/14	17:12 16:12-16:47/35	17:04 15:49-16:29/40
17	06:13 06:36-07:07/31	06:42 18:26-19:34/68	07:13 07:34-08:06/32	07:45 17:49-18:11/22	07:21 07:44-08:36/52	07:51 08:15-08:57/42
	21:03 20:18-20:38/20	20:30	19:39	18:49 08:13-08:31/18	17:11 16:12-16:46/34	17:04 15:49-16:30/41
18	06:14 06:36-07:10/34	06:43 18:26-19:34/68	07:14 07:34-08:05/31	07:46 17:47-18:12/25	07:23 07:45-08:38/53	07:52 08:15-08:57/42
	21:02 20:19-20:37/18	20:29	19:37	18:47 08:12-08:31/19	17:11 16:13-16:46/33	17:04 15:49-16:30/41
19	06:14 06:37-07:12/35	06:44 18:25-19:34/69	07:15 07:35-08:04/29	07:47 08:12-08:33/21	07:24 07:47-08:40/53	07:53 08:16-08:58/42
	21:02 20:21-20:37/16	20:27	19:35	18:46 17:46-18:12/26	17:10 16:14-16:46/32	17:05 15:49-16:31/42
20	06:15 06:38-07:13/35	06:45 18:25-19:34/69	07:16 07:36-08:03/27	07:48 08:11-08:34/23	07:25 07:48-08:41/53 16:15-16:45/30	07:53 08:17-08:59/42
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21	06:16 06:38-07:14/36	06:46 18:24-19:33/69	07:17 07:37-08:01/24	07:49 08:10-08:36/26	07:26 07:49-08:42/53 16:16-16:44/28	07:54 08:17-08:59/42
	21:00 20:26-20:31/5	20:24 07:33-07:42/9	19:32	18:43 17:45-18:14/29	17:08 15:57-16:09/12	17:05 15:49-16:31/42
22	06:17 06:39-07:15/36	06:47 18:24-19:33/69	07:18 07:38-08:00/22	07:51 08:11-08:37/26	07:27 07:50-08:43/53 16:17-16:43/26	07:54 08:18-09:00/42
	21:00	20:23 07:30-07:45/15	19:30	18:42 17:44-18:14/30	17:08 15:54-16:11/17	17:06 15:49-16:31/42
23	06:18 06:40-07:16/36	06:48 18:23-19:33/70	07:19 07:39-07:57/18	07:52 08:12-08:39/27	07:28 07:52-08:45/53 16:18-16:42/24	07:55 08:18-09:00/42
	20:59 18:58-19:09/11	20:21 07:28-07:47/19	19:28	18:40 17:44-18:14/30	17:07 15:53-16:12/19	17:06 15:51-16:32/41
24	06:19 06:41-07:17/36	06:49 18:23-19:33/70	07:20 07:40-07:54/14	07:53 08:14-08:42/28	07:30 07:53-08:45/52 16:20-16:42/22	07:55 08:18-09:00/42
	20:58 18:54-19:13/19	20:20 07:26-07:48/22	19:27	18:39 17:43-18:13/30	17:07 15:53-16:14/21	17:07 15:51-16:33/42
25	06:20 06:42-07:17/35	06:50 18:23-19:32/69	07:21 07:45-07:48/3	07:54 08:15-08:45/30	07:31 07:54-08:46/52 16:21-16:42/21	07:56 08:19-09:01/42
	20:57 18:52-19:16/24	20:18 07:25-07:49/24	19:25	18:37 17:44-18:14/30	17:06 15:52-16:15/23	17:08 15:52-16:34/42
26	06:21 06:43-07:18/35	06:51 18:23-19:32/69	07:22	07:55 08:16-08:47/31	07:32 07:55-08:47/52 16:22-16:41/19	07:56 08:19-09:01/42
	20:56 18:50-19:18/28	20:17 07:24-07:50/26	19:23	18:36 17:44-18:13/29	17:06 15:51-16:16/25	17:08 15:53-16:34/41
27	06:21 06:44-07:19/35	06:52 18:23-19:31/68	07:24	07:56 08:17-08:48/31 17:22-17:35/13	07:33 07:56-08:47/51 16:24-16:39/15	07:56 08:19-09:01/42
	20:55 18:48-19:20/32	20:15 07:23-07:51/28	19:22	18:35 17:44-18:11/27	17:05 15:51-16:17/26	17:09 15:54-16:34/40
28	06:22 06:45-07:19/34	06:53 18:23-19:31/68	07:25	07:57 08:19-08:52/33 17:18-17:37/19	07:34 07:57-08:48/51 16:26-16:37/11	07:57 08:20-09:02/42
	20:54 18:46-19:20/34	20:14 07:22-07:51/29	19:20	18:33 17:44-18:09/25	17:05 15:50-16:18/28	17:10 15:56-16:35/39
29	06:23 06:45-07:19/34	06:54 18:23-19:30/67	07:26	07:59 08:20-08:53/33 17:17-17:40/23	07:35 07:59-08:49/50 16:30-16:34/4	07:57 08:20-09:03/43
	20:53 18:44-19:22/38	20:12 07:21-07:51/30	19:18	18:32 17:45-18:09/24	17:04 15:51-16:20/29	17:10 16:00-16:35/35
30	06:24 06:46-07:19/33	06:55 18:23-19:29/66	07:27	08:00 08:21-08:55/34 17:15-17:41/26	07:36 08:00-08:50/50	07:57 08:20-09:03/43
	20:52 18:43-19:23/40	20:11 07:21-07:51/30	19:17	18:31 17:46-18:07/21	17:04 15:50-16:21/31	17:11 16:01-16:36/35
31	06:25 06:47-07:19/32	06:56 18:23-19:29/66		08:01 08:22-09:02/40 17:14-17:42/28		07:57 08:20-09:03/43
	20:51 18:42-19:25/43	20:09 07:20-07:51/31		18:29 17:46-18:06/20		17:12 16:01-16:36/35
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1679	2523	1457	990	2605	2502

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T76 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (493)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 08:20-08:45/25 17:13	07:43 08:04-08:42/38 17:47 16:53-17:14/21	07:07 07:37-08:05/28 18:22	07:16 07:35-08:00/25 19:56 19:10-19:34/24	06:30 20:27	06:01 06:34-07:06/32 20:57
2	07:57 08:20-08:45/25 17:14	07:42 08:03-08:42/39 17:49 16:54-17:13/19	07:06 07:37-08:03/26 18:23	07:14 07:33-08:00/27 19:57 19:10-19:35/25	06:29 20:28	06:01 06:34-07:06/32 20:58
3	07:57 08:20-08:46/26 17:15	07:41 08:02-08:41/39 17:50 16:55-17:12/17	07:04 07:38-08:01/23 18:24	07:13 07:32-08:01/29 19:58 19:11-19:35/24	06:28 20:29	06:01 06:34-07:05/31 20:58
4	07:57 08:20-08:46/26 17:16	07:40 08:01-08:41/40 17:51 16:57-17:11/14	07:02 07:40-08:00/20 18:25	07:11 07:30-08:00/30 19:59 19:10-19:34/24	06:26 20:30	06:00 06:35-07:06/31 20:59
5	07:57 08:20-08:47/27 17:16	07:39 08:00-08:40/40 17:52 16:59-17:07/8	07:01 07:41-07:57/16 18:26	07:09 07:28-08:00/32 20:00 19:10-19:32/22	06:25 20:31	06:00 06:36-07:06/30 21:00
6	07:57 08:20-08:48/28 17:17	07:38 07:58-08:37/39 17:54	06:59 07:45-07:55/10 18:27	07:08 07:28-08:00/32 19:12-19:31/19 20:00 19:38-19:40/2	06:24 20:32	05:59 06:35-07:05/30 21:00
7	07:57 08:19-08:47/28 17:18	07:37 07:58-08:36/38 17:55	06:58 18:29	07:06 07:27-07:59/32 19:13-19:29/16 20:01 19:33-19:40/7	06:23 06:45-06:54/9 20:33	05:59 06:36-07:05/29 21:01
8	07:57 08:19-08:48/29 17:19	07:36 07:58-08:34/36 17:56	07:56 19:30	07:05 07:27-07:59/32 19:14-19:27/13 20:02 19:30-19:41/11	06:21 06:42-06:57/15 20:34	05:59 06:37-07:05/28 21:02
9	07:57 08:19-08:48/29 17:20	07:35 07:55-08:31/36 17:57	07:54 08:18-08:25/7 19:31	07:03 07:26-07:59/33 19:18-19:23/5 20:03 19:29-19:43/14	06:20 06:41-06:59/18 20:35	05:59 06:21-06:26/5 21:02 06:37-07:05/28
10	07:57 08:19-08:49/30 17:21	07:34 07:54-08:31/37 17:59	07:53 08:13-08:28/15 19:32	07:01 07:26-07:58/32 20:04 19:27-19:43/16	06:19 06:39-06:59/20 20:36	05:59 06:21-06:28/7 21:03 06:38-07:05/27
11	07:57 08:18-08:48/30 17:22 16:52-16:56/4	07:32 07:52-08:29/37 18:00	07:51 08:10-08:30/20 19:33	07:00 07:26-07:58/32 20:06 19:27-19:45/18	06:18 06:38-07:00/22 20:37	05:58 06:21-06:29/8 21:03 06:38-07:05/27
12	07:56 08:18-08:49/31 17:24 16:51-16:58/7	07:31 07:51-08:27/36 18:01 17:37-17:38/1	07:50 08:09-08:32/23 19:34	06:58 07:26-07:56/30 20:07 19:26-19:45/19	06:17 06:37-07:01/24 20:38	05:58 06:20-06:29/9 21:04 06:38-07:05/27
13	07:56 08:18-08:50/32 17:25 16:51-16:59/8	07:30 07:50-08:25/35 18:02 17:33-17:40/7	07:48 08:07-08:33/26 19:35	06:57 07:27-07:56/29 20:08 19:25-19:46/21	06:16 06:36-07:02/26 20:39	05:58 06:20-06:30/10 21:04 06:38-07:05/27
14	07:56 08:17-08:49/32 17:26 16:50-17:00/10	07:29 07:48-08:20/32 18:04 17:30-17:40/10	07:46 08:05-08:34/29 19:36	06:55 07:27-07:55/28 20:09 19:25-19:48/23	06:15 06:35-07:03/28 20:40	05:58 06:20-06:31/11 21:05 06:39-07:05/26
15	07:55 08:17-08:50/33 17:27 16:50-17:01/11	07:27 07:47-08:19/32 18:05 17:29-17:42/13	07:45 08:04-08:35/31 19:38	06:53 07:27-07:53/26 20:10 19:24-19:48/24	06:14 06:35-07:04/29 20:41	05:58 06:20-06:31/11 21:05 06:39-07:05/26
16	07:55 08:16-08:49/33 17:28 16:49-17:02/13	07:26 07:46-08:16/30 18:06 17:29-17:44/15	07:43 08:02-08:35/33 19:39	06:52 07:29-07:52/23 20:11 19:25-19:50/25	06:13 06:34-07:05/31 20:42	05:58 06:20-06:32/12 21:06 06:39-07:05/26
17	07:54 08:16-08:49/33 17:29 16:49-17:04/15	07:25 07:44-08:12/28 18:07 17:27-17:44/17	07:41 08:01-08:35/34 19:40	06:50 07:30-07:49/19 20:12 19:24-19:50/26	06:12 06:33-07:05/32 20:43	05:58 06:21-06:33/12 21:06 06:41-07:06/25
18	07:54 08:15-08:49/34 17:30 16:48-17:05/17	07:23 07:43-08:12/29 18:09 17:27-17:46/19	07:40 08:01-08:35/34 19:41	06:49 07:32-07:48/16 20:13 19:25-19:52/27	06:11 06:32-07:05/33 20:44	05:58 06:21-06:33/12 21:07 06:41-07:06/25
19	07:53 08:15-08:49/34 17:31 16:48-17:05/17	07:22 07:42-08:13/31 18:10 17:26-17:47/21	07:38 08:01-08:35/34 19:42	06:47 07:35-07:43/8 20:14 19:25-19:52/27	06:10 06:32-07:05/33 20:45	05:58 06:21-06:34/13 21:07 06:41-07:06/25
20	07:53 08:14-08:48/34 17:33 16:48-17:07/19	07:20 07:40-08:12/32 18:11 17:26-17:48/22	07:36 08:00-08:34/34 19:43	06:46 19:27-19:54/27 20:15	06:09 06:32-07:05/33 20:46	05:58 06:21-06:34/13 21:07 06:41-07:06/25
21	07:52 08:13-08:47/34 17:34 16:48-17:08/20	07:19 07:39-08:12/33 18:12 17:27-17:50/23	07:35 08:01-08:35/34 19:44	06:44 19:28-19:54/26 20:16	06:09 06:31-07:05/34 20:47	05:59 06:21-06:34/13 21:07 06:41-07:06/25
22	07:52 08:13-08:46/33 17:35 16:48-17:09/21	07:18 07:37-08:11/34 18:13 17:26-17:50/24	07:33 08:00-08:34/34 19:45	06:43 19:30-19:55/25 20:17	06:08 06:32-07:06/34 20:48	05:59 06:21-06:34/13 21:08 06:41-07:06/25
23	07:51 08:12-08:45/33 17:36 16:48-17:11/23	07:16 07:37-08:11/34 18:15 17:27-17:50/23	07:31 08:00-08:33/33 19:46	06:41 19:32-19:55/23 20:18	06:07 06:32-07:06/34 20:49	05:59 06:22-06:35/13 21:08 06:42-07:07/25
24	07:50 08:11-08:43/32 17:37 16:48-17:12/24	07:15 07:36-08:10/34 18:16 17:27-17:49/22	07:29 08:01-08:32/31 19:47	06:40 19:32-19:53/21 20:19	06:06 06:31-07:06/35 20:50	05:59 06:22-06:35/13 21:08 06:42-07:07/25
25	07:49 08:10-08:42/32 17:39 16:48-17:14/26	07:13 07:36-08:09/33 18:17 17:28-17:48/20	07:28 08:01-08:31/30 19:48 19:19-19:27/8	06:38 19:33-19:53/20 20:20	06:05 06:32-07:06/34 20:51	06:00 06:22-06:34/12 21:08 06:42-07:07/25
26	07:49 08:09-08:42/33 17:40 16:48-17:15/27	07:12 07:36-08:07/31 18:18 17:29-17:46/17	07:26 08:01-08:29/28 19:49 19:17-19:28/11	06:37 19:33-19:51/18 20:22	06:05 06:32-07:06/34 20:52	06:00 06:23-06:35/12 21:08 06:42-07:08/26
27	07:48 08:09-08:43/34 17:41 16:49-17:15/26	07:10 07:36-08:06/30 18:19 17:31-17:45/14	07:24 08:02-08:27/25 07:43-07:52/9 19:51 19:14-19:29/15	06:36 19:34-19:50/16 20:23	06:04 06:33-07:06/33 20:53	06:00 06:23-06:35/12 21:08 06:42-07:08/26
28	07:47 08:08-08:43/35 17:42 16:50-17:15/25	07:09 07:36-08:05/29 18:20 17:33-17:42/9	07:23 08:04-08:26/22 07:42-07:56/14 19:52 19:14-19:30/16	06:34 19:36-19:48/12 20:24	06:04 06:32-07:06/34 20:54	06:01 06:23-06:34/11 21:08 06:42-07:08/26
29	07:46 08:07-08:43/36 17:44 16:50-17:15/25		07:21 07:40-07:57/17 19:12-19:31/19 19:53 08:06-08:23/17	06:33 19:39-19:43/4 20:25	06:03 06:32-07:05/33 20:54	06:01 06:24-06:34/10 21:08 06:42-07:09/27
30	07:45 08:06-08:43/37 17:45 16:51-17:15/24		07:19 07:38-07:58/20 19:11-19:32/21 19:54 08:09-08:19/10	06:31 20:26	06:02 06:33-07:06/33 20:55	06:02 06:24-06:34/10 21:08 06:42-07:09/27
31	07:44 08:05-08:43/38 17:46 16:52-17:15/23		07:18 07:37-08:00/23 19:55 19:11-19:34/23		06:02 06:33-07:05/32 20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	1361	1318	903	1139	723	1056

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T76 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (493)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-06:34/9 21:08 06:43-07:09/26	06:26 06:48-07:11/23 20:50	06:57 07:25-07:57/32 20:07 19:26-19:44/18	07:27 07:47-08:12/25 19:15	07:02 07:23-08:00/37 17:28	07:37 08:00-08:30/30 17:04 16:34-16:38/4
2	06:03 06:25-06:33/8 21:08 06:42-07:09/27	06:27 06:49-07:10/21 20:49	06:58 07:25-07:57/32 20:05 19:26-19:42/16	07:28 07:48-08:10/22 19:13	07:03 07:26-08:01/35 17:27	07:38 08:01-08:31/30 17:03 16:37-16:38/1
3	06:03 06:26-06:32/6 21:08 06:42-07:10/28	06:28 06:50-07:09/19 20:48	06:59 07:24-07:57/33 19:16-19:21/5 20:04 19:27-19:41/14	07:30 07:49-08:07/18 19:11	07:04 07:28-08:04/36 17:25	07:39 08:03-08:32/29 17:03
4	06:04 06:26-06:30/4 21:08 06:42-07:10/28	06:29 06:51-07:08/17 20:47	07:00 07:24-07:56/32 19:12-19:25/13 20:02 19:28-19:39/11	07:31 07:52-08:04/12 19:10	07:05 07:28-08:06/38 17:24	07:40 08:04-08:33/29 17:03
5	06:04 06:42-07:11/29 21:08	06:30 06:52-07:05/13 20:46	07:01 07:24-07:56/32 19:10-19:26/16 20:01 19:30-19:37/7	07:32 19:08	07:07 07:28-08:07/39 17:23	07:41 08:05-08:33/28 17:03
6	06:05 06:42-07:11/29 21:08	06:31 06:56-07:01/5 20:44	07:02 07:24-07:56/32 19:08-19:27/19 19:57 19:34-19:36/2	07:33 19:06	07:08 07:30-08:10/40 17:22 16:30-16:38/8	07:42 08:06-08:34/28 17:03
7	06:05 06:42-07:12/30 21:07	06:32 20:43	07:03 07:24-07:56/32 19:56 19:06-19:27/21	07:34 08:24-08:26/2 19:05	07:09 07:31-08:11/40 17:21 16:27-16:41/14	07:43 08:06-08:33/27 17:03
8	06:06 06:42-07:13/31 21:07	06:33 20:42	07:04 07:25-07:55/30 19:54 19:05-19:28/23	07:35 08:18-08:32/14 19:03	07:10 07:32-08:11/39 17:20 16:25-16:42/17	07:44 08:07-08:33/26 17:03
9	06:07 06:41-07:12/31 21:07	06:34 20:41	07:05 07:26-07:55/29 19:52 19:04-19:28/24	07:36 08:16-08:34/18 19:01	07:11 07:34-08:13/39 17:19 16:24-16:43/19	07:45 08:08-08:34/26 17:03
10	06:07 06:42-07:13/31 21:06	06:35 20:39	07:06 07:26-07:53/27 19:50 19:03-19:28/25	07:37 08:13-08:35/22 19:00	07:13 07:35-08:13/38 17:18 16:24-16:45/21	07:46 08:09-08:34/25 17:03
11	06:08 06:42-07:14/32 21:06	06:36 20:38	07:07 07:27-07:52/25 19:49 19:03-19:27/24	07:38 08:12-08:36/24 18:58	07:14 07:36-08:14/38 17:17 16:23-16:46/23	07:46 08:10-08:35/25 17:03
12	06:09 06:41-07:13/32 21:05	06:37 20:37	07:08 07:28-07:51/23 19:47 19:02-19:25/23	07:39 08:10-08:37/27 18:57	07:15 07:37-08:14/37 17:16 16:22-16:46/24	07:47 08:11-08:36/25 17:03
13	06:10 06:41-07:14/33 21:05	06:38 20:36	07:09 07:29-07:50/21 19:02-19:23/21 19:45 08:01-08:09/8	07:40 08:09-08:38/29 18:55	07:16 07:39-08:15/36 17:15 16:22-16:47/25	07:48 08:12-08:36/24 17:03
14	06:10 06:42-07:15/33 21:04	06:39 19:46-19:52/6 20:34	07:10 07:30-07:48/18 19:02-19:22/20 19:44 07:56-08:13/17	07:41 08:08-08:38/30 18:53 18:04-18:16/12	07:17 07:40-08:15/35 17:14 16:22-16:47/25	07:49 08:12-08:36/24 17:03
15	06:11 06:42-07:15/33 21:04	06:40 19:43-19:55/12 20:33	07:11 07:54-08:15/21 07:31-07:46/15 19:42 19:03-19:20/17	07:42 08:09-08:39/30 18:52 18:03-18:18/15	07:19 07:41-08:15/34 17:13 16:22-16:47/25	07:49 08:13-08:36/23 17:03
16	06:12 06:41-07:15/34 21:03	06:41 19:41-19:57/16 20:31	07:12 07:52-08:16/24 07:32-07:42/10 19:40 19:03-19:18/15	07:43 08:08-08:40/32 18:50 18:01-18:19/18	07:20 07:42-08:15/33 17:12 16:21-16:47/26	07:50 08:14-08:37/23 17:04
17	06:13 06:41-07:15/34 21:03	06:42 19:39-19:58/19 20:30	07:13 07:50-08:17/27 19:39 19:04-19:17/13	07:45 08:08-08:41/33 18:49 17:59-18:20/21	07:21 07:44-08:16/32 17:11 16:22-16:48/26	07:51 08:14-08:37/23 17:04
18	06:14 06:42-07:16/34 21:02	06:43 19:38-19:59/21 20:29	07:14 07:49-08:18/29 19:37 19:06-19:15/9	07:46 08:07-08:41/34 18:47 17:58-18:20/22	07:22 07:45-08:17/32 17:11 16:22-16:46/24	07:52 08:15-08:38/23 17:04
19	06:14 06:42-07:16/34 21:01	06:44 19:37-19:59/22 20:27	07:15 07:47-08:18/31 19:35 19:10-19:13/3	07:47 08:07-08:42/35 18:46 17:57-18:21/24	07:23 07:46-08:19/33 17:10 16:22-16:45/23	07:52 08:16-08:38/22 17:05
20	06:15 06:42-07:16/34 21:01	06:45 19:36-19:59/23 20:26	07:16 07:46-08:19/33 19:33	07:48 08:08-08:42/34 18:44 17:57-18:21/24	07:25 07:48-08:21/33 17:09 16:23-16:44/21	07:53 08:16-08:38/22 17:05
21	06:16 06:41-07:15/34 21:00	06:46 19:35-20:00/25 20:24	07:17 07:46-08:19/33 19:32	07:49 08:10-08:43/33 18:43 17:57-18:20/23	07:26 07:49-08:23/34 17:08 16:24-16:44/20	07:53 08:17-08:39/22 17:05
22	06:17 06:42-07:16/34 20:59	06:47 19:32-19:59/27 20:23	07:18 07:45-08:19/34 19:30	07:50 08:11-08:43/32 18:41 17:57-18:19/22	07:27 07:50-08:24/34 17:08 16:24-16:43/19	07:54 08:17-08:39/22 17:06
23	06:18 06:42-07:16/34 20:58	06:48 19:31-19:57/26 20:21	07:19 07:44-08:19/35 19:28	07:51 08:12-08:42/30 18:40 17:57-18:17/20	07:28 07:51-08:25/34 17:07 16:25-16:43/18	07:54 08:18-08:40/22 17:06
24	06:19 06:42-07:16/34 20:58	06:49 07:38-07:48/10 20:20 19:29-19:56/27	07:20 07:44-08:18/34 19:27	07:53 08:13-08:42/29 18:39 17:57-18:15/18	07:29 07:52-08:26/34 17:07 16:25-16:42/17	07:55 08:18-08:40/22 17:07
25	06:20 06:43-07:16/33 20:57	06:50 07:35-07:51/16 20:18 19:28-19:54/26	07:21 07:44-08:18/34 19:25	07:54 08:15-08:42/27 18:37 17:57-18:14/17	07:30 07:54-08:27/33 17:06 16:26-16:41/15	07:55 08:18-08:41/23 17:08
26	06:21 06:43-07:15/32 20:56	06:51 07:32-07:53/21 20:17 19:27-19:53/26	07:22 07:44-08:17/33 19:23	07:55 08:16-08:46/30 18:36 17:59-18:13/14	07:31 07:55-08:28/33 17:06 16:28-16:41/13	07:56 08:19-08:42/23 17:08
27	06:21 06:44-07:15/31 20:55	06:52 07:31-07:54/23 20:15 19:27-19:51/24	07:23 07:44-08:17/33 19:21	07:56 08:17-08:49/32 18:34 17:59-18:11/12	07:33 07:56-08:29/33 17:05 16:29-16:40/11	07:56 08:19-08:42/23 17:09
28	06:22 06:45-07:15/30 20:54	06:53 07:29-07:55/26 20:13 19:26-19:50/24	07:24 07:44-08:16/32 19:20	07:57 08:18-08:50/32 18:33 18:01-18:10/9	07:34 07:57-08:29/32 17:05 16:30-16:40/10	07:56 08:19-08:42/23 17:10
29	06:23 06:45-07:14/29 20:53	06:54 07:28-07:56/28 20:12 19:26-19:48/22	07:25 07:45-08:15/30 19:18	07:58 08:19-08:54/35 18:32 18:02-18:08/6	07:35 07:58-08:30/32 17:04 16:31-16:39/8	07:56 08:19-08:43/24 17:10
30	06:24 06:46-07:13/27 20:52	06:55 07:27-07:56/29 20:10 19:26-19:47/21	07:26 07:46-08:13/27 19:16	08:00 08:21-08:57/36 18:30	07:36 07:59-08:30/31 17:04 16:32-16:39/7	07:57 08:20-08:44/24 17:11
31	06:25 06:47-07:12/25 20:51	06:56 07:26-07:56/30 20:09 19:26-19:45/19		08:01 08:22-08:59/37 18:29		07:57 08:20-08:44/24 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	993	667	1297	1071	1513	769

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T77 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (494)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 15:41-16:39/58 08:20-08:50/30	07:43 16:08-17:09/61	07:07 07:29-08:11/42	07:16 07:35-08:17/42	06:30 07:07-07:35/28	06:01 19:54-20:29/35
	17:13 15:34-15:40/6	17:47	18:22 17:27-17:55/28	19:56 18:36-19:27/51	20:27 18:37-19:15/38	20:57
2	07:57 15:42-16:39/57	07:42 16:09-17:10/61	07:06 07:26-08:09/43	07:14 07:33-08:16/43	06:29 07:08-07:32/24	06:01 19:54-20:30/36
	17:14 08:20-08:50/30	17:49	18:23 17:24-17:56/32	19:57 18:34-19:28/54	20:28 18:39-19:13/34	20:58
3	07:57 15:42-16:40/58	07:41 16:10-17:10/60	07:04 07:25-08:08/43	07:13 07:32-08:16/44	06:28 07:10-07:26/16	06:01 19:53-20:30/37
	17:15 08:21-08:51/30	17:50 08:04-08:09/5	18:24 17:22-17:57/35	19:58 18:34-19:29/55	20:29 18:40-19:10/30	20:58
4	07:57 15:43-16:40/57	07:40 16:12-17:10/58	07:02 07:23-08:05/42	07:11 07:31-08:14/43	06:26 07:12-07:22/10	06:00 19:53-20:31/38
	17:16 08:21-08:51/30	17:51 08:01-08:13/12	18:25 17:21-17:59/38	19:59 18:32-19:30/58	20:30 18:43-19:05/22	20:59
5	07:57 15:44-16:41/57	07:39 16:14-17:10/56	07:01 07:20-08:02/42	07:10 07:29-08:14/45	06:25 18:46-19:01/15	06:00 19:53-20:32/39
	17:17 08:22-08:52/30	17:53 08:00-08:16/16	18:26 17:20-17:59/39	20:00 18:31-19:30/59	20:31	21:00
6	07:57 15:45-16:42/57	07:38 16:15-17:09/54	06:59 07:19-07:56/37	07:08 07:27-08:12/45	06:24	06:00 19:53-20:32/39
	17:17 08:22-08:53/31	17:54 07:58-08:17/19	18:27 17:19-18:01/42	20:00 18:31-19:31/60	20:32	21:00
7	07:57 15:45-16:42/57	07:37 16:19-17:09/50	06:58 07:17-07:56/39	07:06 07:25-08:11/46	06:23	05:59 19:53-20:32/39
	17:18 08:22-08:52/30	17:55 07:57-08:18/21	18:29 17:18-18:01/43	20:01 18:30-19:31/61	20:33	21:01
8	07:57 15:46-16:44/58	07:36 16:23-17:09/46	07:56 08:15-08:56/41	07:05 07:24-08:10/46	06:22	05:59 19:53-20:33/40
	17:19 08:23-08:53/30	17:56 07:56-08:20/24	19:30 18:17-19:01/44	20:02 18:29-19:32/63	20:34	21:02
9	07:57 15:48-16:47/59	07:35 07:55-08:21/26	07:54 08:14-08:57/43	07:03 07:22-08:09/47	06:20	05:59 19:53-20:34/41
	17:20 08:23-08:53/30	17:58 16:24-17:09/45	19:31 18:17-19:02/45	20:03 18:28-19:32/64	20:35	21:02
10	07:57 15:49-16:49/60	07:34 07:54-08:22/28	07:53 08:12-08:56/44	07:01 07:20-08:08/48	06:19	05:59 19:53-20:34/41
	17:22 08:24-08:54/30	17:59 16:25-17:08/43	19:32 18:16-19:02/46	20:05 18:28-19:31/63	20:36	21:03
11	07:57 15:50-16:50/60	07:32 07:52-08:22/30	07:51 08:11-08:56/45	07:00 07:19-08:08/49	06:18	05:58 19:53-20:35/42
	17:23 08:24-08:53/29	18:00 16:25-17:07/42	19:33 18:15-19:02/47	20:06 18:28-19:32/64	20:37	21:04
12	07:56 15:51-16:52/61	07:31 07:51-08:23/32	07:50 08:09-08:56/47	06:58 07:17-08:06/49	06:17	05:58 19:52-20:34/42
	17:24 08:25-08:54/29	18:01 16:26-17:07/41	19:34 18:15-19:02/47	20:07 18:27-19:32/65	20:38	21:04
13	07:56 15:53-16:54/61	07:30 07:50-08:23/33	07:48 08:07-08:56/49	06:57 07:16-08:06/50	06:16	05:58 19:52-20:34/42
	17:25 08:26-08:54/28	18:03 16:28-17:06/38	19:35 18:14-19:02/48	20:08 18:27-19:32/65	20:40	21:05
14	07:56 15:55-16:54/59	07:29 07:49-08:24/35	07:46 08:06-08:55/49	06:55 07:14-08:04/50	06:15	05:58 19:53-20:35/42
	17:26 08:26-08:54/28	18:04 16:28-17:04/36	19:36 18:14-19:01/47	20:09 18:27-19:31/64	20:41	21:05
15	07:55 15:57-16:56/59	07:27 07:47-08:23/36	07:45 08:05-08:55/50	06:53 07:13-08:03/50	06:14	05:58 19:53-20:35/42
	17:27 08:27-08:54/27	18:05 16:30-17:03/33	19:38 18:15-19:01/46	20:10 18:26-19:31/65	20:42	21:05
16	07:55 15:57-16:57/60	07:26 07:46-08:24/38	07:43 08:04-08:54/50	06:52 07:11-08:01/50	06:13	05:58 19:53-20:35/42
	17:28 08:27-08:54/27	18:06 16:32-17:02/30	19:39 18:14-19:00/46	20:11 18:27-19:31/64	20:43	21:06
17	07:54 15:58-16:59/61	07:25 07:44-08:23/39	07:41 08:04-08:52/48	06:50 07:10-07:59/49	06:12	05:58 19:54-20:37/43
	17:29 08:29-08:54/25	18:07 16:33-16:59/26	19:40 18:14-18:59/45	20:12 18:26-19:30/64	20:44	21:06
18	07:54 15:58-16:59/61	07:23 07:43-08:23/40	07:40 08:04-08:52/48	06:49 07:08-07:56/48	06:11	05:58 19:54-20:37/43
	17:30 08:29-08:53/24	18:09 16:36-16:57/21	19:41 18:15-18:59/44	20:13 18:27-19:30/63	20:44	21:07
19	07:53 15:59-17:01/62	07:22 07:42-08:23/41	07:38 08:04-08:50/46	06:47 07:07-07:52/45	06:10	05:58 19:54-20:37/43
	17:32 08:31-08:54/23	18:10 16:40-16:54/14	19:42 18:15-18:58/43	20:14 18:27-19:29/62	20:45	21:07
20	07:53 15:59-17:02/63	07:20 07:41-08:21/40	07:36 07:57-08:49/52	06:46 07:05-07:46/41	06:09	05:59 19:54-20:37/43
	17:33 08:32-08:53/21	18:11	19:43 18:15-18:57/42	20:15 18:27-19:29/62	20:46	21:07
21	07:52 15:59-17:02/63	07:19 07:41-08:21/40	07:35 07:54-08:47/53	06:44 07:05-07:46/41	06:09	05:59 19:54-20:37/43
	17:34 08:33-08:52/19	18:12	19:44 18:17-18:56/39	20:16 18:28-19:28/60	20:47	21:08
22	07:52 16:00-17:04/64	07:18 07:40-08:19/39	07:33 07:52-08:45/53	06:43 07:04-07:45/41	06:08 20:06-20:16/10	05:59 19:54-20:37/43
	17:35 08:35-08:51/16	18:13	19:45 18:17-18:54/37	20:17 18:28-19:27/59	20:48	21:08
23	07:51 16:00-17:05/65	07:16 07:41-08:18/37	07:31 07:50-08:42/52	06:41 07:04-07:45/41	06:07 20:03-20:19/16	05:59 19:55-20:38/43
	17:36 08:36-08:50/14	18:15	19:46 18:18-18:53/35	20:18 18:29-19:27/58	20:49	21:08
24	07:50 16:01-17:05/64	07:15 07:40-08:16/36	07:30 07:49-08:41/52	06:40 07:03-07:44/41	06:06 20:00-20:20/20	05:59 19:55-20:38/43
	17:38 08:39-08:47/8	18:16	19:47 18:20-18:51/31	20:20 18:29-19:25/56	20:50	21:08
25	07:49 16:01-17:06/65	07:13 07:41-08:15/34	07:28 07:47-08:37/50 18:57-19:08/11	06:38 07:04-07:43/39	06:06 20:00-20:23/23	06:00 19:55-20:38/43
	17:39	18:17	19:48 18:21-18:49/28	20:21 18:30-19:24/54	20:51	21:08
26	07:49 16:02-17:06/64	07:12 07:41-08:13/32	07:26 08:24-08:32/8 18:23-18:46/23	06:37 07:04-07:43/39	06:05 19:58-20:24/26	06:00 19:56-20:38/42
	17:40	18:18 17:39-17:42/3	19:50 07:45-08:22/37 18:51-19:13/22	20:22 18:30-19:23/53	20:52	21:08
27	07:48 16:03-17:08/65	07:10 07:41-08:13/32	07:25 07:44-08:18/34 18:47-19:15/28	06:36 07:04-07:41/37	06:04 19:58-20:25/27	06:00 19:56-20:38/42
	17:41	18:19 17:33-17:49/16	19:51 18:26-18:42/16	20:23 18:32-19:22/50	20:53	21:08
28	07:47 16:04-17:08/64	07:09 07:32-08:12/40	07:23 07:42-08:18/36	06:34 07:04-07:40/36	06:04 19:56-20:26/30	06:01 19:56-20:38/42
	17:42	18:21 17:29-17:52/23	19:52 18:45-19:18/33	20:24 18:33-19:21/48	20:54	21:09
29	07:46 16:05-17:08/63		07:21 07:40-08:18/38	06:33 07:05-07:39/34	06:03 19:55-20:26/31	06:01 19:57-20:39/42
	17:44		19:53 18:42-19:21/39	20:25 18:33-19:19/46	20:54	21:09
30	07:45 16:05-17:09/64		07:19 07:38-08:17/39	06:32 07:05-07:37/32	06:02 19:55-20:28/33	06:02 19:56-20:38/42
	17:45		19:54 18:39-19:23/44	20:26 18:35-19:17/42	20:55	21:09
31	07:44 16:06-17:09/63		07:18 07:37-08:18/41		06:02 19:54-20:28/34	
	17:46		19:55 18:38-19:26/48		20:56	
Potential sun hours	297	297	370	399	448	453
Sum of minutes with flicker	2514	1662	2674	3063	467	1234

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T77 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (494)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 19:57-20:39/42 21:08	06:26 20:50	06:57 07:18-08:07/49 20:07 18:27-19:31/64	07:28 07:47-08:35/48 19:15 17:54-18:41/47	07:02 07:23-07:51/28 17:28 15:54-16:37/43	07:37 15:32-16:32/60 17:04 08:06-08:35/29
2	06:03 19:57-20:38/41 21:08	06:27 20:49	06:58 07:19-08:07/48 20:06 18:27-19:30/63	07:29 07:48-08:35/47 19:13 17:53-18:40/47	07:03 07:25-07:51/26 17:27 15:54-16:39/45	07:38 15:31-16:31/60 17:03 08:07-08:37/30
3	06:03 19:58-20:39/41 21:08	06:28 20:48	06:59 07:20-08:07/47 20:04 18:27-19:30/63	07:30 07:49-08:34/45 19:11 17:53-18:40/47	07:04 15:52-16:39/47 17:26 07:26-07:49/23	07:39 15:32-16:31/59 17:03 08:07-08:37/30
4	06:04 19:58-20:38/40 21:08	06:29 20:47	07:00 07:21-08:07/46 20:02 18:27-19:29/62	07:31 07:51-08:35/44 19:10 17:53-18:39/46	07:06 15:48-16:39/51 17:24 07:27-07:48/21	07:40 15:31-16:29/58 17:03 08:08-08:38/30
5	06:04 19:59-20:39/40 21:08	06:30 20:46	07:01 07:22-08:08/46 20:01 18:27-19:28/61	07:32 07:52-08:34/42 19:08 17:54-18:39/45	07:07 15:45-16:39/54 17:23 07:28-07:46/18	07:41 15:31-16:28/57 17:03 08:08-08:38/30
6	06:05 19:59-20:38/39 21:08	06:31 20:44	07:02 07:23-08:08/45 19:57 18:27-19:27/60	07:33 07:53-08:33/40 19:06 17:54-18:38/44	07:08 15:44-16:40/56 17:22 07:30-07:46/16	07:42 15:31-16:28/57 17:03 08:08-08:39/31
7	06:06 20:00-20:38/38 21:07	06:32 18:59-19:08/9 20:43	07:03 07:24-08:09/45 19:56 18:27-19:26/59	07:34 07:54-08:32/38 19:05 17:54-18:37/43	07:09 15:42-16:40/58 17:21 07:31-07:43/12	07:43 15:30-16:27/57 17:03 08:09-08:39/30
8	06:06 20:00-20:38/38 21:07	06:33 07:25-07:28/3 20:42 18:54-19:12/18	07:04 07:26-08:09/43 19:54 18:27-19:25/58	07:35 07:55-08:35/40 19:03 17:55-18:36/41	07:10 15:40-16:40/60 17:20 07:35-07:38/3	07:44 15:30-16:27/57 17:03 08:08-08:39/31
9	06:07 20:00-20:38/38 21:07	06:34 07:21-07:33/12 20:41 18:51-19:17/26	07:05 07:26-08:10/44 19:52 18:28-19:23/55	07:36 07:56-08:38/42 19:02 17:55-18:34/39	07:12 15:40-16:41/61 17:19	07:45 15:30-16:28/58 17:03 08:09-08:39/30
10	06:07 20:01-20:38/37 21:06	06:35 07:18-07:38/20 20:40 18:49-19:20/31	07:06 07:27-08:10/43 19:51 18:28-19:21/53	07:37 07:58-08:40/42 19:00 17:56-18:33/37	07:13 15:38-16:40/62 17:18	07:46 15:31-16:28/57 17:03 08:09-08:40/31
11	06:08 20:02-20:38/36 21:06	06:36 07:16-07:42/26 20:38 18:47-19:23/36	07:07 07:28-08:10/42 19:49 18:28-19:19/51	07:38 07:59-08:42/43 18:58 17:57-18:31/34	07:14 15:37-16:40/63 17:17	07:46 15:31-16:29/58 08:10-08:40/30 17:03 15:25-15:29/4
12	06:09 20:02-20:36/34 21:06	06:37 07:15-07:44/29 20:37 18:45-19:25/40	07:08 07:28-08:09/41 19:47 18:29-19:17/48	07:39 08:01-08:43/42 18:57 17:59-18:29/30	07:15 15:36-16:40/64 17:16	07:47 15:23-16:29/66 17:03 08:11-08:41/30
13	06:10 20:03-20:36/33 21:05	06:38 07:14-07:46/32 20:36 18:43-19:26/43	07:09 07:29-08:08/39 19:45 18:30-19:15/45	07:40 08:03-08:44/41 18:55 18:00-18:26/26	07:16 15:36-16:40/64 17:15	07:48 15:22-16:30/68 17:03 08:12-08:41/29
14	06:10 20:04-20:36/32 21:05	06:39 07:13-07:47/34 20:34 18:42-19:28/46	07:10 07:30-08:08/38 19:44 18:32-19:12/40	07:41 08:07-08:45/38 18:54 18:02-18:23/21	07:18 15:36-16:40/64 17:14	07:49 15:21-16:29/68 17:03 08:12-08:41/29
15	06:11 20:05-20:36/31 21:04	06:40 07:12-07:48/36 20:33 18:40-19:29/49	07:11 07:31-08:07/36 19:42 18:33-19:08/35	07:42 08:14-08:46/32 18:52 18:07-18:20/13	07:19 15:35-16:40/65 17:13	07:50 15:21-16:30/69 17:03 08:13-08:42/29
16	06:12 20:06-20:34/28 21:03	06:41 07:11-07:49/38 20:31 18:38-19:29/51	07:12 07:32-08:07/35 18:16-18:30/14 19:40 18:35-19:05/30	07:44 08:13-08:46/33 18:50	07:20 15:35-16:39/64 17:12	07:50 15:21-16:30/69 17:04 08:14-08:42/28
17	06:13 20:07-20:33/26 21:03	06:42 07:11-07:50/39 20:30 18:37-19:30/53	07:13 08:14-08:19/5 18:12-18:33/21 19:39 07:33-08:09/36 18:38-19:02/24	07:45 08:12-08:47/35 18:49	07:21 15:35-16:40/65 17:11	07:51 15:20-16:30/70 17:04 08:14-08:42/28
18	06:14 20:08-20:33/25 21:02	06:43 07:10-07:50/40 20:29 18:36-19:30/54	07:14 07:34-08:24/50 18:43-18:57/14 19:37 18:09-18:36/27	07:46 08:12-08:48/36 18:47	07:22 15:35-16:39/64 17:11 08:13-08:21/8	07:52 15:21-16:31/70 17:04 08:15-08:43/28
19	06:14 20:10-20:32/22 21:02	06:44 07:09-07:50/41 20:27 18:35-19:31/56	07:15 07:35-08:26/51 19:35 18:07-18:37/30	07:47 08:11-08:49/38 18:46	07:24 15:34-16:39/65 17:10 08:10-08:24/14	07:52 15:22-16:32/70 17:05 08:16-08:44/28
20	06:15 20:12-20:30/18 21:01	06:45 07:09-07:50/41 20:26 18:34-19:32/58	07:16 07:36-08:28/52 19:33 18:05-18:39/34	07:48 08:12-08:51/39 18:44	07:25 15:35-16:39/64 17:09 08:10-08:26/16	07:53 15:21-16:32/71 17:05 08:16-08:44/28
21	06:16 20:13-20:27/14 21:00	06:46 07:08-07:50/42 20:24 18:33-19:32/59	07:17 07:37-08:30/53 19:32 18:03-18:40/37	07:49 08:12-08:52/40 18:43	07:26 15:35-16:38/63 17:09 08:09-08:28/19	07:53 15:22-16:32/70 17:06 08:17-08:45/28
22	06:17 20:18-20:23/5 20:59	06:47 07:08-07:50/42 20:23 18:32-19:32/60	07:18 07:38-08:31/53 19:30 18:01-18:40/39	07:50 08:12-08:52/40 18:41 17:16-17:18/2	07:27 15:35-16:38/63 17:08 08:08-08:29/21	07:54 15:22-16:32/70 17:06 08:17-08:45/28
23	06:18 20:59	06:48 07:09-07:50/41 20:21 18:31-19:33/62	07:19 07:40-08:32/52 19:28 18:00-18:41/41	07:51 08:12-08:52/40 18:40 17:09-17:25/16	07:28 15:35-16:37/62 17:07 08:07-08:30/23	07:54 15:23-16:33/70 17:07 08:18-08:46/28
24	06:19 20:58	06:49 07:10-07:56/46 20:20 18:30-19:33/63	07:20 07:45-08:33/48 19:27 17:59-18:41/42	07:53 08:13-08:52/39 18:39 17:05-17:28/23	07:29 15:35-16:37/62 17:07 08:06-08:30/24	07:55 15:23-16:34/71 17:07 08:18-08:46/28
25	06:20 20:57	06:50 07:11-07:59/48 20:18 18:30-19:33/63	07:21 07:47-08:34/47 19:25 17:58-18:42/44	07:54 08:15-08:53/38 18:37 17:03-17:31/28	07:30 15:36-16:37/61 17:06 08:07-08:32/25	07:55 15:24-16:34/70 17:08 08:18-08:46/28
26	06:21 20:56	06:51 07:12-08:01/49 20:17 18:29-19:33/64	07:22 07:46-08:35/49 19:23 17:57-18:42/45	07:55 08:16-08:53/37 18:36 17:01-17:32/31	07:32 15:36-16:36/60 17:06 08:06-08:33/27	07:56 15:25-16:35/70 17:08 08:19-08:47/28
27	06:22 20:55	06:52 07:13-08:03/50 20:15 18:29-19:33/64	07:23 07:46-08:35/49 19:22 17:56-18:42/46	07:56 08:17-08:53/36 18:34 16:59-17:33/34	07:33 15:36-16:35/59 17:05 08:06-08:33/27	07:56 15:26-16:35/69 17:09 08:19-08:47/28
28	06:22 20:54	06:53 07:14-08:04/50 20:14 18:28-19:32/64	07:24 07:45-08:35/50 19:20 17:55-18:42/47	07:57 08:18-08:53/35 18:33 16:58-17:34/36	07:34 15:35-16:35/60 17:05 08:06-08:34/28	07:56 15:27-16:36/69 17:10 08:19-08:48/29
29	06:23 20:53	06:54 07:15-08:05/50 20:12 18:28-19:32/64	07:25 07:45-08:35/50 19:18 17:54-18:41/47	07:58 08:20-08:53/33 18:32 16:56-17:35/39	07:35 15:33-16:34/61 17:04 08:06-08:34/28	07:57 15:28-16:36/68 17:10 08:19-08:48/29
30	06:24 20:52	06:55 07:16-08:06/50 20:10 18:27-19:32/65	07:26 07:46-08:35/49 19:16 17:54-18:41/47	08:00 08:21-08:52/31 18:31 16:56-17:36/40	07:36 15:32-16:33/61 17:04 08:06-08:35/29	07:57 15:30-16:37/67 17:11 08:20-08:49/29
31	06:25 20:51	06:56 07:17-08:06/49 20:09 18:27-19:31/64		08:01 08:22-08:52/30 18:29 16:55-17:37/42		07:57 15:31-16:38/67 17:12 08:20-08:50/30
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	698	2170	2827	2055	2227	2926

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T78 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (495)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	15:46-16:30/44	07:43		07:07	07:44-07:50/6	07:16		06:31	19:00-20:01/61	06:02	19:59-20:26/27
	17:13		17:48		18:22	16:54-17:40/46	19:56		20:27		20:57	19:30-19:51/21
2	07:57	15:46-16:31/45	07:43		07:06	16:54-17:38/44	07:15		06:29	19:00-20:01/61	06:01	19:59-20:27/28
	17:14		17:49		18:23		19:57		20:28		20:58	19:32-19:51/19
3	07:57	15:47-16:31/44	07:41		07:04	16:55-17:38/43	07:13		06:28	19:01-20:02/61	06:01	19:58-20:29/31
	17:15		17:50		18:24		19:58		20:29		20:58	19:34-19:50/16
4	07:57	15:47-16:32/45	07:40		07:03	16:56-17:37/41	07:11		06:27	19:01-20:02/61	06:01	19:57-20:29/32
	17:16		17:52		18:25		19:59		20:30		20:59	19:35-19:48/13
5	07:57	15:48-16:32/44	07:39		07:01	16:56-17:35/39	07:10		06:25	19:00-20:02/62	06:00	19:57-20:30/33
	17:17		17:53		18:27		20:00		20:31		21:00	19:37-19:47/10
6	07:57	15:48-16:33/45	07:38		06:59	16:58-17:35/37	07:08		06:24	19:01-20:02/61	06:00	19:57-20:31/34
	17:18		17:54		18:28		20:00		20:32		21:00	19:40-19:45/5
7	07:57	15:48-16:32/44	07:37		06:58	16:59-17:33/34	07:06		06:23	19:01-20:02/61	06:00	19:57-20:32/35
	17:19		17:55		18:29		20:01		20:33		21:01	
8	07:57	15:49-16:32/43	07:36	17:12-17:23/11	07:56	18:00-18:30/30	07:05		06:22	19:02-20:02/60	05:59	19:56-20:32/36
	17:20		17:57		19:30		20:03		20:34		21:02	
9	07:57	15:50-16:33/43	07:35	17:08-17:27/19	07:55	18:02-18:29/27	07:03		06:21	19:02-20:02/60	05:59	19:56-20:33/37
	17:21		17:58		19:31		20:04		20:35		21:02	
10	07:57	15:51-16:33/42	07:34	17:06-17:30/24	07:53	18:04-18:26/22	07:02		06:20	19:03-20:02/59	05:59	19:56-20:33/37
	17:22		17:59		19:32		20:05		20:36		21:03	
11	07:57	15:51-16:33/42	07:32	17:03-17:31/28	07:51	18:08-18:23/15	07:00		06:19	19:03-20:02/59	05:59	19:56-20:34/38
	17:23		18:00		19:33		20:06		20:38		21:03	
12	07:56	15:52-16:33/41	07:31	17:02-17:33/31	07:50		06:58		06:17	19:04-20:02/58	05:59	19:56-20:34/38
	17:24		18:02		19:34		20:07		20:39		21:04	
13	07:56	15:53-16:34/41	07:30	17:01-17:35/34	07:48		06:57	19:22-19:37/15	06:16	19:05-20:02/57	05:59	19:56-20:35/39
	17:25		18:03		19:36		20:08		20:40		21:05	
14	07:56	15:53-16:33/40	07:29	07:49-07:53/4	07:46		06:55	19:17-19:40/23	06:15	19:05-20:02/57	05:59	19:56-20:35/39
	17:26		18:04	16:59-17:36/37	19:37		20:09		20:41		21:05	
15	07:55	15:54-16:34/40	07:27	07:47-07:55/8	07:45		06:54	19:15-19:43/28	06:14	19:06-20:01/55	05:59	19:56-20:36/40
	17:27		18:05	16:58-17:37/39	19:38		20:10		20:42		21:05	
16	07:55	15:54-16:33/39	07:26	07:46-07:57/11	07:43		06:52	19:12-19:44/32	06:13	19:07-20:01/54	05:59	19:56-20:36/40
	17:28		18:06	16:57-17:38/41	19:39		20:11		20:43		21:06	
17	07:54	15:56-16:34/38	07:25	07:45-07:58/13	07:41		06:51	19:11-19:46/35	06:12	19:08-20:01/53	05:59	19:56-20:36/40
	17:30		18:08	16:56-17:38/42	19:40		20:12		20:44		21:06	
18	07:54	15:56-16:33/37	07:23	07:43-07:58/15	07:40		06:49	19:09-19:47/38	06:12	19:09-20:00/51	05:59	19:56-20:36/40
	17:31		18:09	16:56-17:39/43	19:41		20:13		20:44		21:07	
19	07:53	15:58-16:33/35	07:22	07:42-07:59/17	07:38		06:48	19:08-19:48/40	06:11	19:10-19:59/49	05:59	19:56-20:37/41
	17:32		18:10	16:55-17:40/45	19:42		20:14		20:45		21:07	
20	07:53	15:59-16:33/34	07:21	07:40-07:59/19	07:36		06:46	19:06-19:48/42	06:10	19:12-20:00/48	05:59	19:56-20:37/41
	17:33		18:11	16:54-17:40/46	19:43		20:15		20:46		21:07	
21	07:52	15:59-16:32/33	07:19	07:39-08:00/21	07:35		06:45	19:05-19:49/44	06:09	19:13-19:59/46	05:59	19:57-20:38/41
	17:34		18:13	16:54-17:41/47	19:44		20:16		20:47		21:08	
22	07:52	16:01-16:32/31	07:18	07:37-07:59/22	07:33		06:43	19:04-19:49/45	06:08	19:14-19:58/44	05:59	19:57-20:38/41
	17:35		18:14	16:53-17:41/48	19:45		20:17		20:48		21:08	
23	07:51	16:03-16:31/28	07:16	07:36-07:59/23	07:31		06:42	19:04-19:53/49	06:07	19:16-19:58/42	06:00	19:57-20:38/41
	17:37		18:15	16:54-17:41/47	19:46		20:19		20:49		21:08	
24	07:50	16:04-16:30/26	07:15	07:36-07:58/22	07:30		06:40	19:03-19:55/52	06:07	19:19-19:58/39	06:00	19:57-20:38/41
	17:38		18:16	16:53-17:41/48	19:48		20:20		20:50		21:08	
25	07:50	16:06-16:28/22	07:13	07:37-07:58/21	07:28		06:39	19:02-19:56/54	06:06	19:22-19:57/35	06:00	19:58-20:38/40
	17:39		18:17	16:53-17:41/48	19:49		20:21		20:51		21:08	
26	07:49	16:08-16:26/18	07:12	07:37-07:56/19	07:26		06:37	19:02-19:57/55	06:05	19:24-19:56/32	06:00	19:58-20:38/40
	17:40		18:18	16:53-17:40/47	19:50		20:22		20:52		21:08	
27	07:48	16:12-16:24/12	07:10	07:39-07:55/16	07:25		06:36	19:01-19:58/57	06:05	20:07-20:17/10	06:01	19:58-20:38/40
	17:42		18:20	16:54-17:40/46	19:51		20:23		20:53	19:26-19:56/30	21:08	
28	07:47		07:09	07:40-07:53/13	07:23		06:35	19:01-19:59/58	06:04	20:04-20:20/16	06:01	19:59-20:38/39
	17:43		18:21	16:53-17:40/47	19:52		20:24		20:54	19:26-19:55/29	21:09	
29	07:46				07:21		06:33	19:01-20:00/59	06:03	20:03-20:22/19	06:02	19:59-20:38/39
	17:44				19:53		20:25		20:54	19:28-19:54/26	21:09	
30	07:45				07:20		06:32	19:00-20:00/60	06:03	20:01-20:24/23	06:02	20:00-20:39/39
	17:45				19:54		20:26		20:55	19:28-19:53/25	21:08	
31	07:44				07:18				06:02	20:00-20:25/25		
	17:47				19:55				20:56	19:30-19:53/23		
Potential sun hours	297		297		370		399		448		452	
Sum of minutes with flicker		996		1062		384		786		1612		1211

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T78 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (495)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September	October		November		December	
1	06:03	20:00-20:38/38	06:27	19:14-20:13/59	06:58	07:28		07:02	16:35-16:58/23	07:37	15:33-16:15/42
	21:08		20:50		20:07	19:15		17:28		17:04	
2	06:03	20:01-20:39/38	06:28	19:13-20:12/59	06:59	07:29	17:48-17:58/10	07:03	16:39-16:56/17	07:38	15:33-16:16/43
	21:08		20:49		20:06	19:13		17:27		17:04	
3	06:04	20:01-20:38/37	06:29	19:12-20:12/60	07:00	07:30	17:44-18:03/19	07:04	16:43-16:51/8	07:39	15:33-16:16/43
	21:08		20:48		20:04	19:12		17:26		17:04	
4	06:04	20:02-20:38/36	06:30	19:12-20:12/60	07:01	07:31	17:41-18:06/25	07:06		07:40	15:33-16:17/44
	21:08		20:47		20:02	19:10		17:25		17:03	
5	06:05	20:02-20:37/35	06:31	19:11-20:12/61	07:02	07:32	17:38-18:07/29	07:07		07:41	15:33-16:17/44
	21:08		20:46		20:01	19:08		17:24		17:03	
6	06:05	20:03-20:37/34	06:32	19:11-20:12/61	07:03	07:33	17:36-18:09/33	07:08		07:42	15:34-16:18/44
	21:08		20:44		19:57	19:07		17:22		17:03	
7	06:06	20:03-20:37/34	06:33	19:10-20:12/62	07:04	07:34	17:34-18:10/36	07:09		07:43	15:34-16:18/44
	21:07	19:44-19:52/8	20:43		19:56	19:05		17:21		17:03	
8	06:07	20:04-20:36/32	06:34	19:10-20:11/61	07:05	07:35	17:32-18:10/38	07:10		07:44	15:34-16:19/45
	21:07	19:43-19:55/12	20:42		19:54	19:03		17:20		17:03	
9	06:07	20:05-20:36/31	06:35	19:10-20:11/61	07:06	07:36	17:31-18:11/40	07:12		07:45	15:35-16:19/44
	21:07	19:42-19:57/15	20:41		19:52	19:02		17:19		17:03	
10	06:08	20:05-20:35/30	06:36	19:09-20:10/61	07:07	07:37	17:30-18:12/42	07:13		07:46	15:35-16:20/45
	21:06	19:40-19:57/17	20:40		19:51	19:00		17:18		17:03	
11	06:09	20:07-20:35/28	06:37	19:09-20:10/61	07:08	07:38	17:28-18:12/44	07:14		07:46	15:36-16:20/44
	21:06	19:39-19:59/20	20:38		19:49	18:59		17:17		17:03	
12	06:09	20:08-20:34/26	06:38	19:09-20:09/60	07:09	07:39	17:27-18:12/45	07:15		07:47	15:36-16:21/45
	21:06	19:38-20:01/23	20:37		19:47	18:57		17:16		17:03	
13	06:10	20:09-20:32/23	06:39	19:09-20:08/59	07:10	07:40	08:16-08:25/9	07:16		07:48	15:37-16:22/45
	21:05	19:37-20:01/24	20:36		19:46	18:55	17:27-18:12/45	17:15		17:03	
14	06:11	20:10-20:31/21	06:40	19:09-20:08/59	07:11	07:42	08:13-08:27/14	07:18		07:49	15:37-16:22/45
	21:05	19:36-20:02/26	20:34		19:44	18:54	17:27-18:13/46	17:14		17:04	
15	06:12	20:12-20:30/18	06:41	19:09-20:06/57	07:11	07:43	08:11-08:28/17	07:19	15:44-15:57/13	07:50	15:37-16:22/45
	21:04	19:36-20:03/27	20:33		19:42	18:52	17:26-18:13/47	17:13		17:04	
16	06:12	20:15-20:28/13	06:42	19:09-20:05/56	07:12	07:44	08:09-08:29/20	07:20	15:41-15:59/18	07:50	15:38-16:23/45
	21:03	19:35-20:05/30	20:32		19:41	18:51	17:25-18:13/48	17:13		17:04	
17	06:13	20:18-20:24/6	06:43	19:09-20:04/55	07:13	07:45	08:08-08:30/22	07:21	15:40-16:02/22	07:51	15:38-16:23/45
	21:03	19:34-20:05/31	20:30		19:39	18:49	17:25-18:12/47	17:12		17:04	
18	06:14	19:33-20:06/33	06:44	19:09-20:02/53	07:14	07:46	08:07-08:30/23	07:22	15:38-16:04/26	07:52	15:39-16:24/45
	21:02		20:29		19:37	18:48	17:25-18:12/47	17:11		17:05	
19	06:15	19:30-20:07/37	06:45	19:09-20:00/51	07:15	07:47	08:07-08:30/23	07:24	15:37-16:05/28	07:52	15:40-16:25/45
	21:02		20:27		19:35	18:46	17:24-18:12/48	17:10		17:05	
20	06:16	19:27-20:08/41	06:46	19:09-19:58/49	07:16	07:48	08:09-08:31/22	07:25	15:36-16:07/31	07:53	15:40-16:24/44
	21:01		20:26		19:34	18:45	17:25-18:12/47	17:10		17:05	
21	06:17	19:26-20:08/42	06:47	19:10-19:55/45	07:17	07:49	08:10-08:30/20	07:26	15:35-16:08/33	07:53	15:41-16:25/44
	21:00		20:24		19:32	18:43	17:25-18:11/46	17:09		17:06	
22	06:17	19:24-20:09/45	06:48	19:10-19:54/44	07:18	07:50	08:11-08:30/19	07:27	15:35-16:09/34	07:54	15:41-16:25/44
	20:59		20:23		19:30	18:42	17:25-18:11/46	17:08		17:06	
23	06:18	19:22-20:09/47	06:49	19:10-19:52/42	07:20	07:52	08:12-08:29/17	07:28	15:34-16:09/35	07:54	15:42-16:26/44
	20:59		20:21		19:29	18:40	17:25-18:10/45	17:08		17:07	
24	06:19	19:21-20:10/49	06:50	19:11-19:51/40	07:21	07:53	08:13-08:28/15	07:29	15:33-16:10/37	07:55	15:42-16:27/45
	20:58		20:20		19:27	18:39	17:25-18:09/44	17:07		17:08	
25	06:20	19:20-20:10/50	06:51	19:12-19:49/37	07:22	07:54	08:15-08:28/13	07:30	15:34-16:12/38	07:55	15:42-16:27/45
	20:57		20:18		19:25	18:38	17:27-18:09/42	17:07		17:08	
26	06:21	19:19-20:11/52	06:52	19:13-19:48/35	07:23	07:55	08:16-08:26/10	07:32	15:33-16:12/39	07:56	15:43-16:28/45
	20:56		20:17		19:23	18:36	17:27-18:08/41	17:06		17:09	
27	06:22	19:18-20:11/53	06:53	19:14-19:46/32	07:24	07:56	08:17-08:24/7	07:33	15:33-16:13/40	07:56	15:43-16:28/45
	20:55		20:15		19:22	18:35	17:28-18:06/38	17:06		17:09	
28	06:23	19:17-20:12/55	06:54	19:16-19:43/27	07:25	07:57	08:18-08:21/3	07:34	15:33-16:13/40	07:56	15:43-16:28/45
	20:54		20:14		19:20	18:33	17:29-18:05/36	17:05		17:10	
29	06:24	19:16-20:12/56	06:55	19:18-19:41/23	07:26	07:59	17:31-18:04/33	07:35	15:33-16:14/41	07:57	15:44-16:28/44
	20:53		20:12		19:18	18:32		17:05		17:11	
30	06:25	19:16-20:12/56	06:56	19:22-19:37/15	07:27	08:00	17:32-18:03/31	07:36	15:33-16:14/41	07:57	15:44-16:29/45
	20:52		20:11		19:17	18:31		17:04		17:12	
31	06:26	19:15-20:13/58	06:57			08:01	17:33-18:01/28			07:57	15:45-16:30/45
	20:51		20:09			18:30				17:12	
Potential sun hours	459		428		375	345		297		287	
Sum of minutes with flicker	1387		1505		0	1420		564		1377	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T79 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (496)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 14:55-15:41/46 17:13 08:19-08:23/4	07:43 08:14-08:34/20 17:48 16:02-17:01/59	07:07 07:26-07:59/33 18:22 15:58-17:08/70	07:16 07:35-08:04/29 19:56 18:44-19:16/32	06:30 18:20-19:28/68 20:27	06:02 20:05-20:31/26 20:56
2	07:57 14:55-15:41/46 17:14 08:19-08:25/6	07:42 08:15-08:32/17 17:49 16:01-17:03/62	07:05 07:25-07:58/33 18:23 15:59-17:08/69	07:14 07:35-08:03/28 19:57 18:41-19:18/37	06:29 18:21-19:28/67 20:28	06:01 20:05-20:31/26 20:57
3	07:57 14:56-15:41/45 17:15 08:19-08:26/7	07:41 08:16-08:31/15 17:50 16:00-17:04/64	07:04 07:23-07:55/32 18:24 15:59-17:07/68	07:13 07:35-08:03/28 19:58 18:39-19:21/42	06:28 18:20-19:26/66 20:29	06:01 20:05-20:31/26 20:58
4	07:57 14:57-15:41/44 17:16 08:19-08:27/8	07:40 08:19-08:29/10 17:51 16:00-17:05/65	07:02 07:22-07:52/30 18:25 16:01-17:06/65	07:11 07:35-08:02/27 19:59 18:36-19:22/46	06:26 18:21-19:26/65 20:30	06:00 20:06-20:31/25 20:59
5	07:57 14:58-15:41/43 17:17 08:19-08:28/9	07:39 15:59-17:06/67 17:53	07:01 07:20-07:50/30 18:26 16:01-17:05/64	07:09 07:35-08:01/26 20:00 18:34-19:23/49	06:25 18:22-19:26/64 20:31	06:00 20:06-20:31/25 20:59
6	07:57 14:59-15:41/42 17:18 08:19-08:29/10	07:38 15:59-17:07/68 17:54	06:59 07:18-07:49/31 18:27 16:02-17:03/61	07:08 07:36-08:01/25 20:00 18:32-19:25/53	06:24 18:22-19:25/63 20:32	06:00 20:06-20:31/25 21:00
7	07:57 15:01-15:41/40 17:19 08:19-08:30/11	07:37 15:58-17:08/70 17:55	06:58 07:17-07:49/32 18:29 16:03-17:03/60	07:06 07:37-07:59/22 20:01 18:30-19:26/56	06:23 18:23-19:25/62 20:33	05:59 20:06-20:31/25 21:01
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30	07:45 08:13-08:36/23 17:45 16:04-16:59/55		07:19 07:38-08:04/26 19:54 18:55-19:05/10	06:32 18:19-19:28/69 20:26	06:03 20:05-20:31/26 20:55	06:02 20:12-20:35/23 21:08
31	07:44 08:13-08:35/22 17:46 16:03-17:00/57		07:18 07:37-08:05/28 19:55 18:49-19:12/23		06:02 20:05-20:31/26 20:56	
Potential sun hours	297	297	370	399	448	452
Sum of minutes with flicker	1691	2435	1447	2535	1563	687

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T79 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (496)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:13-20:36/23 21:08	06:26 18:37-19:31/54 20:50	06:57 07:18-07:32/14 20:07 18:25-19:28/63	07:27 07:56-08:20/24 19:15 16:51-17:32/41	07:02 15:26-16:39/73 17:28	07:37 08:00-08:16/16 17:04 14:48-15:22/34
2	06:03 20:12-20:36/24 21:08	06:27 18:36-19:32/56 20:49	06:58 07:19-07:30/11 18:25-19:27/62 20:05 07:41-07:51/10	07:28 07:55-08:21/26 19:13 16:48-17:34/46	07:03 15:27-16:38/71 17:27	07:38 08:01-08:16/15 17:04 14:47-15:23/36
3	06:03 20:13-20:37/24 21:08	06:28 18:35-19:33/58 20:48	06:59 07:20-07:26/6 18:26-19:26/60 20:04 07:37-07:53/16	07:29 07:54-08:22/28 19:11 16:46-17:35/49	07:04 15:27-16:37/70 17:26	07:39 14:47-15:24/37 17:03 08:02-08:16/14
4	06:04 20:12-20:36/24 21:08	06:29 18:34-19:33/59 20:46	07:00 07:35-07:55/20 20:02 18:27-19:24/57	07:30 07:53-08:23/30 19:10 16:44-17:36/52	07:05 15:28-16:37/69 17:24	07:40 14:46-15:25/39 17:03 08:03-08:16/13
5	06:04 20:13-20:37/24 21:07	06:30 18:33-19:34/61 20:45	07:01 07:34-07:56/22 20:00 18:27-19:23/56	07:32 07:53-08:24/31 19:08 16:42-17:37/55	07:06 15:29-16:37/68 17:23	07:41 14:46-15:26/40 17:03 08:04-08:16/12
6	06:05 20:12-20:37/25 21:07	06:31 18:33-19:34/61 20:44	07:02 07:32-07:57/25 19:57 18:28-19:21/53	07:33 07:52-08:25/33 19:06 16:40-17:38/58	07:08 07:53-07:55/2 17:22 15:29-16:36/67	07:42 14:46-15:27/41 17:03 08:05-08:15/10
7	06:06 20:13-20:38/25 21:07	06:32 18:32-19:35/63 20:43	07:03 07:31-07:57/26 19:55 18:30-19:19/49	07:34 07:54-08:26/32 19:05 16:38-17:39/61	07:09 07:49-08:00/11 17:21 15:31-16:36/65	07:43 14:45-15:28/43 17:03 08:06-08:15/9
8	06:06 20:13-20:38/25 21:07	06:33 18:31-19:35/64 20:42	07:04 07:30-07:57/27 19:54 18:30-19:16/46	07:35 07:55-08:26/31 19:03 16:37-17:40/63	07:10 07:47-08:02/15 17:20 15:31-16:34/63	07:43 14:45-15:29/44 17:03 08:07-08:15/8
9	06:07 20:12-20:38/26 21:06	06:34 18:30-19:36/66 20:40	07:05 07:29-07:57/28 19:52 18:32-19:14/42	07:36 07:56-08:26/30 19:01 16:36-17:41/65	07:11 07:45-08:03/18 17:19 15:32-16:33/61	07:44 14:45-15:30/45 17:03 08:08-08:15/7
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12	06:09 20:13-20:39/26 21:05	06:37 18:29-19:37/68 20:37	07:08 07:28-07:56/28 19:47 18:39-19:04/25	07:39 07:59-08:32/33 18:57 16:32-17:42/70	07:15 07:43-08:07/24 17:16 15:36-16:31/55	07:47 14:45-15:32/47 17:03 08:10-08:13/3
13	06:10 20:13-20:39/26 21:05	06:38 18:28-19:37/69 20:35	07:09 07:29-07:55/26 19:45 18:45-18:58/13	07:40 08:00-08:33/33 18:55 16:31-17:42/71	07:16 07:43-08:08/25 17:15 15:37-16:29/52	07:48 14:45-15:33/48 17:03 08:11-08:13/2
14	06:11 20:13-20:39/26 21:04	06:39 07:25-07:30/5 20:34 18:28-19:37/69	07:10 07:30-07:54/24 19:44	07:41 08:01-08:34/33 18:53 16:30-17:42/72	07:17 07:43-08:10/27 17:14 15:39-16:29/50	07:48 14:46-15:34/48 17:03
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16	06:12 20:13-20:37/24 21:03	06:41 07:19-07:36/17 20:31 18:26-19:36/70	07:12 07:32-07:52/20 19:40	07:43 08:04-08:35/31 18:50 16:29-17:43/74	07:20 07:43-08:12/29 17:12 15:41-16:26/45	07:50 14:46-15:35/49 17:04
17	06:13 20:14-20:37/23 21:02 18:59-19:09/10	06:42 07:17-07:37/20 20:30 18:25-19:36/71	07:13 07:33-07:51/18 19:38	07:44 08:05-08:35/30 18:49 16:28-17:43/75	07:21 07:43-08:12/29 17:12 15:43-16:24/41	07:51 14:47-15:36/49 17:04
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31	06:25 18:37-19:30/53 20:51	06:56 07:17-07:34/17 20:09 18:24-19:29/65	 	08:01 16:26-17:40/74 18:29	 	07:57 14:54-15:41/47 17:12 08:19-08:22/3
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1140	2467	1187	2852	1860	1546

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T8 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (427)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 16:14-16:38/24 17:13	07:44 08:04-08:32/28 17:47	07:07 18:22	07:16 19:56	06:30 07:04-07:15/11 20:27	06:01 20:02-20:33/31 20:57
2	07:58 16:15-16:38/23 17:13	07:43 08:03-08:33/30 17:48	07:06 18:23	07:14 19:57	06:29 07:07-07:12/5 20:28	06:01 20:02-20:33/31 20:58
3	07:58 16:16-16:38/22 17:14	07:42 08:03-08:33/30 17:50	07:04 18:24	07:13 19:58	06:27 20:29	06:00 20:03-20:34/31 20:59
4	07:58 16:18-16:38/20 17:15	07:41 08:03-08:33/30 17:51	07:03 18:25	07:11 19:59	06:26 20:30	06:00 20:03-20:35/32 20:59
5	07:58 16:20-16:38/18 17:16	07:40 08:03-08:34/31 17:52	07:01 18:26	07:09 20:00	06:25 20:31	05:59 20:03-20:35/32 21:00
6	07:58 16:21-16:38/17 17:17	07:38 08:04-08:34/30 17:54	06:59 18:27	07:08 20:00	06:24 20:33	05:59 20:04-20:36/32 21:01
7	07:58 16:22-16:38/16 17:18	07:37 08:04-08:34/30 17:55	06:58 18:29	07:06 20:01	06:22 20:34	05:59 20:05-20:37/32 21:02
8	07:58 16:24-16:38/14 17:19	07:36 08:04-08:33/29 17:56	07:56 19:30	07:05 20:03	06:21 20:08-20:11/3 20:35	05:59 20:06-20:38/32 21:02
9	07:57 16:24-16:37/13 17:20	07:35 08:05-08:32/27 17:57	07:55 19:31	07:03 20:04	06:20 20:05-20:13/8 20:36	05:58 20:06-20:37/31 21:03
10	07:57 16:26-16:36/10 17:21	07:34 08:06-08:32/26 17:59	07:53 19:32	07:01 20:05	06:19 20:03-20:14/11 20:37	05:58 20:07-20:38/31 21:03
11	07:57 16:29-16:35/6 17:22	07:33 08:07-08:31/24 18:00	07:51 19:33	07:00 20:06	06:18 20:02-20:15/13 20:38	05:58 20:08-20:39/31 21:04
12	07:57 17:23	07:31 08:07-08:29/22 18:01	07:50 19:34	06:58 20:07	06:17 20:01-20:16/15 20:39	05:58 20:09-20:39/30 21:04
13	07:56 17:24	07:30 08:09-08:28/19 18:02	07:48 19:35	06:56 20:08	06:16 20:00-20:16/16 20:40	05:58 20:10-20:39/29 21:05
14	07:56 17:25	07:29 08:11-08:27/16 18:04	07:46 19:36	06:55 20:09	06:15 19:59-20:17/18 20:41	05:58 20:11-20:39/28 21:05
15	07:56 17:27	07:28 08:14-08:23/9 18:05	07:45 19:38	06:53 07:12-07:16/4 20:10	06:14 19:59-20:18/19 20:42	05:58 20:11-20:39/28 21:06
16	07:55 17:28	07:26 18:06	07:43 19:39	06:52 07:11-07:19/8 20:11	06:13 19:58-20:19/21 20:43	05:58 20:11-20:40/29 21:06
17	07:55 17:29	07:25 18:07	07:41 19:40	06:50 07:09-07:20/11 20:12	06:12 19:58-20:20/22 20:44	05:58 20:11-20:40/29 21:07
18	07:54 17:30	07:23 18:08	07:40 19:41	06:49 07:08-07:22/14 20:13	06:11 19:58-20:22/24 20:45	05:58 20:11-20:40/29 21:07
19	07:54 17:31	07:22 18:10	07:38 19:42	06:47 07:06-07:22/16 20:14	06:10 19:58-20:22/24 20:46	05:58 20:11-20:40/29 21:07
20	07:53 17:32	07:21 18:11	07:36 19:43	06:46 07:05-07:23/18 20:15	06:09 19:58-20:23/25 20:47	05:58 20:13-20:41/28 21:08
21	07:53 17:34	07:19 18:12	07:35 19:44	06:44 07:03-07:22/19 20:16	06:08 19:57-20:24/27 20:48	05:58 20:13-20:41/28 21:08
22	07:52 08:13-08:19/6 17:35	07:18 18:13	07:33 19:45	06:43 07:02-07:23/21 20:18	06:07 19:57-20:24/27 20:49	05:59 20:13-20:41/28 21:08
23	07:51 08:12-08:22/10 17:36	07:16 18:15	07:31 19:46	06:41 07:01-07:23/22 20:19	06:07 19:58-20:26/28 20:50	05:59 20:13-20:41/28 21:08
24	07:51 08:11-08:24/13 17:37	07:15 18:16	07:30 19:47	06:40 06:59-07:22/23 20:20	06:06 19:58-20:26/28 20:50	05:59 20:13-20:42/29 21:09
25	07:50 08:11-08:26/15 17:38	07:13 18:17	07:28 19:49	06:38 06:59-07:22/23 20:21	06:05 19:58-20:27/29 20:51	05:59 20:13-20:42/29 21:09
26	07:49 08:10-08:27/17 17:40	07:12 18:18	07:26 19:50	06:37 06:58-07:21/23 20:22	06:05 19:59-20:28/29 20:52	06:00 20:13-20:42/29 21:09
27	07:48 08:09-08:29/20 17:41	07:10 18:19	07:24 19:51	06:35 06:59-07:21/22 20:23	06:04 19:59-20:29/30 20:53	06:00 20:14-20:43/29 21:09
28	07:47 08:08-08:29/21 17:42	07:09 18:20	07:23 19:52	06:34 07:00-07:20/20 20:24	06:03 20:00-20:30/30 20:54	06:00 20:14-20:42/28 21:09
29	07:46 08:07-08:30/23 17:43		07:21 19:53	06:33 07:00-07:18/18 20:25	06:03 20:00-20:30/30 20:55	06:01 20:13-20:42/29 21:09
30	07:46 08:06-08:31/25 17:45		07:19 19:54	06:31 07:02-07:17/15 20:26	06:02 20:01-20:32/31 20:56	06:01 20:13-20:43/30 21:09
31	07:45 08:05-08:32/27 17:46		07:18 19:55		06:02 20:01-20:32/31 20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	360	381	0	277	555	892

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T8 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (427)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:12-20:43/31 21:09	06:26 20:12-20:26/14 20:50	06:57 20:07	07:28 19:15	07:02 07:35-08:02/27 17:28	07:37 16:11-16:17/6 17:03
2	06:02 20:12-20:43/31 21:09	06:27 20:13-20:25/12 20:49	06:58 20:06	07:29 19:13	07:03 07:34-08:02/28 17:27	07:38 16:09-16:19/10 17:03
3	06:03 20:12-20:43/31 21:09	06:28 20:14-20:24/10 20:48	06:59 20:04	07:30 19:11	07:05 07:34-08:02/28 17:25	07:39 16:08-16:21/13 17:03
4	06:03 20:12-20:43/31 21:08	06:29 20:16-20:23/7 20:47	07:00 20:02	07:31 19:10	07:06 07:33-08:03/30 17:24	07:40 16:08-16:22/14 17:03
5	06:04 20:11-20:42/31 21:08	06:30 20:46	07:01 20:01	07:32 19:08	07:07 07:34-08:04/30 17:23	07:41 16:07-16:23/16 17:02
6	06:04 20:11-20:42/31 21:08	06:31 20:45	07:02 19:57	07:33 19:06	07:08 07:33-08:03/30 17:22	07:42 16:07-16:24/17 17:02
7	06:05 20:11-20:42/31 21:08	06:32 20:44	07:03 19:56	07:34 19:05	07:09 07:33-08:03/30 17:21	07:43 16:07-16:25/18 17:02
8	06:06 20:10-20:42/32 21:07	06:33 20:42	07:04 19:54	07:35 19:03	07:11 07:34-08:04/30 17:20	07:44 16:06-16:26/20 17:02
9	06:06 20:10-20:42/32 21:07	06:34 20:41	07:05 19:52	07:36 19:01	07:12 07:34-08:04/30 17:19	07:45 16:06-16:27/21 17:02
10	06:07 20:10-20:42/32 21:07	06:35 20:40	07:06 19:51	07:37 19:00	07:13 07:35-08:03/28 17:18	07:46 16:05-16:28/23 17:02
11	06:08 20:09-20:40/31 21:06	06:36 07:14-07:22/8 20:38	07:07 19:49	07:38 18:58	07:14 07:36-08:03/27 17:17	07:47 16:04-16:28/24 17:02
12	06:09 20:09-20:40/31 21:06	06:37 07:12-07:25/13 20:37	07:08 19:47	07:39 18:57	07:15 07:38-08:03/25 17:16	07:48 16:04-16:28/24 17:02
13	06:09 20:09-20:40/31 21:05	06:38 07:10-07:26/16 20:36	07:09 19:46	07:40 18:55	07:17 07:39-08:02/23 17:15	07:48 16:05-16:29/24 17:03
14	06:10 20:08-20:39/31 21:05	06:39 07:08-07:26/18 20:34	07:10 19:44	07:41 18:53	07:18 07:40-08:01/21 17:14	07:49 16:05-16:30/25 17:03 08:59-09:02/3
15	06:11 20:08-20:39/31 21:04	06:40 07:07-07:27/20 20:33	07:11 19:42	07:43 18:52	07:19 07:42-08:01/19 17:13	07:50 16:04-16:30/26 17:03 08:58-09:04/6
16	06:12 20:08-20:38/30 21:04	06:41 07:06-07:27/21 20:32	07:12 19:40	07:44 18:50	07:20 07:43-08:00/17 17:12	07:51 16:05-16:31/26 17:03 08:56-09:05/9
17	06:12 20:08-20:38/30 21:03	06:42 07:05-07:28/23 20:30	07:13 19:39	07:45 18:49	07:21 07:44-07:59/15 17:11	07:51 16:06-16:32/26 17:04 08:57-09:06/9
18	06:13 20:08-20:38/30 21:03	06:43 07:05-07:28/23 20:29	07:14 19:37	07:46 18:47	07:23 07:45-07:58/13 17:10	07:52 16:05-16:32/27 17:04 08:57-09:08/11
19	06:14 20:07-20:36/29 21:02	06:44 07:05-07:28/23 20:27	07:15 19:35	07:47 18:46	07:24 07:47-07:57/10 17:10	07:53 16:06-16:33/27 17:04 08:56-09:08/12
20	06:15 20:08-20:36/28 21:01	06:45 07:06-07:28/22 20:26	07:16 19:34	07:48 18:44	07:25 07:48-07:54/6 17:09	07:53 16:07-16:34/27 17:05 08:57-09:09/12
21	06:16 20:08-20:35/27 21:00	06:46 07:07-07:28/21 20:24	07:17 19:32	07:49 18:43	07:26 17:08	07:54 16:07-16:34/27 17:05 08:57-09:09/12
22	06:17 20:08-20:35/27 21:00	06:47 07:08-07:27/19 20:23	07:18 19:30	07:50 18:41	07:27 17:08	07:54 16:08-16:35/27 17:06 08:58-09:10/12
23	06:18 20:08-20:34/26 20:59	06:48 07:09-07:26/17 20:21	07:19 19:28	07:52 18:40	07:28 17:07	07:55 16:08-16:35/27 17:06 08:58-09:10/12
24	06:18 20:08-20:33/25 20:58	06:49 07:10-07:26/16 20:20	07:20 19:27	07:53 18:38	07:30 17:06	07:55 16:08-16:35/27 17:07 08:58-09:10/12
25	06:19 20:09-20:33/24 20:57	06:50 07:11-07:24/13 20:18	07:21 19:25	07:54 18:37	07:31 17:06	07:56 16:09-16:36/27 17:07 09:00-09:11/11
26	06:20 20:08-20:31/23 20:56	06:51 07:12-07:23/11 20:17	07:22 19:23	07:55 18:36	07:32 17:05	07:56 16:09-16:36/27 17:08 09:00-09:11/11
27	06:21 20:08-20:30/22 20:55	06:52 07:13-07:21/8 20:15	07:23 19:22	07:56 08:43-08:53/10 18:34	07:33 17:05	07:56 16:10-16:36/26 17:09 09:01-09:10/9
28	06:22 20:09-20:29/20 20:54	06:53 07:14-07:18/4 20:14	07:24 19:20	07:57 08:41-08:57/16 18:33	07:34 17:04	07:57 16:11-16:37/26 17:09 09:03-09:11/8
29	06:23 20:09-20:28/19 20:53	06:54 20:12	07:25 19:18	07:59 08:38-08:58/20 18:32	07:35 17:04	07:57 16:12-16:37/25 17:10 09:05-09:09/4
30	06:24 20:10-20:28/18 20:52	06:55 20:11	07:27 19:16	08:00 08:37-08:59/22 18:30	07:36 17:04	07:57 16:12-16:37/25 17:11
31	06:25 20:11-20:27/16 20:51	06:56 20:09		08:01 08:35-09:00/25 18:29		07:57 16:13-16:37/24 17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	862	339	0	93	467	855

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T80 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (497)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:57 15:25-16:14/49	07:43 16:43-17:03/20	07:07 07:27-07:28/1	07:16	06:31	06:02	06:03	06:27	06:58	07:28 07:54-08:14/20	07:02 07:32-08:07/35	07:37 15:17-15:57/40
	17:14 16:36-16:47/11	17:48 17:13-17:24/11	18:22 07:53-08:45/52	19:56	20:27	20:57	21:08	20:50	20:07	19:15 08:43-09:05/22	17:28 16:39-17:03/24	17:04 16:16-16:39/23
2	07:57 15:26-16:15/49	07:42 16:45-17:02/17	07:06 07:25-07:32/7	07:15	06:29	06:02	06:03	06:28	06:59	07:29 07:52-08:14/22	07:03 07:33-08:05/32	07:38 15:16-15:58/42
	17:14 16:35-16:48/13	17:49 17:12-17:25/13	18:23 07:52-08:44/52	19:57	20:28	20:57	21:08	20:49	20:06	19:13 08:41-09:09/28	17:27 16:38-17:03/25	17:04 16:17-16:39/22
3	07:57 15:27-16:15/48	07:41 16:47-17:00/13	07:04 07:24-07:35/11	07:13	06:28	06:01	06:04	06:29	07:00	07:30 07:51-08:14/23	07:04 07:36-08:04/28	07:39 15:16-15:58/42
	17:15 16:35-16:49/14	17:50 17:11-17:27/16	18:24 07:53-08:44/51	19:58	20:29	20:58	21:08	20:48	20:04	19:12 08:38-09:11/33	17:26 16:39-17:03/24	17:04 16:18-16:38/20
4	07:57 15:27-16:14/47	07:40 16:50-16:56/6	07:03 07:22-07:35/13	07:11	06:27	06:01	06:04	06:30	07:01	07:31 07:51-08:14/23	07:06 07:38-08:02/24	07:40 15:15-15:59/44
	17:16 16:35-16:50/15	17:52 17:10-17:27/17	18:25 07:53-08:42/49	19:59	20:30	20:59	21:08	20:47	20:02	19:10 08:36-09:12/36	17:25 16:39-17:01/22	17:04 16:19-16:38/19
5	07:57 15:28-16:14/46	07:39 08:15-08:24/9	07:01 07:20-07:36/16	07:10	06:26	06:00	06:05	06:31	07:02	07:32 07:52-08:14/22	07:07 07:41-07:58/17	07:41 15:15-16:00/45
	17:17 16:35-16:51/16	17:53 17:09-17:29/20	18:27 07:54-08:41/47	20:00	20:31	21:00	21:08	20:46	20:01	19:08 08:34-09:13/39	17:24 16:39-17:00/21	17:03 16:20-16:38/18
6	07:57 15:29-16:15/46	07:38 08:10-08:29/19	06:59 07:19-07:37/18	07:08	06:24	06:00	06:06	06:32	07:03	07:33 07:53-08:13/20	07:08 07:47-07:54/7	07:42 15:15-16:01/46
	17:18 16:35-16:52/17	17:54 17:09-17:30/21	18:28 07:55-08:40/45	20:00	20:32	21:00	21:07	20:44	19:57	19:07 08:33-09:14/41	17:23 16:40-16:59/19	17:03 16:21-16:38/17
7	07:57 15:30-16:15/45	07:37 08:08-08:32/24	06:58 07:17-07:37/20	07:07	06:23	06:00	06:06	06:33	07:04	07:34 07:54-08:13/19	07:09 16:20-16:27/7	07:43 15:15-16:02/47
	17:19 16:35-16:53/18	17:55 17:09-17:32/23	18:29 07:55-08:38/43	20:01	20:33	21:01	21:07	20:43	19:56	19:05 08:31-09:15/44	17:21 16:41-16:58/17	17:03 16:22-16:38/16
8	07:57 15:31-16:15/44	07:36 08:05-08:35/30	07:56 08:16-08:37/21	07:05	06:22	06:00	06:07	06:34	07:05	07:35 07:55-08:12/17	07:10 16:17-16:30/13	07:44 15:15-16:02/47
	17:20 16:35-16:54/19	17:57 17:09-17:33/24	19:30 08:57-09:37/40	20:02	20:34	21:02	21:07	20:42	19:54	19:03 08:30-09:16/46	17:20 16:41-16:57/16	17:03 16:23-16:38/15
9	07:57 15:33-16:15/42	07:35 08:04-08:37/33	07:55 08:14-08:37/23	07:03	06:21	05:59	06:07	06:35	07:06	07:36 07:56-08:11/15	07:11 16:15-16:32/17	07:45 15:15-16:03/48
	17:21 16:35-16:55/20	17:58 17:09-17:34/25	19:31 08:58-09:35/37	20:04	20:35	21:02	21:07	20:41	19:52	19:02 08:29-09:17/48	17:19 16:42-16:55/13	17:03 16:24-16:38/14
10	07:57 15:33-16:14/41	07:34 08:03-08:39/36	07:53 08:13-08:36/23	07:02	06:20	05:59	06:08	06:36	07:07	07:37 07:57-08:09/12	07:13 16:14-16:34/20	07:45 15:15-16:04/49
	17:22 16:34-16:56/22	17:59 17:09-17:33/24	19:32 08:59-09:33/34	20:05	20:36	21:03	21:06	20:39	19:51	19:00 08:27-09:17/50	17:18 16:44-16:55/11	17:03 16:25-16:38/13
11	07:56 15:35-16:15/40	07:32 08:00-08:40/40	07:51 08:14-08:36/22	07:00	06:19	05:59	06:09	06:37	07:08	07:38 07:58-08:07/9	07:14 16:13-16:35/22	07:46 15:16-16:05/49
	17:23 16:34-16:57/23	18:00 17:09-17:33/24	19:33 09:01-09:31/30	20:06	20:37	21:03	21:06	20:38	19:49	18:59 08:26-09:17/51	17:17 16:46-16:54/8	17:03 16:27-16:38/11
12	07:56 15:36-16:15/39	07:31 07:59-08:41/42	07:50 08:14-08:34/20	06:59	06:18	05:59	06:10	06:38	07:09	07:39 07:59-08:04/5	07:15 16:11-16:36/25	07:47 15:16-16:05/49
	17:24 16:34-16:59/25	18:02 17:10-17:33/23	19:35 09:03-09:28/25	20:07	20:38	21:04	21:05	20:37	19:47	18:57 08:26-09:18/52	17:16 16:48-16:52/4	17:03 16:28-16:38/10
13	07:56 15:37-16:14/37	07:30 07:59-08:43/44	07:48 08:14-08:33/19	06:57	06:17	05:59	06:10	06:39	07:10	07:40 08:25-09:18/53	07:16 16:11-16:37/26	07:48 15:15-16:05/50
	17:25 16:34-16:59/25	18:03 17:11-17:33/22	19:36 09:06-09:24/18	20:08	20:39	21:04	21:05	20:36	19:46	18:55	17:15	17:04 16:29-16:38/9
14	07:56 15:39-16:14/35	07:29 07:57-08:43/46	07:46 08:16-08:32/16	06:55	06:16	05:59	06:11	06:40	07:11	07:41 08:25-09:19/54	07:17 16:11-16:38/27	07:49 15:16-16:06/50
	17:26 16:34-17:01/27	18:04 17:11-17:31/20	19:37	20:09	20:40	21:05	21:04	20:34	19:44	18:54	17:14	17:04 16:30-16:38/8
15	07:55 15:42-16:14/32	07:27 07:56-08:44/48	07:45 08:17-08:29/12	06:54	06:15	05:59	06:12	06:41	07:12	07:43 08:25-09:19/54	07:19 16:10-16:39/29	07:49 15:17-16:07/50
	17:28 16:34-17:01/27	18:05 17:13-17:30/17	19:38	20:10	20:41	21:05	21:04	20:33	19:42	18:52	17:14	17:04 16:32-16:37/5
16	07:55 15:44-16:12/28	07:26 07:56-08:45/49	07:43	06:52	06:14	05:59	06:13	06:42	07:13	07:44 08:24-09:19/55	07:20 16:10-16:39/29	07:50 15:16-16:07/51
	17:29 16:34-17:03/29	18:07 17:15-17:29/14	19:39	20:11	20:42	21:06	21:03	20:31	19:40	18:51	17:13	17:04 16:34-16:35/1
17	07:54 15:48-16:11/23	07:25 07:55-08:45/50	07:41	06:51	06:13	05:59	06:13	06:43	07:14	07:45 08:24-09:18/54	07:21 16:10-16:40/30	07:51 15:17-16:08/51
	17:30 16:34-17:03/29	18:08 17:17-17:26/9	19:40	20:12	20:43	21:06	21:03	20:30	19:39	18:49	17:12	17:05
18	07:54 15:51-16:10/19	07:23 07:54-08:46/52	07:40	06:49	06:12	05:59	06:14	06:44	07:15	07:46 08:23-09:18/55	07:22 16:10-16:40/30	07:51 15:18-16:09/51
	17:31 16:34-17:04/30	18:09	19:41	20:13	20:44	21:06	21:02	20:29	19:37	18:48	17:11	17:05
19	07:53 15:53-16:08/15	07:22 07:54-08:47/53	07:38	06:48	06:11	05:59	06:15	06:45	07:16	07:47 08:23-09:18/55	07:23 16:10-16:40/30	07:52 15:17-16:08/51
	17:32 16:34-17:04/30	18:10	19:42	20:14	20:45	21:07	21:01	20:27	19:35	18:46	17:10	17:05
20	07:53 15:57-16:05/8	07:21 07:53-08:46/53	07:36	06:46	06:10	05:59	06:16	06:46	07:17	07:48 08:24-09:18/54	07:25 16:10-16:40/30	07:53 15:18-16:09/51
	17:33 16:35-17:05/30	18:11	19:43	20:15	20:46	21:07	21:01	20:26	19:34	18:45	17:10	17:06
21	07:52 16:35-17:05/30	07:19 07:53-08:47/54	07:35	06:45	06:09	05:59	06:17	06:47	07:18	07:49 08:24-09:18/54	07:26 16:11-16:41/30	07:53 15:18-16:09/51
	17:34	18:13	19:44	20:16	20:47	21:07	21:00	20:24	19:32	18:43	17:09	17:06
22	07:51 16:35-17:05/30	07:18 07:52-08:47/55	07:33	06:43	06:08	06:00	06:18	06:48	07:19	07:50 08:24-09:17/53	07:27 15:34-15:41/7	07:54 15:19-16:10/51
	17:36	18:14	19:45	20:17	20:48	21:08	20:59	20:23	19:30	18:42	17:08 16:11-16:41/30	17:07
23	07:51 16:36-17:06/30	07:16 07:53-08:47/54	07:31	06:42	06:08	06:00	06:18	06:49	07:20	07:51 08:24-09:16/52	07:28 15:30-15:45/15	07:54 15:19-16:10/51
	17:37	18:15	19:46	20:18	20:49	21:08	20:58	20:21	19:29	18:40	17:08 16:11-16:41/30	17:07
24	07:50 16:36-17:06/30	07:15 07:52-08:47/55	07:30	06:40	06:07	06:00	06:19	06:50	07:21	07:53 08:24-09:15/51	07:29 15:28-15:47/19	07:55 15:20-16:11/51
	17:38	18:16	19:48	20:19	20:50	21:08	20:58	20:20	19:27	18:39	17:07 16:11-16:41/30	17:08
25	07:49 16:36-17:06/30	07:13 07:52-08:47/55	07:28	06:39	06:06	06:00	06:20	06:51	07:22	07:54 08:25-09:16/51	07:30 15:25-15:49/24	07:55 15:21-16:11/50
	17:39	18:17	19:49	20:21	20:51	21:08	20:57	20:18	19:25	18:38 17:46-17:56/10	17:07 16:12-16:41/29	17:08
26	07:49 16:37-17:06/29	07:12 07:52-08:46/54	07:26	06:37	06:05	06:01	06:21	06:52	07:23	07:55 08:26-09:15/49	07:31 15:23-15:51/28	07:55 15:21-16:12/51
	17:41	18:19	19:50	20:22	20:52	21:08	20:56	20:17	19:23	18:36 17:44-17:59/15	17:06 16:13-16:42/29	17:09
27	07:48 16:37-17:06/29	07:10 07:52-08:46/54	07:25	06:36	06:05	06:01	06:22	06:53	07:24	07:56 08:26-09:14/48	07:33 15:21-15:53/32	07:56 15:22-16:13/51
	17:42	18:20	19:51	20:23	20:53	21:08	20:55	20:15	19:22	18:35 17:42-18:00/18	17:06 16:14-16:41/27	17:10
28	07:47 16:38-17:05/27	07:09 07:52-08:45/53	07:23	06:35	06:04	06:01	06:23	06:54	07:25 07:59-08:08/9	07:57 08:27-09:12/45	07:34 15:20-15:54/34	07:56 15:22-16:13/51
	17:43	18:21	19:52	20:24	20:53	21:08	20:54	20:14	19:20	18:34 17:41-18:01/20	17:05 16:14-16:41/27	17:10 16:39-16:43/4
29	07:46 16:40-17:06/26		07:21	06:33	06:04	06:02	06:24	06:55	07:26 07:56-08:11/15	07:58 08:28-09:11/43	07:35 15:18-15:55/37	07:56 15:23-16:13/50
	17:44		19:53	20:25	20:54	21:08	20:53	20:12	19:18	18:32 17:40-18:02/22	17:05 16:15-16:40/25	17:11 16:38-16:44/6
30	07:45 16:41-17:05/24		07:20	06:32	06:03	06:02	06:25	06:56	07:27 07:54-08:12/18	08:00 08:29-09:11/42	07:36 15:18-15:56/38	07:57 15:23-16:13/50
	17:45 17:17-17:21/4		19:54	20:26	20:55	21:08	20:52	20:10	19:17 08:47-09:01/14	18:31 17:40-18:03/23	17:05 16:15-16:40/25	17:12 16:37-16:45/8
31	07:44 16:42-17:04/22		07:18		06:03		06:26	06:57		08:01 08:30-09:09/39		07:57 15:24-16:13/49
	17:47 17:15-17:23/8		19:55		20:56		20:51	20:09		18:30 17:39-18:03/24		17:13 16:36-16:46/10
Potential sun hours	298	297	370	399	448	452	459	428	375	345	298	288
Sum of minutes with flicker	1492	1441	765	0	0	0	0	0	56	1790	1198	1758

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T81 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (498)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February		March		April		May		June
1	07:57	07:43	16:50-17:03/13	07:07	07:27-07:31/4	07:16		06:31	19:01-19:58/57	06:02
	17:14	17:48		18:22	16:23-17:31/68	19:56		20:27		20:57
2	07:57	07:42	16:46-17:08/22	07:06	07:25-07:34/9	07:15	19:27-19:36/9	06:29	19:02-19:58/56	06:02
	17:14	17:49		18:23	16:23-17:30/67	19:57		20:28		20:57
3	07:57	07:41	16:43-17:11/28	07:04	07:24-07:36/12	07:13	19:24-19:37/13	06:28	19:03-19:58/55	06:01
	17:15	17:50		18:24	16:23-17:29/66	19:58		20:29		20:58
4	07:57	07:40	16:40-17:13/33	07:03	07:22-07:36/14	07:11	19:21-19:37/16	06:27	19:05-19:57/52	06:01
	17:16	17:52		18:25	16:24-17:29/65	19:59		20:30		20:59
5	07:57	07:39	16:38-17:15/37	07:01	07:20-07:37/17	07:10	19:19-19:39/20	06:26	19:05-19:56/51	06:00
	17:17	17:53		18:27	16:24-17:28/64	20:00		20:31		21:00
6	07:57	07:38	16:36-17:17/41	06:59	07:19-07:38/19	07:08	19:14-19:40/26	06:24	19:07-19:56/49	06:00
	17:18	17:54		18:28	16:25-17:28/63	20:00		20:32		21:00
7	07:57	07:37	16:35-17:19/44	06:58	07:17-07:37/20	07:07	19:11-19:40/29	06:23	19:09-19:55/46	06:00
	17:19	17:55		18:29	16:25-17:27/62	20:01		20:33		21:01
8	07:57	07:36	16:34-17:21/47	07:56	08:16-08:38/22	07:05	19:09-19:42/33	06:22	19:13-19:55/42	06:00
	17:20	17:57		19:30	17:26-18:25/59	20:02		20:34		21:02
9	07:57	07:35	16:33-17:23/50	07:55	08:14-08:37/23	07:03	19:07-19:42/35	06:21	19:24-19:54/30	05:59
	17:21	17:58		19:31	17:27-18:25/58	20:04		20:35		21:02
10	07:57	07:34	16:31-17:23/52	07:53	08:14-08:36/22	07:02	19:06-19:44/38	06:20	19:25-19:53/28	05:59
	17:22	17:59		19:32	17:28-18:24/56	20:05		20:36		21:03
11	07:56	07:32	16:30-17:25/55	07:51	08:15-08:36/21	07:00	19:04-19:45/41	06:19	19:26-19:52/26	05:59
	17:23	18:00		19:33	17:29-18:23/54	20:06		20:37		21:03
12	07:56	07:31	16:29-17:26/57	07:50	08:15-08:34/19	06:59	19:02-19:45/43	06:18	19:27-19:51/24	05:59
	17:24	18:02		19:35	17:30-18:21/51	20:07	07:18-07:23/5	20:38		21:04
13	07:56	07:30	16:29-17:27/58	07:48	08:15-08:33/18	06:57	19:02-19:47/45	06:17	19:29-19:49/20	05:59
	17:25	18:03		19:36	17:31-18:19/48	20:08	07:16-07:25/9	20:39		21:04
14	07:55	07:29	16:27-17:27/60	07:46	08:18-08:31/13	06:55	19:00-19:47/47	06:16	19:30-19:48/18	05:59
	17:26	18:04		19:37	17:33-18:18/45	20:09	07:14-07:27/13	20:40		21:05
15	07:55	07:27	16:27-17:28/61	07:45	08:20-08:28/8	06:54	19:00-19:49/49	06:15	19:32-19:45/13	05:59
	17:28	18:05		19:38	17:34-18:16/42	20:10	07:13-07:28/15	20:41		21:05
16	07:55	07:26	16:26-17:29/63	07:43	17:36-18:13/37	06:52	18:59-19:49/50	06:14	19:36-19:41/5	05:59
	17:29	18:07		19:39		20:11	07:11-07:29/18	20:42		21:06
17	07:54	07:25	16:25-17:29/64	07:41	17:39-18:11/32	06:51	18:59-19:51/52	06:13		05:59
	17:30	18:08		19:40		20:12	07:10-07:30/20	20:43		21:06
18	07:54	07:23	16:25-17:30/65	07:40	17:42-18:07/25	06:49	18:58-19:51/53	06:12		05:59
	17:31	18:09		19:41		20:13	07:08-07:29/21	20:44		21:06
19	07:53	07:22	16:25-17:31/66	07:38	17:46-18:02/16	06:48	18:58-19:53/55	06:11		05:59
	17:32	18:10		19:42		20:14	07:07-07:30/23	20:45		21:07
20	07:53	07:21	16:24-17:31/67	07:36		06:46	18:57-19:53/56	06:10		05:59
	17:33	18:11		19:43		20:15	07:05-07:29/24	20:46		21:07
21	07:52	07:19	16:24-17:32/68	07:35		06:45	18:57-19:55/58	06:09		05:59
	17:34	18:13		19:44		20:16	07:04-07:30/26	20:47		21:07
22	07:51	07:18	16:23-17:31/68	07:33		06:43	18:57-19:55/58	06:08		06:00
	17:36	18:14		19:45		20:17	07:04-07:30/26	20:48		21:08
23	07:51	07:16	16:23-17:32/69	07:31		06:42	18:57-19:57/60	06:08		06:00
	17:37	18:15		19:46		20:18	07:03-07:29/26	20:49		21:08
24	07:50	07:15	16:23-17:31/68	07:30		06:40	18:58-19:58/60	06:07		06:00
	17:38	18:16		19:48		20:19	07:04-07:29/25	20:50		21:08
25	07:49	07:13	16:23-17:32/69	07:28		06:39	18:57-19:58/61	06:06		06:00
	17:39	18:17		19:49		20:21	07:04-07:27/23	20:51		21:08
26	07:49	07:12	16:22-17:31/69	07:26		06:37	18:58-19:59/61	06:05		06:01
	17:41	18:19		19:50		20:22	07:04-07:27/23	20:52		21:08
27	07:48	07:10	16:23-17:32/69	07:25		06:36	18:59-19:59/60	06:05		06:01
	17:42	18:20		19:51		20:23	07:06-07:26/20	20:53		21:08
28	07:47	07:09	16:23-17:31/68	07:23		06:35	18:59-19:58/59	06:04		06:01
	17:43	18:21		19:52		20:24	07:06-07:24/18	20:53		21:08
29	07:46			07:21		06:33	19:00-19:59/59	06:04		06:02
	17:44			19:53		20:25	07:08-07:22/14	20:54		21:08
30	07:45			07:20		06:32	19:01-19:59/58	06:03		06:02
	17:45			19:54		20:26	07:10-07:20/10	20:55		21:08
31	07:44			07:18				06:03		
	17:47			19:55				20:56		
Potential sun hours	298	297		370		399		448		452
Sum of minutes with flicker	0	1531		1219		1663		572		0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T81 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (498)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 21:08	06:27 19:37-20:02/25 20:50	06:58 19:03-19:44/41 20:07	07:28 07:55-08:14/19 19:15 17:09-17:59/50	07:02 16:01-16:53/52 17:28	07:37 17:04
2	06:03 21:08	06:28 19:36-20:03/27 20:49	06:59 19:04-19:42/38 20:06	07:29 07:54-08:14/20 19:13 17:07-18:00/53	07:03 16:02-16:51/49 17:27	07:38 17:04
3	06:04 21:08	06:29 19:35-20:04/29 20:48	07:00 19:05-19:40/35 20:04	07:30 07:52-08:14/22 19:12 17:07-18:02/55	07:04 16:04-16:51/47 17:26	07:39 17:04
4	06:04 21:08	06:30 19:33-20:04/31 20:47 19:27-19:29/2	07:01 19:06-19:39/33 20:02	07:31 07:52-08:15/23 19:10 17:05-18:02/57	07:06 16:05-16:49/44 17:25	07:40 17:04
5	06:05 21:08	06:31 19:21-20:04/43 20:45	07:02 19:08-19:37/29 20:01	07:32 07:52-08:14/22 19:08 17:04-18:03/59	07:07 16:06-16:47/41 17:24	07:41 17:03
6	06:06 21:07	06:32 19:18-20:05/47 20:44	07:03 19:10-19:36/26 19:57	07:33 07:53-08:14/21 19:07 17:02-18:03/61	07:08 16:09-16:46/37 17:23	07:42 17:03
7	06:06 21:07	06:33 19:16-20:06/50 20:43	07:04 19:13-19:34/21 19:56	07:34 07:54-08:13/19 19:05 17:01-18:03/62	07:09 16:11-16:44/33 17:21	07:43 17:03
8	06:07 21:07	06:34 19:14-20:06/52 20:42	07:05 19:16-19:32/16 19:54	07:35 07:55-08:13/18 19:03 17:00-18:04/64	07:10 16:13-16:41/28 17:20	07:44 17:03
9	06:07 21:06	06:35 19:13-20:06/53 20:41	07:06 19:18-19:31/13 19:52	07:36 07:56-08:12/16 19:02 16:59-18:04/65	07:11 16:16-16:38/22 17:19	07:45 17:03
10	06:08 21:06	06:36 19:11-20:06/55 20:39	07:07 19:20-19:29/9 19:51	07:37 07:57-08:10/13 19:00 16:58-18:04/66	07:13 16:22-16:34/12 17:18	07:45 17:03
11	06:09 21:06	06:37 19:10-20:07/57 20:38	07:08 19:49	07:38 07:58-08:08/10 18:59 16:57-18:04/67	07:14 17:17	07:46 17:03
12	06:10 21:05	06:38 19:09-20:07/58 20:37 07:22-07:24/2	07:09 19:47	07:39 07:59-08:06/7 18:57 16:56-18:04/68	07:15 17:16	07:47 17:03
13	06:10 21:05	06:39 19:08-20:07/59 20:36 07:17-07:28/11	07:10 19:46	07:40 08:00-08:01/1 18:55 16:56-18:04/68	07:16 17:15	07:48 17:04
14	06:11 21:04	06:40 19:07-20:06/59 20:34 07:15-07:30/15	07:11 19:44	07:41 16:56-18:04/68 18:54	07:17 17:15	07:49 17:04
15	06:12 21:04	06:41 19:06-20:06/60 20:33 07:13-07:32/19	07:12 19:42	07:43 16:55-18:04/69 18:52	07:19 17:14	07:49 17:04
16	06:13 21:03	06:42 19:05-20:06/61 20:31 07:12-07:33/21	07:13 19:40	07:44 16:55-18:04/69 18:51	07:20 17:13	07:50 17:04
17	06:13 21:03	06:43 19:05-20:05/60 20:30 07:11-07:34/23	07:14 19:39	07:45 16:55-18:03/68 18:49	07:21 17:12	07:51 17:05
18	06:14 21:02	06:44 19:04-20:05/61 20:29 07:10-07:34/24	07:15 19:37	07:46 16:54-18:03/69 18:48	07:22 17:11	07:51 17:05
19	06:15 21:01	06:45 19:04-20:04/60 20:27 07:09-07:34/25	07:16 19:35	07:47 16:54-18:02/68 18:46	07:23 17:10	07:52 17:05
20	06:16 21:01	06:46 19:03-20:02/59 20:26 07:09-07:35/26	07:17 19:34	07:48 16:54-18:02/68 18:45	07:25 17:10	07:53 17:06
21	06:17 21:00	06:47 19:03-20:01/58 20:24 07:09-07:35/26	07:18 19:32	07:49 16:55-18:02/67 18:43	07:26 17:09	07:53 17:06
22	06:18 20:59	06:48 19:02-19:59/57 20:23 07:09-07:35/26	07:19 19:30	07:50 16:55-18:01/66 18:42	07:27 17:08	07:54 17:07
23	06:18 20:58	06:49 19:02-19:58/56 20:21 07:10-07:34/24	07:20 19:29	07:51 16:55-18:01/66 18:40	07:28 17:08	07:54 17:07
24	06:19 20:58	06:50 19:02-19:57/55 20:20 07:11-07:34/23	07:21 17:31-17:44/13 19:27	07:53 16:55-18:00/65 18:39	07:29 17:07	07:55 17:08
25	06:20 20:57	06:51 19:01-19:54/53 20:18 07:12-07:33/21	07:22 17:25-17:49/24 19:25	07:54 16:55-17:59/64 18:38	07:30 17:07	07:55 17:08
26	06:21 20:56	06:52 19:01-19:53/52 20:17 07:13-07:32/19	07:23 17:22-17:52/30 19:23	07:55 16:56-17:59/63 18:36	07:31 17:06	07:55 17:09
27	06:22 20:55	06:53 19:01-19:51/50 20:15 07:14-07:31/17	07:24 17:18-17:54/36 19:22	07:56 16:56-17:58/62 18:35	07:32 17:06	07:56 17:10
28	06:23 19:45-19:54/9 20:54	06:54 19:01-19:50/49 20:14 07:14-07:29/15	07:25 08:03-08:06/3 19:20 17:16-17:55/39	07:57 16:57-17:57/60 18:34	07:34 17:05	07:56 17:10
29	06:24 19:42-19:57/15 20:53	06:55 19:01-19:48/47 20:12 07:15-07:27/12	07:26 07:58-08:10/12 19:18 17:13-17:57/44	07:58 16:57-17:56/59 18:32	07:35 17:05	07:56 17:11
30	06:25 19:40-19:59/19 20:52	06:56 19:02-19:47/45 20:10 07:16-07:25/9	07:27 07:56-08:12/16 19:17 17:11-17:58/47	08:00 16:59-17:55/56 18:31	07:36 17:05	07:57 17:12
31	06:26 19:39-20:00/21 20:51	06:57 19:02-19:45/43 20:09 07:17-07:21/4		08:01 17:00-17:54/54 18:30		07:57 17:13
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	64	1935	525	2167	365	0

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T82 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (506)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:57 16:25-16:47/22 17:14 08:20-08:33/13	07:43 16:33-17:24/51 17:48	07:07 18:22	07:16 19:56	06:31 06:50-07:31/41 20:27	06:02 06:24-06:48/24 20:57 20:10-20:33/23
2	07:57 16:25-16:48/23 17:15 08:20-08:33/13	07:42 16:34-17:26/52 17:49	07:06 18:23	07:15 07:34-07:36/2 19:57	06:29 06:49-07:31/42 20:28	06:02 06:23-06:47/24 20:57 20:09-20:33/24
3	07:57 16:26-16:49/23 17:15 08:20-08:34/14	07:41 16:34-17:27/53 17:51	07:04 18:24	07:13 07:32-07:39/7 19:58	06:28 06:48-07:31/43 20:29	06:01 06:23-06:46/23 20:58 20:10-20:34/24
4	07:57 16:27-16:50/23 17:16 08:20-08:34/14	07:40 16:34-17:27/53 17:52	07:03 18:26	07:11 07:30-07:40/10 19:59	06:27 06:47-07:30/43 20:30	06:01 06:23-06:45/22 20:59 20:10-20:35/25
5	07:57 16:28-16:51/23 17:17 08:19-08:34/15	07:39 16:35-17:29/54 17:53	07:01 18:27	07:10 07:29-07:42/13 20:00	06:26 06:46-07:30/44 20:31	06:01 06:22-06:44/22 21:00 20:10-20:35/25
6	07:57 16:28-16:52/24 17:18 08:19-08:35/16	07:38 16:36-17:30/54 17:54	06:59 18:28	07:08 07:27-07:42/15 20:00	06:24 06:44-07:28/44 20:32	06:00 06:22-06:44/22 21:00 20:10-20:35/25
7	07:57 16:29-16:53/24 17:19 08:19-08:36/17	07:37 16:37-17:32/55 17:56	06:58 18:29	07:07 07:26-07:43/17 20:01	06:23 06:43-07:28/45 20:33	06:00 06:22-06:44/22 21:01 20:11-20:36/25
8	07:57 16:30-16:54/24 17:20 08:19-08:36/17	07:36 16:38-17:33/55 17:57 07:56-07:58/2	07:56 19:30	07:05 07:24-07:43/19 20:02	06:22 06:42-07:27/45 20:34	06:00 06:22-06:45/23 21:01 20:11-20:37/26
9	07:57 16:32-16:55/23 17:21 08:19-08:37/18	07:35 16:40-17:35/55 17:58 07:55-08:00/5	07:55 19:31	07:03 07:22-07:43/21 20:04	06:21 06:41-07:26/45 20:35	05:59 06:22-06:45/23 21:02 20:11-20:37/26
10	07:57 16:31-16:56/25 17:22 08:18-08:37/19	07:34 16:40-17:35/55 17:59 07:54-08:02/8	07:53 19:32	07:02 07:21-07:43/22 20:05	06:20 06:40-07:25/45 20:36	05:59 06:21-06:44/23 21:03 20:11-20:37/26
11	07:56 16:31-16:57/26 17:23 08:18-08:38/20	07:32 16:42-17:37/55 18:00 07:52-08:02/10	07:51 19:33	07:00 07:19-07:42/23 20:06	06:19 06:39-07:24/45 20:37	05:59 06:21-06:44/23 21:03 20:12-20:38/26
12	07:56 16:31-16:59/28 17:24 08:18-08:38/20	07:31 16:44-17:39/55 18:02 07:51-08:03/12	07:50 19:35	06:59 07:18-07:43/25 20:07	06:18 06:38-07:23/45 20:38	05:59 06:21-06:45/24 21:04 20:12-20:39/27
13	07:56 16:31-16:59/28 17:25 08:17-08:38/21	07:30 16:47-17:39/52 18:03 07:50-08:04/14	07:48 19:36	06:57 07:16-07:41/25 20:08	06:17 06:37-07:21/44 20:39	05:59 06:21-06:45/24 21:04 20:12-20:39/27
14	07:55 16:31-17:01/30 17:26 08:17-08:39/22	07:29 16:50-17:39/49 18:04 07:48-08:04/16	07:46 19:37	06:55 07:14-07:40/26 20:09	06:16 06:36-07:20/44 20:40	05:59 06:21-06:45/24 21:05 20:13-20:40/27
15	07:55 16:30-17:01/31 17:28 08:17-08:40/23	07:27 07:47-08:05/18 18:05 16:55-17:39/44	07:45 19:38	06:54 07:13-07:40/27 20:10	06:15 06:35-07:19/44 20:41	05:59 06:21-06:45/24 21:05 20:13-20:40/27
16	07:55 16:31-17:03/32 17:29 08:16-08:39/23	07:26 07:46-08:05/19 18:07 16:56-17:39/43	07:43 19:39	06:52 07:11-07:38/27 20:11	06:14 06:34-07:19/45 20:42 20:16-20:19/3	05:59 06:21-06:45/24 21:06 20:13-20:40/27
17	07:54 16:30-17:04/34 17:30 08:16-08:40/24	07:25 07:44-08:05/21 18:08 16:56-17:38/42	07:41 19:40	06:51 07:10-07:38/28 20:12	06:13 06:33-07:18/45 20:43 20:14-20:20/6	05:59 06:21-06:45/24 21:06 20:13-20:41/28
18	07:54 16:31-17:06/35 17:31 08:15-08:40/25	07:23 07:43-08:05/22 18:09 16:56-17:38/42	07:40 19:41	06:49 07:08-07:37/29 20:13	06:12 06:33-07:17/44 20:44 20:13-20:20/7	05:59 06:21-06:46/25 21:06 20:13-20:41/28
19	07:53 16:30-17:06/36 17:32 08:14-08:39/25	07:22 07:42-08:05/23 18:10 16:57-17:37/40	07:38 19:42	06:48 07:07-07:37/30 20:14	06:11 06:32-07:17/45 20:45 20:12-20:22/10	05:59 06:22-06:47/25 21:07 20:14-20:41/27
20	07:53 16:31-17:08/37 17:33 08:15-08:40/25	07:21 07:40-08:04/24 18:11 16:58-17:36/38	07:36 19:43	06:46 07:05-07:36/31 20:15	06:10 06:31-07:16/45 20:46 20:12-20:23/11	05:59 06:22-06:47/25 21:07 20:15-20:42/27
21	07:52 16:30-17:09/39 17:35 08:15-08:39/24	07:19 07:39-08:03/24 18:13 16:59-17:36/37	07:35 19:44	06:45 07:04-07:35/31 20:16	06:09 06:30-07:15/45 20:47 20:11-20:23/12	05:59 06:22-06:47/25 21:07 20:15-20:42/27
22	07:51 16:30-17:10/40 17:36 08:16-08:39/23	07:18 07:38-08:02/24 18:14 16:59-17:34/35	07:33 19:45	06:43 07:03-07:34/31 20:17	06:08 06:29-07:14/45 20:48 20:10-20:24/14	06:00 06:22-06:47/25 21:07 20:15-20:42/27
23	07:51 16:31-17:12/41 17:37 08:17-08:39/22	07:16 07:40-08:01/21 18:15 17:01-17:33/32	07:31 19:46	06:42 07:01-07:32/31 20:18	06:08 06:29-07:14/45 20:49 20:10-20:26/16	06:00 06:22-06:47/25 21:08 20:15-20:42/27
24	07:50 16:31-17:13/42 17:38 08:18-08:38/20	07:15 07:41-07:59/18 18:16 17:02-17:31/29	07:30 19:48	06:40 07:00-07:33/33 20:19	06:07 06:28-07:12/44 20:50 20:10-20:26/16	06:00 06:23-06:48/25 21:08 20:15-20:43/28
25	07:49 16:31-17:14/43 17:39 08:19-08:37/18	07:13 07:43-07:58/15 18:17 17:04-17:30/26	07:28 19:49	06:39 06:58-07:32/34 20:21	06:06 06:27-06:51/24 06:54-07:10/16 20:51 20:09-20:27/18	06:00 06:23-06:47/24 21:08 20:15-20:43/28
26	07:49 16:31-17:16/45 17:41 08:21-08:35/14	07:12 17:06-17:27/21 18:19 07:45-07:54/9	07:26 19:50	06:38 06:57-07:33/36 20:22	06:06 06:27-06:51/24 06:56-07:09/13 20:52 20:09-20:28/19	06:01 06:23-06:47/24 21:08 20:15-20:42/27
27	07:48 16:31-17:17/46 17:42 08:23-08:33/10	07:10 17:10-17:24/14 18:20	07:25 19:51	06:36 06:56-07:33/37 20:23	06:05 06:26-06:51/25 06:58-07:07/9 20:53 20:09-20:28/19	06:01 06:24-06:48/24 21:08 20:16-20:43/27
28	07:47 16:31-17:18/47 17:43	07:09 18:21	07:23 19:52	06:35 06:54-07:32/38 20:24	06:04 06:26-06:51/25 20:53 20:09-20:30/21	06:02 06:24-06:48/24 21:08 20:16-20:43/27
29	07:46 16:32-17:20/48 17:44		07:21 19:53	06:33 06:53-07:32/39 20:25	06:04 06:25-06:50/25 20:54 20:09-20:30/21	06:02 06:24-06:48/24 21:08 20:15-20:42/27
30	07:45 16:32-17:22/50 17:46		07:20 19:54	06:32 06:52-07:32/40 20:26	06:03 06:25-06:50/25 20:55 20:10-20:31/21	06:02 06:25-06:49/24 21:08 20:16-20:43/27
31	07:44 16:33-17:23/50 17:47		07:18 19:55		06:03 06:24-06:48/24 20:56 20:09-20:31/22	
Potential sun hours	298	297	370	399	448	452
Sum of minutes with flicker	1557	1496	0	747	1508	1506

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
2019-01-07_Emerson SFA

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T82 - VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (506)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:03 06:25-06:49/24	06:27 06:49-07:34/45	06:58 07:18-07:41/23	07:28	07:02 16:10-17:05/55	07:37 16:13-16:39/26
	21:08 20:16-20:42/26	20:50	20:07	19:15	17:28 07:23-07:30/7	17:04 08:00-08:20/20
2	06:03 06:26-06:49/23	06:28 06:50-07:35/45	06:59 07:19-07:41/22	07:29	07:03 16:08-17:03/55	07:38 16:14-16:39/25
	21:08 20:16-20:43/27	20:49	20:06	19:13	17:27 07:25-07:30/5	17:04 08:01-08:20/19
3	06:04 06:26-06:49/23	06:29 06:51-07:36/45	07:00 07:20-07:41/21	07:30	07:04 16:08-17:03/55	07:39 16:15-16:39/24
	21:08 20:16-20:42/26	20:48	20:04	19:12	17:26 07:26-07:27/1	17:04 08:02-08:20/18
4	06:04 06:27-06:50/23	06:30 06:52-07:37/45	07:01 07:21-07:40/19	07:31	07:05 16:07-17:01/54	07:40 16:15-16:38/23
	21:08 20:16-20:42/26	20:47	20:02	19:10	17:25	17:04 08:03-08:20/17
5	06:05 06:28-06:50/22	06:31 06:53-07:38/45	07:02 07:22-07:39/17	07:32	07:07 16:05-17:00/55	07:41 16:14-16:38/24
	21:08 20:16-20:42/26	20:45	20:01	19:08	17:24	17:03 08:04-08:21/17
6	06:06 06:28-06:50/22	06:32 06:53-07:38/45	07:03 07:23-07:38/15	07:33	07:08 16:06-17:00/54	07:42 16:15-16:38/23
	21:07 20:17-20:42/25	20:44	19:57	19:07	17:23	17:03 08:05-08:21/16
7	06:06 06:29-06:51/22	06:33 06:54-07:38/44	07:04 07:24-07:37/13	07:34	07:09 16:05-16:58/53	07:43 16:15-16:38/23
	21:07 20:17-20:42/25	20:43	19:56	19:05	17:21	17:03 08:06-08:21/15
8	06:07 06:29-06:51/22	06:34 06:55-07:39/44	07:05 07:25-07:35/10	07:35	07:10 16:04-16:57/53	07:44 16:15-16:38/23
	21:07 20:17-20:41/24	20:42	19:54	19:03	17:20	17:03 08:07-08:21/14
9	06:07 06:30-06:53/23	06:35 06:56-07:39/43	07:06 07:26-07:33/7	07:36	07:11 16:03-16:55/52	07:44 16:15-16:38/23
	21:06 20:17-20:41/24	20:41	19:52	19:02	17:19	17:03 08:08-08:22/14
10	06:08 06:31-06:54/23	06:36 06:57-07:40/43	07:07 07:27-07:30/3	07:37	07:13 16:04-16:55/51	07:45 16:15-16:38/23
	21:06 20:17-20:41/24	20:39	19:51	19:00	17:18	17:03 08:09-08:22/13
11	06:09 06:31-06:55/24	06:37 06:58-07:40/42	07:08	07:38	07:14 16:04-16:54/50	07:46 16:16-16:38/22
	21:06 20:17-20:40/23	20:38	19:49	18:59	17:17	17:03 08:10-08:23/13
12	06:10 06:32-06:56/24	06:38 06:59-07:40/41	07:09	07:39	07:15 16:03-16:52/49	07:47 16:15-16:37/22
	21:05 20:17-20:40/23	20:37	19:47	18:57	17:16	17:03 08:11-08:23/12
13	06:10 06:33-06:58/25	06:39 07:00-07:40/40	07:10	07:40	07:16 16:03-16:51/48	07:48 16:16-16:38/22
	21:05 20:18-20:40/22	20:35	19:46	18:55	17:15	17:04 08:11-08:23/12
14	06:11 06:33-06:58/25	06:40 07:01-07:40/39	07:11	07:41 17:45-17:52/7	07:17 16:04-16:51/47	07:49 16:16-16:38/22
	21:04 20:17-20:39/22	20:34	19:44	18:54	17:15	17:04 08:12-08:23/11
15	06:12 06:34-06:59/25	06:41 07:02-07:40/38	07:12	07:43 17:41-17:58/17	07:19 16:04-16:50/46	07:49 16:17-16:39/22
	21:04 20:18-20:38/20	20:33	19:42	18:52	17:14 07:56-08:06/10	17:04 08:13-08:24/11
16	06:13 06:35-07:00/25 07:09-07:14/5	06:42 07:03-07:40/37	07:13	07:44 08:16-08:28/12	07:20 16:04-16:49/45	07:50 16:17-16:38/21
	21:03 20:18-20:38/20	20:31	19:41	18:51 17:37-18:00/23	17:13 07:54-08:08/14	17:04 08:13-08:23/10
17	06:13 06:36-07:00/24 07:06-07:18/12	06:43 07:04-07:39/35	07:14	07:45 08:14-08:30/16	07:21 16:05-16:48/43	07:51 16:18-16:39/21
	21:03 20:19-20:38/19	20:30	19:39	18:49 17:35-18:02/27	17:12 07:53-08:11/18	17:05 08:14-08:24/10
18	06:14 06:37-07:01/24 07:05-07:20/15	06:44 07:05-07:39/34	07:15	07:46 08:12-08:31/19	07:22 16:05-16:47/42	07:51 16:18-16:39/21
	21:02 20:18-20:36/18	20:29	19:37	18:48 17:33-18:03/30	17:11 07:52-08:12/20	17:05 08:15-08:25/10
19	06:15 06:37-07:01/24 07:03-07:21/18	06:45 07:06-07:38/32	07:16	07:47 08:10-08:32/22	07:23 16:05-16:46/41	07:52 16:18-16:39/21
	21:01 20:19-20:36/17	20:27	19:35	18:46 17:31-18:04/33	17:11 07:51-08:13/22	17:05 08:15-08:25/10
20	06:16 06:38-07:22/44	06:46 07:07-07:38/31	07:17	07:48 08:10-08:34/24	07:25 16:05-16:45/40	07:53 16:19-16:40/21
	21:01 20:19-20:35/16	20:26	19:34	18:45 17:29-18:05/36	17:10 07:51-08:14/23	17:06 08:16-08:25/9
21	06:17 06:39-07:24/45	06:47 07:08-07:39/31	07:18	07:49 08:10-08:34/24	07:26 16:05-16:44/39	07:53 16:19-16:40/21
	21:00 20:20-20:35/15	20:24	19:32	18:43 17:29-18:06/37	17:09 07:51-08:15/24	17:06 08:16-08:25/9
22	06:18 06:40-07:25/45	06:48 07:09-07:40/31	07:19	07:50 08:11-08:35/24	07:27 16:07-16:44/37	07:54 16:20-16:41/21
	20:59 20:21-20:34/13	20:23	19:30	18:42 17:28-18:07/39	17:08 07:51-08:16/25	17:07 08:17-08:26/9
23	06:19 06:41-07:26/45	06:49 07:10-07:41/31	07:20	07:51 08:12-08:35/23	07:28 16:07-16:43/36	07:54 16:20-16:41/21
	20:58 20:22-20:34/12	20:21	19:29	18:40 17:27-18:07/40	17:08 07:51-08:16/25	17:07 08:17-08:26/9
24	06:19 06:42-07:27/45	06:50 07:11-07:41/30	07:21	07:53 08:13-08:35/22	07:29 16:08-16:43/35	07:55 16:21-16:42/21
	20:57 20:22-20:32/10	20:20	19:27	18:39 17:26-18:07/41	17:07 07:52-08:17/25	17:08 08:18-08:27/9
25	06:20 06:42-07:27/45	06:51 07:12-07:41/29	07:22	07:54 08:15-08:35/20	07:30 16:08-16:42/34	07:55 16:21-16:42/21
	20:57 20:23-20:31/8	20:18	19:25	18:38 17:25-18:08/43	17:07 07:53-08:17/24	17:08 08:18-08:28/10
26	06:21 06:43-07:28/45	06:52 07:13-07:41/28	07:23	07:55 08:16-08:35/19	07:31 16:09-16:41/32	07:55 16:21-16:43/22
	20:56 20:24-20:31/7	20:17	19:23	18:36 17:25-18:09/44	17:06 07:55-08:18/23	17:09 08:18-08:28/10
27	06:22 06:44-07:29/45	06:53 07:13-07:41/28	07:24	07:56 08:17-08:34/17	07:32 16:10-16:41/31	07:56 16:23-16:44/21
	20:55 20:25-20:30/5	20:15	19:22	18:35 17:25-18:08/43	17:06 07:56-08:19/23	17:10 08:19-08:29/10
28	06:23 06:45-07:29/44	06:54 07:14-07:41/27	07:25	07:57 17:19-18:08/49	07:34 16:11-16:41/30	07:56 16:23-16:44/21
	20:54 20:27-20:29/2	20:14	19:20	18:34 08:18-08:34/16	17:05 07:57-08:19/22	17:10 08:19-08:30/11
29	06:24 06:46-07:30/44	06:55 07:15-07:41/26	07:26	07:58 17:15-18:08/53	07:35 16:12-16:40/28	07:56 16:23-16:45/22
	20:53	20:12	19:18	18:32 08:19-08:33/14	17:05 07:58-08:19/21	17:11 08:19-08:30/11
30	06:25 06:47-07:31/44	06:56 07:16-07:41/25	07:27	08:00 17:14-18:08/54	07:36 16:12-16:40/28	07:57 16:24-16:45/21
	20:52	20:10	19:17	18:31 08:21-08:33/12	17:05 07:59-08:19/20	17:12 08:19-08:30/11
31	06:26 06:48-07:32/44	06:57 07:17-07:41/24		08:01 17:11-18:07/56		07:57 16:24-16:46/22
	20:51	20:09		18:30 08:22-08:32/10		17:13 08:19-08:31/12
Potential sun hours	459	428	375	345	298	288
Sum of minutes with flicker	1557	1123	150	966	1670	1068

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T83 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (499)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	14:56-16:14/78	07:43	15:43-16:07/24	07:07		07:16	07:35-07:52/17	06:31		06:02	06:26-07:05/39
	17:14	16:38-16:47/9	17:48		18:22		19:56		20:27		20:57	20:01-20:27/26
2	07:57	14:57-16:14/77	07:42	15:46-16:04/18	07:06		07:15	07:34-07:53/19	06:29		06:02	06:24-07:05/41
	17:15	16:38-16:48/10	17:49		18:23		19:57		20:28		20:57	20:01-20:26/25
3	07:57	14:59-16:15/76	07:41	15:53-15:59/6	07:04		07:13	07:32-07:52/20	06:28		06:01	06:24-07:06/42
	17:15	16:38-16:49/11	17:50		18:24		19:58		20:29		20:58	20:02-20:26/24
4	07:57	15:00-16:15/75	07:40		07:03		07:11	07:30-07:52/22	06:27		06:01	06:24-07:06/42
	17:16	16:38-16:50/12	17:52		18:25		19:59		20:30		20:59	20:03-20:30/27
5	07:57	15:02-16:15/73	07:39		07:01		07:10	07:29-07:52/23	06:26		06:01	06:23-07:06/43
	17:17	16:38-16:51/13	17:53		18:27		20:00		20:31		21:00	20:02-20:32/30
6	07:57	15:04-16:16/72	07:38		06:59		07:08	07:27-07:51/24	06:24		06:00	06:23-07:07/44
	17:18	16:38-16:52/14	17:54		18:28		20:00		20:32		21:00	20:03-20:33/30
7	07:57	15:06-16:16/70	07:37		06:58		07:07	07:26-07:51/25	06:23		06:00	06:23-07:07/44
	17:19	16:39-16:53/14	17:55		18:29		20:01		20:33		21:01	20:04-20:35/31
8	07:57	15:09-16:17/68	07:36		07:56		07:05	07:24-07:50/26	06:22		06:00	06:23-07:08/45
	17:20	16:39-16:54/15	17:57		19:30		20:02		20:34		21:01	20:05-20:36/31
9	07:57	15:14-16:17/63	07:35		07:55		07:03	07:22-07:50/28	06:21		05:59	06:22-07:07/45
	17:21	16:40-16:55/15	17:58		19:31		20:04		20:35		21:02	20:04-20:36/32
10	07:57	16:39-16:56/17	07:34		07:53		07:02	07:21-07:50/29	06:20		05:59	06:22-07:07/45
	17:22	15:16-16:17/61	17:59		19:32		20:05		20:36		21:03	20:05-20:37/32
11	07:56	16:40-16:57/17	07:32		07:51		07:00	07:19-07:49/30	06:19	20:07-20:14/7	05:59	06:22-07:08/46
	17:23	15:17-16:17/60	18:00		19:33		20:06		20:37		21:03	20:06-20:38/32
12	07:56	16:40-16:59/19	07:31		07:50		06:59	07:18-07:50/32	06:18	20:05-20:15/10	05:59	06:22-07:08/46
	17:24	15:18-16:18/60	18:02		19:35		20:07		20:38		21:04	20:06-20:39/33
13	07:56	16:40-16:59/19	07:30		07:48		06:57	07:16-07:49/33	06:17	20:04-20:16/12	05:59	06:23-07:08/45
	17:25	15:18-16:18/60	18:03		19:36		20:08		20:39		21:04	20:07-20:39/32
14	07:55	16:40-17:01/21	07:29		07:46		06:55	07:14-07:47/33	06:16	20:03-20:17/14	05:59	06:23-07:09/46
	17:26	15:19-16:18/59	18:04		19:37		20:09		20:40		21:05	20:07-20:40/33
15	07:55	16:40-17:01/21	07:27		07:45		06:54	07:13-07:47/34	06:15	20:02-20:18/16	05:59	06:23-07:09/46
	17:28	15:19-16:18/59	18:05		19:38		20:10		20:41		21:05	20:07-20:40/33
16	07:55	16:41-17:03/22	07:26		07:43		06:52	07:12-07:45/33	06:14	20:01-20:19/18	05:59	06:23-07:09/46
	17:29	15:21-16:18/57	18:07		19:39		20:11		20:42		21:06	20:08-20:40/32
17	07:54	16:41-17:04/23	07:25		07:41		06:51	07:13-07:44/31	06:13	06:39-06:49/10	05:59	06:23-07:09/46
	17:30	15:21-16:18/57	18:08		19:40		20:12		20:43	20:00-20:20/20	21:06	20:08-20:41/33
18	07:54	16:42-17:06/24	07:23		07:40		06:49	07:12-07:42/30	06:12	06:36-06:52/16	05:59	06:23-07:09/46
	17:31	15:22-16:18/56	18:09		19:41		20:13		20:44	19:59-20:20/21	21:06	20:08-20:41/33
19	07:53	16:42-17:06/24	07:22		07:38		06:48	07:13-07:41/28	06:11	06:35-06:54/19	05:59	06:23-07:09/46
	17:32	15:23-16:18/55	18:10		19:42		20:14		20:45	20:00-20:22/22	21:07	20:09-20:41/32
20	07:53	16:44-17:07/23	07:20		07:36		06:46	07:12-07:39/27	06:10	06:33-06:56/23	05:59	06:24-07:11/47
	17:33	15:24-16:18/54	18:11		19:43		20:15		20:46	19:59-20:23/24	21:07	20:10-20:42/32
21	07:52	16:44-17:06/22	07:19		07:35		06:45	07:13-07:38/25	06:09	06:31-06:57/26	05:59	06:24-07:11/47
	17:34	15:25-16:18/53	18:13		19:44		20:16		20:47	19:59-20:23/24	21:07	20:10-20:42/32
22	07:51	16:44-17:06/22	07:18		07:33		06:43	07:14-07:37/23	06:08	06:30-06:58/28	06:00	06:24-07:11/47
	17:36	15:26-16:17/51	18:14		19:45		20:17		20:48	19:59-20:24/25	21:07	20:10-20:42/32
23	07:51	16:46-17:06/20	07:16		07:31		06:42	07:15-07:36/21	06:08	06:30-06:59/29	06:00	06:24-07:11/47
	17:37	15:27-16:17/50	18:15		19:46		20:18		20:49	19:59-20:26/27	21:08	20:10-20:42/32
24	07:50	16:47-17:05/18	07:15		07:30		06:40	07:16-07:34/18	06:07	06:29-07:00/31	06:00	06:25-07:11/46
	17:38	15:28-16:17/49	18:16		19:48		20:19		20:50	19:59-20:26/27	21:08	20:10-20:43/33
25	07:49	16:48-17:04/16	07:13		07:28		06:39	07:17-07:32/15	06:06	06:28-07:00/32	06:00	06:25-07:11/46
	17:39	15:29-16:16/47	18:17		19:49		20:21		20:51	19:59-20:26/27	21:08	20:10-20:43/33
26	07:49	16:49-17:03/14	07:12		07:26		06:38	07:21-07:29/8	06:06	06:28-07:02/34	06:01	06:25-07:11/46
	17:41	15:31-16:15/44	18:19		19:50		20:22		20:52	20:00-20:27/27	21:08	20:10-20:42/32
27	07:48	16:51-17:01/10	07:10		07:25		06:36		06:05	06:27-07:02/35	06:01	06:26-07:12/46
	17:42	15:32-16:14/42	18:20		19:51		20:23		20:53	19:59-20:27/28	21:08	20:11-20:43/32
28	07:47	15:33-16:13/40	07:09		07:23	07:42-07:47/5	06:35		06:04	06:27-07:03/36	06:02	06:26-07:12/46
	17:43		18:21		19:52		20:24		20:53	20:00-20:27/27	21:08	20:10-20:43/33
29	07:46	15:36-16:13/37			07:21	07:40-07:49/9	06:33		06:04	06:27-07:03/36	06:02	06:26-07:12/46
	17:44				19:53		20:25		20:54	20:00-20:27/27	21:08	20:10-20:42/32
30	07:45	15:38-16:11/33			07:20	07:39-07:51/12	06:32		06:03	06:27-07:04/37	06:02	06:27-07:12/45
	17:45				19:54		20:26		20:55	20:01-20:27/26	21:08	20:10-20:43/33
31	07:44	15:40-16:10/30			07:18	07:37-07:52/15			06:03	06:26-07:04/38		
	17:47				19:55				20:56	20:01-20:26/25		
Potential sun hours	298		297		370		399		448		452	
Sum of minutes with flicker	2231		48		41		654		884		2289	

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T83 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (499)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July		August		September		October	November		December	
1	06:03	06:26-07:12/46	06:27	20:17-20:26/9	06:58	07:18-07:48/30	07:28	07:02		07:37	16:22-16:39/17
	21:08	20:10-20:42/32	20:50		20:07		19:15	17:28		17:04	14:59-15:59/60
2	06:03	06:27-07:13/46	06:28	20:19-20:25/6	06:59	07:19-07:48/29	07:29	07:03		07:38	16:22-16:39/17
	21:08	20:10-20:43/33	20:49		20:06		19:13	17:27		17:04	14:59-16:00/61
3	06:04	06:27-07:12/45	06:29		07:00	07:20-07:48/28	07:30	07:04		07:39	16:23-16:39/16
	21:08	20:10-20:42/32	20:48		20:04		19:12	17:26		17:04	14:59-16:00/61
4	06:04	06:28-07:13/45	06:30		07:01	07:21-07:47/26	07:31	07:05		07:40	14:53-16:01/68
	21:08	20:10-20:42/32	20:47		20:02		19:10	17:25		17:04	16:23-16:38/15
5	06:05	06:28-07:12/44	06:31		07:02	07:22-07:47/25	07:32	07:07		07:41	14:51-16:01/70
	21:08	20:09-20:40/31	20:45		20:01		19:08	17:24		17:03	16:24-16:38/14
6	06:06	06:29-07:13/44	06:32		07:03	07:23-07:47/24	07:33	07:08		07:42	14:50-16:02/72
	21:07	20:09-20:40/31	20:44		19:57		19:07	17:23		17:03	16:25-16:38/13
7	06:06	06:30-07:13/43	06:33		07:04	07:24-07:47/23	07:34	07:09		07:43	14:49-16:02/73
	21:07	20:10-20:39/29	20:43		19:56		19:05	17:21		17:03	16:25-16:38/13
8	06:07	06:30-07:13/43	06:34		07:05	07:25-07:47/22	07:35	07:10	15:21-15:30/9	07:44	14:48-16:03/75
	21:07	20:09-20:37/28	20:42		19:54		19:03	17:20		17:03	16:26-16:38/12
9	06:07	06:31-07:13/42	06:35		07:06	07:26-07:47/21	07:36	07:11	15:16-15:35/19	07:44	14:48-16:04/76
	21:06	20:09-20:34/25	20:41		19:52		19:02	17:19		17:03	16:27-16:38/11
10	06:08	06:32-07:13/41	06:36		07:07	07:27-07:46/19	07:37	07:13	15:14-15:39/25	07:45	14:47-16:04/77
	21:06	20:09-20:34/25	20:39		19:51		19:00	17:18		17:03	16:28-16:38/10
11	06:09	06:32-07:12/40	06:37		07:08	07:28-07:45/17	07:38	07:14	15:11-15:41/30	07:46	14:47-16:05/78
	21:06	20:09-20:34/25	20:38		19:49		18:59	17:17		17:03	16:29-16:38/9
12	06:10	06:34-07:13/39	06:38		07:09	07:29-07:44/15	07:39	07:15	15:09-15:42/33	07:47	14:46-16:05/79
	21:05	20:09-20:35/26	20:37		19:47		18:57	17:16		17:03	16:29-16:37/8
13	06:10	06:35-07:13/38	06:39		07:10	07:30-07:43/13	07:40	07:16	15:07-15:44/37	07:48	14:46-16:05/79
	21:05	20:09-20:35/26	20:35		19:46		18:55	17:15		17:04	16:30-16:38/8
14	06:11	06:35-07:12/37	06:40		07:11	07:31-07:41/10	07:41	07:17	16:28-16:30/2	07:49	14:47-16:06/79
	21:04	20:08-20:35/27	20:34		19:44		18:54	17:15	15:06-15:46/40	17:04	16:31-16:38/7
15	06:12	06:36-07:12/36	06:41		07:12	07:32-07:38/6	07:43	07:19	16:24-16:34/10	07:49	14:47-16:07/80
	21:04	20:09-20:35/26	20:33		19:42		18:52	17:14	15:05-15:47/42	17:04	16:32-16:39/7
16	06:13	06:36-07:12/36	06:42		07:13		07:44	07:20	16:22-16:36/14	07:50	14:46-16:06/80
	21:03	20:09-20:36/27	20:31		19:40		18:51	17:13	15:04-15:48/44	17:04	16:32-16:38/6
17	06:13	06:37-07:11/34	06:43	07:27-07:36/9	07:14		07:45	07:21	16:21-16:37/16	07:51	14:47-16:07/80
	21:03	20:09-20:36/27	20:30		19:39		18:49	17:12	15:03-15:50/47	17:05	16:33-16:39/6
18	06:14	06:38-07:11/33	06:44	07:24-07:39/15	07:15		07:46	07:22	16:21-16:39/18	07:51	14:47-16:08/81
	21:02	20:08-20:36/28	20:29		19:37		18:48	17:11	15:02-15:51/49	17:05	16:34-16:39/5
19	06:15	06:38-07:10/32	06:45	07:22-07:40/18	07:16		07:47	07:23	16:20-16:40/20	07:52	14:47-16:08/81
	21:01	20:08-20:36/28	20:27		19:35		18:46	17:10	15:01-15:51/50	17:05	16:34-16:39/5
20	06:16	06:39-07:09/30	06:46	07:20-07:42/22	07:17		07:48	07:24	16:19-16:41/22	07:53	14:48-16:09/81
	21:01	20:09-20:35/26	20:26		19:34		18:45	17:10	15:01-15:52/51	17:06	16:35-16:40/5
21	06:17	06:40-07:09/29	06:47	07:19-07:42/23	07:18		07:49	07:26	16:19-16:41/22	07:53	14:48-16:09/81
	21:00	20:09-20:35/26	20:24		19:32		18:43	17:09	15:00-15:53/53	17:06	16:35-16:40/5
22	06:18	06:41-07:08/27	06:48	07:18-07:43/25	07:19		07:50	07:27	16:20-16:43/23	07:54	14:49-16:10/81
	20:59	20:09-20:34/25	20:23		19:30		18:42	17:08	15:00-15:54/54	17:07	16:36-16:41/5
23	06:19	06:43-07:07/24	06:49	07:17-07:44/27	07:20		07:51	07:28	16:19-16:43/24	07:54	14:49-16:10/81
	20:58	20:10-20:34/24	20:21		19:29		18:40	17:08	15:00-15:55/55	17:07	16:36-16:41/5
24	06:19	06:44-07:06/22	06:50	07:17-07:45/28	07:21		07:53	07:29	16:19-16:43/24	07:55	14:50-16:11/81
	20:57	20:09-20:32/23	20:20		19:27		18:39	17:07	14:59-15:55/56	17:08	16:37-16:42/5
25	06:20	06:45-07:03/18	06:51	07:16-07:46/30	07:22		07:54	07:30	16:19-16:42/23	07:55	14:50-16:11/81
	20:57	20:10-20:31/21	20:18		19:25		18:38	17:07	14:59-15:56/57	17:08	16:37-16:42/5
26	06:21	06:48-07:01/13	06:52	07:16-07:47/31	07:23		07:55	07:31	16:19-16:41/22	07:55	14:51-16:11/80
	20:56	20:10-20:31/21	20:17		19:23		18:36	17:06	14:59-15:56/57	17:09	16:37-16:43/6
27	06:22	06:52-06:57/5	06:53	07:15-07:47/32	07:24		07:56	07:32	16:20-16:41/21	07:56	14:52-16:12/80
	20:55	20:11-20:30/19	20:15		19:22		18:35	17:06	15:00-15:58/58	17:10	16:38-16:44/6
28	06:23	20:12-20:29/17	06:54	07:14-07:48/34	07:25		07:57	07:34	16:20-16:41/21	07:56	14:53-16:13/80
	20:54		20:14		19:20		18:34	17:05	14:59-15:58/59	17:10	16:38-16:44/6
29	06:24	20:13-20:28/15	06:55	07:15-07:48/33	07:26		07:58	07:35	16:21-16:40/19	07:56	14:53-16:13/80
	20:53		20:12		19:18		18:32	17:05	14:59-15:59/60	17:11	16:38-16:45/7
30	06:25	20:14-20:27/13	06:56	07:16-07:48/32	07:27		08:00	07:36	16:21-16:40/19	07:57	14:54-16:13/79
	20:52		20:10		19:17		18:31	17:05	14:59-15:59/60	17:12	16:38-16:45/7
31	06:26	20:15-20:27/12	06:57	07:17-07:49/32			08:01			07:57	14:55-16:13/78
	20:51		20:09				18:30			17:13	16:38-16:46/8
Potential sun hours	459		428		375		345	298		288	
Sum of minutes with flicker		1712		406		308		0	1365		2642

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T84 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (500)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:20-09:01/41	07:44 08:18-08:34/16	07:07 17:28-17:40/12	07:16 07:50-08:39/49	06:30 07:31-08:41/70	06:01 06:23-06:34/11
	17:12 09:07-09:55/48	17:47	18:21	19:56	20:27	20:57
2	07:58 08:20-09:01/41	07:43 08:20-08:32/12	07:06	07:14 07:48-08:40/52	06:29 07:31-08:39/68	06:00 06:22-06:34/12
	17:13 09:07-09:55/48	17:48	18:23	19:57	20:28	20:58 20:32-20:33/1
3	07:58 08:20-09:01/41	07:42 08:24-08:29/5	07:04	07:13 07:47-08:42/55	06:27 07:31-08:39/68	06:00 06:22-06:35/13
	17:14 09:08-09:55/47	17:50	18:24	19:58	20:29	20:59 20:31-20:34/3
4	07:58 08:20-09:01/41	07:41	07:02	07:11 07:45-08:43/58	06:26 20:04-20:08/4	06:00 06:22-06:36/14
	17:15 09:09-09:55/46	17:51	18:25	19:59	20:30 07:32-08:38/66	20:59 20:29-20:34/5
5	07:58 08:20-09:01/41	07:39	07:01	07:09 07:43-08:43/60	06:25 20:02-20:09/7	05:59 06:21-06:36/15
	17:16 09:10-09:56/46	17:52	18:26	20:00	20:31 07:33-08:38/65	21:00 20:29-20:35/6
6	07:58 08:20-09:01/41	07:38	06:59	07:08 07:42-08:45/63	06:24 19:59-20:09/10	05:59 06:21-06:37/16
	17:17 09:10-09:56/46	17:53	18:27	20:00	20:32 07:33-08:37/64	21:01 20:29-20:36/7
7	07:58 08:20-09:01/41	07:37	06:58	07:06 07:40-08:45/65	06:22 19:58-20:10/12	05:59 06:21-06:37/16
	17:18 09:11-09:56/45	17:55	18:28	20:01	20:33 07:33-08:35/62	21:01 20:28-20:37/9
8	07:57 08:20-09:01/41	07:36	07:56	07:04 07:39-08:45/66	06:21 19:57-20:12/15	05:58 06:21-06:38/17
	17:19 09:13-09:56/43	17:56	19:30	20:02	20:35 07:34-08:34/60	21:02 20:27-20:37/10
9	07:57 08:19-08:59/40	07:35	07:54	07:03 07:38-08:46/68	06:20 19:57-20:13/16	05:58 06:20-06:37/17
	17:20 09:13-09:55/42	17:57	19:31	20:03	20:36 07:35-08:34/59	21:03 20:27-20:37/10
10	07:57 08:19-08:59/40	07:34 17:32-17:35/3	07:53	07:01 07:37-08:46/69	06:19 19:56-20:14/18	05:58 06:20-06:38/18
	17:21 09:14-09:55/41	17:58	19:32	20:05	20:37 07:35-08:33/58	21:03 20:27-20:38/11
11	07:57 08:19-08:58/39	07:33 17:28-17:36/8	07:51	06:59 07:36-08:47/71	06:18 19:56-20:15/19	05:58 06:20-06:38/18
	17:22 09:15-09:55/40	18:00	19:33	20:06	20:38 07:36-08:32/56	21:04 20:27-20:39/12
12	07:57 08:18-08:55/37	07:31 17:26-17:37/11	07:50	06:58 07:35-08:47/72	06:17 19:55-20:16/21	05:58 06:20-06:39/19
	17:23 09:16-09:54/38	18:01	19:34	20:07	20:39 07:37-08:31/54	21:04 20:27-20:39/12
13	07:56 08:18-08:55/37	07:30 17:25-17:39/14	07:48	06:56 07:34-08:47/73	06:16 19:55-20:17/22	05:58 06:20-06:39/19
	17:24 09:17-09:54/37	18:02	19:35	20:08	20:40 07:38-08:30/52	21:05 20:27-20:40/13
14	07:56 08:18-08:54/36	07:29 17:24-17:41/17	07:46	06:55 07:34-08:47/73	06:15 19:55-20:17/22	05:58 06:20-06:39/19
	17:25 09:19-09:54/35	18:03	19:36	20:09	20:41 07:39-08:28/49	21:05 20:27-20:40/13
15	07:56 08:17-08:53/36	07:27 17:23-17:41/18	07:45	06:53 07:33-08:47/74	06:14 19:55-20:18/23	05:58 06:20-06:40/20
	17:26 09:19-09:53/34	18:05	19:37	20:10	20:42 07:40-08:27/47	21:06 20:27-20:41/14
16	07:55 08:17-08:52/35	07:26 17:22-17:43/21	07:43	06:52 07:33-08:47/74	06:13 19:55-20:19/24	05:58 06:20-06:40/20
	17:28 09:21-09:52/31	18:06	19:39	20:11	20:43 07:41-08:26/45	21:06 20:27-20:41/14
17	07:55 08:16-08:51/35	07:25 17:21-17:44/23	07:41	06:50 07:32-08:47/75	06:12 19:55-20:20/25	05:58 06:20-06:40/20
	17:29 09:23-09:51/28	18:07	19:40	20:12	20:44 07:42-08:25/43	21:07 20:27-20:41/14
18	07:54 08:16-08:51/35	07:23 17:21-17:46/25	07:40	06:48 07:32-08:47/75	06:11 19:55-20:20/25	05:58 06:20-06:40/20
	17:30 09:24-09:49/25	18:08	19:41	20:13	20:45 07:43-08:23/40	21:07 20:28-20:41/13
19	07:54 08:15-08:49/34	07:22 17:21-17:47/26	07:38	06:47 07:31-08:46/75	06:10 19:56-20:20/24	05:58 06:20-06:40/20
	17:31 09:27-09:48/21	18:10	19:42	20:14	20:46 07:46-08:22/36	21:07 20:28-20:42/14
20	07:53 08:14-08:48/34	07:21 17:20-17:48/28	07:36	06:45 07:31-08:46/75	06:09 19:56-20:20/24	05:58 06:21-06:41/20
	17:32 09:29-09:45/16	18:11	19:43	20:15	20:47 07:47-08:21/34	21:08 20:28-20:42/14
21	07:52 08:14-08:47/33	07:19 17:21-17:49/28	07:34	06:44 07:30-08:46/76	06:08 19:57-20:19/22	05:58 06:21-06:41/20
	17:33 09:34-09:42/8	18:12	19:44	20:16	20:48 07:48-08:19/31	21:08 20:29-20:43/14
22	07:52 08:13-08:44/31	07:18 17:20-17:48/28	07:33	06:42 07:30-08:46/76	06:07 19:57-20:19/22	05:58 06:21-06:41/20
	17:35	18:13	19:45	20:17	20:49 07:50-08:17/27	21:08 20:29-20:43/14
23	07:51 08:12-08:42/30	07:16 17:21-17:48/27	07:31	06:41 07:30-08:45/75	06:06 19:58-20:19/21	05:59 06:21-06:41/20
	17:36	18:14	19:46	20:19	20:49 07:53-08:15/22	21:08 20:29-20:43/14
24	07:50 08:11-08:41/30	07:15 17:21-17:47/26	07:29	06:40 07:30-08:45/75	06:06 19:59-20:18/19	05:59 06:21-06:41/20
	17:37	18:16	19:47	20:20	20:50 07:55-08:13/18	21:08 20:29-20:42/13
25	07:50 08:12-08:40/28	07:13 17:22-17:47/25	07:28	06:38 07:30-08:45/75	06:05 19:59-20:17/18	05:59 06:22-06:42/20
	17:38	18:17	19:48	20:21	20:51 07:58-08:09/11	21:09 20:29-20:43/14
26	07:49 08:13-08:39/26	07:12 17:22-17:45/23	07:26	06:37 07:30-08:43/73	06:04 20:01-20:17/16	05:59 06:22-06:42/20
	17:40	18:18	19:49	20:22	20:52	21:09 20:29-20:43/14
27	07:48 08:13-08:38/25	07:10 17:24-17:44/20	07:24 08:08-08:24/16	06:35 07:30-08:43/73	06:04 20:01-20:16/15	06:00 06:23-06:43/20
	17:41	18:19	19:51	20:23	20:53 06:25-06:28/3	21:09 20:29-20:43/14
28	07:47 08:14-08:37/23	07:09 17:25-17:42/17	07:23 08:03-08:30/27	06:34 07:30-08:42/72	06:03 20:02-20:14/12	06:00 06:23-06:42/19
	17:42	18:20	19:52	20:24	20:54 06:25-06:30/5	21:09 20:30-20:43/13
29	07:46 08:14-08:36/22		07:21 07:59-08:33/34	06:33 07:30-08:42/72	06:02 20:04-20:13/9	06:01 06:23-06:42/19
	17:43		19:53	20:25	20:55 06:24-06:31/7	21:09 20:30-20:43/13
30	07:45 08:15-08:36/21		07:19 07:55-08:35/40	06:31 07:31-08:41/70	06:02 20:06-20:11/5	06:01 06:24-06:43/19
	17:45		19:54	20:26	20:56 06:24-06:33/9	21:09 20:31-20:43/12
31	07:45 08:17-08:35/18		07:18 07:53-08:38/45		06:01 06:23-06:33/10	
	17:46		19:55		20:56	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	1818	421	174	2079	1709	871

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T84 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (500)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:24-06:43/19	06:26 20:06-20:26/20	06:57 07:35-08:46/71	07:27	07:02 17:02-17:04/2	07:37 08:01-08:40/39
	21:09 20:31-20:43/12	20:50 07:47-08:42/55	20:07	19:15	17:28	17:03 08:57-09:37/40
2	06:02 06:25-06:43/18	06:27 20:06-20:25/19	06:58 07:36-08:45/69	07:28	07:03	07:38 08:02-08:42/40
	21:09 20:32-20:43/11	20:49 07:47-08:43/56	20:06	19:13	17:26	17:03 08:57-09:38/41
3	06:03 06:25-06:43/18	06:28 20:07-20:24/17	06:59 07:36-08:44/68	07:30	07:04	07:39 08:03-08:43/40
	21:09 20:32-20:43/11	20:48 07:46-08:44/58	20:04	19:11	17:25	17:03 08:57-09:39/42
4	06:03 06:26-06:43/17	06:29 20:07-20:23/16	07:00 07:37-08:43/66	07:31	07:06	07:40 08:04-08:45/41
	21:08 20:33-20:43/10	20:47 07:45-08:44/59	20:02	19:10	17:24	17:02 08:57-09:40/43
5	06:04 06:26-06:43/17	06:30 20:08-20:22/14	07:01 07:37-08:42/65	07:32	07:07	07:41 08:05-08:46/41
	21:08 20:33-20:42/9	20:46 07:44-08:45/61	20:01	19:08	17:23	17:02 08:57-09:41/44
6	06:04 06:27-06:43/16	06:31 20:08-20:20/12	07:02 07:37-08:40/63	07:33	07:08	07:42 08:06-08:47/41
	21:08 20:35-20:42/7	20:45 07:43-08:46/63	19:57	19:06	17:22	17:02 08:57-09:42/45
7	06:05 06:28-06:43/15	06:32 20:09-20:19/10	07:03 07:38-08:38/60	07:34	07:09	07:43 08:07-08:48/41
	21:08 20:35-20:42/7	20:43 07:43-08:47/64	19:56	19:05	17:21	17:02 08:57-09:43/46
8	06:06 06:28-06:43/15	06:33 20:11-20:17/6	07:04 07:39-08:37/58	07:35	07:11 07:54-08:00/6	07:44 08:08-08:49/41
	21:07 20:36-20:42/6	20:42 07:41-08:46/65	19:54	19:03	17:19	17:02 08:57-09:43/46
9	06:06 06:29-06:43/14	06:34 20:14-20:16/2	07:05 07:40-08:35/55	07:36	07:12 07:51-08:03/12	07:45 08:09-08:50/41
	21:07 20:38-20:42/4	20:41 07:40-08:47/67	19:52	19:01	17:18	17:02 08:57-09:44/47
10	06:07 06:30-06:43/13	06:35 07:40-08:48/68	07:06 07:41-08:33/52	07:37	07:13 07:49-08:05/16	07:46 08:10-08:51/41
	21:07 20:39-20:41/2	20:40	19:51	19:00	17:17	17:02 08:57-09:45/48
11	06:08 06:30-06:42/12	06:36 07:39-08:48/69	07:07 07:42-08:31/49	07:38	07:14 07:47-08:06/19	07:47 08:10-08:51/41
	21:06	20:38	19:49	18:58	17:16	17:02 08:57-09:45/48
12	06:08 06:31-06:42/11	06:37 07:39-08:49/70	07:08 07:44-08:29/45	07:39 18:03-18:11/8	07:15 07:47-08:08/21	07:48 08:11-08:52/41
	21:06	20:37	19:47	18:56	17:15	17:02 08:57-09:46/49
13	06:09 06:32-06:41/9	06:38 07:38-08:49/71	07:09 07:46-08:26/40	07:40 17:59-18:14/15	07:17 07:46-08:08/22	07:48 08:12-08:52/40
	21:05	20:36	19:45	18:55	17:14	17:02 08:58-09:47/49
14	06:10 20:14-20:21/7	06:39 07:38-08:49/71	07:10 07:48-08:23/35	07:41 17:57-18:15/18	07:18 07:46-08:09/23	07:49 08:13-08:53/40
	21:05 06:32-06:40/8	20:34	19:44	18:53	17:14	17:03 08:58-09:48/50
15	06:11 20:12-20:23/11	06:40 07:37-08:50/73	07:11 07:51-08:20/29	07:42 17:56-18:17/21	07:19 07:46-08:11/25	07:50 08:14-08:54/40
	21:04 06:33-06:39/6	20:33	19:42	18:52	17:13	17:03 08:58-09:47/49
16	06:11 20:11-20:24/13	06:41 07:37-08:50/73	07:12 07:56-08:14/18	07:44 17:54-18:18/24	07:20 07:46-08:12/26	07:51 08:14-08:54/40
	21:04 06:34-06:38/4	20:32	19:40	18:50	17:12	17:03 08:58-09:48/50
17	06:12 20:10-20:26/16	06:42 07:36-08:50/74	07:13	07:45 17:53-18:19/26	07:21 07:45-08:13/28	07:51 08:15-08:55/40
	21:03 06:35-06:36/1	20:30	19:39	18:49	17:11	17:03 08:59-09:49/50
18	06:13 20:09-20:26/17	06:43 07:36-08:50/74	07:14	07:46 17:52-18:19/27	07:23 07:45-08:15/30	07:52 08:15-08:55/40
	21:02 08:12-08:14/2	20:29	19:37	18:47	17:10	17:04 08:59-09:49/50
19	06:14 20:08-20:27/19	06:44 07:36-08:50/74	07:15	07:47 17:51-18:19/28	07:24 07:47-08:17/30	07:53 08:16-08:56/40
	21:02 08:06-08:20/14	20:27	19:35	18:46	17:09	17:04 09:00-09:50/50
20	06:15 20:08-20:28/20	06:45 07:35-08:51/76	07:16	07:48 17:52-18:20/28	07:25 07:48-08:19/31	07:53 08:17-08:57/40
	21:01 08:03-08:24/21	20:26	19:33	18:44	17:09	17:05 09:01-09:51/50
21	06:16 20:08-20:29/21	06:46 07:35-08:50/75	07:17	07:49 17:51-18:19/28	07:26 07:49-08:22/33	07:54 08:17-08:57/40
	21:00 08:01-08:26/25	20:24	19:32	18:43	17:08 09:09-09:17/8	17:05 09:01-09:51/50
22	06:16 20:07-20:30/23	06:47 07:35-08:50/75	07:18	07:50 17:51-18:18/27	07:27 07:50-08:24/34	07:54 08:18-08:58/40
	21:00 08:00-08:28/28	20:23	19:30	18:41	17:07 09:05-09:21/16	17:05 09:02-09:52/50
23	06:17 20:07-20:30/23	06:48 07:35-08:50/75	07:19	07:52 17:51-18:17/26	07:28 07:52-08:26/34	07:55 08:18-08:58/40
	20:59 07:58-08:30/32	20:21	19:28	18:40	17:07 09:04-09:25/21	17:06 09:02-09:52/50
24	06:18 20:06-20:30/24	06:49 07:35-08:50/75	07:20	07:53 17:51-18:15/24	07:30 07:53-08:28/35	07:55 08:18-08:58/40
	20:58 07:57-08:32/35	20:20	19:27	18:38	17:06 09:02-09:27/25	17:07 09:02-09:52/50
25	06:19 20:06-20:30/24	06:50 07:35-08:50/75	07:21	07:54 17:52-18:14/22	07:31 07:54-08:29/35	07:56 08:19-08:59/40
	20:57 07:55-08:33/38	20:18	19:25	18:37	17:06 09:01-09:29/28	17:07 09:03-09:53/50
26	06:20 20:06-20:31/25	06:51 07:35-08:50/75	07:22	07:55 17:52-18:12/20	07:32 07:55-08:30/35	07:56 08:19-08:59/40
	20:56 07:53-08:34/41	20:17	19:23	18:36	17:05 09:00-09:30/30	17:08 09:03-09:53/50
27	06:21 20:05-20:30/25	06:52 07:35-08:49/74	07:23	07:56 17:52-18:11/19	07:33 07:56-08:32/36	07:56 08:19-08:59/40
	20:55 07:52-08:36/44	20:15	19:21	18:34	17:05 08:59-09:32/33	17:08 09:03-09:53/50
28	06:22 20:05-20:29/24	06:53 07:35-08:49/74	07:24	07:57 17:53-18:09/16	07:34 07:57-08:33/36	07:57 08:20-09:00/40
	20:54 07:51-08:37/46	20:14	19:20	18:33	17:04 08:58-09:33/35	17:09 09:05-09:54/49
29	06:23 20:06-20:29/23	06:54 07:35-08:48/73	07:25	07:59 17:55-18:09/14	07:35 07:59-08:36/37	07:57 08:20-09:00/40
	20:53 07:50-08:38/48	20:12	19:18	18:31	17:04 08:58-09:35/37	17:10 09:05-09:55/50
30	06:24 20:06-20:28/22	06:55 07:35-08:48/73	07:26	08:00 17:56-18:07/11	07:36 08:00-08:37/37	07:57 08:20-09:00/40
	20:52 07:49-08:39/50	20:10	19:16	18:30	17:04 08:58-09:36/38	17:11 09:05-09:55/50
31	06:25 20:06-20:27/21	06:56 07:35-08:47/72		08:01 17:58-18:05/7		07:57 08:20-09:00/40
	20:51 07:48-08:41/53	20:09		18:29		17:11 09:06-09:55/49
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1127	2273	843	409	914	2733

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T85 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (501)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 15:25-16:43/78 17:13 08:47-09:36/49	07:44 08:17-09:00/43 17:47	07:07 07:34-08:25/51 18:22	07:16 07:39-07:48/9 19:56 18:11-19:15/64	06:30 06:54-07:30/36 20:27	06:01 06:23-07:03/40 20:57 19:58-20:33/35
2	07:58 15:25-16:44/79 17:13 08:47-09:36/49	07:43 08:17-09:00/43 17:48	07:06 07:28-08:23/55 18:23	07:14 07:35-07:51/16 19:57 18:10-19:15/65	06:29 06:53-07:29/36 20:28	06:00 06:22-07:02/40 20:58 19:57-20:33/36
3	07:58 15:26-16:44/78 17:14 08:48-09:37/49	07:42 08:17-09:00/43 17:50	07:04 07:24-08:22/58 18:24	07:13 07:33-07:54/21 19:58 18:11-19:15/64	06:27 06:54-07:29/35 20:29	06:00 06:22-07:02/40 20:59 19:58-20:34/36
4	07:58 15:27-16:44/77 17:15 08:48-09:37/49	07:41 08:18-09:00/42 17:51	07:03 07:22-08:19/57 18:25	07:11 07:30-07:55/25 19:59 18:10-19:15/65	06:26 06:54-07:29/35 20:30	06:00 06:22-07:02/40 20:59 19:57-20:34/37
5	07:58 15:28-16:45/77 17:16 08:49-09:38/49	07:40 08:18-09:00/42 17:52	07:01 07:20-08:16/56 18:26	07:09 07:28-07:56/28 20:00 18:09-19:14/65	06:25 06:54-07:29/35 20:31	05:59 06:21-07:01/40 21:00 19:58-20:35/37
6	07:58 15:29-16:45/76 17:17 08:50-09:38/48	07:38 08:19-09:00/41 17:53	06:59 07:19-08:16/57 18:27	07:08 07:27-07:58/31 20:00 18:10-19:14/64	06:24 06:44-07:28/44 20:32	05:59 06:21-07:01/40 21:01 19:58-20:36/38
7	07:58 15:30-16:46/76 17:18 08:50-09:38/48	07:37 08:05-08:12/7 17:55 08:18-08:59/41	06:58 07:17-08:15/58 18:28	07:06 07:26-07:58/32 20:01 18:10-19:14/64	06:22 06:42-07:27/45 20:34	05:59 06:21-07:01/40 21:01 19:59-20:37/38
8	07:58 15:31-16:46/75 17:19 08:51-09:39/48	07:36 08:01-08:17/16 17:56 08:19-08:59/40	07:56 08:15-09:14/59 19:30	07:04 07:24-07:58/34 20:02 18:09-19:13/64	06:21 06:41-07:27/46 20:35	05:58 06:21-07:01/40 21:02 19:58-20:37/39
9	07:57 15:31-16:45/74 08:27-08:35/8 17:20 08:51-09:38/47	07:35 07:58-08:19/21 17:57 08:20-08:58/38	07:54 08:15-09:14/59 19:31	07:03 07:24-07:59/35 20:04 18:10-19:13/63	06:20 06:40-07:26/46 20:36	05:58 06:20-07:00/40 21:03 19:59-20:37/38
10	07:57 15:33-16:46/73 08:25-08:39/14 17:21 08:52-09:39/47	07:34 07:57-08:58/61 17:58	07:53 08:14-09:12/58 19:32	07:01 07:23-07:58/35 20:05 18:10-19:12/62	06:19 06:39-07:25/46 20:37	05:58 06:20-07:00/40 21:03 19:59-20:38/39
11	07:57 15:34-16:46/72 08:24-08:41/17 17:22 08:53-09:39/46	07:33 07:55-08:57/62 18:00	07:51 08:14-09:11/57 19:33	07:00 07:23-07:59/36 20:06 18:11-19:12/61	06:18 06:38-07:25/47 20:38	05:58 06:20-07:00/40 21:04 20:00-20:39/39
12	07:57 15:35-16:45/70 08:23-08:42/19 17:23 08:53-09:38/45	07:31 07:53-08:55/62 18:01	07:50 08:13-09:10/57 19:34	06:58 07:22-07:58/36 20:07 18:11-19:10/59	06:17 06:37-07:24/47 20:39 20:10-20:16/6	05:58 06:20-07:00/40 21:04 20:00-20:39/39
13	07:56 15:36-16:45/69 08:22-08:44/22 17:24 08:54-09:39/45	07:30 07:53-08:54/61 18:02	07:48 08:13-09:09/56 19:35	06:56 07:21-07:57/36 20:08 18:11-19:09/58	06:16 06:36-07:23/47 20:40 20:06-20:17/11	05:58 06:20-07:00/40 21:05 20:01-20:40/39
14	07:56 16:12-16:46/34 08:22-08:46/24 17:25 08:55-09:39/44 15:38-16:05/27	07:29 07:52-08:53/61 18:03	07:46 08:12-09:06/54 19:36	06:55 07:22-07:58/36 20:09 18:12-19:09/57	06:15 06:35-07:21/46 20:41 20:03-20:17/14	05:58 06:20-07:00/40 21:05 20:01-20:40/39
15	07:56 16:12-16:44/32 08:21-08:47/26 17:26 08:56-09:38/42 15:40-16:04/24	07:27 07:51-08:50/59 18:05	07:45 08:13-09:05/52 19:37 18:40-18:56/16	06:53 07:21-07:57/36 20:10 18:12-19:07/55	06:14 06:34-07:20/46 20:42 20:02-20:18/16	05:58 06:20-07:00/40 21:06 20:01-20:41/40
16	07:55 16:14-16:44/30 08:20-08:49/29 17:28 08:57-09:39/42 15:42-16:03/21	07:26 07:50-08:28/38 18:06 08:30-08:48/18	07:43 08:13-09:02/49 19:39 18:35-19:00/25	06:52 07:22-07:57/35 20:11 18:13-19:07/54	06:13 06:33-07:18/45 20:43 20:01-20:19/18	05:58 06:20-07:00/40 21:06 20:01-20:41/40
17	07:55 16:15-16:43/28 08:19-08:50/31 17:29 08:58-09:38/40 15:44-16:01/17	07:25 07:50-08:29/39 18:07 08:34-08:45/11	07:41 08:13-08:59/46 19:40 18:31-19:03/32	06:50 07:21-07:55/34 20:12 18:13-19:05/52	06:12 06:32-07:03/31 07:04-07:16/12 20:44 20:00-20:20/20	05:58 06:20-07:00/40 21:07 20:02-20:41/39
18	07:54 16:16-16:40/24 08:19-08:52/33 17:30 08:59-09:38/39 15:46-15:58/12	07:23 07:49-08:29/40 18:08	07:40 08:14-08:42/28 18:29-19:06/37 19:41 08:47-08:54/7	06:49 07:22-07:55/33 20:13 18:15-19:04/49	06:11 06:32-07:04/32 07:09-07:13/4 20:45 19:59-20:21/22	05:58 06:20-07:00/40 21:07 20:02-20:41/39
19	07:54 16:18-16:37/19 08:19-08:52/33 17:31 09:00-09:37/37	07:22 07:49-08:29/40 18:10	07:38 08:15-08:40/25 19:42 18:26-19:08/42	06:47 07:09-07:18/9 18:15-19:03/48 20:14 07:22-07:53/31	06:10 06:31-07:04/33 20:46 19:59-20:22/23	05:58 06:20-07:00/40 21:07 20:02-20:42/40
20	07:53 16:19-16:35/16 08:18-08:53/35 17:32 09:00-09:36/36	07:21 07:45-08:29/44 18:11	07:36 08:16-08:38/22 19:43 18:24-19:09/45	06:45 07:06-07:22/16 18:17-19:01/44 20:15 07:23-07:53/30	06:09 06:30-07:04/34 20:47 19:58-20:23/25	05:58 06:21-07:02/41 21:08 20:02-20:42/40
21	07:52 16:22-16:34/12 08:18-08:55/37 17:33 09:02-09:36/34	07:19 07:43-08:29/46 18:12	07:35 08:18-08:36/18 19:44 18:23-19:11/48	06:44 07:03-07:51/48 20:16 18:18-18:59/41	06:08 06:29-07:04/35 20:48 19:57-20:24/27	05:58 06:21-07:02/41 21:08 20:03-20:43/40
22	07:52 16:26-16:30/4 08:18-08:55/37 17:35 09:03-09:35/32	07:18 07:41-08:29/48 18:13	07:33 08:20-08:33/13 19:45 18:21-19:11/50	06:43 07:02-07:50/48 20:17 18:20-18:58/38	06:07 06:28-07:04/36 20:49 19:57-20:24/27	05:58 06:21-07:02/41 21:08 20:03-20:43/40
23	07:51 09:05-09:34/29 17:36 08:17-08:56/39	07:16 07:40-08:29/49 18:14	07:31 18:19-19:12/53 19:46	06:41 07:00-07:47/47 20:19 18:21-18:55/34	06:07 06:28-07:04/36 20:49 19:57-20:26/29	05:59 06:21-07:02/41 21:08 20:03-20:43/40
24	07:50 09:06-09:32/26 17:37 08:17-08:56/39	07:15 07:38-08:28/50 18:16	07:29 18:17-19:13/56 19:47	06:40 06:59-07:27/28 18:23-18:53/30 20:20 07:28-07:45/17	06:06 06:27-07:04/37 20:50 19:57-20:26/29	05:59 06:22-07:02/40 21:09 20:03-20:42/39
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26	07:49 09:11-09:29/18 17:40 08:17-08:58/41	07:12 07:36-08:27/51 18:18	07:26 18:15-19:14/59 19:49	06:37 06:56-07:28/32 20:22 18:29-18:47/18	06:04 06:26-07:04/38 20:52 19:57-20:28/31	06:00 06:22-07:02/40 21:09 20:04-20:43/39
27	07:48 09:15-09:26/11 17:41 08:17-08:59/42	07:10 07:35-08:27/52 18:19	07:24 18:14-19:14/60 19:51	06:35 06:56-07:29/33 20:23 18:36-18:40/4	06:04 06:25-07:04/39 20:53 19:57-20:29/32	06:00 06:23-07:03/40 21:09 20:03-20:43/40
28	07:47 08:16-08:59/43 17:42	07:09 07:34-08:25/51 18:20	07:23 18:14-19:15/61 19:52	06:34 06:55-07:30/35 20:24	06:03 06:25-07:04/39 20:54 19:57-20:30/33	06:00 06:23-07:03/40 21:09 20:04-20:43/39
29	07:46 08:16-08:59/43 17:43		07:21 18:13-19:15/62 19:53	06:33 06:54-07:29/35 20:25	06:03 06:24-07:03/39 20:55 19:57-20:30/33	06:01 06:23-07:03/40 21:09 20:04-20:43/39
30	07:46 08:16-09:00/44 17:45		07:19 18:12-19:15/63 19:54	06:31 06:54-07:29/35 20:26	06:02 06:24-07:04/40 20:56 19:56-20:31/35	06:01 06:24-07:04/40 21:09 20:04-20:43/39
31	07:45 08:16-09:00/44 17:46		07:18 18:12-19:16/64 19:55		06:01 06:23-07:03/40 20:56 19:57-20:32/35	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	3086	1411	1882	2401	1742	2365

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T85 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (501)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:24-07:04/40	06:26 06:48-07:35/47	06:57 07:22-07:58/36	07:27 07:52-08:48/56	07:02 07:27-08:28/61	07:37 15:16-16:28/72 08:06-08:23/17
	21:09 20:04-20:43/39	20:50 20:23-20:26/3	20:07 18:10-19:11/61	19:15	17:28	17:03 08:35-09:21/46
2	06:02 06:25-07:05/40	06:27 06:49-07:35/46	06:58 07:22-07:57/35	07:29 07:51-08:49/58	07:03 07:29-07:49/20	07:38 15:16-16:29/73 08:08-08:22/14
	21:09 20:05-20:43/38	20:49	20:06 18:09-19:11/62	19:13	17:26 07:50-08:28/38	17:03 08:35-09:22/47
3	06:03 06:25-07:05/40	06:28 06:50-07:36/46	06:59 07:22-07:57/35	07:30 07:51-08:50/59	07:05 07:31-07:46/15	07:39 15:15-16:29/74 08:11-08:20/9
	21:09 20:04-20:43/39	20:48	20:04 18:08-19:11/63	19:11	17:25 07:49-08:29/40	17:03 08:35-09:22/47
4	06:03 06:26-07:06/40	06:29 06:51-07:37/46	07:00 07:22-07:56/34	07:31 07:52-08:51/59	07:06 07:36-07:40/4	07:40 15:15-16:30/75
	21:08 20:05-20:43/38	20:47	20:02 18:07-19:11/64	19:10	17:24 07:48-08:29/41	17:03 08:35-09:23/48
5	06:04 06:26-07:06/40	06:30 06:52-07:37/45	07:01 07:23-07:55/32	07:32 07:52-08:51/59	07:07 07:48-08:30/42	07:41 15:15-16:31/76
	21:08 20:04-20:42/38	20:46	20:01 18:07-19:11/64	19:08	17:23	17:02 08:36-09:23/47
6	06:04 06:27-07:07/40	06:31 06:53-07:38/45	07:02 07:23-07:54/31	07:33 07:53-08:51/58	07:08 07:48-08:30/42	07:42 15:15-16:31/76
	21:08 20:05-20:42/37	20:45	19:57 18:05-19:09/64	19:06	17:22	17:02 08:36-09:24/48
7	06:05 06:28-07:08/40	06:32 06:54-07:03/9	07:03 07:24-07:52/28	07:34 07:54-08:51/57	07:09 07:47-08:30/43	07:43 15:15-16:32/77
	21:08 20:05-20:43/38	20:43 07:04-07:38/34	19:56 18:04-19:09/65	19:05	17:21	17:02 08:36-09:25/49
8	06:06 06:28-07:08/40	06:33 07:04-07:38/34	07:04 07:24-07:50/26	07:35 07:55-08:51/56	07:11 07:48-08:31/43	07:44 15:15-16:33/78
	21:07 20:05-20:42/37	20:42	19:54 18:04-19:09/65	19:03	17:20	17:02 08:36-09:25/49
9	06:06 06:29-07:09/40	06:34 07:03-07:38/35	07:05 07:25-07:47/22	07:36 07:56-08:53/57	07:12 07:48-08:31/43	07:45 15:15-16:33/78
	21:07 20:05-20:42/37	20:41	19:52 18:04-19:09/65	19:01	17:18	17:02 08:37-09:26/49
10	06:07 06:30-07:10/40	06:35 07:02-07:38/36	07:06 07:27-07:45/18	07:37 07:57-08:55/58	07:13 07:47-08:31/44	07:46 15:15-16:34/79
	21:07 20:04-20:41/37	20:40	19:51 18:03-19:08/65	19:00	17:17	17:02 08:37-09:27/50
11	06:08 06:30-07:10/40	06:36 07:02-07:37/35	07:07 07:31-07:41/10	07:38 07:59-08:56/57	07:14 07:47-08:31/44	07:47 15:15-16:33/78
	21:06 20:05-20:41/36	20:38	19:49 18:03-19:08/65	18:58	17:16	17:02 08:37-09:26/49
12	06:08 06:31-07:11/40	06:37 07:02-07:37/35	07:08 18:03-19:07/64	07:39 08:07-08:57/50	07:15 07:48-08:32/44	07:48 15:15-16:34/79
	21:06 20:05-20:40/35	20:37	19:47	18:57	17:15	17:02 08:37-09:27/50
13	06:09 06:32-07:12/40	06:38 07:02-07:37/35	07:09 18:03-19:06/63	07:40 08:07-08:57/50	07:17 07:48-08:31/43	07:48 15:16-16:35/79
	21:05 20:06-20:40/34	20:36	19:45	18:55	17:15	17:02 08:38-09:28/50
14	06:10 06:32-07:11/39	06:39 07:02-07:37/35	07:10 18:03-19:05/62	07:41 08:08-08:59/51	07:18 07:48-08:31/43	07:49 15:16-16:36/80
	21:05 20:05-20:39/34	20:34	19:44	18:53	17:14	17:03 08:39-09:28/49
15	06:11 06:33-07:12/39	06:40 07:02-07:36/34	07:11 18:03-19:05/62	07:43 08:08-08:59/51	07:19 08:48-08:59/11	07:50 15:16-16:35/79
	21:04 20:05-20:39/34	20:33	19:42	18:52	17:13 07:50-08:32/42	17:03 08:39-09:29/50
16	06:11 06:34-07:13/39	06:41 07:03-07:36/33	07:12 18:03-19:04/61	07:44 08:09-08:59/50	07:20 08:44-09:02/18	07:51 15:16-16:36/80
	21:04 20:06-20:38/32	20:32 18:40-18:49/9	19:40	18:50	17:12 07:50-08:31/41	17:03 08:39-09:29/50
17	06:12 06:35-07:13/38	06:42 07:03-07:35/32	07:13 18:03-19:03/60	07:45 08:09-09:00/51	07:21 08:42-09:04/22	07:51 15:17-16:37/80
	21:03 20:06-20:38/32	20:30 18:35-18:54/19	19:39	18:49	17:11 07:50-08:31/41	17:03 08:40-09:30/50
18	06:13 06:36-07:14/38	06:43 07:04-07:34/30 18:32-18:57/25	07:14 18:04-19:01/57	07:46 08:10-09:00/50	07:23 08:40-09:06/26	07:52 15:17-16:37/80
	21:02 20:06-20:37/31	20:29 07:36-07:49/13	19:37	18:47	17:10 07:51-08:30/39	17:04 08:40-09:30/50
19	06:14 06:36-07:13/37	06:44 07:05-07:52/47	07:15 18:04-19:00/56	07:47 08:11-08:59/48	07:24 08:40-09:09/29	07:53 15:18-16:38/80
	21:02 20:06-20:36/30	20:27 18:29-19:00/31	19:35	18:46	17:10 07:52-08:31/39	17:04 08:41-09:31/50
20	06:15 06:37-07:14/37	06:45 07:06-07:53/47	07:16 18:05-18:59/54	07:48 08:13-09:00/47	07:25 16:01-16:05/4 07:53-08:30/37	07:53 15:19-16:38/79
	21:01 20:07-20:36/29	20:26 18:26-19:01/35	19:33	18:44	17:09 08:38-09:10/32	17:05 08:41-09:31/50
21	06:16 06:38-07:14/36	06:46 07:07-07:55/48	07:17 08:07-08:17/10	07:49 08:14-09:00/46	07:26 15:57-16:09/12 07:53-08:30/37	07:54 15:18-16:38/80
	21:00 20:07-20:35/28	20:24 18:24-19:03/39	19:32 18:06-18:57/51	18:43	17:08 08:37-09:11/34	17:05 08:41-09:31/50
22	06:17 06:39-07:14/35	06:47 07:08-07:56/48	07:18 08:03-08:20/17	07:50 08:16-08:59/43	07:27 15:55-16:11/16 07:54-08:29/35	07:54 15:19-16:39/80
	21:00 20:08-20:35/27	20:23 18:22-19:04/42	19:30 18:07-18:55/48	18:41	17:07 08:36-09:12/36	17:06 08:42-09:32/50
23	06:17 06:40-07:15/35	06:48 07:10-07:26/16 18:21-19:05/44	07:19 08:01-08:22/21	07:52 08:19-08:59/40	07:28 15:55-16:14/19 07:56-08:29/33	07:55 15:19-16:39/80
	20:59 20:08-20:34/26	20:21 07:27-07:57/30	19:28 18:08-18:54/46	18:40	17:07 08:37-09:14/37	17:06 08:42-09:32/50
24	06:18 06:41-07:15/34	06:49 07:13-07:22/9 18:19-19:06/47	07:20 07:59-08:23/24	07:53 08:20-08:59/39	07:30 15:54-16:18/24 07:56-08:29/33	07:55 15:20-16:40/80
	20:58 20:09-20:33/24	20:20 07:26-07:57/31	19:27 18:09-18:52/43	18:38	17:06 08:36-09:15/39 15:25-15:36/11	17:07 08:42-09:33/51
25	06:19 06:42-07:15/33	06:50 07:25-07:58/33	07:21 07:57-08:24/27	07:54 08:20-08:58/38	07:31 15:53-16:20/27 07:57-08:28/31	07:56 15:21-16:41/80
	20:57 20:09-20:32/23	20:18 18:18-19:07/49	19:25 18:11-18:49/38	18:37 09:02-09:16/14	17:06 08:36-09:16/40 15:22-15:39/17	17:07 08:44-09:34/50
26	06:20 06:42-07:14/32 07:16-07:25/9	06:51 07:24-07:58/34	07:22 07:56-08:24/28 18:13-18:46/33	07:55 08:20-08:57/37	07:32 15:52-16:22/30 07:58-08:27/29	07:56 15:21-16:41/80
	20:56 20:10-20:31/21	20:17 18:16-19:08/52	19:23 08:25-08:40/15	18:36 08:59-09:19/20	17:05 08:35-09:17/42 15:20-15:41/21	17:08 08:44-09:34/50
27	06:21 06:43-07:28/45	06:52 07:23-07:58/35	07:23 07:55-08:43/48	07:56 08:20-09:21/61	07:33 15:51-16:23/32 07:59-08:26/27	07:56 15:21-16:41/80
	20:55 20:11-20:30/19	20:15 18:15-19:09/54	19:21 18:15-18:43/28	18:34	17:05 08:35-09:17/42 15:19-15:43/24	17:08 08:44-09:34/50
28	06:22 06:44-07:30/46	06:53 07:23-07:59/36	07:24 07:54-08:45/51	07:57 08:21-09:22/61	07:34 15:51-16:25/34 08:01-08:25/24	07:57 15:23-16:42/79
	20:54 20:12-20:29/17	20:14 18:14-19:09/55	19:20 18:19-18:39/20	18:33	17:04 08:34-09:18/44 15:18-15:44/26	17:09 08:45-09:35/50
29	06:23 06:45-07:31/46	06:54 07:22-07:59/37	07:25 07:53-08:46/53	07:59 08:23-09:24/61	07:35 15:18-16:26/68 08:03-08:26/23	07:57 15:23-16:42/79
	20:53 20:13-20:29/16	20:12 18:13-19:10/57	19:18 18:27-18:30/3	18:32	17:04 08:35-09:20/45	17:10 08:46-09:35/49
30	06:24 06:46-07:33/47	06:55 07:22-07:58/36	07:26 07:52-08:48/56	08:00 08:23-09:25/62	07:36 15:17-16:27/70 08:05-08:24/19	07:57 15:23-16:43/80
	20:52 20:15-20:28/13	20:10 18:12-19:10/58	19:16	18:30	17:04 08:35-09:20/45	17:11 08:46-09:36/50
31	06:25 06:47-07:34/47	06:56 07:22-07:58/36		08:01 08:24-09:26/62		07:57 15:24-16:43/79
	20:51 20:17-20:27/10	20:09 18:11-19:10/59		18:29		17:11 08:46-09:36/50
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2161	1906	2209	1666	2157	3997

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T86 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (502)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January		February		March		April		May		June	
1	07:57	15:56-16:38/42	07:44	17:04-17:23/19	07:07	07:27-07:46/19	07:16	19:10-19:34/24	06:30	19:48-20:05/17	06:01	06:23-07:00/37
	17:12	08:26-09:00/34	17:47		18:21		19:56		20:27		20:57	19:42-20:12/30
2	07:58	15:56-16:39/43	07:43	17:04-17:24/20	07:06	07:25-07:48/23	07:14	19:10-19:35/25	06:29	19:45-20:06/21	06:00	06:22-07:00/38
	17:13	08:27-09:00/33	17:48		18:23		19:57		20:28		20:58	19:42-20:11/29
3	07:58	15:57-16:39/42	07:42	17:04-17:26/22	07:04	07:23-07:49/26	07:13	19:11-19:36/25	06:27	19:44-20:07/23	06:00	06:22-07:00/38
	17:14	08:27-09:00/33	17:50		18:24		19:58		20:29		20:59	19:43-20:11/28
4	07:58	15:57-16:40/43	07:41	17:04-17:27/23	07:02	07:22-07:51/29	07:11	19:11-19:37/26	06:26	19:42-20:08/26	06:00	06:22-07:01/39
	17:15	08:28-09:01/33	17:51		18:25		19:59		20:30		20:59	19:43-20:10/27
5	07:58	15:58-16:40/42	07:39	17:04-17:28/24	07:01	07:20-07:51/31	07:09	19:12-19:38/26	06:25	19:41-20:09/28	05:59	06:21-07:00/39
	17:16	08:29-09:01/32	17:52		18:26		20:00		20:31		21:00	19:44-20:10/26
6	07:58	15:59-16:41/42	07:38	17:03-17:29/26	06:59	07:19-07:52/33	07:08	19:14-19:40/26	06:23	19:39-20:09/30	05:59	06:21-07:01/40
	17:17	08:29-09:02/33	17:53		18:27		20:00		20:32		21:01	19:45-20:10/25
7	07:58	15:59-16:41/42	07:37	17:04-17:31/27	06:58	07:18-07:53/35	07:06	19:17-19:41/24	06:22	19:39-20:10/31	05:59	06:21-07:01/40
	17:18	08:30-09:02/32	17:55		18:28	18:01-18:07/6	20:01		20:33		21:01	19:46-20:10/24
8	07:57	15:59-16:41/42	07:36	17:05-17:32/27	07:56	08:16-08:53/37	07:04	19:17-19:41/24	06:21	19:38-20:12/34	05:58	06:20-07:02/42
	17:19	08:31-09:03/32	17:56		19:30	18:58-19:08/10	20:02		20:35		21:02	19:46-20:09/23
9	07:57	16:00-16:41/41	07:35	17:05-17:33/28	07:54	08:16-08:53/37	07:03	19:19-19:42/23	06:20	19:38-20:13/35	05:58	06:20-07:01/41
	17:20	08:31-09:02/31	17:57		19:31	18:57-19:09/12	20:03		20:36		21:03	19:47-20:09/22
10	07:57	16:01-16:42/41	07:34	17:07-17:32/25	07:53	08:15-08:53/38	07:01	19:20-19:41/21	06:19	19:37-20:13/36	05:58	06:20-07:01/41
	17:21	08:31-09:02/31	17:58		19:32	18:56-19:10/14	20:05		20:37		21:03	19:48-20:09/21
11	07:57	16:02-16:42/40	07:32	17:07-17:31/24	07:51	08:15-08:53/38	06:59	19:20-19:39/19	06:18	19:37-20:14/37	05:58	06:20-07:02/42
	17:22	08:32-09:03/31	18:00		19:33	18:54-19:11/17	20:06		20:38	06:38-06:40/2	21:04	19:49-20:08/19
12	07:57	16:02-16:42/40	07:31	17:09-17:31/22	07:49	08:15-08:53/38	06:58	19:22-19:38/16	06:17	19:37-20:14/37	05:58	06:20-07:02/42
	17:23	08:32-09:02/30	18:01		19:34	18:54-19:13/19	20:07		20:39	06:37-06:43/6	21:04	19:49-20:08/19
13	07:56	16:03-16:42/39	07:30	17:11-17:30/19	07:48	08:15-08:52/37	06:56	19:23-19:36/13	06:16	19:36-20:14/38	05:58	06:20-07:02/42
	17:24	08:34-09:03/29	18:02		19:35	18:53-19:14/21	20:08		20:40	06:36-06:45/9	21:05	19:50-20:08/18
14	07:56	16:03-16:42/39	07:29	17:15-17:28/13	07:46	08:14-08:51/37	06:55	19:26-19:33/7	06:15	19:36-20:14/38	05:58	06:20-07:02/42
	17:25	08:35-09:03/28	18:03		19:36	18:53-19:15/22	20:09		20:41	06:35-06:46/11	21:05	19:51-20:08/17
15	07:56	16:04-16:42/38	07:27	17:16-17:25/9	07:45	08:15-08:51/36	06:53		06:14	19:36-20:14/38	05:58	06:20-07:02/42
	17:26	08:35-09:02/27	18:05		19:37	18:53-19:16/23	20:10		20:42	06:34-06:49/15	21:06	19:51-20:08/17
16	07:55	16:06-16:42/36	07:26		07:43	08:15-08:50/35	06:52		06:13	19:36-20:14/38	05:58	06:20-07:02/42
	17:28	08:37-09:03/26	18:06		19:39	18:53-19:16/23	20:11		20:43	06:33-06:50/17	21:06	19:52-20:07/15
17	07:55	16:06-16:42/36	07:25		07:41	08:15-08:49/34	06:50		06:12	19:36-20:14/38	05:58	06:20-07:03/43
	17:29	08:37-09:02/25	18:07		19:40	18:53-19:14/21	20:12		20:44	06:32-06:51/19	21:07	19:52-20:07/15
18	07:54	16:07-16:41/34	07:23		07:39	08:16-08:48/32	06:48		06:11	19:36-20:14/38	05:58	06:20-07:03/43
	17:30	08:38-09:01/23	18:08		19:41	18:55-19:14/19	20:13		20:45	06:31-06:52/21	21:07	19:53-20:07/14
19	07:54	16:09-16:41/32	07:22		07:38	08:17-08:46/29	06:47		06:10	06:31-06:54/23	05:58	06:20-07:03/43
	17:31	08:40-09:01/21	18:10		19:42	18:55-19:12/17	20:14		20:46	19:37-20:15/38	21:07	19:53-20:07/14
20	07:53	16:09-16:40/31	07:21		07:36	08:18-08:44/26	06:45		06:09	06:30-06:55/25	05:58	06:20-07:03/43
	17:32	08:41-08:59/18	18:11		19:43	18:57-19:09/12	20:15		20:47	19:37-20:15/38	21:08	19:53-20:07/14
21	07:52	16:11-16:39/28	07:19		07:34	08:20-08:43/23	06:44		06:08	06:29-06:55/26	05:58	06:21-07:04/43
	17:33	08:43-08:59/16	18:12		19:44	19:00-19:05/5	20:16		20:48	19:37-20:14/37	21:08	19:54-20:08/14
22	07:52	16:13-16:39/26	07:18		07:33	08:21-08:40/19	06:42		06:07	06:28-06:56/28	05:58	06:21-07:04/43
	17:35	08:46-08:57/11	18:13		19:45		20:17		20:48	19:37-20:14/37	21:08	19:54-20:08/14
23	07:51	16:14-16:38/24	07:16		07:31	19:20-19:25/5	06:41		06:06	06:28-06:57/29	05:59	06:21-07:04/43
	17:36		18:14		19:46	08:24-08:36/12	20:18		20:49	19:38-20:14/36	21:08	19:54-20:08/14
24	07:50	16:17-16:35/18	07:15		07:29	19:17-19:25/8	06:40		06:06	06:27-06:57/30	05:59	06:21-07:04/43
	17:37		18:16		19:47		20:20		20:50	19:38-20:14/36	21:08	19:54-20:08/14
25	07:50	17:10-17:13/3	07:13		07:28	19:15-19:27/12	06:38		06:05	06:26-06:57/31	05:59	06:22-07:05/43
	17:38	16:20-16:32/12	18:17		19:48		20:21		20:51	19:38-20:13/35	21:09	19:55-20:09/14
26	07:49	17:09-17:15/6	07:12		07:26	19:13-19:28/15	06:37		06:04	06:26-06:58/32	05:59	06:22-07:05/43
	17:40		18:18		19:49		20:22		20:52	19:39-20:14/35	21:09	19:54-20:09/15
27	07:48	17:07-17:16/9	07:10		07:24	19:12-19:29/17	06:35		06:04	06:25-06:58/33	06:00	06:22-07:04/42
	17:41		18:19		19:51		20:23		20:53	19:39-20:13/34	21:09	19:54-20:10/16
28	07:47	17:06-17:17/11	07:09	07:31-07:42/11	07:23	19:12-19:30/18	06:34		06:03	06:25-06:59/34	06:00	06:23-07:05/42
	17:42		18:20		19:52		20:24		20:54	19:39-20:12/33	21:09	19:54-20:11/17
29	07:46	17:05-17:19/14			07:21	19:11-19:31/20	06:33		06:02	06:24-06:59/35	06:01	06:23-07:05/42
	17:43				19:53		20:25		20:55	19:40-20:13/33	21:09	19:53-20:11/18
30	07:45	17:05-17:20/15			07:19	19:10-19:32/22	06:31	19:52-20:01/9	06:02	06:24-07:00/36	06:01	06:24-07:06/42
	17:45				19:54		20:26		20:56	19:40-20:12/32	21:09	19:54-20:12/18
31	07:45	17:04-17:21/17			07:18	19:10-19:34/24			06:01	06:23-07:00/37		
	17:46				19:55				20:56	19:41-20:12/31		
Potential sun hours	297		297		370		399		449		453	
Sum of minutes with flicker		1577		339		1086		308		1537		1816

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T86 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (502)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:24-07:06/42	06:26 19:47-20:24/37	06:57 19:20-19:39/19	07:27 07:54-08:31/37	07:02 16:35-17:01/26	07:37 15:44-16:24/40
	21:09 19:53-20:12/19	20:50 06:48-06:53/5	20:07	19:15 18:33-18:52/19	17:28	17:03 08:14-08:45/31
2	06:02 06:25-07:06/41	06:27 19:48-20:24/36	06:58 19:19-19:40/21	07:28 07:53-08:31/38	07:03 16:35-17:02/27	07:38 15:44-16:25/41
	21:09 19:53-20:14/21	20:49	20:06	19:13 18:33-18:50/17	17:26	17:03 08:14-08:45/31
3	06:03 06:25-07:06/41	06:28 19:48-20:24/36	06:59 19:16-19:39/23	07:29 07:53-08:31/38	07:04 16:34-17:02/28	07:39 15:44-16:25/41
	21:09 19:52-20:14/22	20:48	20:04	19:11 18:33-18:49/16	17:25	17:03 08:15-08:46/31
4	06:03 06:26-07:07/41	06:29 19:48-20:23/35	07:00 19:14-19:38/24	07:31 07:53-08:30/37	07:06 16:34-17:00/26	07:40 15:44-16:26/42
	21:08 19:52-20:15/23	20:47	20:02	19:10 18:33-18:47/14	17:24	17:02 08:15-08:47/32
5	06:04 06:26-07:06/40	06:30 19:49-20:22/33	07:01 19:13-19:37/24	07:32 07:54-08:30/36	07:07 16:33-16:59/26	07:41 15:44-16:26/42
	21:08 19:52-20:15/23	20:46	20:01	19:08 18:34-18:45/11	17:23	17:02 08:15-08:47/32
6	06:04 06:27-07:07/40	06:31 19:49-20:20/31	07:02 19:09-19:35/26	07:33 07:54-08:30/36	07:08 16:34-16:58/24	07:42 15:45-16:27/42
	21:08 19:52-20:16/24	20:45	19:57	19:06 18:37-18:44/7	17:22	17:02 08:15-08:48/33
7	06:05 06:28-07:08/40	06:32 19:49-20:19/30	07:03 19:07-19:33/26	07:34 07:54-08:29/35	07:09 16:34-16:57/23	07:43 15:45-16:27/42
	21:08 19:51-20:16/25	20:43	19:56	19:05 18:40-18:42/2	17:21	17:02 08:16-08:48/32
8	06:06 06:28-07:07/39	06:33 19:50-20:17/27	07:04 19:05-19:32/27	07:35 07:55-08:27/32	07:10 16:34-16:55/21	07:44 15:45-16:28/43
	21:07 19:51-20:17/26	20:42	19:54	19:03	17:19	17:02 08:16-08:49/33
9	06:06 06:29-07:08/39	06:34 19:51-20:16/25	07:05 19:04-19:30/26	07:36 07:56-08:26/30	07:12 16:35-16:55/20	07:45 15:46-16:28/42
	21:07 19:51-20:18/27	20:41	19:52	19:01	17:18	17:02 08:16-08:49/33
10	06:07 06:29-07:07/38	06:35 19:53-20:15/22	07:06 19:03-19:28/25	07:37 07:57-08:24/27	07:13 16:35-16:54/19	07:46 15:45-16:28/43
	21:07 19:50-20:18/28	20:40	19:51	19:00	17:17	17:02 08:17-08:50/33
11	06:08 06:30-07:08/38	06:36 19:54-20:14/20	07:07 19:02-19:27/25	07:38 07:58-08:22/24	07:14 16:35-16:52/17	07:47 15:46-16:29/43
	21:06 19:50-20:19/29	20:38	19:49	18:58	17:16	17:02 08:17-08:50/33
12	06:08 06:31-07:08/37	06:37 19:57-20:12/15	07:08 19:01-19:25/24	07:39 07:59-08:20/21	07:15 16:37-16:52/15	07:48 15:46-16:29/43
	21:06 19:50-20:20/30	20:37	19:47	18:56	17:15	17:02 08:17-08:50/33
13	06:09 06:32-07:08/36	06:38 20:01-20:07/6	07:09 19:01-19:23/22	07:40 08:01-08:17/16	07:17 16:37-16:51/14	07:48 15:47-16:30/43
	21:05 19:50-20:21/31	20:36	19:45	18:55	17:14	17:02 08:18-08:51/33
14	06:10 06:32-07:07/35	06:39	07:10 19:01-19:22/21	07:41 08:07-08:13/6	07:18 16:38-16:49/11	07:49 15:48-16:30/42
	21:05 19:49-20:21/32	20:34	19:44	18:53	17:14	17:03 08:18-08:52/34
15	06:11 06:33-07:08/35	06:40	07:11 19:01-19:20/19	07:42	07:19 16:39-16:48/9	07:50 15:47-16:30/43
	21:04 19:49-20:21/32	20:33	19:42	18:52	17:13	17:03 08:18-08:51/33
16	06:11 06:34-07:08/34	06:41	07:12 19:01-19:18/17	07:44	07:20 16:42-16:48/6	07:51 15:48-16:31/43
	21:04 19:48-20:22/34	20:32	19:40	18:50	17:12	17:03 08:19-08:52/33
17	06:12 06:35-07:08/33	06:42	07:13 19:01-19:17/16	07:45	07:21 16:44-16:47/3	07:51 15:49-16:32/43
	21:03 19:48-20:23/35	20:30	19:39	18:49	17:11 15:54-16:06/12	17:03 08:20-08:53/33
18	06:13 06:35-07:07/32	06:43	07:14 19:02-19:15/13	07:46	07:22 15:51-16:09/18	07:52 15:49-16:32/43
	21:02 19:47-20:23/36	20:29	19:37	18:47	17:10	17:04 08:20-08:53/33
19	06:14 06:36-07:07/31	06:44	07:15 19:03-19:13/10	07:47	07:24 15:48-16:12/24	07:52 15:50-16:32/42
	21:02 19:47-20:23/36	20:27	19:35	18:46	17:09	17:04 08:20-08:54/34
20	06:15 06:37-07:07/30	06:45	07:16 19:06-19:11/5	07:48	07:25 15:48-16:14/26	07:53 15:50-16:32/42
	21:01 19:47-20:24/37	20:26	19:33 08:12-08:21/9	18:44	17:09 08:21-08:32/11	17:05 08:21-08:55/34
21	06:16 06:38-07:06/28	06:46	07:17 08:07-08:25/18	07:49	07:26 15:47-16:15/28	07:54 15:51-16:33/42
	21:00 19:47-20:24/37	20:24	19:32	18:43	17:08 08:18-08:34/16	17:05 08:21-08:55/34
22	06:16 06:39-07:06/27	06:47	07:18 08:05-08:27/22	07:50	07:27 15:46-16:16/30	07:54 15:51-16:33/42
	21:00 19:47-20:25/38	20:23	19:30	18:41	17:07 08:17-08:35/18	17:05 08:22-08:56/34
23	06:17 06:40-07:06/26	06:48	07:19 08:02-08:28/26	07:51	07:28 15:45-16:17/32	07:55 15:52-16:34/42
	20:59 19:47-20:25/38	20:21	19:28 18:42-18:53/11	18:40	17:07 08:17-08:38/21	17:06 08:22-08:56/34
24	06:18 06:41-07:05/24	06:49	07:20 08:01-08:29/28	07:53	07:30 15:45-16:19/34	07:55 15:52-16:34/42
	20:58 19:46-20:24/38	20:20	19:26 18:39-18:55/16	18:38	17:06 08:16-08:39/23	17:07 08:22-08:56/34
25	06:19 06:41-07:03/22	06:50	07:21 07:59-08:30/31	07:54	07:31 15:44-16:20/36	07:56 15:53-16:36/43
	20:57 19:46-20:24/38	20:18	19:25 18:38-18:56/18	18:37	17:06 08:15-08:40/25	17:07 08:24-08:57/33
26	06:20 19:46-20:25/39	06:51	07:22 07:58-08:31/33	07:55	07:32 15:44-16:20/36	07:56 15:53-16:36/43
	20:56 06:42-07:03/21	20:17	19:23 18:36-18:57/21	18:35	17:05 08:15-08:41/26	17:08 08:24-08:57/33
27	06:21 19:46-20:25/39	06:52	07:23 07:57-08:31/34	07:56 17:45-17:56/11	07:33 15:43-16:21/38	07:56 15:53-16:36/43
	20:55 06:43-07:02/19	20:15	19:21 18:35-18:57/22	18:34	17:05 08:14-08:41/27	17:08 08:24-08:57/33
28	06:22 19:46-20:25/39	06:53	07:24 07:56-08:32/36	07:57 17:43-17:58/15	07:34 15:43-16:22/39	07:57 15:53-16:36/43
	20:54 06:44-07:00/16	20:14	19:20 18:34-18:57/23	18:33	17:04 08:14-08:42/28	17:09 08:25-08:58/33
29	06:23 19:47-20:25/38	06:54 19:27-19:34/7	07:25 07:55-08:32/37	07:58 17:40-18:00/20	07:35 15:43-16:22/39	07:57 15:55-16:37/42
	20:53 06:45-06:58/13	20:12	19:18 18:33-18:56/23	18:31	17:04 08:15-08:44/29	17:10 08:25-08:59/34
30	06:24 19:47-20:25/38	06:55 19:24-19:37/13	07:26 07:54-08:32/38	08:00 17:38-18:01/23	07:36 15:44-16:24/40	07:57 15:55-16:38/43
	20:52 06:46-06:57/11	20:10	19:16 18:33-18:54/21	18:30	17:03 08:15-08:44/29	17:11 08:26-08:59/33
31	06:25 19:47-20:25/38	06:56 19:22-19:38/16		08:01 17:36-18:01/25		07:57 15:55-16:38/43
	20:51 06:47-06:55/8	20:09		18:29		17:11 08:26-08:59/33
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	1947	394	880	593	1000	2335

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T87 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (503)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58 08:27-09:41/74 14:22-15:23/61 17:13 10:08-11:33/85	07:44 08:04-09:36/92	07:07 07:27-07:58/31 18:22 16:35-16:41/6	07:16 07:35-08:17/42 19:56	06:30	06:02 06:23-07:00/37 20:57 19:44-20:29/45
2	07:58 08:27-09:41/74 14:23-15:23/60 17:14 10:08-11:33/85	07:43 08:03-09:36/93 17:49 16:06-17:25/79	07:06 07:25-07:58/33 18:23	07:15 07:34-08:16/42 19:57	06:29 20:28	06:01 06:23-07:01/38 20:58 19:45-20:30/45
3	07:58 08:27-09:41/74 14:24-15:23/59 17:15 10:09-11:33/84	07:42 08:02-09:35/93 17:50 16:06-17:26/80	07:04 07:24-07:59/35 18:24	07:13 07:32-08:15/43 19:58	06:28 20:29	06:01 06:22-07:00/38 20:59 19:44-20:29/45
4	07:58 08:27-09:42/75 14:25-15:23/58 17:16 10:10-11:34/84	07:41 08:01-09:35/94 17:51 16:06-17:27/81	07:03 07:22-07:58/36 18:25	07:11 07:30-08:13/43 19:59	06:27 20:30	06:00 06:22-07:01/39 20:59 19:44-20:30/46
5	07:58 08:27-09:42/75 14:26-15:23/57 17:17 10:11-11:34/83	07:40 08:00-09:34/94 17:53 16:06-17:29/83	07:01 07:21-07:58/37 18:27	07:10 07:29-08:12/43 20:01	06:25 20:32	06:00 06:22-07:01/39 21:00 19:45-20:31/46
6	07:58 08:27-09:43/76 10:11-11:34/83 17:18 16:25-16:32/7 14:27-15:23/56	07:39 07:59-09:33/94 17:54 16:07-17:30/83	07:00 07:19-07:57/38 18:28	07:08 07:27-08:10/43 20:01	06:24 20:33	06:00 06:22-07:02/40 21:01 19:44-20:30/46
7	07:58 08:28-09:43/75 10:12-11:34/82 17:19 16:22-16:36/14 14:28-15:24/56	07:37 07:58-09:33/95 17:55 16:07-17:31/84	06:58 07:17-07:56/39 18:29	07:06 07:25-08:07/42 20:02	06:23 20:34	05:59 06:21-07:01/40 21:01 19:44-20:31/47
8	07:58 08:28-09:44/76 10:13-11:34/81 17:20 16:21-16:39/18 14:29-15:24/55	07:36 07:56-09:31/95 17:56 16:06-17:32/86	07:56 08:16-08:56/40 19:30	07:05 07:24-08:06/42 20:03	06:22 20:35	05:59 06:21-07:01/40 21:02 19:45-20:31/46
9	07:57 08:27-09:43/76 10:13-11:33/80 17:21 16:18-16:40/22 14:30-15:23/53	07:35 07:55-09:30/95 17:58 16:07-17:34/87	07:55 08:14-08:55/41 19:31	07:03 07:22-08:04/42 20:04	06:21 20:36	05:59 06:21-07:01/40 21:03 19:45-20:32/47
10	07:57 08:26-09:44/78 10:14-11:34/80 17:22 16:18-16:42/24 14:31-15:23/52	07:34 07:54-09:28/94 17:59 16:07-17:36/89	07:53 08:12-08:53/41 19:32	07:02 07:21-08:04/43 20:05	06:19 20:37	05:59 06:21-07:02/41 21:03 19:45-20:32/47
11	07:57 08:26-09:44/78 10:15-11:34/79 17:23 16:17-16:45/28 14:33-15:23/50	07:33 07:53-09:27/94 18:00 16:08-17:37/89	07:51 08:11-08:52/41 19:33	07:00 07:20-08:02/42 20:06	06:18 20:38	05:58 06:21-07:02/41 21:04 19:45-20:32/47
12	07:57 08:24-09:44/80 10:15-11:33/78 17:24 16:15-16:46/31 14:33-15:22/49	07:31 07:52-09:24/92 18:01 16:07-17:38/91	07:50 08:09-08:50/41 19:34	06:58 07:19-07:59/40 20:07	06:17 06:38-06:48/10 20:39	05:58 06:21-07:02/41 21:04 19:46-20:33/47
13	07:56 08:24-09:45/81 10:17-11:33/76 17:25 16:15-16:48/33 14:35-15:22/47	07:30 07:52-09:22/90 18:03 16:08-17:39/91	07:48 08:07-08:47/40 19:36	06:57 07:19-07:58/39 20:08	06:16 06:37-06:51/14 20:40	05:58 06:21-07:02/41 21:05 19:45-20:32/47
14	07:56 08:24-09:45/81 10:18-11:33/75 17:26 16:14-16:50/36 14:37-15:22/45	07:29 07:52-09:19/87 18:04 16:09-17:40/91	07:47 08:06-08:44/38 19:37	06:55 07:19-07:54/35 20:09	06:15 06:36-06:52/16 20:41 19:59-20:12/13	05:58 06:21-07:02/41 21:05 19:45-20:32/47
15	07:56 08:23-09:45/82 10:18-11:32/74 17:27 16:13-16:50/37 14:38-15:20/42	07:28 07:52-09:12/80 18:05 16:09-17:39/90	07:45 08:04-08:42/38 19:38	06:54 07:20-07:49/29 20:10	06:14 06:35-06:54/19 20:42 19:56-20:15/19	05:58 06:22-07:02/40 21:06 19:45-20:33/48
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Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	6717	4112	1179	757	1158	2613

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T87 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (503)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 06:25-07:06/41	06:26 06:48-06:57/9	06:57 07:19-08:01/42	07:28 07:48-08:28/40	07:02 07:24-08:58/94	07:37 08:08-09:26/78 09:57-11:16/79
	21:09 19:50-20:37/47	20:50	20:07	19:15	17:28 15:37-17:05/88	17:04 15:59-16:27/28 14:15-15:05/50
2	06:03 06:25-07:06/41	06:27	06:58 07:19-08:02/43	07:29 07:49-08:30/41	07:03 07:25-09:00/95	07:38 08:09-09:27/78 09:57-11:17/80
	21:09 19:49-20:36/47	20:49	20:06	19:13	17:27 15:36-17:04/88	17:04 16:01-16:26/25 14:14-15:06/52
3	06:03 06:26-07:07/41	06:28	06:59 07:20-08:02/42	07:30 07:50-08:31/41	07:05 07:26-09:01/95	07:39 08:11-09:27/76 09:57-11:17/80
	21:09 19:50-20:37/47	20:48	20:04	19:12	17:26 15:36-17:02/86	17:03 16:02-16:24/22 14:14-15:07/53
4	06:04 06:26-07:06/40	06:29	07:00 07:21-08:03/42	07:31 07:51-08:32/41	07:06 07:27-09:02/95	07:40 08:12-09:28/76 09:57-11:18/81
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5	06:04 06:27-07:07/40	06:30	07:01 07:22-08:04/42	07:32 07:52-08:32/40	07:07 07:29-09:03/94	07:41 08:13-09:28/75 09:57-11:19/82
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6	06:05 06:28-07:08/40	06:31	07:02 07:23-08:06/43	07:33 07:53-08:33/40	07:08 07:30-09:04/94	07:42 08:13-09:29/76 09:57-11:20/83
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7	06:06 06:28-07:07/39	06:32	07:03 07:24-08:07/43	07:34 07:54-08:33/39	07:09 07:31-09:05/94	07:43 08:14-09:29/75 14:13-15:10/57
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	20:51	20:09		18:29 16:36-18:06/90		17:12 10:07-11:33/86
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2149	304	1187	2897	6024	7040

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T9 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (428)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	January	February	March	April	May	June
1	07:58	07:44	07:07	07:16 07:35-07:56/21	06:30 07:22-08:38/76	06:01 19:57-20:23/26
	17:13	17:47	18:22	19:56	20:27	20:57 07:38-08:19/41
2	07:58	07:43	07:06	07:14 07:34-07:57/23	06:29 07:23-08:38/75	06:01 19:57-20:22/25
	17:14	17:49	18:23	19:57	20:28	20:58 07:39-08:18/39
3	07:58	07:42	07:04	07:13 07:32-07:56/24	06:27 07:22-08:37/75	06:00 19:58-20:23/25
	17:14	17:50	18:24	19:58 07:59-08:17/18	20:29	20:59 07:40-08:18/38
4	07:58	07:41	07:03	07:11 07:30-08:21/51	06:26 07:22-08:36/74	06:00 19:58-20:23/25
	17:15	17:51	18:25	19:59	20:30	21:00 07:41-08:17/36
5	07:58	07:40	07:01	07:09 07:30-08:24/54	06:25 07:22-08:36/74	06:00 19:58-20:22/24
	17:16	17:52	18:26	20:00	20:32	21:00 07:42-08:16/34
6	07:58	07:39	06:59	07:08 07:30-08:27/57	06:24 07:23-08:36/73	05:59 19:59-20:22/23
	17:17	17:54	18:27	20:00	20:33	21:01 07:43-08:16/33
7	07:58	07:37	06:58	07:06 07:30-08:29/59	06:23 20:06-20:11/5	05:59 20:00-20:22/22 07:44-08:15/31
	17:18	17:55	18:29	20:01	20:34 07:23-08:36/73	21:02 20:34-20:37/3
8	07:58	07:36	07:56	07:05 07:31-08:31/60	06:21 20:02-20:11/9	05:59 20:01-20:22/21 07:45-08:15/30
	17:19	17:56	19:30	20:03	20:35 07:22-08:34/72	21:02 20:33-20:38/5
9	07:57	07:35	07:55	07:03 07:31-08:32/61	06:20 20:00-20:13/13	05:58 20:01-20:21/20 07:46-08:14/28
	17:20	17:57	19:31	20:04	20:36 07:23-08:34/71	21:03 20:31-20:37/6
10	07:57	07:34	07:53	07:01 07:32-08:33/61	06:19 19:58-20:14/16	05:58 20:01-20:21/20 07:47-08:13/26
	17:21	17:59	19:32	20:05	20:37 07:23-08:33/70	21:03 20:30-20:38/8
11	07:57	07:33	07:51	07:00 07:34-08:35/61	06:18 19:57-20:15/18	05:58 20:02-20:21/19 07:48-08:12/24
	17:22	18:00	19:33	20:06	20:38 07:23-08:33/70	21:04 20:30-20:39/9
12	07:57	07:31	07:50	06:58 07:35-08:35/60	06:17 19:56-20:16/20	05:58 20:03-20:21/18 07:49-08:12/23
	17:23	18:01	19:34	20:07	20:39 07:24-08:32/68	21:04 20:30-20:39/9
13	07:56	07:30	07:48	06:56 07:34-08:37/63	06:16 19:55-20:16/21	05:58 20:03-20:20/17 07:50-08:11/21
	17:24	18:02	19:35	20:08	20:40 07:24-08:32/68	21:05 20:30-20:40/10
14	07:56	07:29	07:46	06:55 07:32-08:37/65	06:15 19:55-20:17/22	05:58 20:04-20:20/16 07:51-08:11/20
	17:26	18:04	19:37	20:09	20:41 07:25-08:31/66	21:05 20:30-20:40/10
15	07:56	07:28	07:45	06:53 07:30-08:37/67	06:14 19:54-20:18/24	05:58 20:04-20:20/16 07:51-08:10/19
	17:27	18:05	19:38	20:10	20:42 07:25-08:30/65	21:06 20:30-20:40/10
16	07:55	07:26	07:43	06:52 07:30-08:38/68	06:13 19:54-20:19/25	05:58 20:05-20:20/15 07:52-08:10/18
	17:28	18:06	19:39	20:11	20:43 07:26-08:30/64	21:06 20:29-20:41/12
17	07:55	07:25	07:41	06:50 07:28-08:38/70	06:12 19:53-20:20/27	05:58 20:05-20:20/15 07:53-08:09/16
	17:29	18:07	19:40	20:12	20:44 07:27-08:30/63	21:07 20:29-20:41/12
18	07:54	07:23	07:40	06:49 07:28-08:39/71	06:11 19:54-20:22/28	05:58 20:05-20:20/15 07:53-08:09/16
	17:30	18:09	19:41	20:13	20:45 07:27-08:29/62	21:07 20:29-20:41/12
19	07:54	07:22	07:38	06:47 07:27-08:38/71	06:10 19:54-20:22/28	05:58 20:06-20:20/14 07:55-08:10/15
	17:31	18:10	19:42	20:14	20:46 07:28-08:28/60	21:07 20:29-20:41/12
20	07:53	07:21	07:36	06:46 07:26-08:39/73	06:09 19:53-20:23/30	05:58 20:07-20:21/14 07:55-08:10/15
	17:32	18:11	19:43	20:15	20:47 07:28-08:27/59	21:08 20:30-20:43/13
21	07:53	07:19	07:35	06:44 07:25-08:39/74	06:08 19:53-20:23/30	05:58 20:07-20:21/14 07:55-08:09/14
	17:34	18:12	19:44	20:17	20:48 07:29-08:26/57	21:08 20:30-20:43/13
22	07:52	07:18	07:33	06:43 07:25-08:39/74	06:07 19:53-20:23/30	05:59 20:07-20:21/14 07:55-08:10/15
	17:35	18:13	19:45	20:18	20:49 07:30-08:27/57	21:08 20:30-20:43/13
23	07:51	07:16	07:31	06:41 07:25-08:40/75	06:07 19:54-20:24/30	05:59 20:07-20:21/14 07:55-08:10/15
	17:36	18:15	19:46	20:19	20:50 07:31-08:26/55	21:08 20:30-20:43/13
24	07:51	07:15	07:30	06:40 07:24-08:39/75	06:06 19:54-20:24/30	05:59 20:08-20:22/14 07:56-08:11/15
	17:37	18:16	19:47	20:20	20:50 07:31-08:25/54	21:09 20:31-20:43/12
25	07:50	07:13	07:28	06:38 07:24-08:39/75	06:05 19:53-20:23/30	05:59 20:07-20:22/15 07:55-08:11/16
	17:39	18:17	19:49	20:21	20:51 07:32-08:25/53	21:09 20:31-20:43/12
26	07:49	07:12	07:26	06:37 07:23-08:38/75	06:05 19:54-20:24/30	06:00 20:07-20:22/15 07:54-08:12/18
	17:40	18:18	19:50	20:22	20:52 07:33-08:23/50	21:09 20:31-20:43/12
27	07:48	07:10	07:25 07:44-07:51/7	06:35 07:23-08:39/76	06:04 19:54-20:23/29	06:00 20:08-20:23/15 07:55-08:13/18
	17:41	18:19	19:51	20:23	20:53 07:33-08:22/49	21:09 20:32-20:44/12
28	07:47	07:09	07:23 07:42-07:53/11	06:34 07:23-08:39/76	06:03 19:55-20:24/29	06:00 20:07-20:23/16 07:54-08:13/19
	17:42	18:21	19:52	20:24	20:54 07:35-08:22/47	21:09 20:33-20:43/10
29	07:47		07:21 07:40-07:54/14	06:33 07:22-08:38/76	06:03 19:55-20:23/28	06:01 20:07-20:23/16 07:54-08:15/21
	17:44		19:53	20:25	20:55 07:35-08:21/46	21:09 20:33-20:43/10
30	07:46		07:19 07:39-07:56/17	06:31 07:22-08:38/76	06:02 19:56-20:24/28	06:01 20:07-20:24/17 07:53-08:15/22
	17:45		19:54	20:26	20:56 07:37-08:21/44	21:09 20:34-20:43/9
31	07:45		07:18 07:37-07:56/19		06:02 19:56-20:23/27	
	17:46		19:55		20:56 07:37-08:20/43	
Potential sun hours	297	297	370	399	449	453
Sum of minutes with flicker	0	0	68	1910	2540	1483

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/7/2019 5:03 PM/3.2.737

SHADOW - Calendar per WTG

Calculation: 2019-01-07_Emerson SFA**WTG:** T9 - NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (428)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067	738	557	368	264	8,760

	July	August	September	October	November	December
1	06:02 20:06-20:25/19 07:52-08:16/24	06:26 20:07-20:26/19	06:57 07:33-08:34/61	07:28	07:02	07:37
	21:09 20:34-20:43/9	20:50 07:34-08:43/69	20:07	19:15	17:28	17:03
2	06:02 20:07-20:26/19 07:52-08:17/25	06:27 20:08-20:25/17	06:58 07:31-08:32/61	07:29	07:03	07:38
	21:09 20:35-20:43/8	20:49 07:34-08:44/70	20:06	19:13	17:27	17:03
3	06:03 20:06-20:26/20 07:51-08:18/27	06:28 20:09-20:24/15	06:59 07:29-08:30/61	07:30	07:05	07:39
	21:09 20:36-20:43/7	20:48 07:34-08:44/70	20:04	19:11	17:25	17:03
4	06:03 20:06-20:27/21 07:51-08:19/28	06:29 20:11-20:23/12	07:00 07:28-08:28/60	07:31	07:06	07:40
	21:09 20:37-20:43/6	20:47 07:33-08:45/72	20:02	19:10	17:24	17:03
5	06:04 20:05-20:27/22 07:51-08:21/30	06:30 20:13-20:22/9	07:01 07:27-08:26/59	07:32	07:07	07:41
	21:08 20:38-20:42/4	20:46 07:33-08:45/72	20:01	19:08	17:23	17:03
6	06:05 20:06-20:28/22 07:49-08:21/32	06:31 07:33-08:45/72	07:02 07:26-08:23/57	07:33	07:08	07:42
	21:08 20:41-20:42/1	20:45	19:57	19:06	17:22	17:02
7	06:05 20:06-20:29/23	06:32 07:32-08:46/74	07:03 07:25-08:20/55	07:34	07:09	07:43
	21:08 07:49-08:23/34	20:44	19:56	19:05	17:21	17:02
8	06:06 20:05-20:29/24	06:33 07:32-08:46/74	07:04 07:25-08:17/52	07:35	07:11	07:44
	21:08 07:48-08:23/35	20:42	19:54	19:03	17:20	17:02
9	06:06 20:05-20:30/25	06:34 07:32-08:46/74	07:05 07:26-07:50/24	07:36	07:12	07:45
	21:07 07:48-08:25/37	20:41	19:52 07:53-08:12/19	19:01	17:19	17:02
10	06:07 20:05-20:30/25	06:35 07:32-08:46/74	07:06 07:27-07:50/23	07:37	07:13	07:46
	21:07 07:47-08:26/39	20:40	19:51	19:00	17:18	17:02
11	06:08 20:04-20:30/26	06:36 07:31-08:46/75	07:07 07:28-07:49/21	07:38	07:14	07:47
	21:06 07:46-08:26/40	20:39	19:49	18:58	17:17	17:02
12	06:09 20:04-20:31/27	06:37 07:31-08:47/76	07:08 07:29-07:48/19	07:39	07:15	07:48
	21:06 07:46-08:27/41	20:37	19:47	18:57	17:16	17:02
13	06:09 20:04-20:32/28	06:38 07:31-08:47/76	07:09 07:29-07:46/17	07:40	07:17	07:48
	21:05 07:45-08:29/44	20:36	19:46	18:55	17:15	17:03
14	06:10 20:05-20:32/27	06:39 07:30-08:46/76	07:10 07:30-07:45/15	07:42	07:18	07:49
	21:05 07:45-08:30/45	20:35	19:44	18:53	17:14	17:03
15	06:11 20:04-20:32/28	06:40 07:30-08:46/76	07:11 07:31-07:43/12	07:43	07:19	07:50
	21:04 07:43-08:30/47	20:33	19:42	18:52	17:13	17:03
16	06:12 20:04-20:33/29	06:41 07:30-08:45/75	07:12 07:32-07:40/8	07:44	07:20	07:51
	21:04 07:43-08:31/48	20:32	19:40	18:50	17:12	17:03
17	06:12 20:04-20:33/29	06:42 07:30-08:45/75	07:13	07:45	07:21	07:51
	21:03 07:43-08:32/49	20:30	19:39	18:49	17:11	17:04
18	06:13 20:04-20:34/30	06:43 07:30-08:45/75	07:14	07:46	07:23	07:52
	21:03 07:42-08:34/52	20:29	19:37	18:47	17:10	17:04
19	06:14 20:03-20:33/30	06:44 07:30-08:45/75	07:15	07:47	07:24	07:53
	21:02 07:42-08:35/53	20:27	19:35	18:46	17:10	17:04
20	06:15 20:03-20:33/30	06:45 07:30-08:44/74	07:16	07:48	07:25	07:53
	21:01 07:40-08:35/55	20:26	19:34	18:44	17:09	17:05
21	06:16 20:03-20:34/31	06:46 07:30-08:44/74	07:17	07:49	07:26	07:54
	21:00 07:40-08:36/56	20:25	19:32	18:43	17:08	17:05
22	06:17 20:04-20:34/30	06:47 07:30-08:43/73	07:18	07:51	07:27	07:54
	21:00 07:39-08:37/58	20:23	19:30	18:41	17:08	17:06
23	06:18 20:04-20:34/30	06:48 07:30-08:43/73	07:19	07:52	07:29	07:55
	20:59 07:39-08:37/58	20:22	19:28	18:40	17:07	17:06
24	06:19 20:04-20:33/29	06:49 07:31-08:42/71	07:20	07:53	07:30	07:55
	20:58 07:39-08:38/59	20:20	19:27	18:39	17:06	17:07
25	06:19 20:04-20:33/29	06:50 07:31-08:41/70	07:21	07:54	07:31	07:56
	20:57 07:38-08:39/61	20:18	19:25	18:37	17:06	17:07
26	06:20 20:04-20:31/27	06:51 07:31-08:41/70	07:22	07:55	07:32	07:56
	20:56 07:38-08:40/62	20:17	19:23	18:36	17:05	17:08
27	06:21 20:04-20:30/26	06:52 07:32-08:40/68	07:23	07:56	07:33	07:56
	20:55 07:36-08:40/64	20:15	19:22	18:34	17:05	17:09
28	06:22 20:04-20:29/25	06:53 07:32-08:39/67	07:24	07:57	07:34	07:57
	20:54 07:36-08:40/64	20:14	19:20	18:33	17:04	17:09
29	06:23 20:05-20:28/23	06:54 07:33-08:38/65	07:26	07:59	07:35	07:57
	20:54 07:35-08:41/66	20:12	19:18	18:32	17:04	17:10
30	06:24 20:06-20:28/22	06:55 07:34-08:36/62	07:27	08:00	07:36	07:57
	20:53 07:35-08:42/67	20:11	19:16	18:30	17:04	17:11
31	06:25 20:06-20:27/21	06:56 07:35-08:35/60		08:01		07:57
	20:51 07:35-08:42/67	20:09		18:29		17:12
Potential sun hours	460	429	375	345	297	287
Sum of minutes with flicker	2299	2299	624	0	0	0

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

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Attachment C

Cumulative Impacts Analysis WindPro Results

Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

Assumptions for shadow calculations

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

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.40	0.44	0.52	0.57	0.64	0.66	0.61	0.59	0.48	0.30	0.22

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
300	301	557	671	325	294	265	370	495	1,070	1,118	1,067

W	WNW	NW	NNW	Sum
738	557	368	264	8,760

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_2018-10-16_Emerson SFA_2.wpo (5)
Obstacles not used in calculation
Eye height for map: 1.5 m
Grid resolution: 10.0 m

All coordinates are in
UTM (north)-NAD83 (US+CA) Zone: 17

WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
6	344,091	4,547,062	284.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
7	343,526	4,548,885	294.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
8	344,224	4,549,004	290.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
9	343,620	4,548,367	290.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
10	343,981	4,548,202	290.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
11	345,634	4,548,114	287.2	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
12	345,621	4,547,498	290.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
13	345,673	4,547,043	292.0	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
14	344,827	4,548,953	286.4	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
15	342,880	4,548,961	294.7	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: ...	Yes	GE WIND ENERGY	GE 2.5-127-2,500	2,500	127.0	134.0	13.0
T1	349,610	4,577,737	217.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T10	350,596	4,574,852	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T11	349,346	4,574,706	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T12	350,350	4,574,226	220.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T13	350,857	4,574,161	220.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T14	357,937	4,573,872	214.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T15	358,653	4,573,775	212.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T16	359,025	4,573,635	210.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T17	354,188	4,573,276	218.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T18	353,140	4,572,979	220.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T19	354,497	4,572,964	218.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T2	351,853	4,577,442	218.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T20	354,709	4,572,600	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T21	353,014	4,572,078	226.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T22	354,553	4,571,744	222.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T23	352,819	4,569,529	230.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T24	348,396	4,569,363	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T25	348,244	4,568,858	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T26	348,798	4,568,694	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T27	351,228	4,567,779	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T28	352,926	4,567,712	231.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T29	349,444	4,567,624	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T3	358,825	4,576,927	210.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T30	351,584	4,567,411	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T31	353,180	4,567,359	230.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T32	349,341	4,567,218	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7

To be continued on next page...

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Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

...continued from previous page

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
T33	353,823	4,567,087	229.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T34	346,474	4,567,059	239.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T35	351,585	4,566,709	236.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T36	353,266	4,566,658	230.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T37	346,951	4,566,553	241.9	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T38	346,312	4,566,449	244.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T39	348,733	4,565,759	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T4	359,059	4,576,484	209.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T40	350,634	4,563,323	239.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T41	350,633	4,562,919	238.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T42	350,980	4,562,522	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T42	343,005	4,567,906	236.4	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T43	343,157	4,568,376	236.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T43	346,461	4,562,366	252.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T44	343,321	4,568,070	235.1	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T44	351,176	4,561,655	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T45	343,604	4,568,382	231.1	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T45	351,138	4,561,116	241.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T46	350,550	4,560,477	242.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T46	343,770	4,568,055	235.1	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T47	344,804	4,565,988	243.9	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T47	346,548	4,559,973	249.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T48	348,005	4,557,521	254.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T48	344,861	4,566,427	244.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T49	344,878	4,567,522	240.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T49	350,518	4,557,129	252.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T5	359,405	4,576,468	208.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T50	347,093	4,557,038	257.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T50	345,325	4,567,813	239.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T51	347,967	4,556,813	256.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T52	346,198	4,556,139	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T53	346,199	4,555,776	263.2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T54	351,385	4,555,703	254.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T55	350,877	4,555,552	254.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T56	349,645	4,555,532	258.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T57	346,776	4,555,489	261.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T58	351,517	4,554,997	256.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T59	347,062	4,554,879	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T6	349,536	4,575,674	218.4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T60	353,545	4,553,056	260.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T61	348,088	4,552,977	268.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T62	353,545	4,552,541	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T63	348,267	4,552,275	270.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T64	346,500	4,551,303	274.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T65	348,263	4,551,051	272.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T66	351,881	4,550,874	267.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T67	351,296	4,550,732	266.7	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T68	350,723	4,550,571	269.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T69	349,753	4,550,478	270.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T7	350,758	4,575,598	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T70	347,305	4,550,131	275.5	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T71	350,744	4,549,945	268.1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T72	350,171	4,575,540	218.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T73	347,988	4,574,744	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T74	347,821	4,574,437	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T75	348,951	4,569,244	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T76	352,771	4,562,205	239.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T77	351,065	4,562,197	240.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T78	346,973	4,555,202	262.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T79	353,883	4,552,527	261.5	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T8	351,344	4,575,426	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T80	346,667	4,547,606	290.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T81	346,668	4,546,855	291.6	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T82	346,447	4,545,876	284.0	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TO...	Yes	VESTAS	V150-4.2-4,200	4,200	150.0	105.0	10.4
T83	346,772	4,545,781	287.8	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7

To be continued on next page...

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Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

...continued from previous page

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
T84	354,248	4,576,820	216.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T85	353,297	4,576,782	220.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T86	354,685	4,576,614	216.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T87	346,898	4,567,229	238.0	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7
T9	350,345	4,575,175	219.3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m...	Yes	NORDEX	N149/4.0-4.5-4,500	4,500	149.0	125.0	10.7

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
15	345,797	4,566,154	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
37	346,674	4,548,267	286.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
94	345,801	4,567,370	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
95	346,311	4,567,623	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
114	345,801	4,567,317	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
127	345,817	4,566,194	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
198	345,218	4,567,181	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
199	345,881	4,567,518	238.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
254	345,816	4,565,902	244.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
275	345,961	4,566,804	241.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
304	345,777	4,566,429	242.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
338	345,885	4,568,343	236.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
367	345,301	4,565,438	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
418	345,797	4,567,453	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
447	345,885	4,567,227	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
451	346,278	4,567,619	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
467	345,810	4,565,930	244.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
476	345,887	4,567,695	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
489	345,814	4,567,816	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
496	346,100	4,547,861	290.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
533	345,465	4,565,556	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
539	345,241	4,546,338	292.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
544	345,907	4,565,791	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
626	345,557	4,566,604	241.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
639	345,728	4,565,326	245.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
665	346,372	4,567,707	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
743	346,219	4,567,625	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
772	345,803	4,567,357	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
815	345,355	4,546,628	292.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
826	345,797	4,567,414	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
852	345,721	4,565,328	245.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
864	345,799	4,567,218	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
872	345,753	4,568,254	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
908	346,325	4,567,718	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
909	345,809	4,567,858	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
923	345,895	4,566,816	240.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
959	345,203	4,565,546	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
968	345,811	4,566,113	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
999	345,898	4,567,282	239.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1013	346,750	4,567,586	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1061	345,713	4,565,364	245.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1091	346,439	4,567,620	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1094	346,811	4,548,270	286.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1105	345,804	4,567,260	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1119	345,792	4,566,007	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1127	345,882	4,567,698	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1137	345,804	4,566,473	242.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1177	345,821	4,566,197	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1190	345,804	4,566,058	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1191	345,520	4,566,585	242.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1206	345,235	4,546,346	292.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1224	345,826	4,565,981	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1302	346,513	4,548,253	287.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0

To be continued on next page...

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Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

...continued from previous page

No.	Easting	Northing	Z [m]	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
1309	346,437	4,567,694	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1318	345,917	4,565,508	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1319	345,782	4,567,136	240.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1362	346,362	4,567,630	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1374	345,885	4,568,329	236.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1395	345,808	4,566,059	244.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1496	345,809	4,568,267	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1574	345,179	4,565,533	245.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1586	345,822	4,567,489	239.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1592	346,159	4,567,667	238.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
1595	345,904	4,565,792	245.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2175	345,217	4,547,164	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2964	345,235	4,547,905	288.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3022	345,218	4,547,164	288.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3164	345,904	4,565,110	246.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0

Calculation Results

Shadow receptor

	Shadow, worst case			**Shadow, expected values**
No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
15	67:18	138	0:55	24:26
37	34:32	95	0:28	8:26
94	101:42	232	0:47	24:47
95	86:03	173	0:50	19:00
114	98:16	223	0:48	25:38
127	84:32	178	0:50	32:29
198	32:40	103	0:27	6:41
199	155:27	260	0:54	38:00
254	40:26	107	0:33	13:56
275	218:50	244	1:35	51:12
304	127:05	172	1:31	44:12
338	41:29	58	0:57	7:45
367	0:00	0	0:00	0:00
418	100:20	219	0:45	22:24
447	127:54	253	0:55	34:18
451	80:47	165	0:48	19:03
467	52:56	114	0:47	18:56
476	140:11	244	1:01	40:03
489	121:27	182	1:09	38:37
496	136:50	194	1:12	33:54
533	2:43	17	0:11	0:53
539	9:50	36	0:24	2:24
544	21:43	83	0:30	7:13
626	136:23	220	1:25	42:25
639	0:00	0	0:00	0:00
665	85:00	134	0:52	15:15
743	76:37	161	0:45	19:26
772	101:49	238	0:47	25:07
815	44:14	148	0:26	11:04
826	101:24	225	0:46	23:39
852	0:00	0	0:00	0:00
864	110:36	241	0:49	31:25
872	66:07	70	1:14	12:44
908	91:10	167	0:49	17:35
909	119:22	179	1:09	37:10
923	225:00	254	1:20	58:01
959	0:00	0	0:00	0:00
968	77:26	163	0:55	29:26
999	124:20	248	0:55	31:06
1013	103:57	114	1:27	17:12
1061	0:00	0	0:00	0:00
1091	110:07	155	0:59	19:27

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Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

...continued from previous page

No.	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
1094	29:23	106	0:25	7:18
1105	98:56	214	0:49	27:27
1119	85:46	136	1:01	32:18
1127	141:13	245	1:02	40:26
1137	129:30	162	1:37	43:12
1177	85:12	178	0:49	32:50
1190	84:33	150	0:58	32:18
1191	136:08	207	1:26	42:19
1206	9:44	37	0:24	2:22
1224	72:25	131	0:54	26:48
1302	31:34	84	0:33	8:27
1309	84:03	127	0:56	14:34
1318	25:06	80	0:29	8:38
1319	141:38	277	1:01	43:21
1362	104:45	193	0:53	20:32
1374	47:28	64	0:58	9:00
1395	83:15	150	0:57	31:50
1496	65:49	74	1:08	12:49
1574	0:00	0	0:00	0:00
1586	105:17	228	0:46	22:58
1592	76:08	162	0:42	19:43
1595	21:47	83	0:30	7:14
2175	77:22	83	1:27	22:53
2964	111:09	158	1:16	19:51
3022	77:42	82	1:27	22:59
3164	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
6	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (25)	39:09	10:37
7	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (26)	0:00	0:00
8	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (27)	0:00	0:00
9	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (28)	0:00	0:00
10	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (29)	10:32	3:25
11	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (30)	30:50	10:17
12	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (31)	174:09	32:19
13	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (32)	58:43	17:10
14	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (33)	0:00	0:00
15	GE WIND ENERGY GE 2.5-127 2500 127.0 !O! hub: 134.0 m (TOT: 197.5 m) (34)	0:00	0:00
T1	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (420)	0:00	0:00
T10	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (429)	0:00	0:00
T11	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (430)	0:00	0:00
T12	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (431)	0:00	0:00
T13	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (432)	0:00	0:00
T14	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (433)	0:00	0:00
T15	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (434)	0:00	0:00
T16	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (435)	0:00	0:00
T17	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (436)	0:00	0:00
T18	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (437)	0:00	0:00
T19	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (438)	0:00	0:00
T2	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (421)	0:00	0:00
T20	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (439)	0:00	0:00
T21	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (440)	0:00	0:00
T22	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (441)	0:00	0:00
T23	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (442)	0:00	0:00
T24	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (443)	0:00	0:00
T25	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (444)	0:00	0:00
T26	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (445)	0:00	0:00
T27	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (446)	0:00	0:00
T28	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (447)	0:00	0:00
T29	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (448)	0:00	0:00
T3	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (422)	0:00	0:00

To be continued on next page...

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SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
T30	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (449)	0:00	0:00
T31	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (450)	0:00	0:00
T32	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (451)	0:00	0:00
T33	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (452)	0:00	0:00
T34	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (453)	302:57	83:05
T35	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (454)	0:00	0:00
T36	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (455)	0:00	0:00
T37	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (456)	167:29	50:43
T38	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (457)	321:22	81:39
T39	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (458)	0:00	0:00
T4	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (423)	0:00	0:00
T40	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (459)	0:00	0:00
T41	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (460)	0:00	0:00
T42	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (461)	0:00	0:00
T42	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (35)	0:00	0:00
T43	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (36)	0:00	0:00
T43	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (462)	0:00	0:00
T44	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (37)	0:00	0:00
T44	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (463)	0:00	0:00
T45	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (38)	0:00	0:00
T45	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (464)	0:00	0:00
T46	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (465)	0:00	0:00
T46	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (39)	0:00	0:00
T47	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (40)	164:02	46:31
T47	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (466)	0:00	0:00
T48	NORDEX N149/4.0-4.5 4500 149.0 !O! hub: 125.0 m (TOT: 199.5 m) (467)	0:00	0:00
T48	VESTAS V150-4.2 4200 150.0 !O! hub: 105.0 m (TOT: 180.0 m) (41)	195:26	60:56
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Licensed user:
EDR
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:
1/8/2019 12:49 PM/3.2.737

SHADOW - Main Result

Calculation: 2019-01-07_Cumulative Emerson SFA

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Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

Exhibit I
Cultural Resources Records Review

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Cultural Resources Records Review

Emerson Creek Wind Farm

Groton and Oxford Townships, Erie County, Ohio

Lyme, Ridgefield, Sherman, Norwich and Richmond Townships, Huron County, Ohio

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January 2019

MANAGEMENT SUMMARY

Involved State and Federal Agencies:	Ohio Power Siting Board (OPSB) Ohio Historic Preservation Office (OHPO)
Phase of Survey:	Cultural Resources Records Review
Location Information:	Groton and Oxford Townships, Erie County Lyme, Ridgefield, Sherman, Norwich and Richmond Townships, Huron County
Survey Area:	
Project Description:	Up to 87 wind turbines and associated infrastructure
Project Area:	Up to 132 square miles
Cultural Resources Study Area:	A 10-mile study area measuring 946 square miles
USGS 7.5-Minute Quadrangle Maps:	*Bellevue, Centeron, Flat Rock, Kimball, Monroeville, and Willard, Ohio*
Report Authors:	Susan Lawson, Nick Freeland, RPA, Patrick Heaton, RPA
Date of Report:	January 2019

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Figure 7. USGS 1950 *Marion, OH* and 1956 *Toledo, OH* 1:250000 Topographical Quadrangles.

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Appendix F. Previous Cultural Resource Surveys within the Study Area

1.0 INTRODUCTION

1.1 Purpose and Goals of the Investigation

Firelands Wind, LLC (hereafter referred to as the Applicant), is proposing to construct the Emerson Creek Wind Farm (hereafter referred to as the Project) in Groton and Oxford Townships, Erie County; and Lyme, Ridgefield, Sherman, Norwich and Richmond Townships, Huron County. The Applicant is currently in the process of preparing an Application for a Certificate of Environmental Compatibility and Public Need (the Application), in compliance with Section 4906.06 of the Ohio Revised Code and in accordance with Chapters 4906-4-01 through 4906-4-09 of the Ohio Administrative Code (OAC).

On behalf of the Applicant, EDR prepared the following cultural resources records review in support of environmental review and permitting for the proposed Project. This cultural resources records review has been prepared by a Registered Professional Archaeologist (RPA) who meets the Secretary of the Interior's Standards for Archaeology (36 C.F.R. Part 61) and a qualified architectural historian who meets the U.S. Secretary of Interior's Standards for Historic Preservation (36 C.F.R. Part 61). The cultural resources records review and impact assessment is designed to satisfy the requirements of OAC Rule 4906-04-08(D)(1) and (2) for the OPSB which requires that all cultural resources be evaluated within ten miles (8.1 kilometers [km]) of the Project Area.

1.2 Project Location and Description

The Project Area is defined as the area encompassing all Project-related development and consists of approximately 41,000 acres of private land. The Project presented herein consists of up to 87 wind turbine generators, each with a nameplate rating of 4.2 to 4.5 megawatts (MW), depending on the final turbine model selected. In addition to the turbines, the Project will include associated facilities consisting of up to 36 miles of access roads, up to 120 miles of buried 34.5 kV electrical collection cable, a collection substation, a temporary laydown yard for construction staging, an O&M building, and up to three permanent meteorological towers. All turbines and associated facilities will be located on private land in Groton and Oxford Townships (Erie County) and Lyme, Ridgefield, Sherman, Norwich, and Richmond Townships (Huron County). A detailed description of the Project, including each Project component, can be found in Section 03 of the Application.

The following terms are used throughout this document to describe the proposed action:

Project:	Collectively refers to all components of the Emerson Creek Wind Farm, which is permitting up to 87 wind turbines and associated infrastructure in Erie and Huron Counties, Ohio.
Project Area:	Those parcels currently under, or being pursued, for lease (or other real property interests) with the Applicant for the location of all Project components (which will be defined in the Certificate Application). This Area is synonymous with the term 'Project Area' used in the OPSB Application, and includes portions of Erie, Huron, and Seneca Counties.
Study Area:	The area within ten miles of the Project, which is defined in Section 1.3 of this report as the appropriate study area for indirect (visual) effects on cultural resources. The Study Area includes portions of Erie, Huron, Seneca, Sandusky and Richland Counties.
APE for Direct Effects:	The area of potential effect (APE) for Direct Effects for the Project is the area containing all proposed soil disturbance associated with the Project.
APE for Indirect Effects:	The APE for Indirect Effects on historic resources includes those areas where the Project may result in indirect effects on cultural resources, such as visual impacts. As presently envisioned, the APE for Indirect (Visual) Effects for the Project is the area within ten miles of proposed turbines (the Study Area) which are within the potential viewshed (based on topography) of the Project.

1.3 Area of Potential Effect

The Area of Potential Effect (APE) for Direct Effects to historic resources is defined as all areas where potential soil disturbance (or other direct, physical impacts) is anticipated during construction of the Project. Preliminary design of the Project is underway, but the final layout will occupy less than the Project Area (see Figure 2). Therefore, the total ground disturbance during construction is anticipated to be minimal relative to the overall size of the Project Area.

The APE for Indirect Effects on historic resources includes those areas where the Project may result in indirect effects on cultural resources, such as visual or auditory impacts. The Project's potential indirect effect on historic resources would be a change in the historic resource's setting resulting from the introduction of wind turbines or other Project components. This could theoretically consist of auditory and/or visual impacts; however, utility-scale wind facilities produce minimal noise, so auditory impacts resulting from the Project are not considered a significant type of impact to the setting of historic resources. Therefore, potential visual impacts associated with the Project are the most significant consideration for defining an APE for Indirect Effects.

Additional information about indirect effects is found below in Section 2.3. Impact Assessment.

2.0 RECORDS REVIEW AND IMPACT ASSESSMENT

2.1 Methodology

Per the requirements of Ohio Administrative Code Chapter 4906-04-08(D), the cultural resources records review was completed for the area within a 10-mile radius of the Project ("the Study Area", Figure 3) and included the following records available from the Ohio State Historic Preservation Office (OHPO):

- National Register of Historic Places (NRHP)
- NRHP Determination of Eligibility (DOE)
- National Historic Landmarks (NHL)
- Ohio Historic Inventory (OHI)
- Ohio Department of Transportation (ODOT) Historic Bridge Inventory
- Ohio Archaeological Inventory (OAI)
- Ohio Genealogical Society (OGS) cemetery files
- Mills *Archaeological Atlas of Ohio* (1914)
- OHPO previous cultural resources surveys

2.2 Cultural Resources Records Review

Archives and repositories consulted during EDR's research for the project included the online Geographic Information Systems (GIS) mapping system of the OHPO (Ohio History Connection, 2018), the David Rumsey map collection (Cartography Associates, 2018), and EDR's in-house collection of reference materials. The results of the cultural resources records review for the Study Area associated with the Project are described below and depicted on Figures 3 and 4.

2.2.1 National Register of Historic Places (NRHP)

The records review of the OHPO online GIS mapping system identified 148 NRHP-listed resources recorded within the Study Area, one of which is located within the Project Area (see Figure 3 and Appendix A).

- Hunts Corners (93NR000896) is a historic district comprised of 14 contributing resources at the intersection of Sandhill Road and State Route 547 in Lyme Township. The late nineteenth century buildings serve various domestic, agricultural and religious functions, built in either wood frame or brick. Hunts Corners was founded as an agricultural crossroads settlement built by German-American settlers.

2.2.2 NRHP Determination of Eligibility (DOE)

The records review of the OHPO online GIS mapping system identified 43 NRHP-eligible historic properties that are located within the Study Area. None occur within the Project Area (see Figure 3 and Appendix B).

2.2.3 National Historic Landmarks (NHL)

No designated National Historic Landmarks are located within the Study Area.

2.2.4 Ohio Historic Inventory (OHI)

The records review of the OHPO online GIS mapping system identified 2,777 OHI properties recorded within the Study Area, 78 of which are located within the Project Area (see Figure 3 and Appendix C).

2.2.5 Ohio Department of Transportation (ODOT)

The ODOT Historic Bridge Inventory lists six historic bridges that are NRHP-eligible within the Study Area. None occur within the Project Area (see Figure 3 and Table 1).

Table 1. ODOT Historic Bridges within the Study Area

Bridge ID	Intersects	Carries	Township	County	NRHP Status	Distance from Project Area (miles)
3942007	West Branch Huron River	TR 100 (Hanville Corner Rd.)	Fairfield	Huron	Eligible	3.3
7450192	Royer Ditch	TR 80	Thompson	Seneca	Eligible	4.1
3946304	West Branch Huron River	TR 109	New Haven	Huron	Eligible	5.8
3937003	East Branch Huron River	TR 114 (Ridge Rd.)	Bronson	Huron	Eligible	5.9
3937178	County Ditch 114	CR 114 (Ridge Rd.)	Bronson	Huron	Eligible	6.7
2201569	Mills Creek	US 6 (Tiffin Ave.)	Sandusky	Erie	Eligible	7.1

2.2.6 Ohio Archaeological Inventory (OAI)

The records review of the OHPO online GIS mapping identified 1,344 OAI sites that have been recorded within the Study Area (see Figure 3 and Appendix D). One hundred and nine of these sites occur within the Project Area.

2.2.7 Ohio Genealogical Society (OGS) Cemeteries

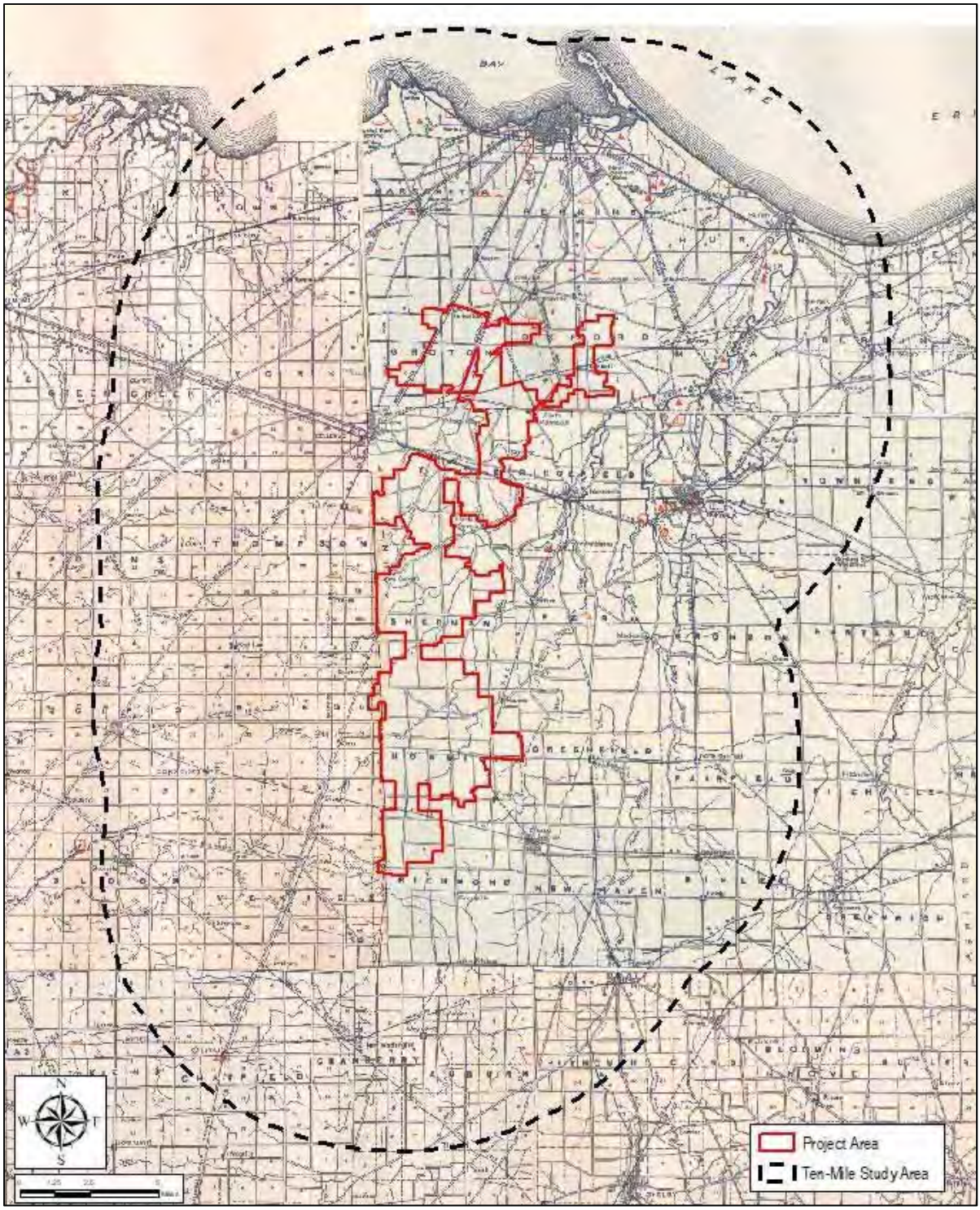
The records review of the OHPO online GIS mapping identified 219 OGS cemeteries have been recorded within the Study Area, six of which are located inside the Project Area (see Figure 3 and Appendix E).

2.2.8 Mills Archaeological Atlas of Ohio (1914)

A review of the 1914 *Archaeological Atlas of Ohio,* Mills (1914) depicts 53 archaeological sites within the Study Area; however, none of these sites occur within the Project Area. The closest site is a cemetery depicted approximately 1,000 feet (31 meters) west of the Project Area in Seneca County.

Regarding the counties occupied by the Project Area, Mills (1914:22) notes:

- Prehistoric habitation within Erie County was primarily concentrated along major watercourses as well as the shore of Lake Erie, approximately 6 miles (10 km) north of the Project Area (Mills 1914:22).
- "The more important earthworks of Huron County are found in and near the city of Norwalk. There are a few mounds, village sites, burials, etc., scattered mainly throughout the northern central portion of the county" (Mills, 1914:39). The majority of the sites Mills (1914) depicts in the county are in the vicinity of Norwalk, which is approximately 5 miles (8 km) east of the Project Area.
- Prehistoric sites are located primarily along major watercourses in Seneca County, namely the Sandusky River and its major tributaries near the center of the county, approximately 15 miles (24 km) west of the Project Area. However, Mills (1914:74) does note that "Thompson township, in the extreme northeast of the county, presents many evidences of prehistoric occupation." The west-central portion of the Project Area is bordered by Thompson Township to the west, but, as previously noted, none of the archaeological sites recorded by Mills are located within the Project Area.



Inset 1. Excerpt from the 1914 Mills *Archaeological Atlas of Ohio,* showing the Project and Study Areas (annotation by EDR).

2.2.9 Previous Cultural Resources Surveys

The records review of the OHPO online GIS mapping identified 127 cultural resource surveys that have been completed within 10 miles of the Project Area (see Figure 4 and Appendix F). These consist of 117 Phase 1 archaeological surveys, seven Phase 2 archaeological investigations, two Phase 3 archaeological investigations, and one historic resources survey. Three of the Phase 1 archaeological surveys and none of the other survey/investigation types are located within the Project Area.

2.2.10 Historic Map Review

Historic maps reviewed included the 1872 Gray and Walling *Topographical Atlas of Cuyahoga, Erie, Huron, Lorain, Medina, Ottawa, Sandusky, Seneca, and Summit Counties, Ohio* (Figure 5), the USGS 1900 *Oak Harbor, OH*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion, OH*; 1904 *Sandusky, OH*; 1906 *Sycamore, Tiffin, OH*; 1908 *New London, Ashland, OH*; 1915 *Bucyrus, Crestline, Norwalk, Siam, OH*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles (Figure 6), and the USGS 1950 *Marion, OH* and 1956 *Toledo, OH* 1:250000 Topographical Quadrangles (Figure 7).

An excerpt from the 1872 Gray and Walling *Topographical Atlas of Cuyahoga, Erie, Huron, Lorain, Medina, Ottawa, Sandusky, Seneca, and Summit Counties, Ohio* (Figure 5) depicts the Project Area within Groton and Oxford Townships, Erie County; Lyme, Ridgefield, Sherman, Norwich, Greenfield and Richmond Townships, Huron County; and Reed Township in Seneca County. Erie and Seneca Counties are separated into grids from 0.5-to1-mile square, with orthogonal roadways along most of those boundaries. In Huron County, Townships appear to be divided into quadrants, then subdivided individually, resulting in irregular settlement patterns of varying lengths and widths.

Throughout the Study Area, diagonal thoroughfares cross through the orthogonal grids connecting to settlements, the largest being Sandusky City along Lake Erie. The 1872 Gray and Walling Atlas does not depict structures aside from post offices. Instead, a dense grid of local streets is shown in the more developed areas, suggesting that by 1872 there were many burgeoning villages in the otherwise agricultural landscape. The settlements are primarily located along the Lake Shore and Michigan Southern and the Sandusky, Mansfield and Newark Railways. The only hamlet within the Project Area is Weavers Corners in Sherman Township, Huron County.

The USGS 1900 *Oak Harbor, OH*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion, OH*; 1904 *Sandusky, OH*; 1906 *Sycamore, Tiffin, OH*; 1908 *New London, Ashland, OH*; 1915 *Bucyrus, Crestline, Norwalk, Siam, OH*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles (Figure 6) is largely similar to the 1872 Gray and Walling Atlas with the addition of two new railroads that transverse the Study and Project Areas. The Norfolk and Western Railroad (opened in 1881) had stops in Bellevue and Vermillion, and the Baltimore and Ohio Railroad (opened in

1874) stopped in Republic and Chicago Junction. Both lines connected north to Sandusky, west to Chicago and into the northeast United States.

The 1914 Mills *Archaeological Atlas of Ohio* (see Inset 1) was also reviewed during background research for the Project Area, and prehistoric archaeological sites depicted in the atlas were discussed in Section 2.2.8 of this report. In addition to archaeological sites, the Mills Atlas also depicts the state of development throughout Ohio in 1914. It depicts the gridded pattern of rural roads throughout the area, as well as two small crossroads hamlets (Parkertown and Weaver's Corners) within the Project Area. Additionally, the 1914 map shows the "LS Electric" railroad trending northwest/southeast through the Project Area, and the "Pennsylvania System, Sandusky and Columbus Line", trending roughly north/south through the northwest corner of the Project Area.

The USGS 1950 *Marion, OH* and 1956 *Toledo, OH* 1:250000 Topographical Quadrangles (Figure 7) show similar conditions to the 1914 Mills Atlas. Rural development increased between 1914 and 1950 and though sparse, settlements are spaced out along state, county and local roads, concentrated at their intersections. The addition of highways due to the rise in automotive use is the most obvious change within the Study Area during this time. The mid-twentieth century USGS maps depict similar patterns of the development to the present day.

2.3 Impact Assessment

Per the requirements of 4906-4-08(D) of the Ohio Administrative Code, EDR assessed the potential impact(s) on cultural resources that could result from construction and operation of the Project. The results of this impact assessment are discussed below.

2.3.1 Potential Direct Effects

Based on current design, there will be no direct impacts to known cultural resources (i.e., cemeteries or historic structures) from construction of the Project. The Applicant will seek to avoid any potentially significant (i.e., NRHP-eligible or -unevaluated) archaeological sites located within the Project Area.

2.3.2 Potential Indirect Effects

The Project has the potential to cause indirect (visual) impacts to aboveground historic resources within the Cultural Resource Study Area. A complete Visual Resources Assessment will be prepared in support of the Certificate Application for the Project, in accordance with Ohio Administrative Code Chapter 4906-04-08(D)(4). The Visual Assessment includes viewshed analyses and photographic simulations and assesses the potential visual impacts of the Project.

3.0 SUMMARY AND CONCLUSIONS

3.1 Summary of Cultural Resources Records Review

EDR prepared this cultural resources records review in support of environmental review and permitting for the proposed Emerson Creek Wind Farm. This report is designed to satisfy the requirements of Ohio Administrative Code Chapter 4906-04-08(D)(1) and (2) for the OPSB which requires that all cultural resources be evaluated within ten miles (8.1 km) of the Project. The results of the Cultural Resources Records Review for the proposed Emerson Creek Wind Farm can be summarized as follows:

- 148 NRHP-listed resources have been recorded within the Study Area. One NRHP-listed historic district is located within the Project Area (see Appendix A).
- 43 resources previously determined eligible for listing in the NRHP have been recorded within the Study Area. No NRHP-eligible properties are located within the Project Area (see Appendix B).
- No NHLs have been recorded within the Study Area.
- 2,776 OHI properties have been recorded within the Study Area. Seventy-Eight OHI properties are located within the Project Area (see Appendix C).
- Six historic bridges within the ODOT inventory have been recorded within the Study Area. No ODOT historic bridges are located within the Project Area (see Table 1).
- 1,355 OAI sites have been recorded within the Study Area. One hundred and nine OAI sites are located within the Project Area (see Appendix D).
- 219 OGS cemeteries have been recorded within the Study Area. Six OGS cemeteries are located within the Project Area (see Appendix E).
- 127 cultural resource surveys have been completed within the Study Area. Three of the Phase 1 archaeological surveys and none of the other survey/investigation types are located within the Project Area (see Appendix F).
- The 1914 Mills *Archaeological Atlas of Ohio* (see Inset 1) does not depict any archaeological sites within the Project Area.

4.0 REFERENCES

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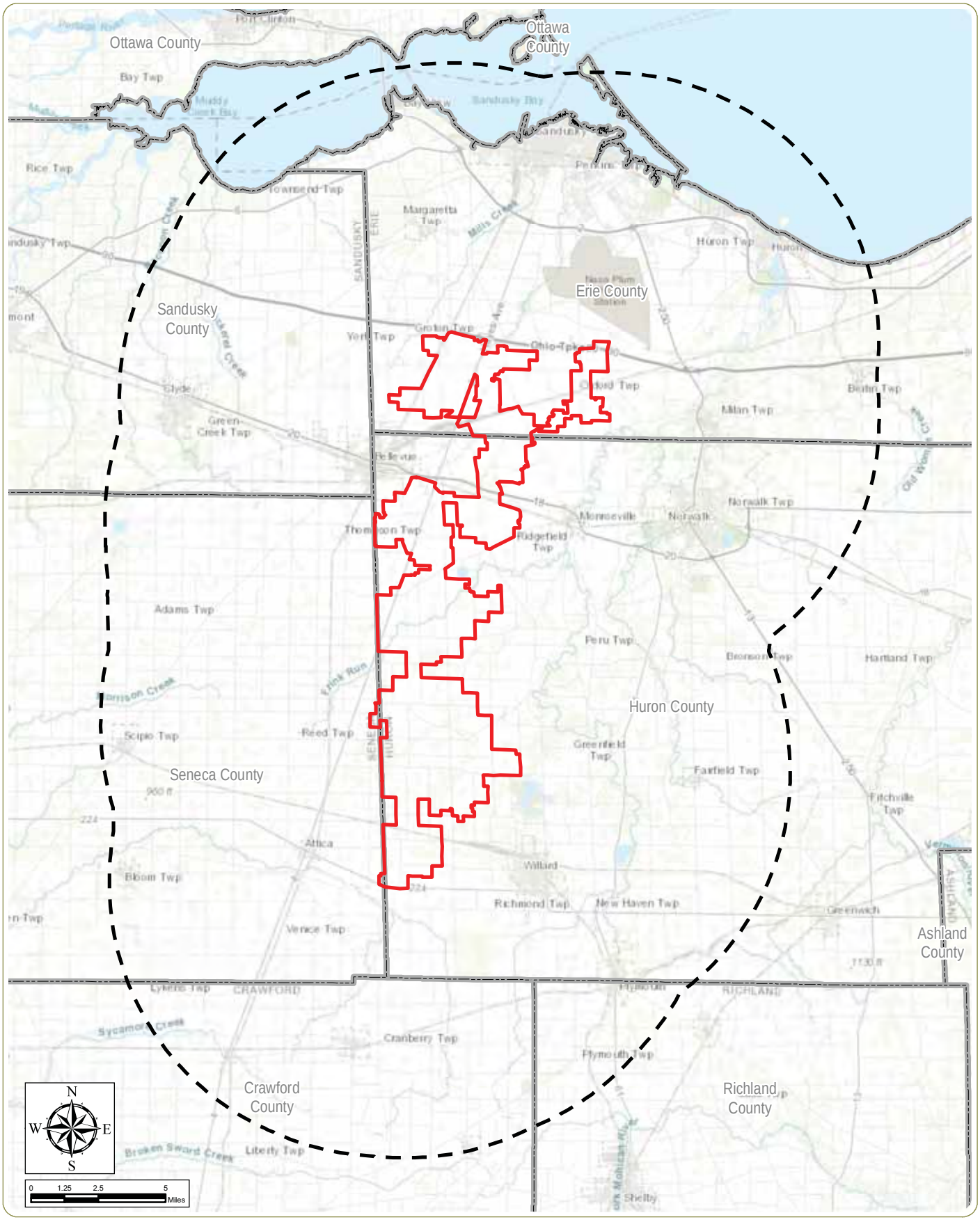
Figures

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 1: Regional Project Location

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Emerson Creek Wind Farm

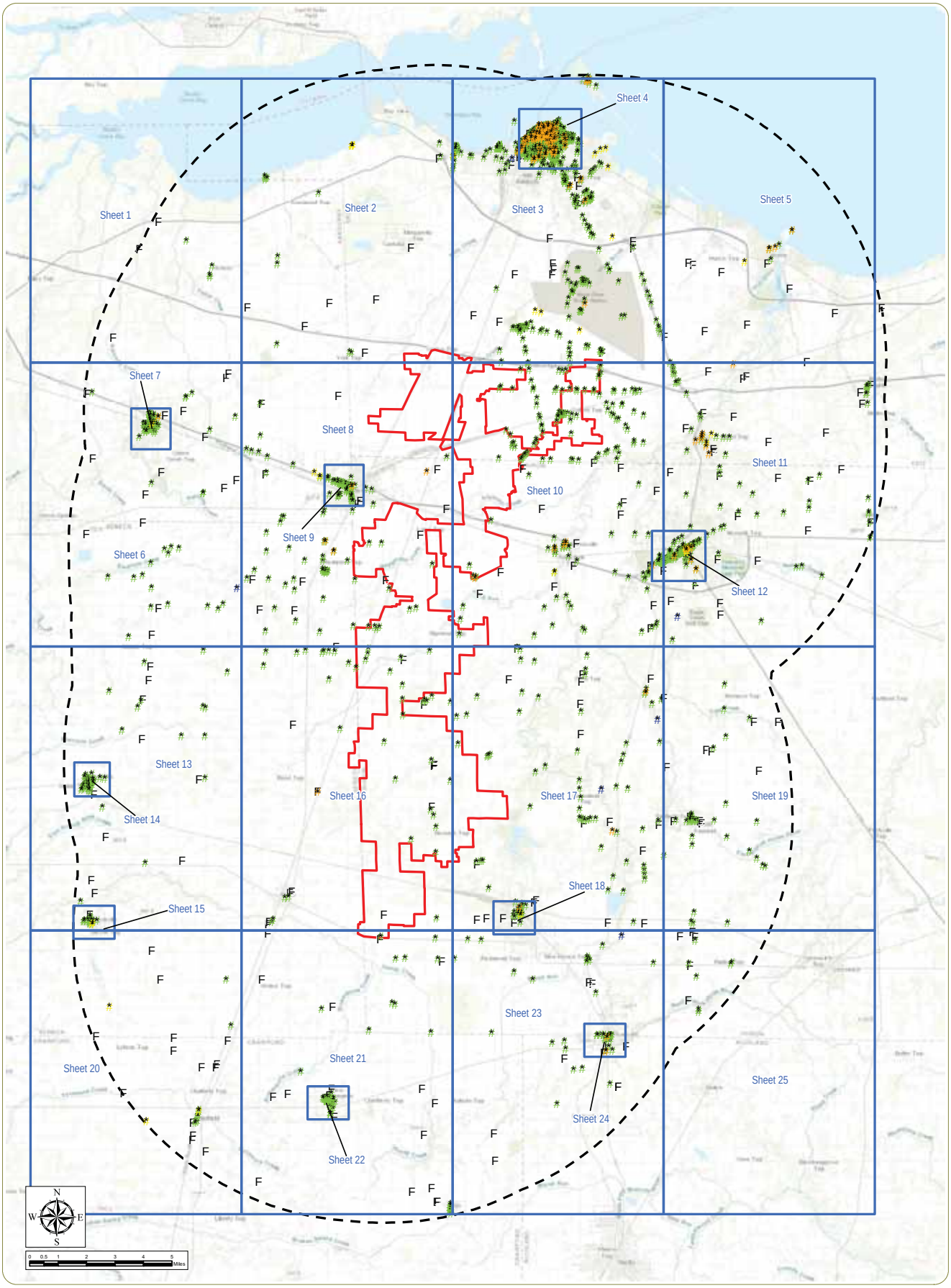
Erie, Huron, and Seneca Counties, Ohio

Figure 2: Project Area and Study Area

Project Area

Ten-Mile Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Index

NRHP-Listed Resource
NRHP-Eligible Resource (OHPO Determined)
NRHP-Eligible Bridges (ODOT Determined)
OHI Historic Structure
F Ohio Genealogical Society Cemetery

Previously Recorded Archaeological Site (Redacted)
Project Area
Ten-Mile Study Area
Map Sheets

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 18, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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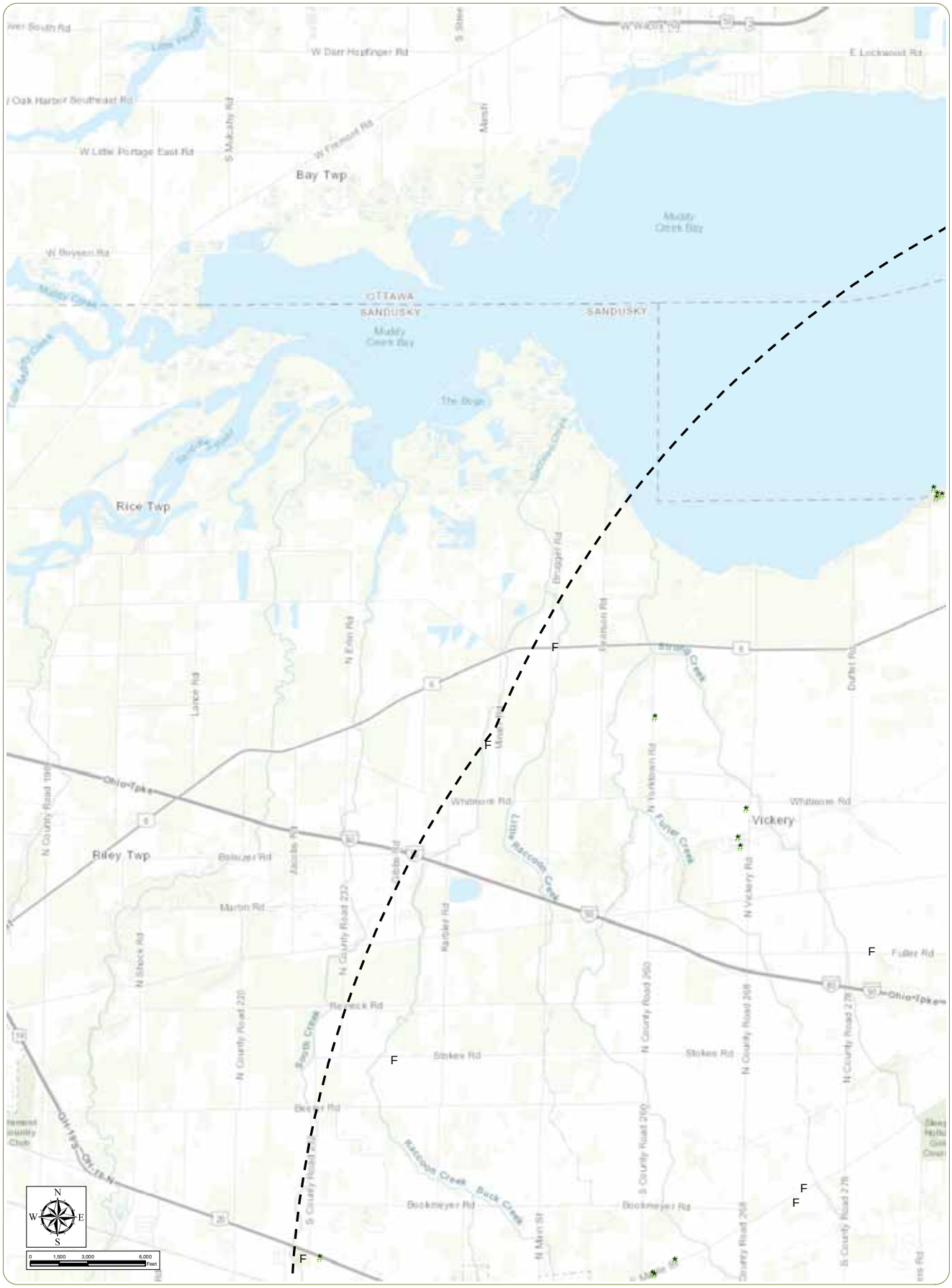

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 1 of 25

- NRHP-Listed Resource
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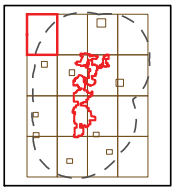
- Previously Recorded Archaeological Site (Redacted)
- Project Area
- Ten-Mile Study Area



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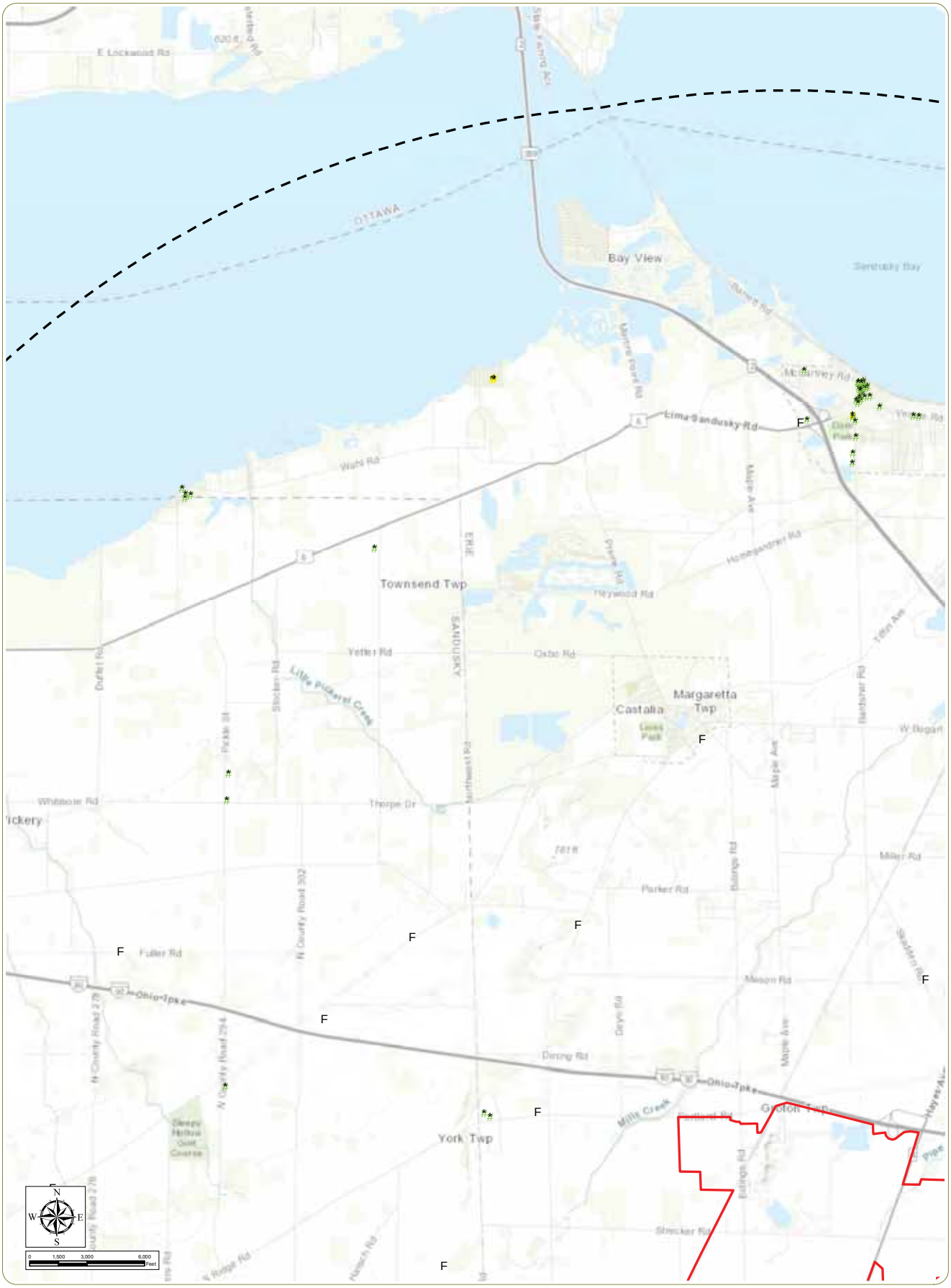

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 2 of 25

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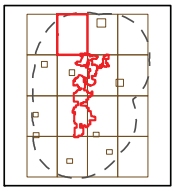
- Project Area
- Ten-Mile Study Area



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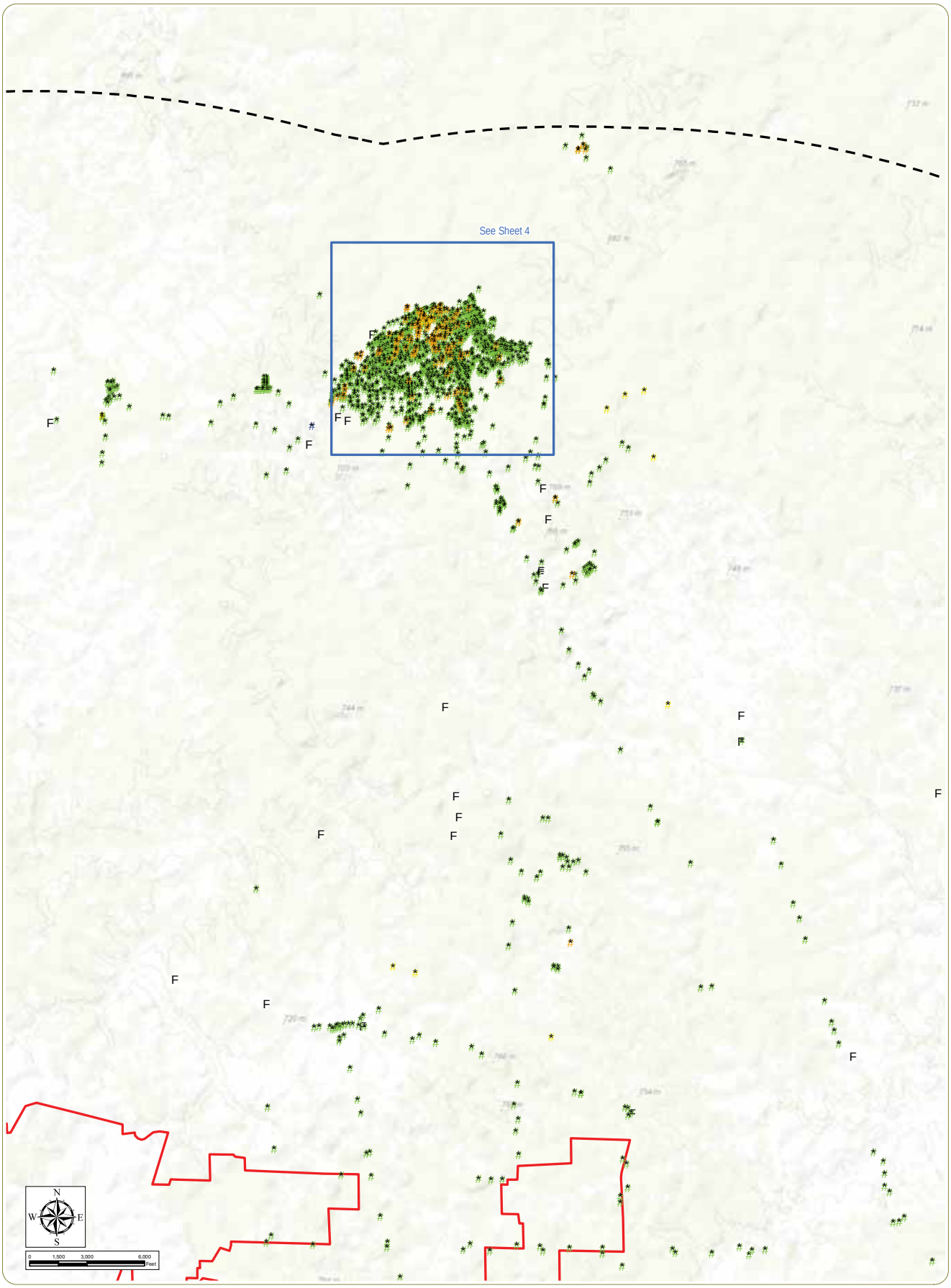

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 3 of 25

- NRHP-Listed Resource
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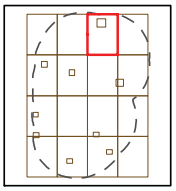

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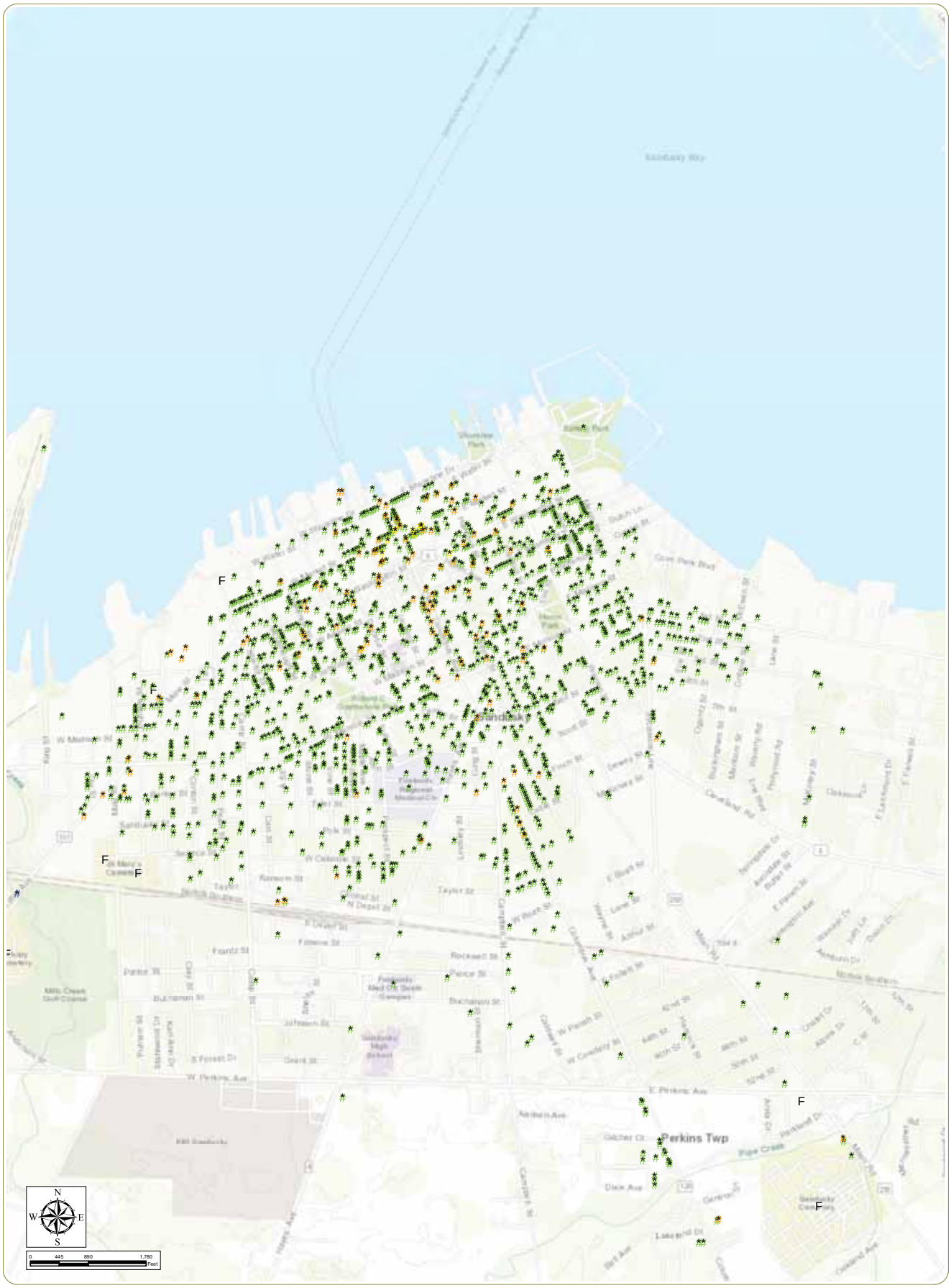

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 4 of 25

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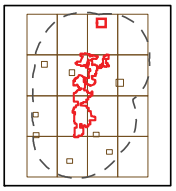

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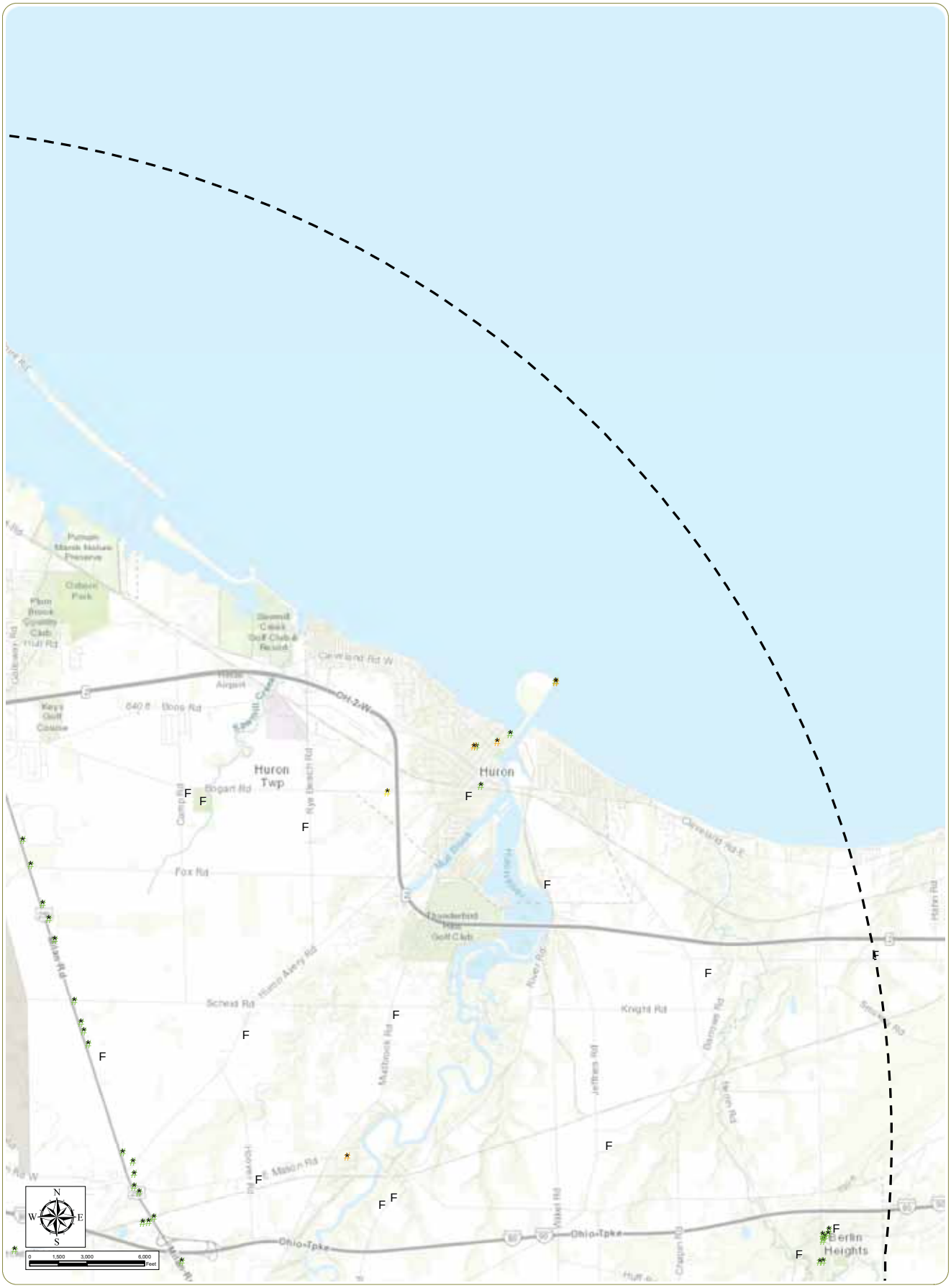

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 5 of 25

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- F Ohio Genealogical Society Cemetery
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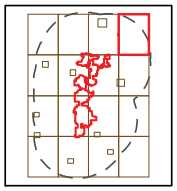

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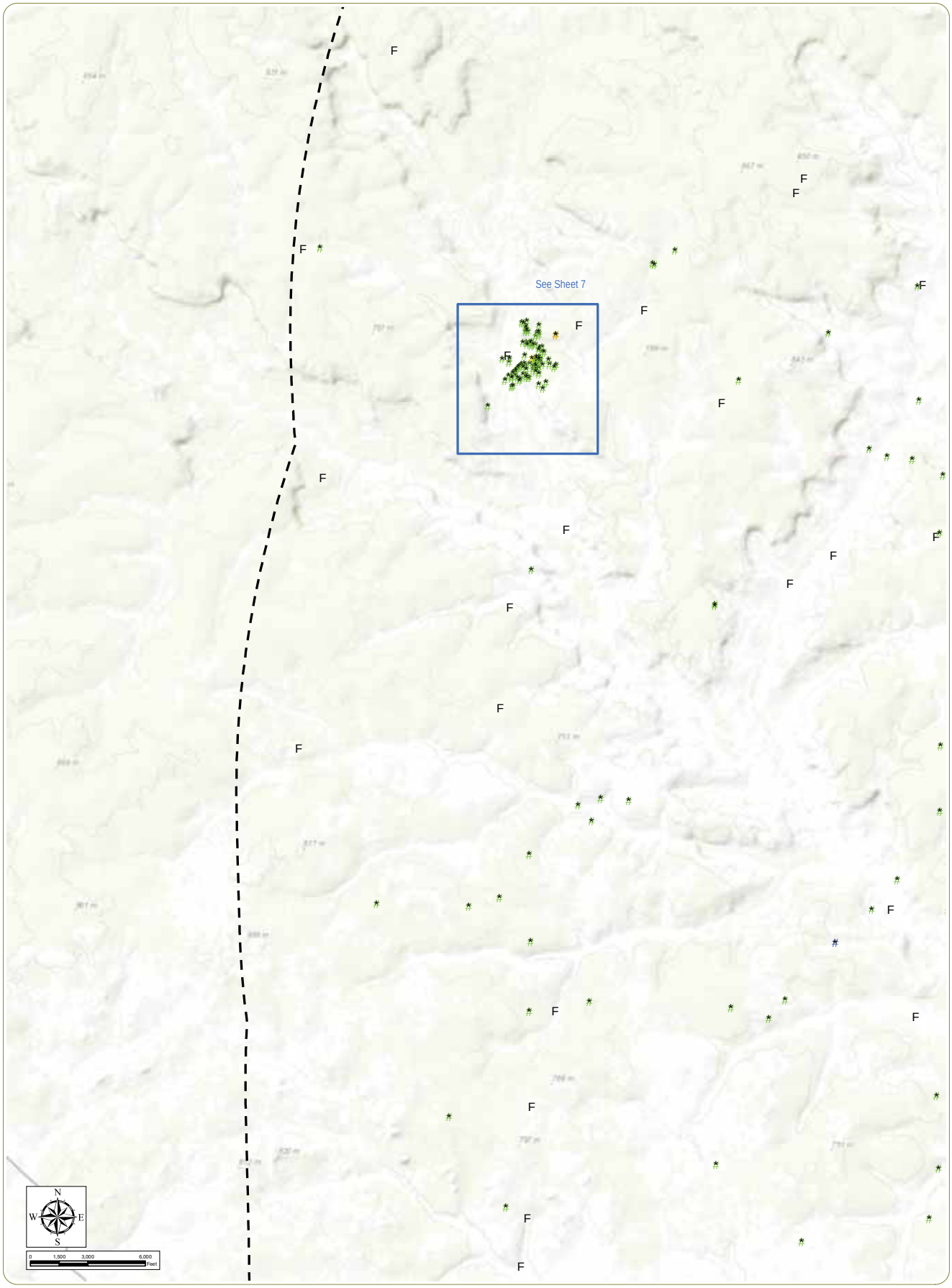

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 6 of 25

- NRHP-Listed Resource
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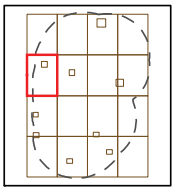

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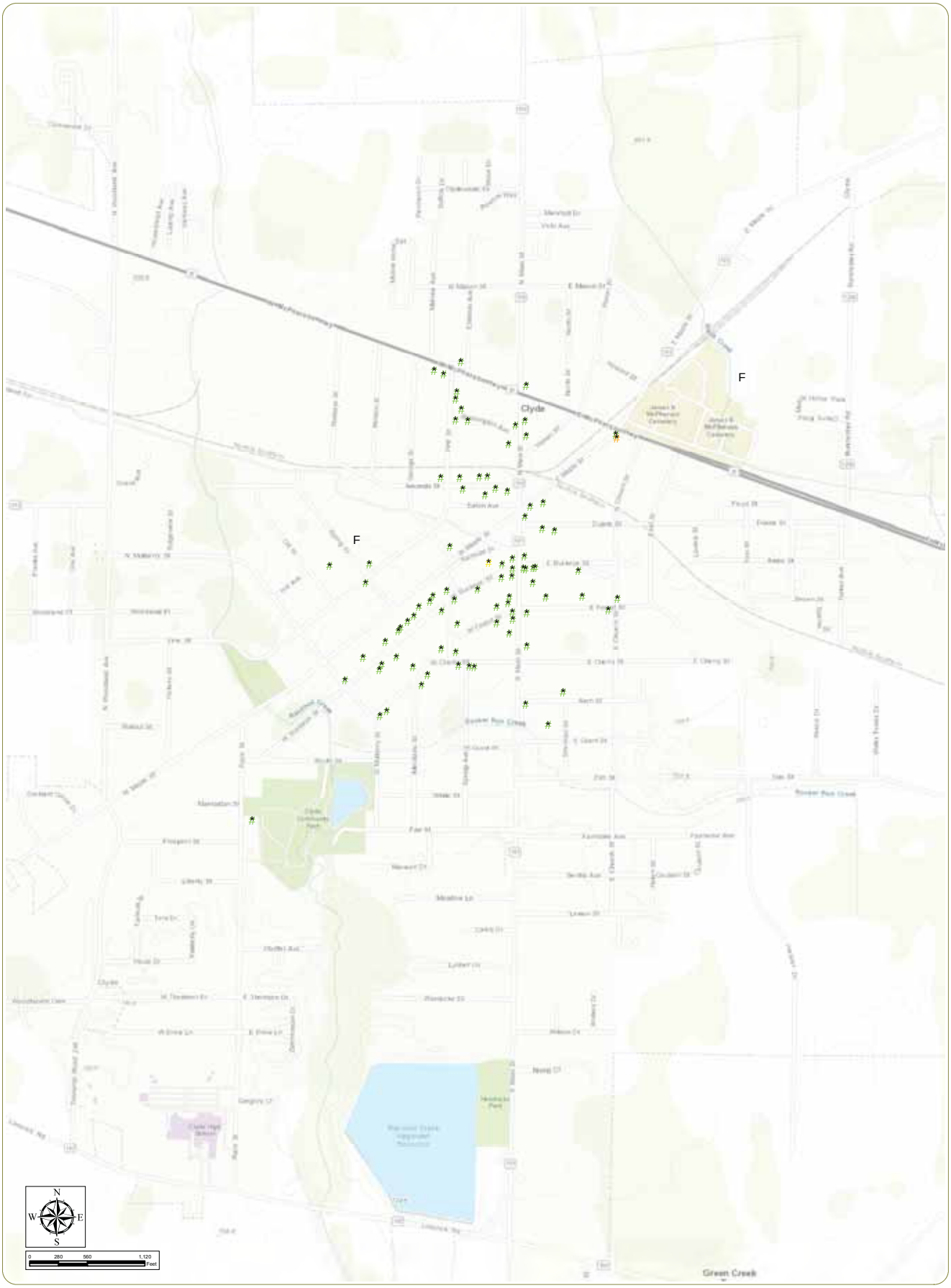

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 7 of 25

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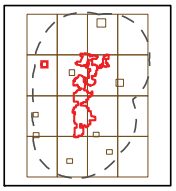

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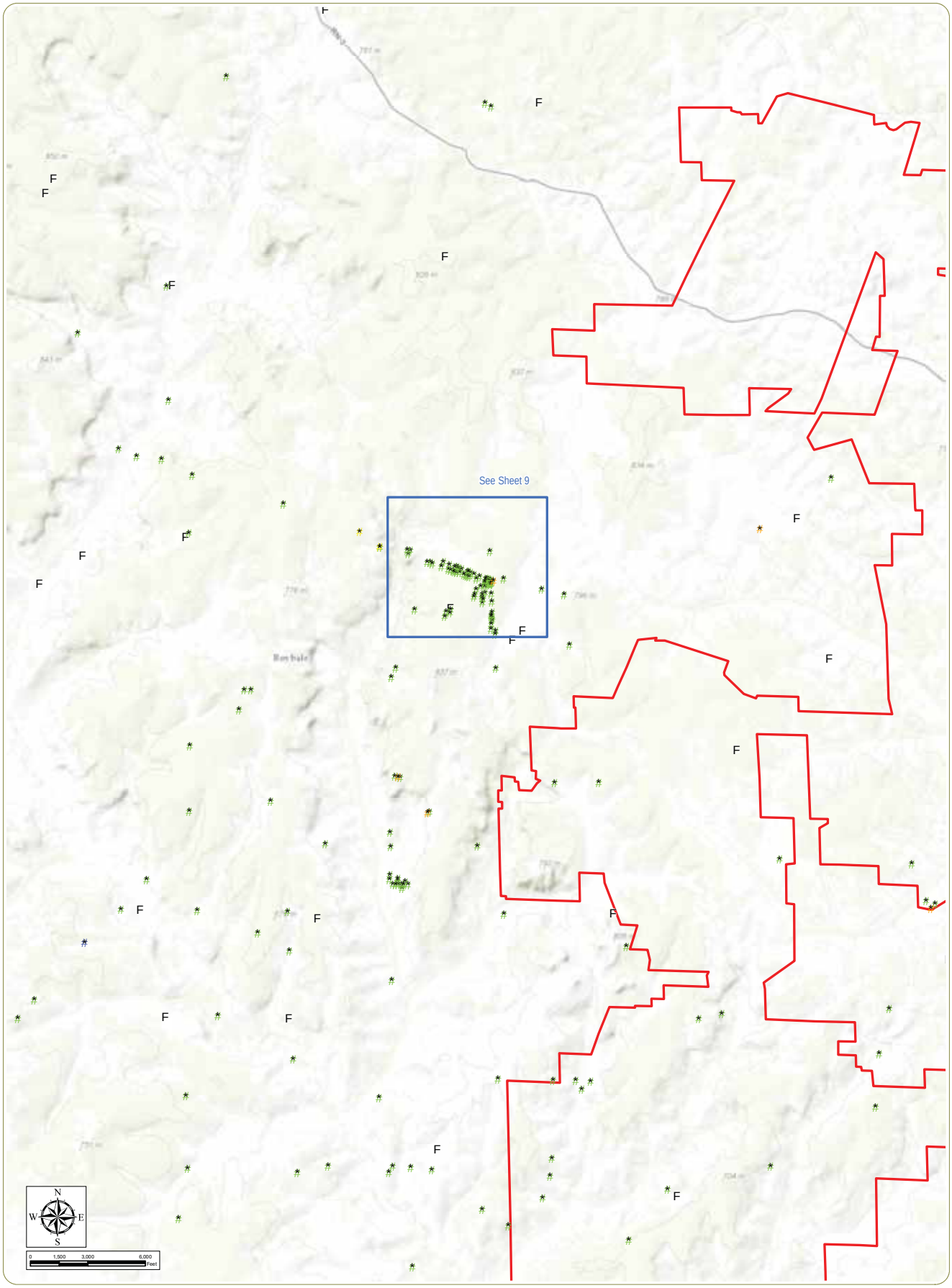

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 8 of 25

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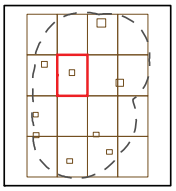

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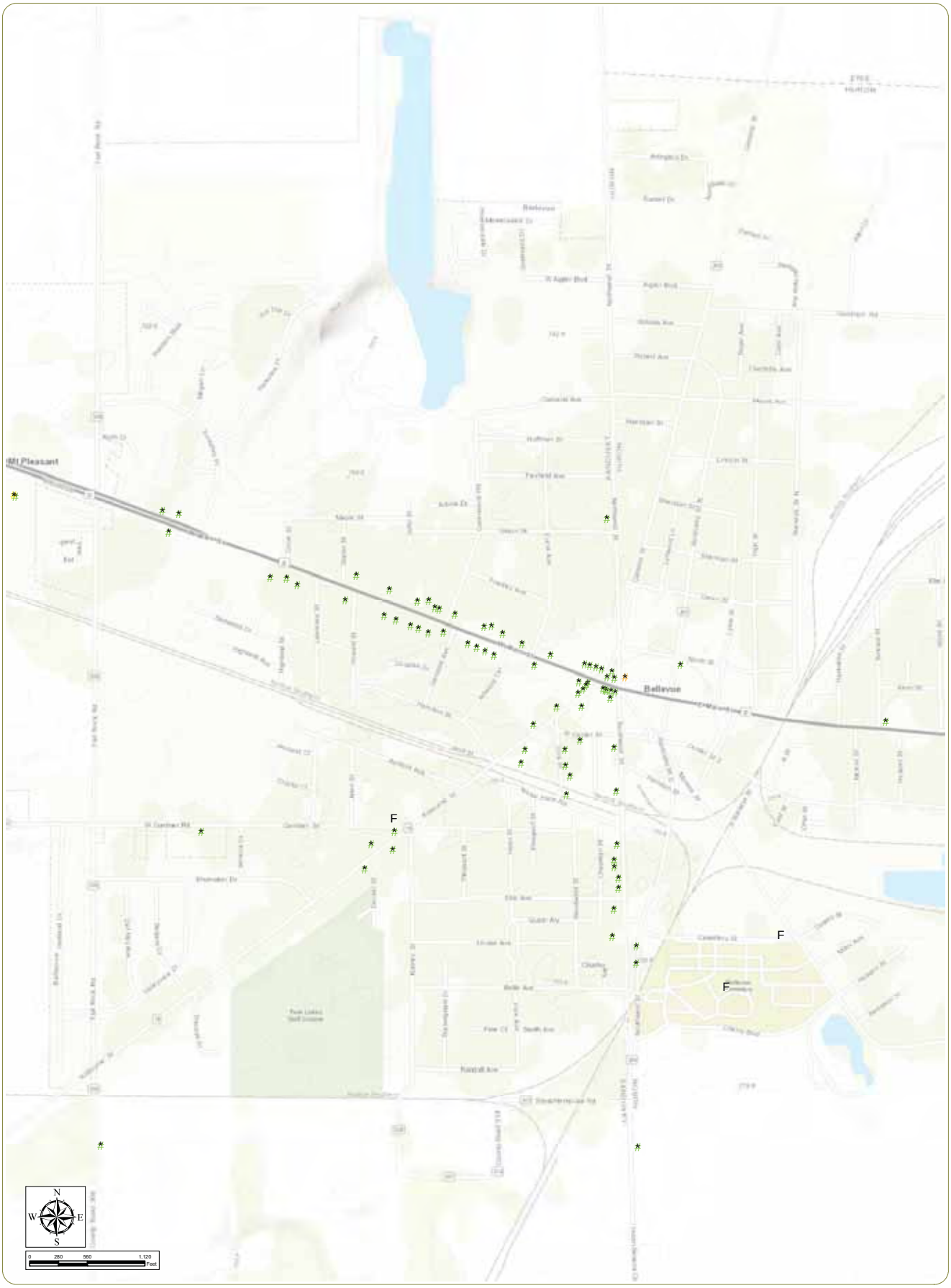

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 9 of 25

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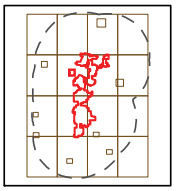

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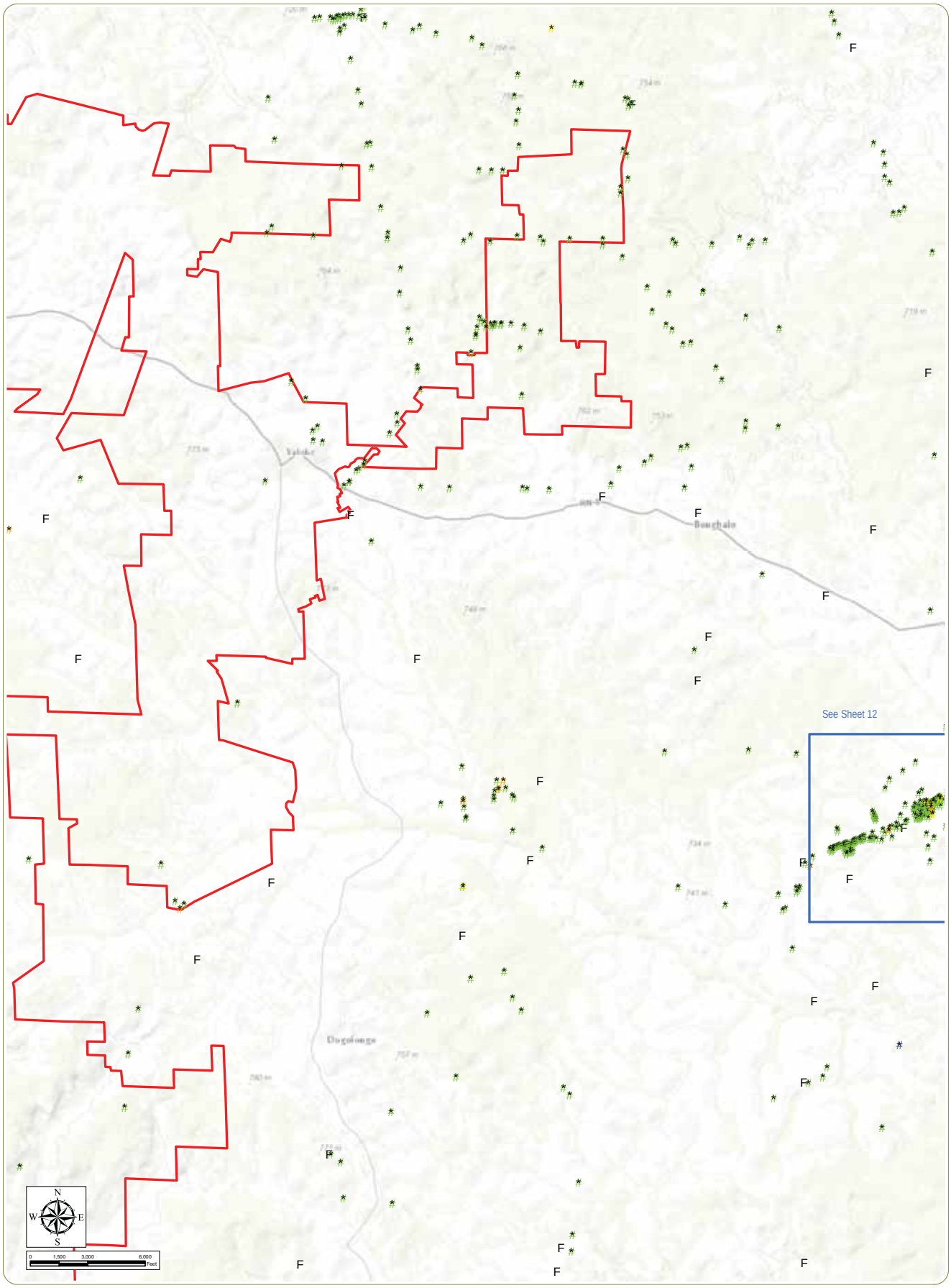

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 10 of 25

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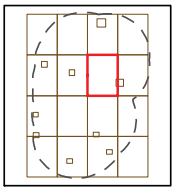

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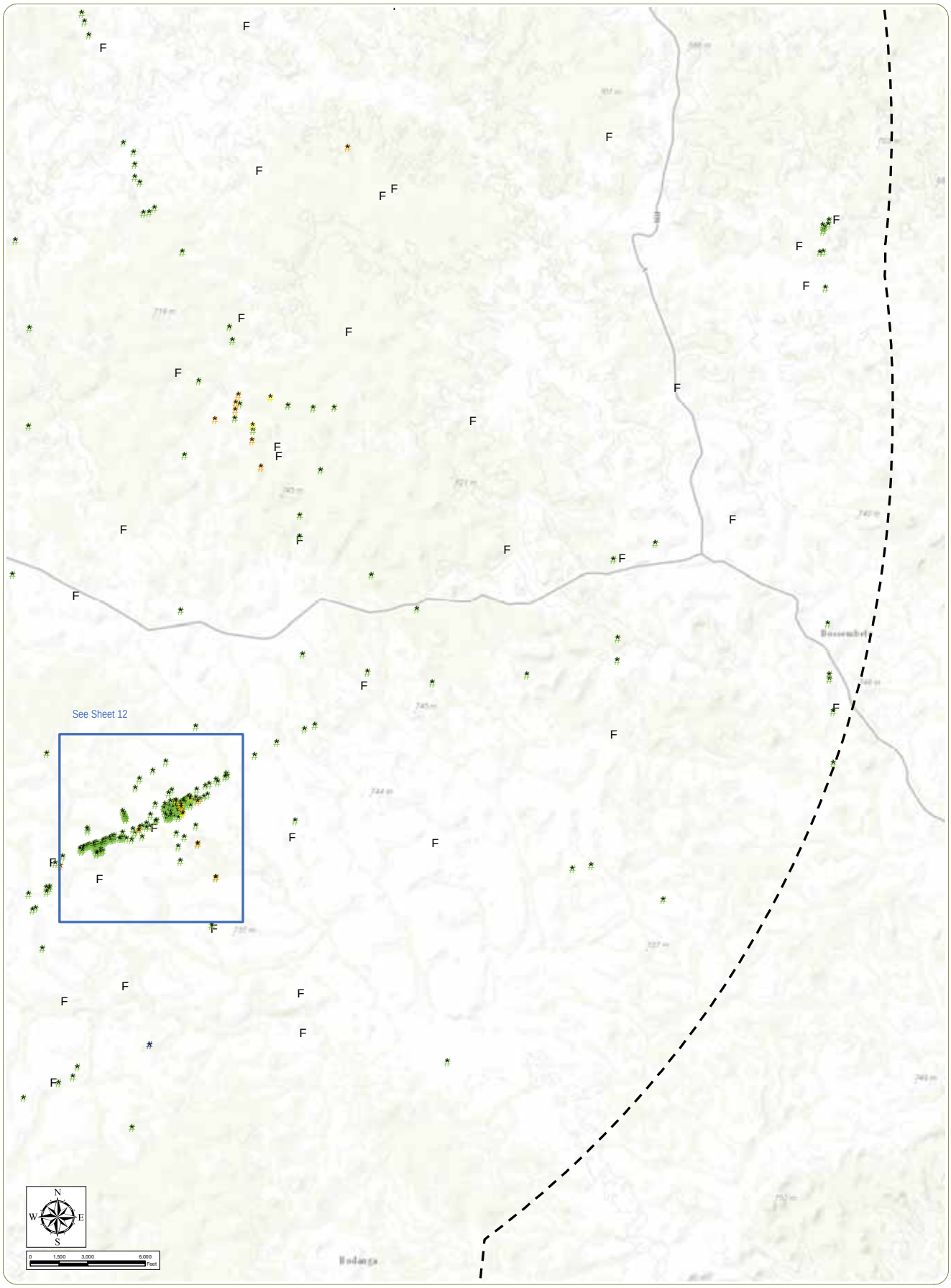

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 11 of 25

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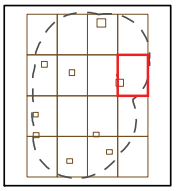

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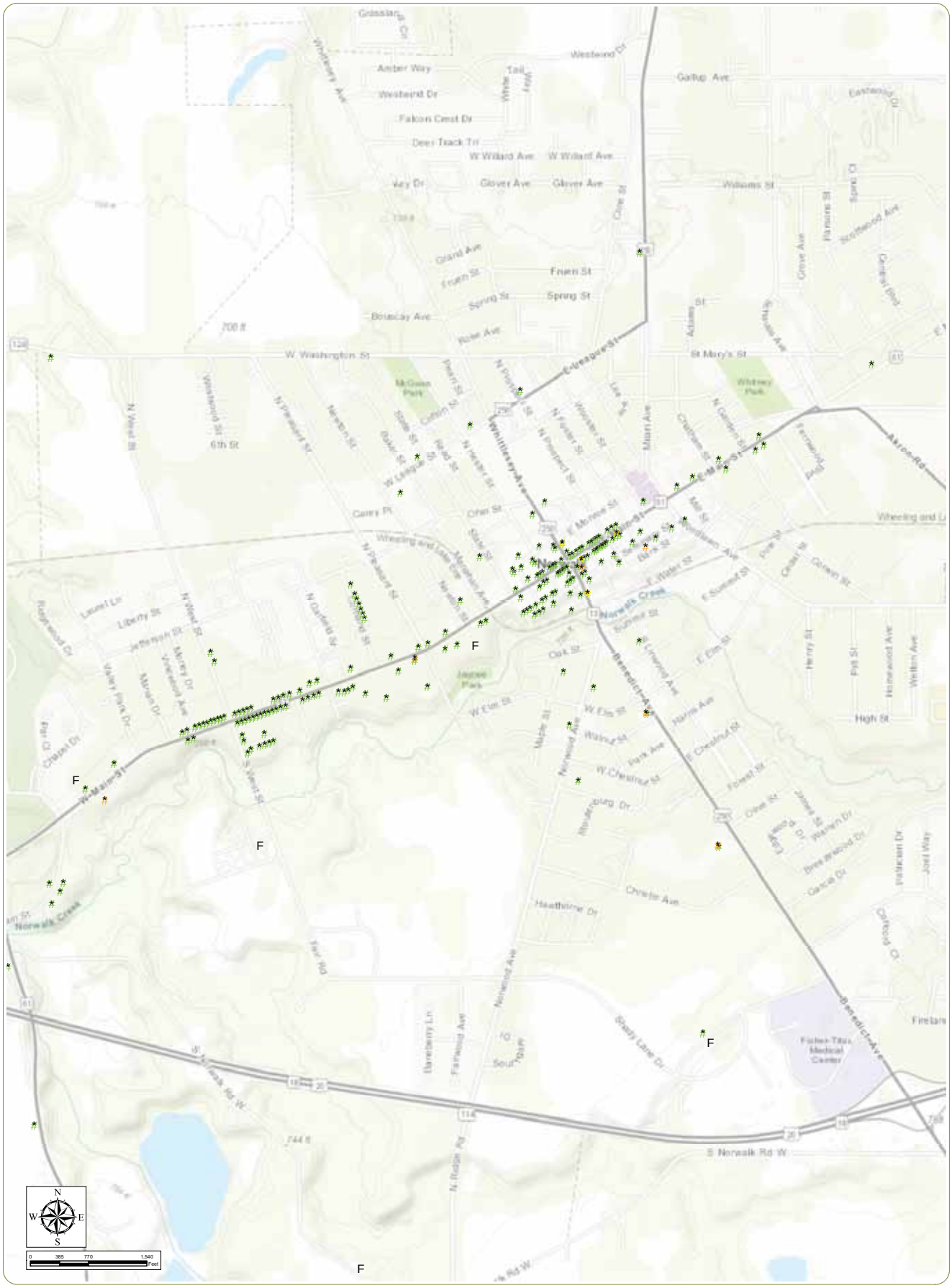

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 12 of 25

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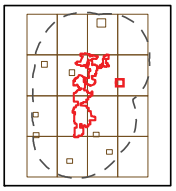

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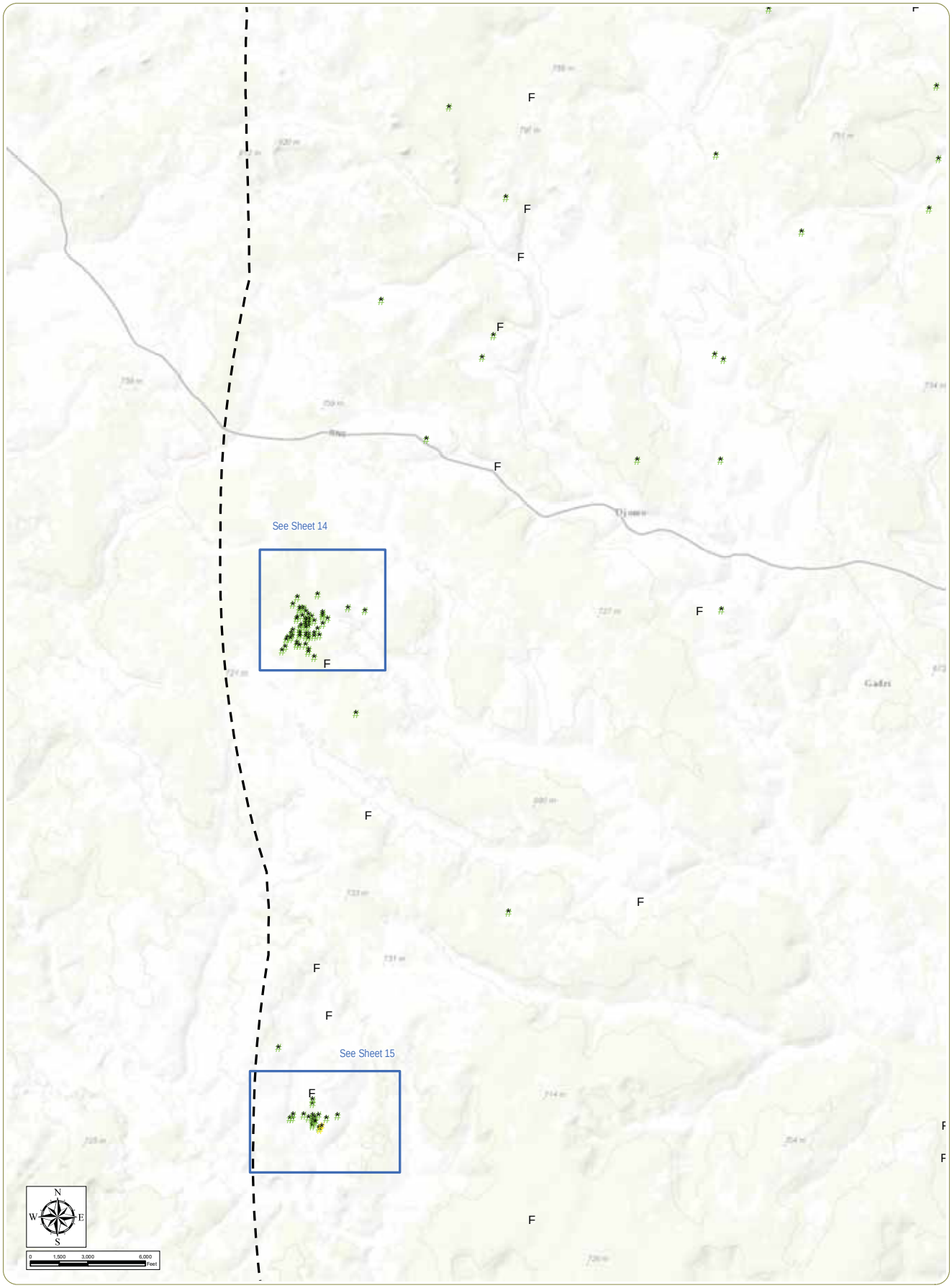

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 13 of 25

- NRHP-Listed Resource
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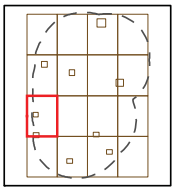

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Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 14 of 25

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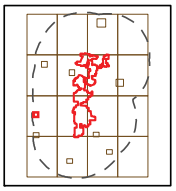

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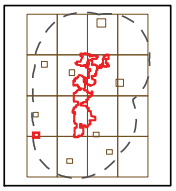
Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 15 of 25

- NRHP-Listed Resource
- NRHP-Eligible Resource (OHPO Determined)
- NRHP-Eligible Bridges (ODOT Determined)
- OHI Historic Structure
- F Ohio Genealogical Society Cemetery
- Previously Recorded Archaeological Site (Redacted)
- Project Area
- Ten-Mile Study Area



Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 18, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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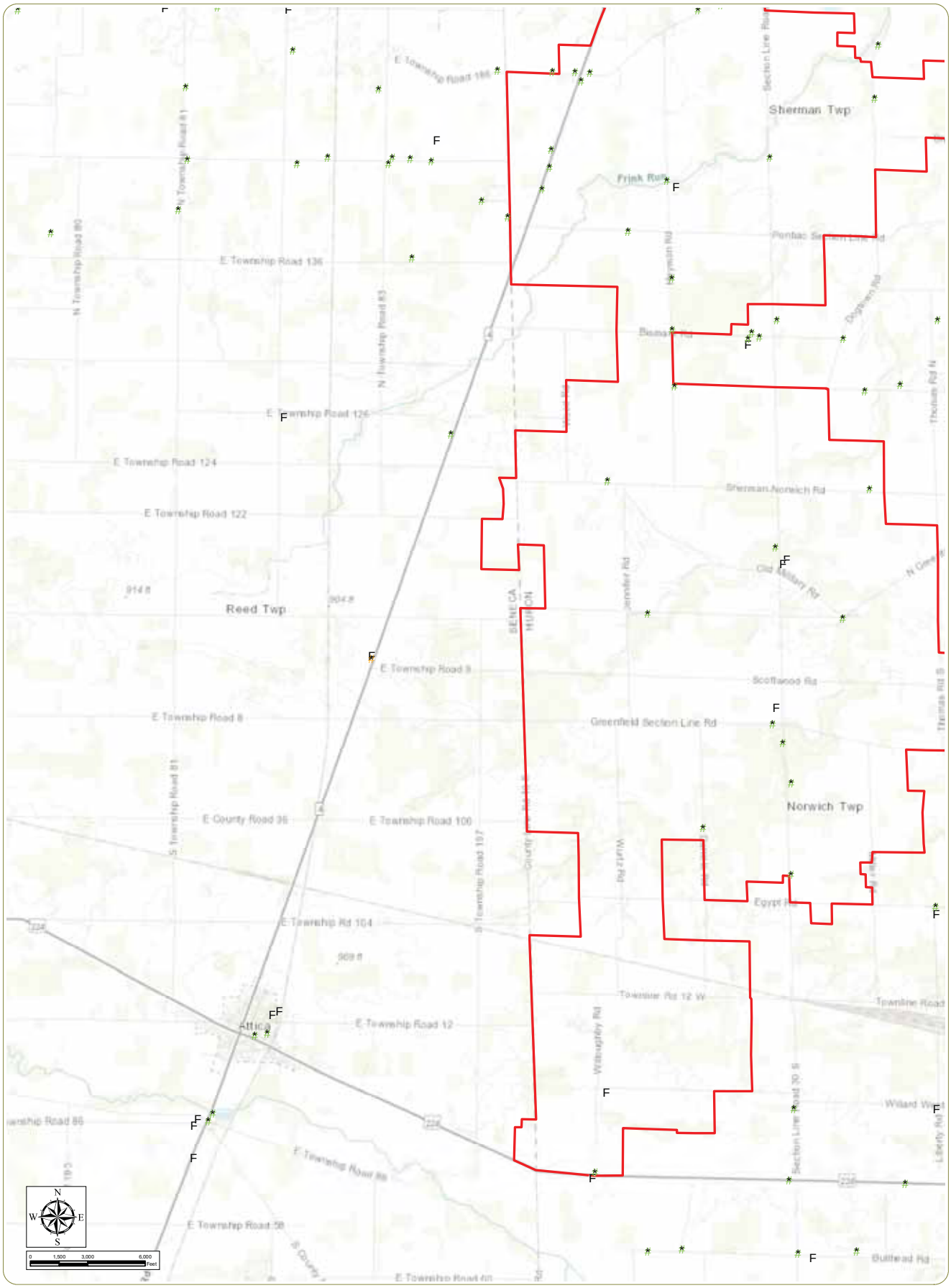


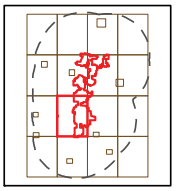
Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 16 of 25

- NRHP-Listed Resource
- NRHP-Eligible Resource (OHPO Determined)
- NRHP-Eligible Bridges (ODOT Determined)
- OHI Historic Structure
- F Ohio Genealogical Society Cemetery
- Previously Recorded Archaeological Site (Redacted)
- Project Area
- Ten-Mile Study Area



Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 18, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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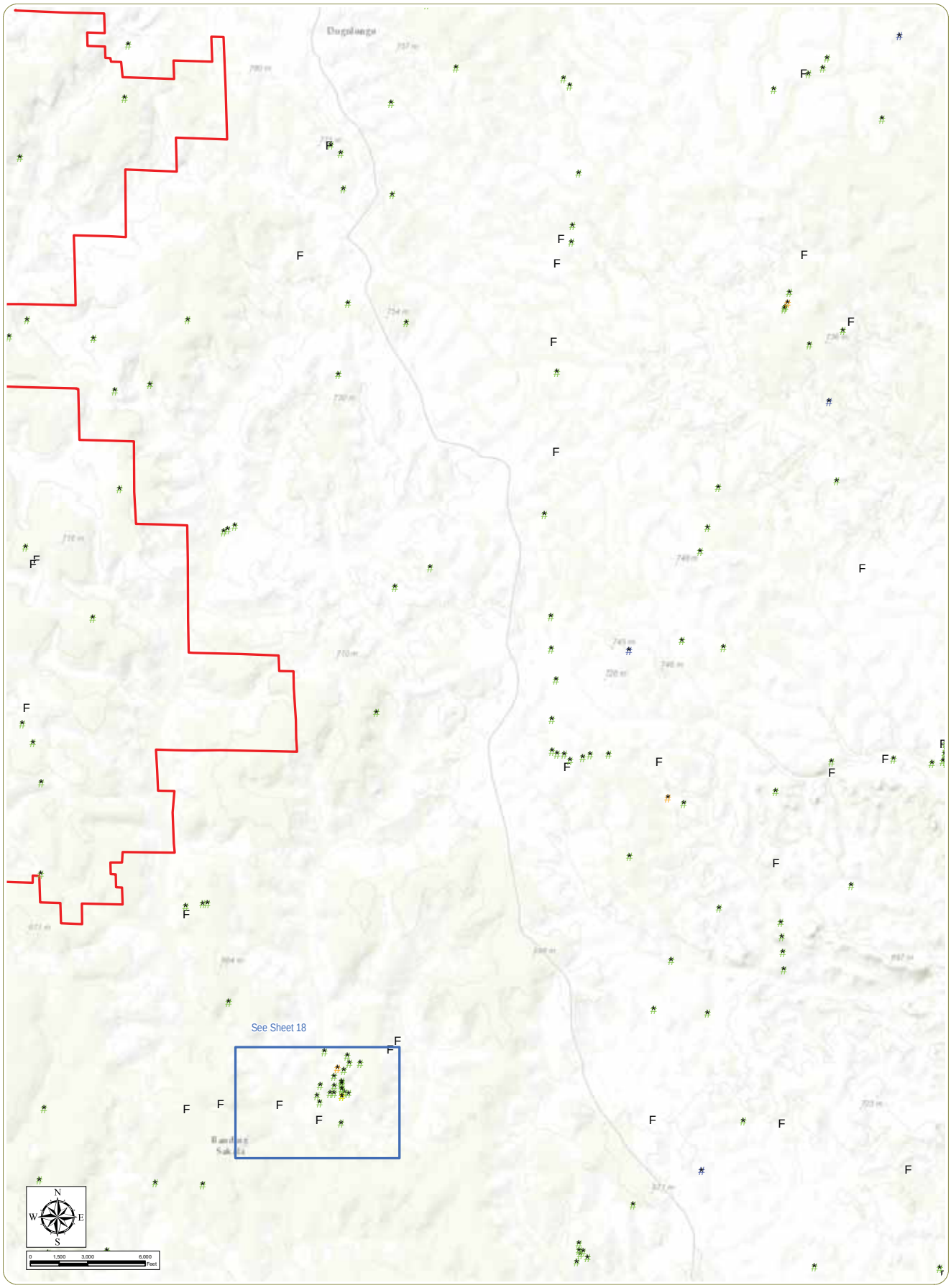

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 17 of 25

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- NRHP-Eligible Resource (OHPO Determined)
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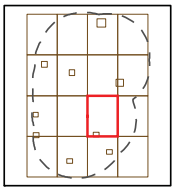

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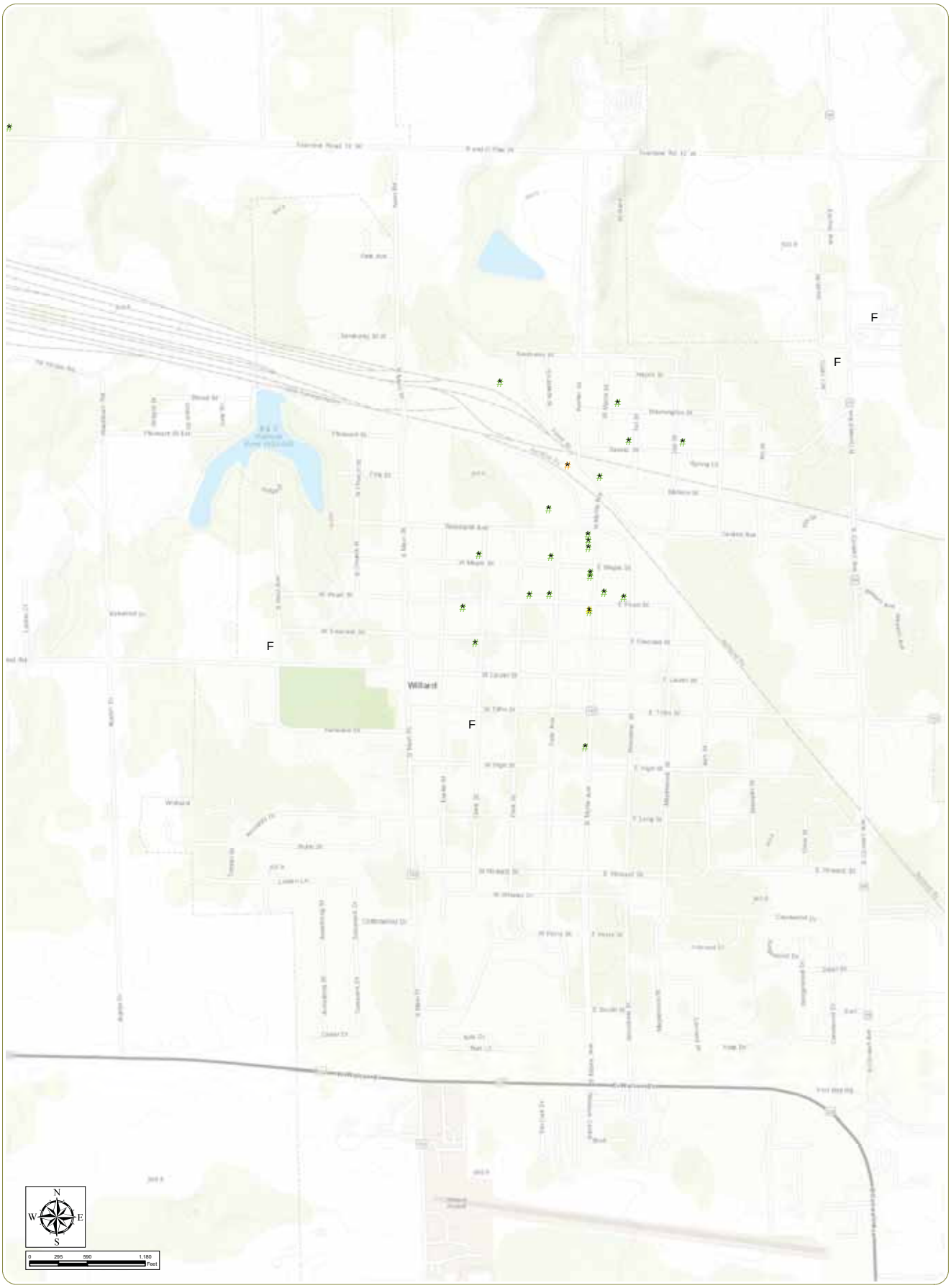

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 18 of 25

- NRHP-Listed Resource
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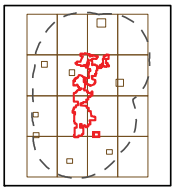

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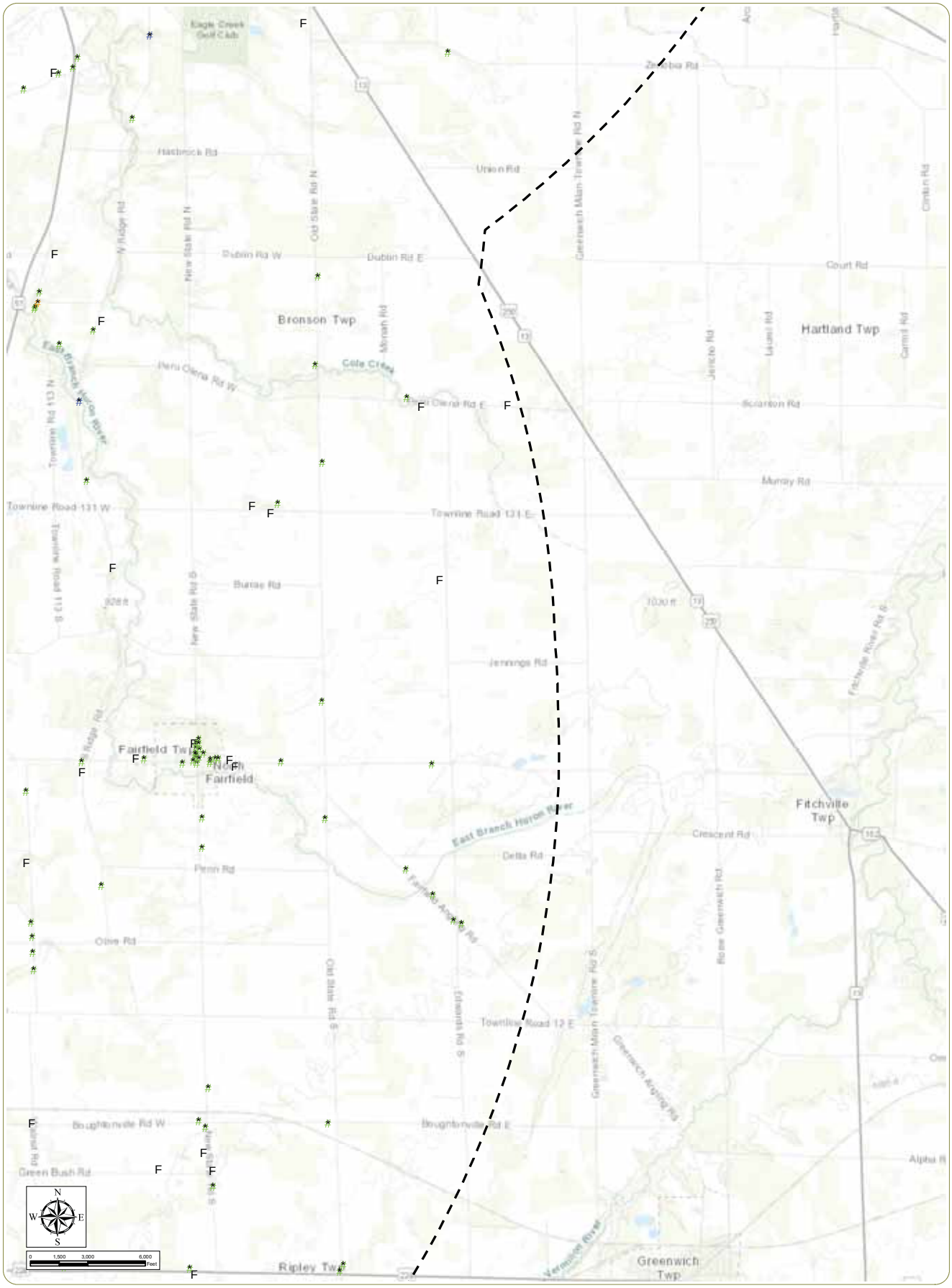

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 19 of 25

- NRHP-Listed Resource
- NRHP-Eligible Resource (OHPO Determined)
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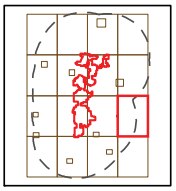

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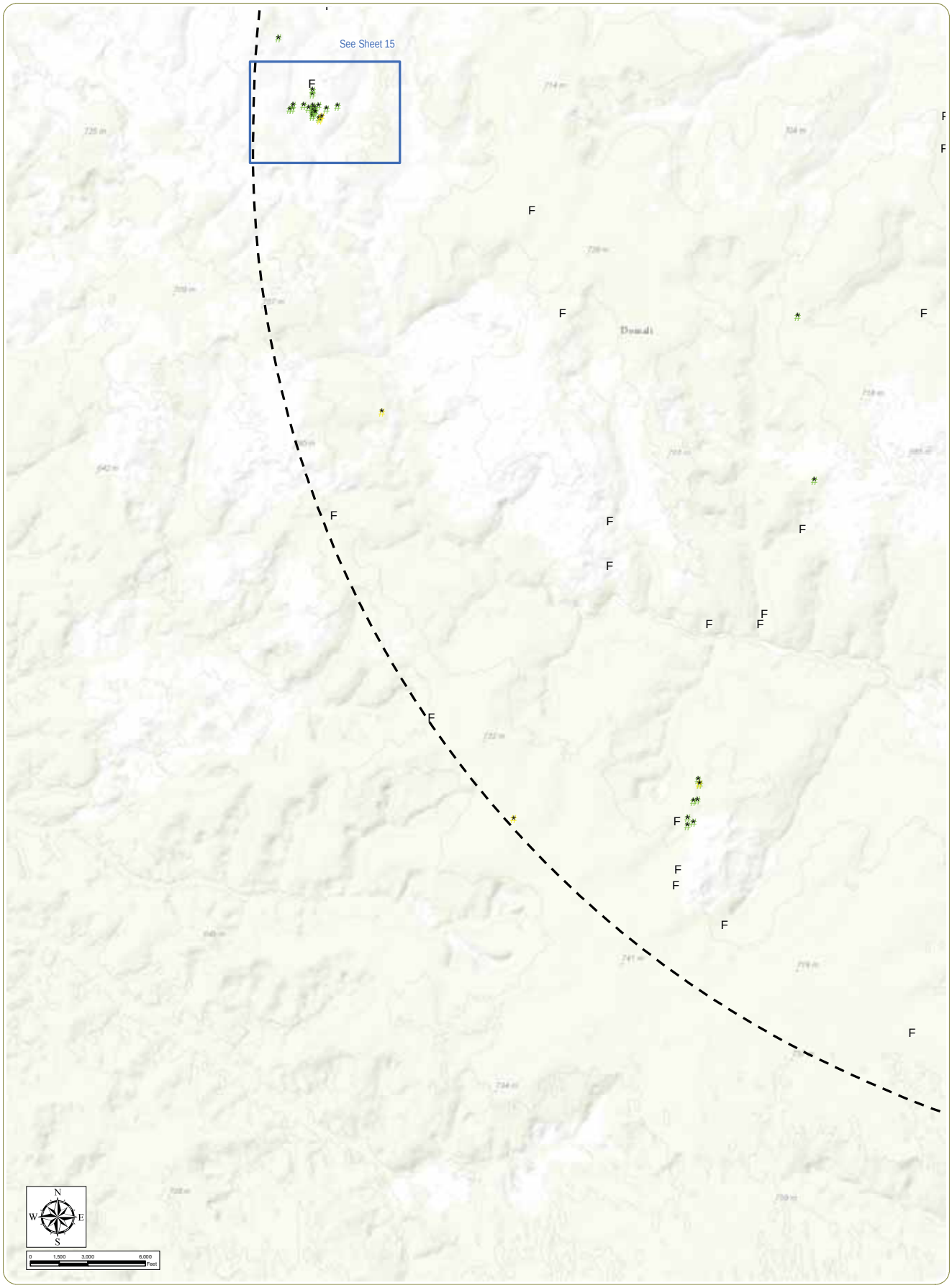

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 20 of 25

- NRHP-Listed Resource
- NRHP-Eligible Resource (OHPO Determined)
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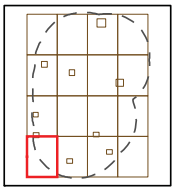
- OHI Historic Structure
- F Ohio Genealogical Society Cemetery
- Previously Recorded Archaeological Site (Redacted)
- Facility Site
- Ten-Mile Study Area



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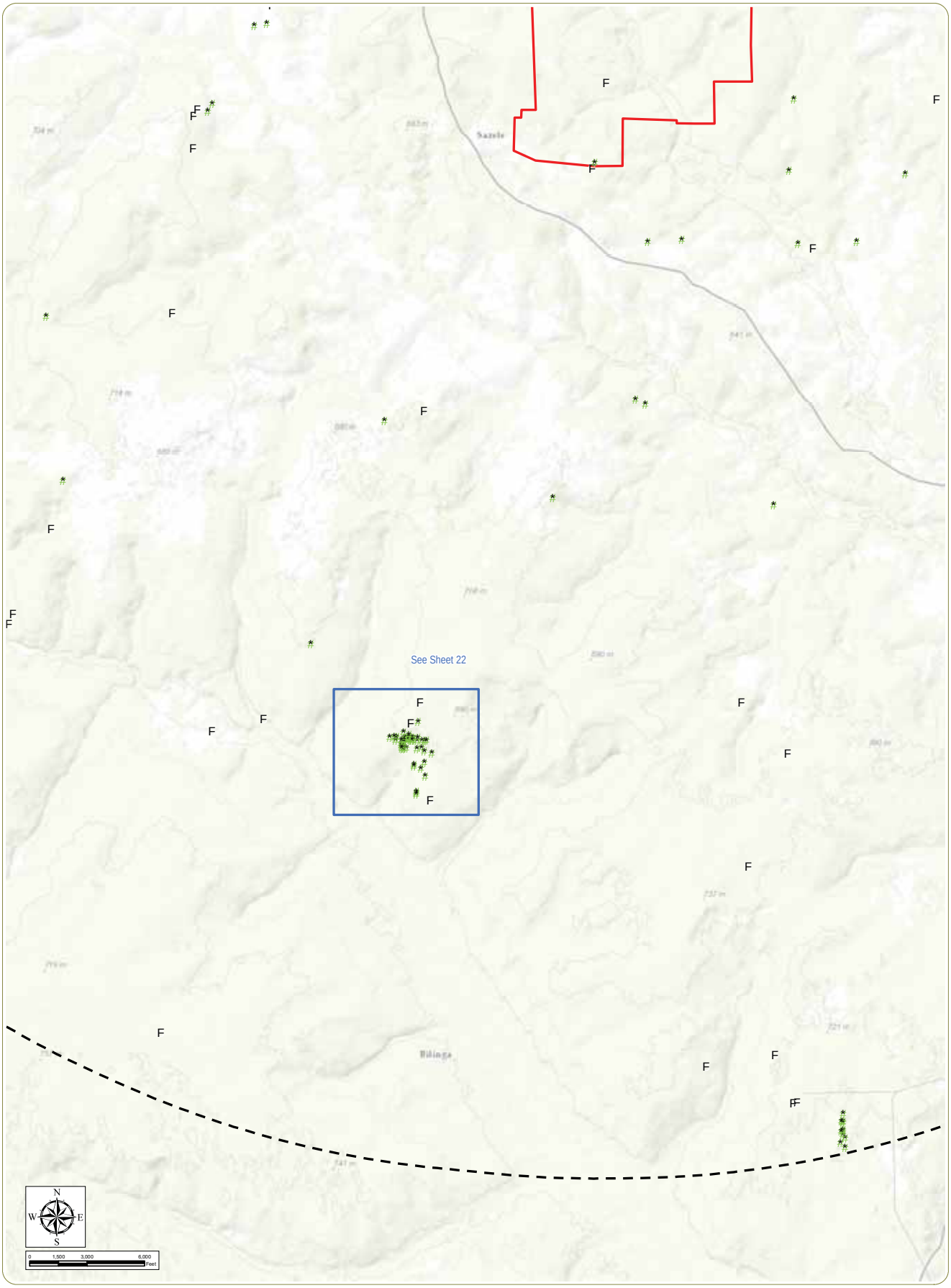

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 21 of 25

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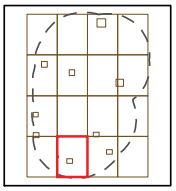

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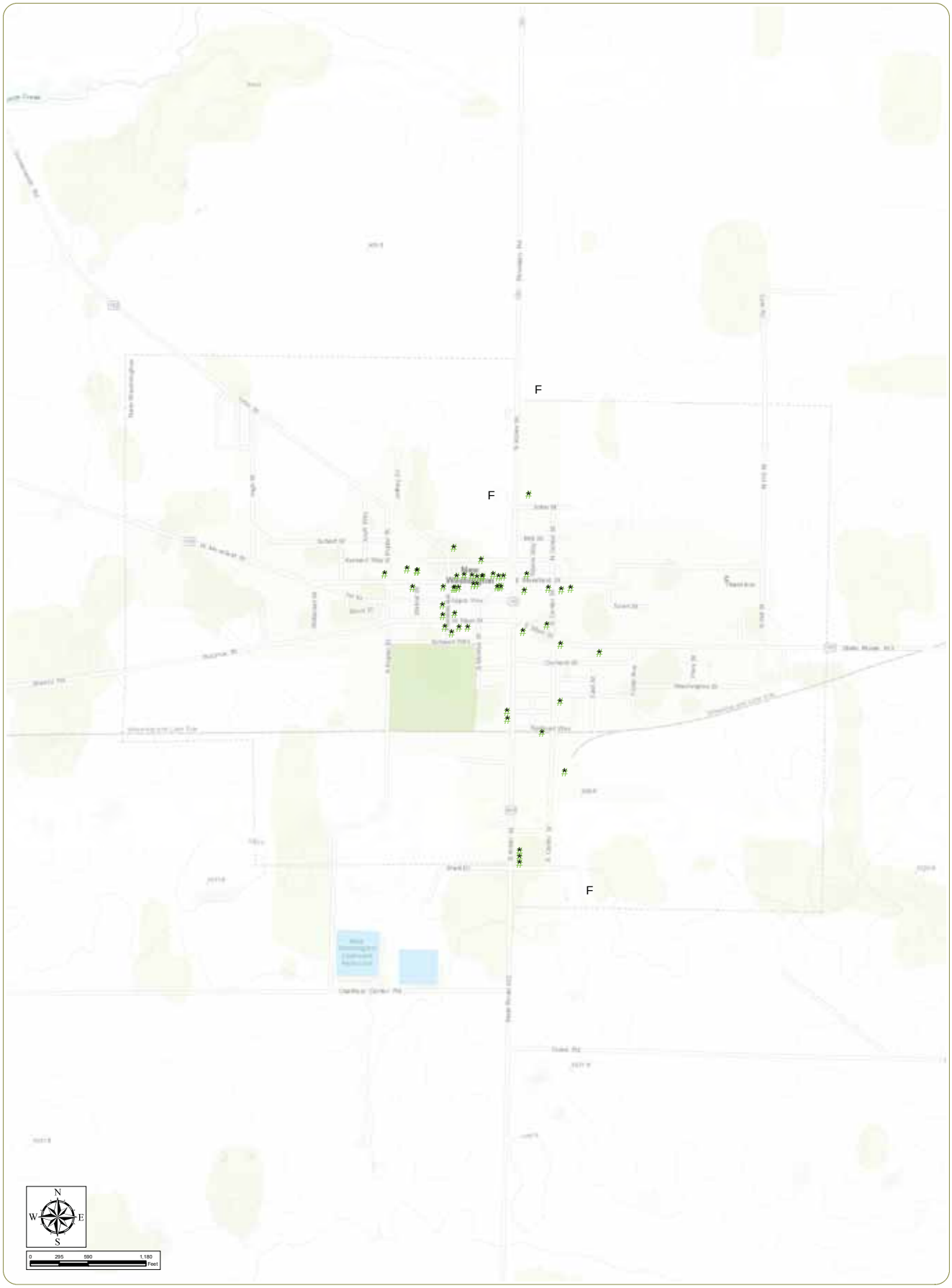

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 22 of 25

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- OHI Historic Structure
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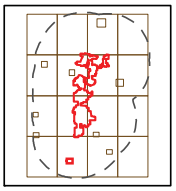

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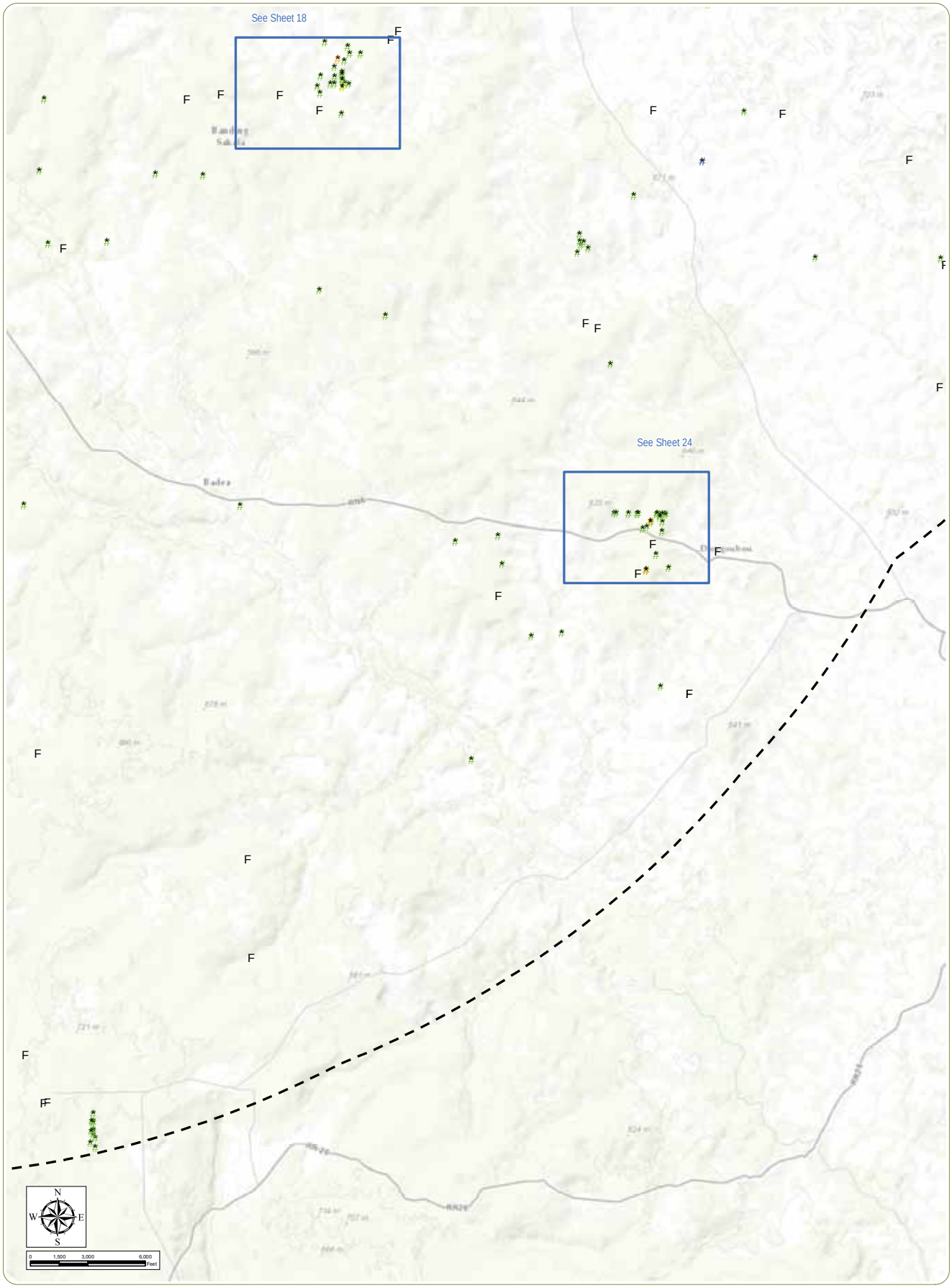

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 23 of 25

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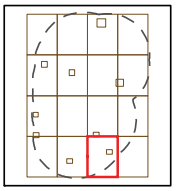

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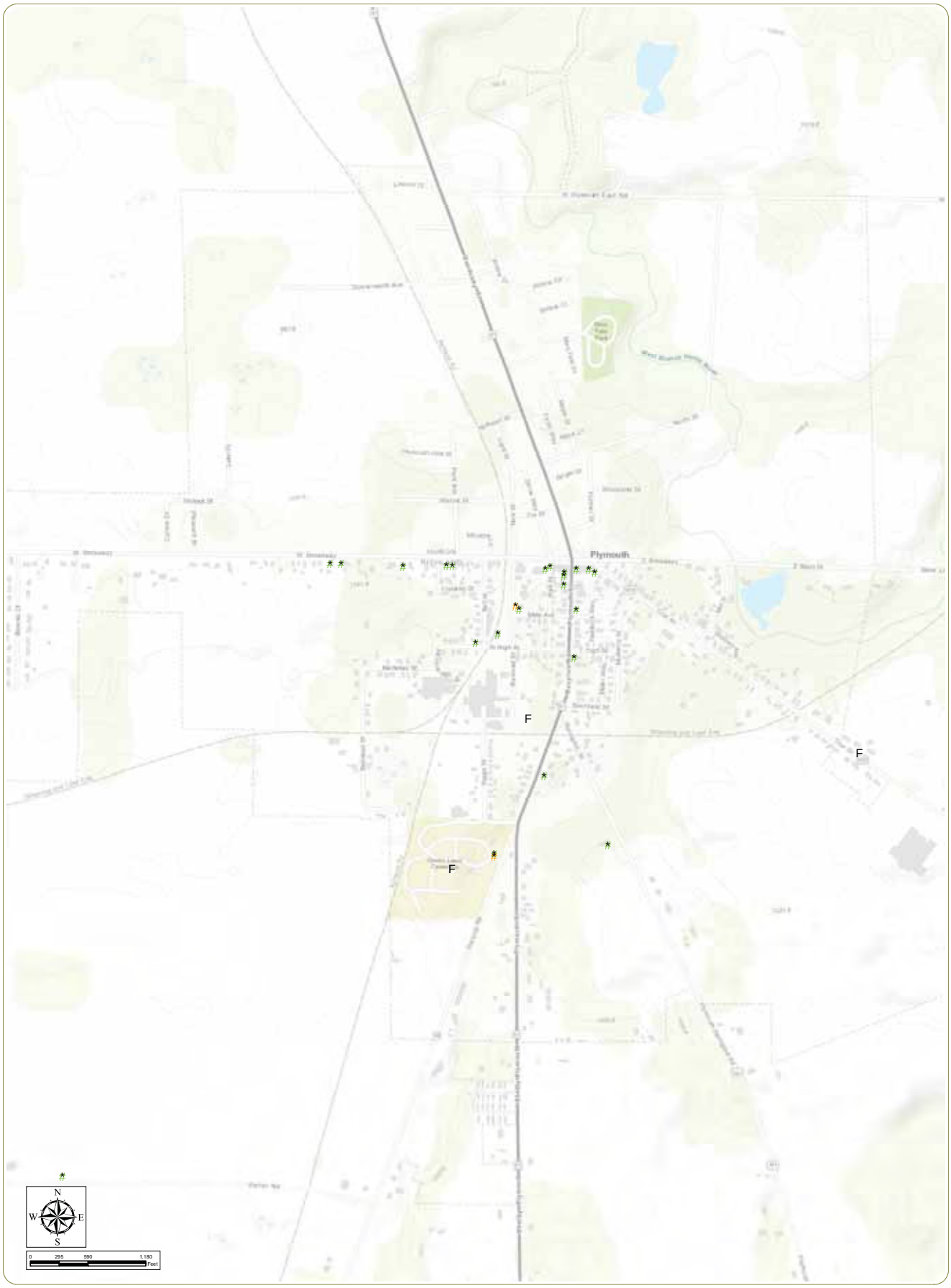

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 24 of 25

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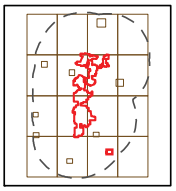

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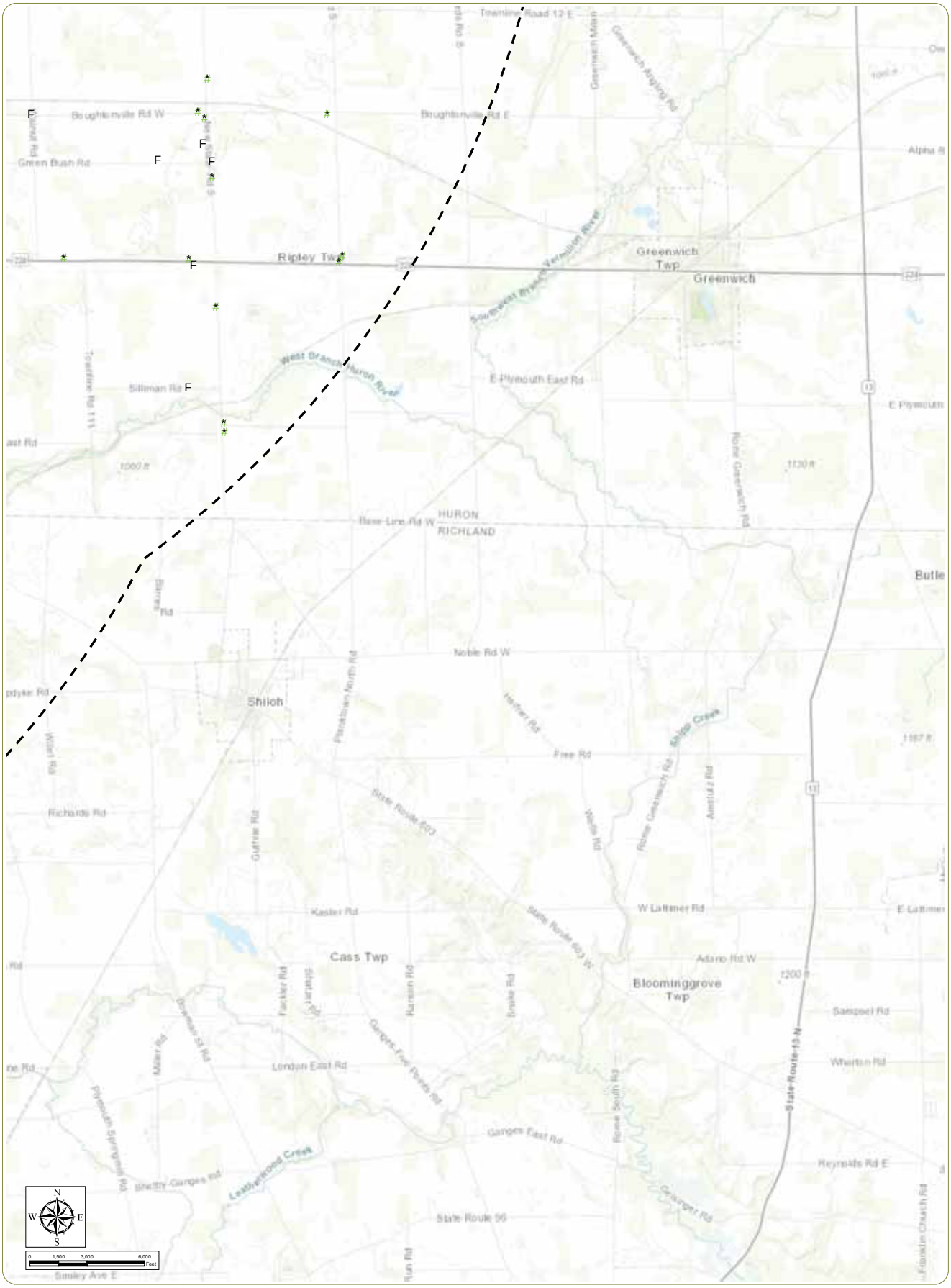

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 3: Previously Identified Cultural Resources - Sheets

Sheet 25 of 25

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- Previously Recorded Archaeological Site (Redacted)
- Project Area
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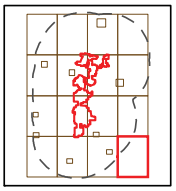

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 18, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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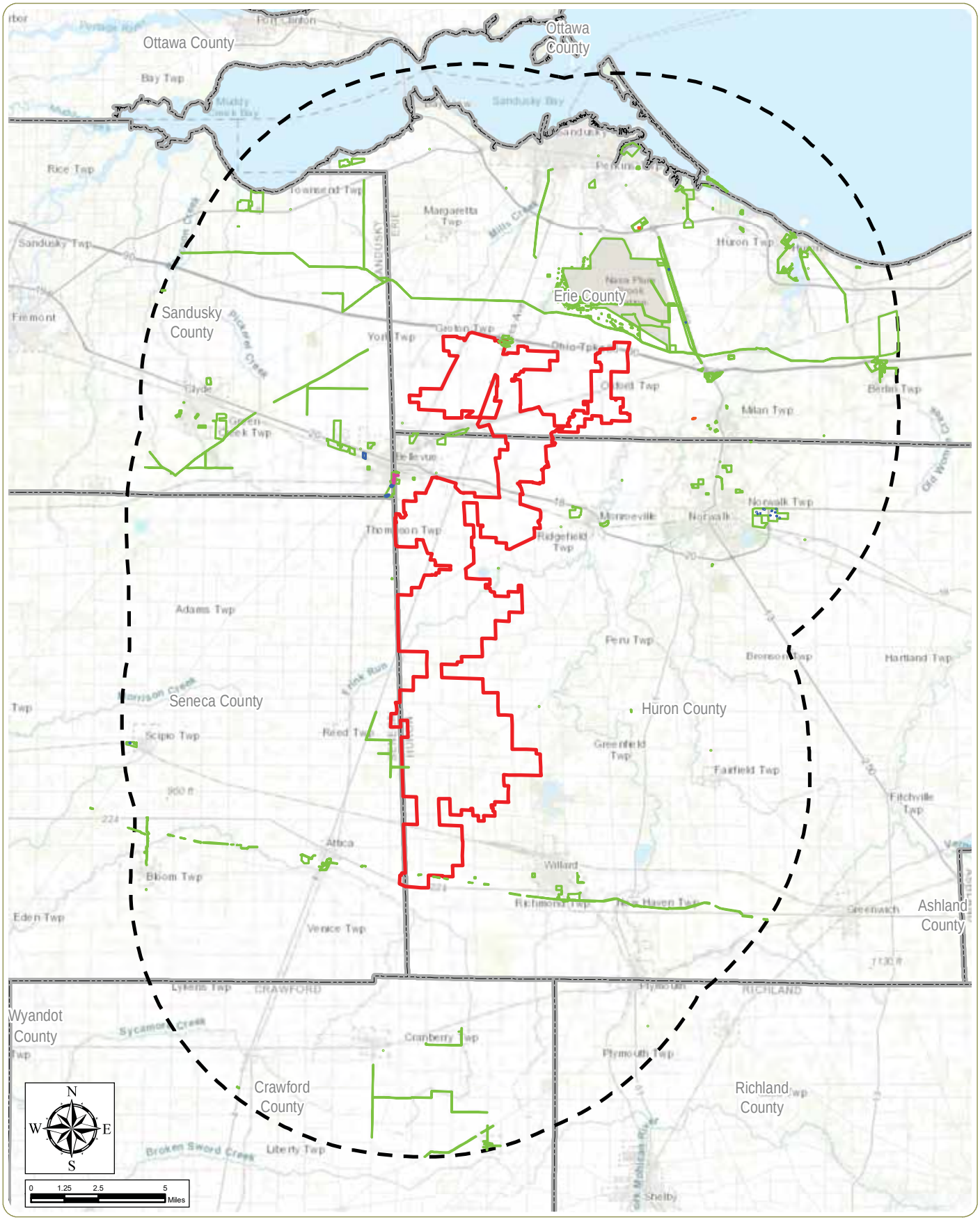

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 4: Previous Cultural Resources Surveys

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on January 2, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Previous Phase 1 Archaeological Survey
- Previous Phase 2 Archaeological Investigation
- Previous Phase 3 Archaeological Investigation
- Previous Historic Resources Survey
- Project Area
- Ten-Mile Study Area

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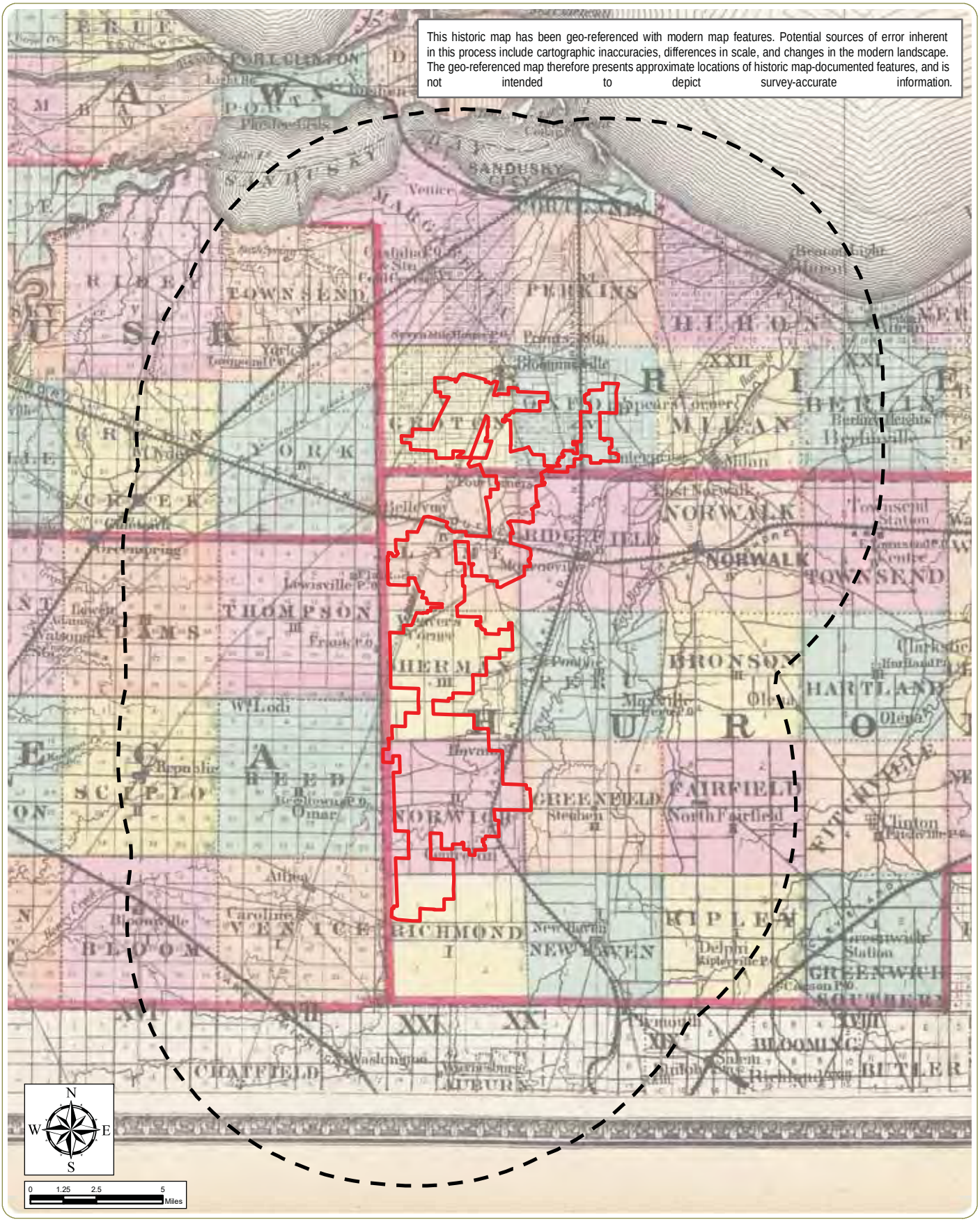

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 5: 1872 Gray and Walling *Topographical Atlas of Cuyahoga, Erie, Huron, Lorain, Medina, Ottawa, Sandusky, Seneca, and Summit Counties, Ohio*

Project Area

Ten-Mile Study Area

Notes: 1. Basemap: Gray and Walling *Topographical Atlas of Cuyahoga, Erie, Huron, Lorain, Medina, Ottawa, Sandusky, Seneca, and Summit Counties, Ohio* 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may

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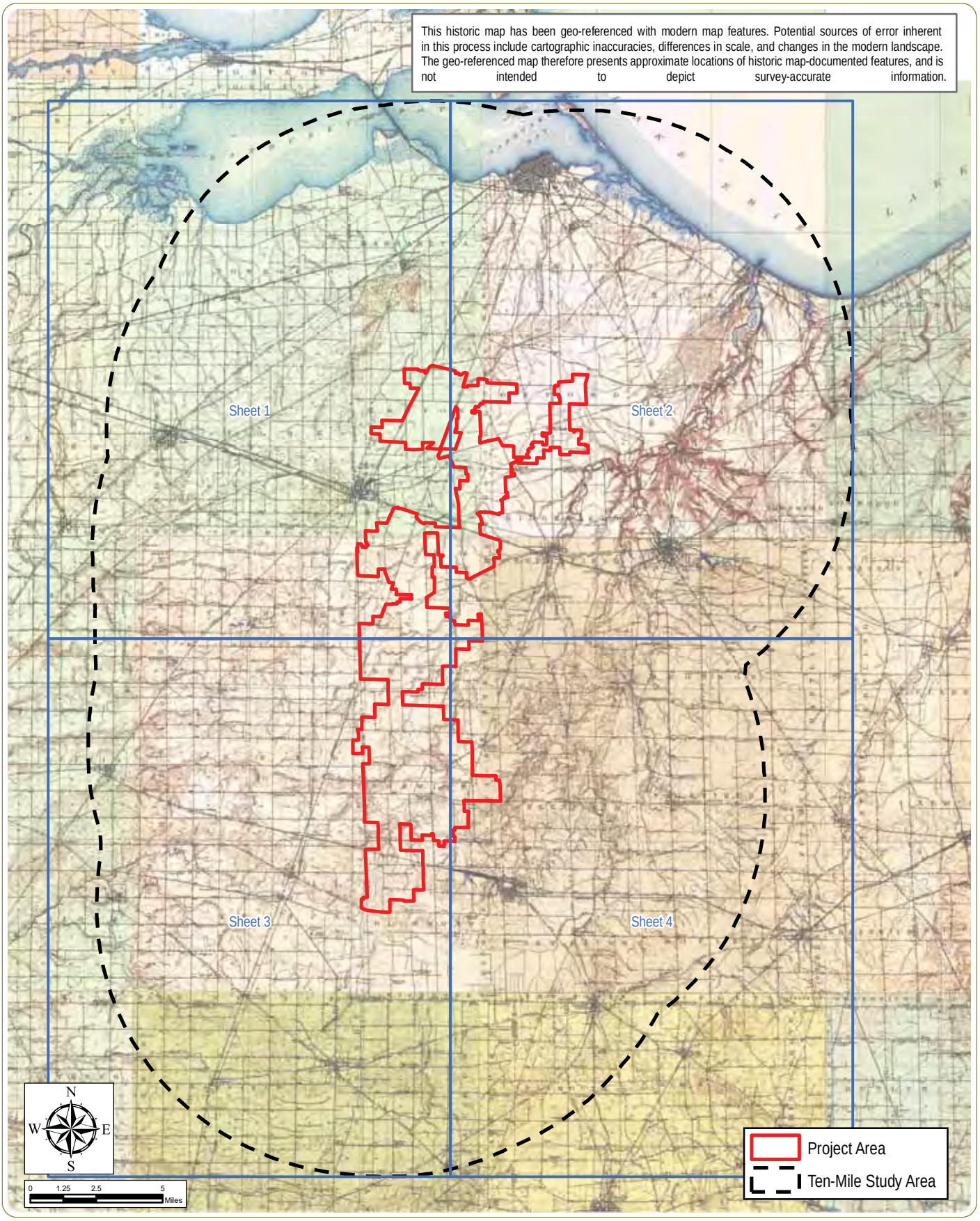
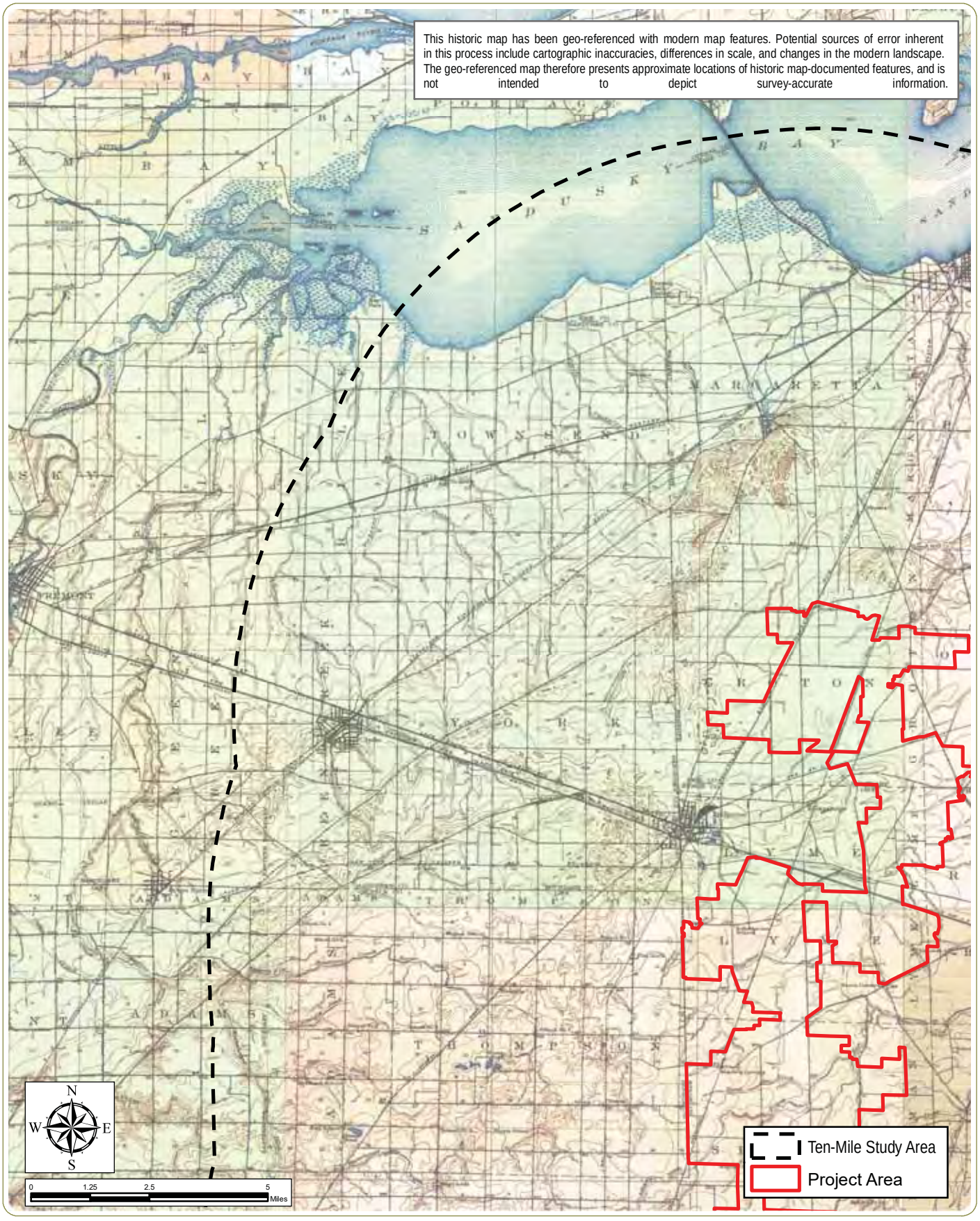


Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 6: USGS 1900 *Oak Harbor*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion*; 1904 *Sandusky*; 1906 *Syrcamore, Tiffin*; 1908 *New London, Ashland*; 1915 *Bucyrus, Crestline, Norwalk, Siam*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles - Index

Notes: 1. Basemap:See above list of USGS 1:62500 Topographical Quadrangles. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

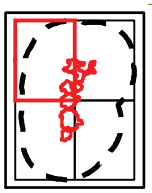


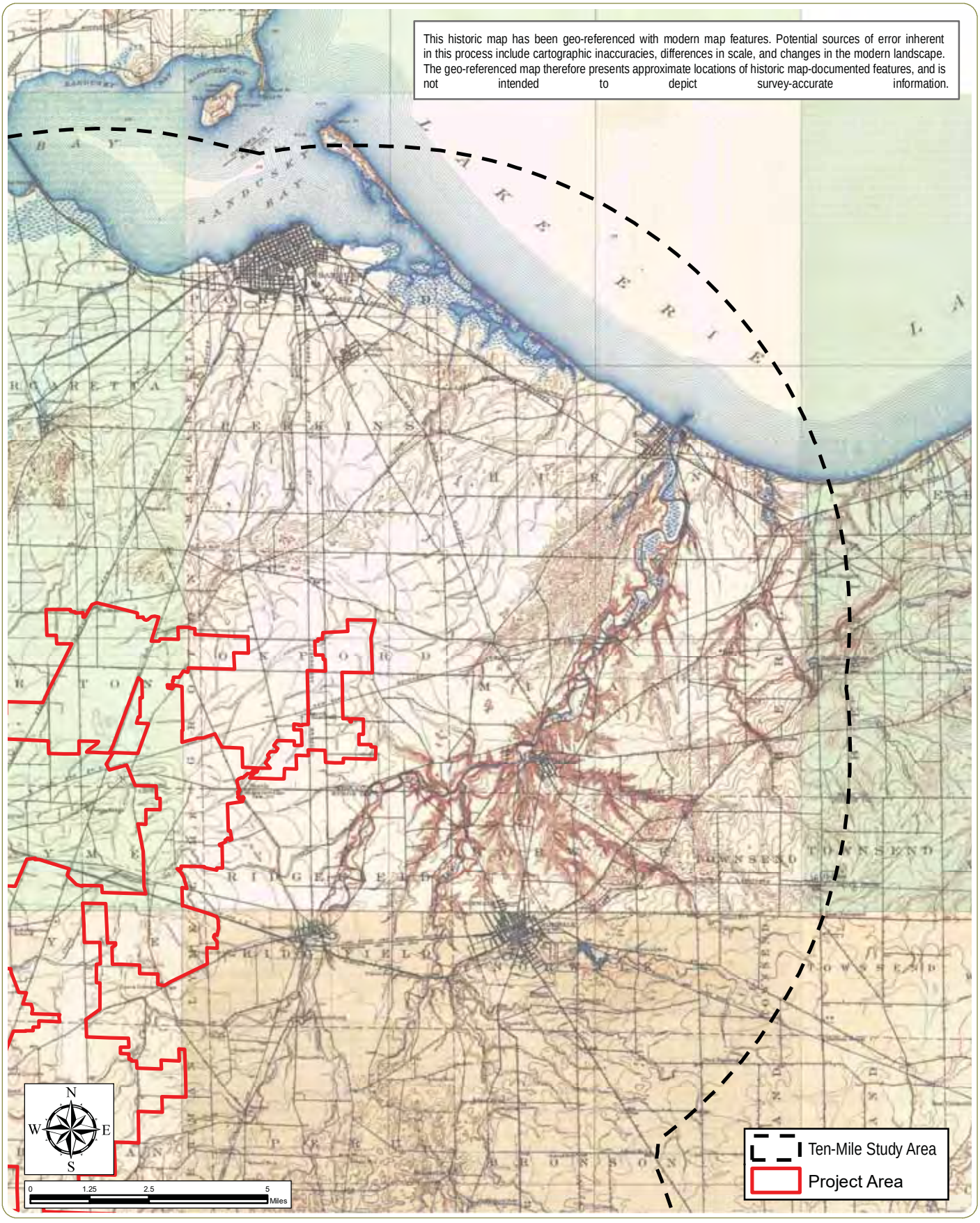
Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 6: USGS 1900 *Oak Harbor*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion*; 1904 *Sandusky*; 1906 *Syrcamore, Tiffin*; 1908 *New London, Ashland*; 1915 *Bucyrus, Crestline, Norwalk, Siam*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles - Sheets

Notes: 1. Basemap:See above list of USGS 1:62500 Topographical Quadrangles. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



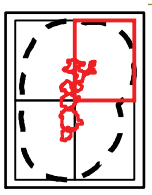


Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 6: USGS 1900 *Oak Harbor*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion*; 1904 *Sandusky*; 1906 *Syrcamore, Tiffin*; 1908 *New London, Ashland*; 1915 *Bucyrus, Crestline, Norwalk, Siam*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles - Sheets

Notes: 1. Basemap:See above list of USGS 1:62500 Topographical Quadrangles. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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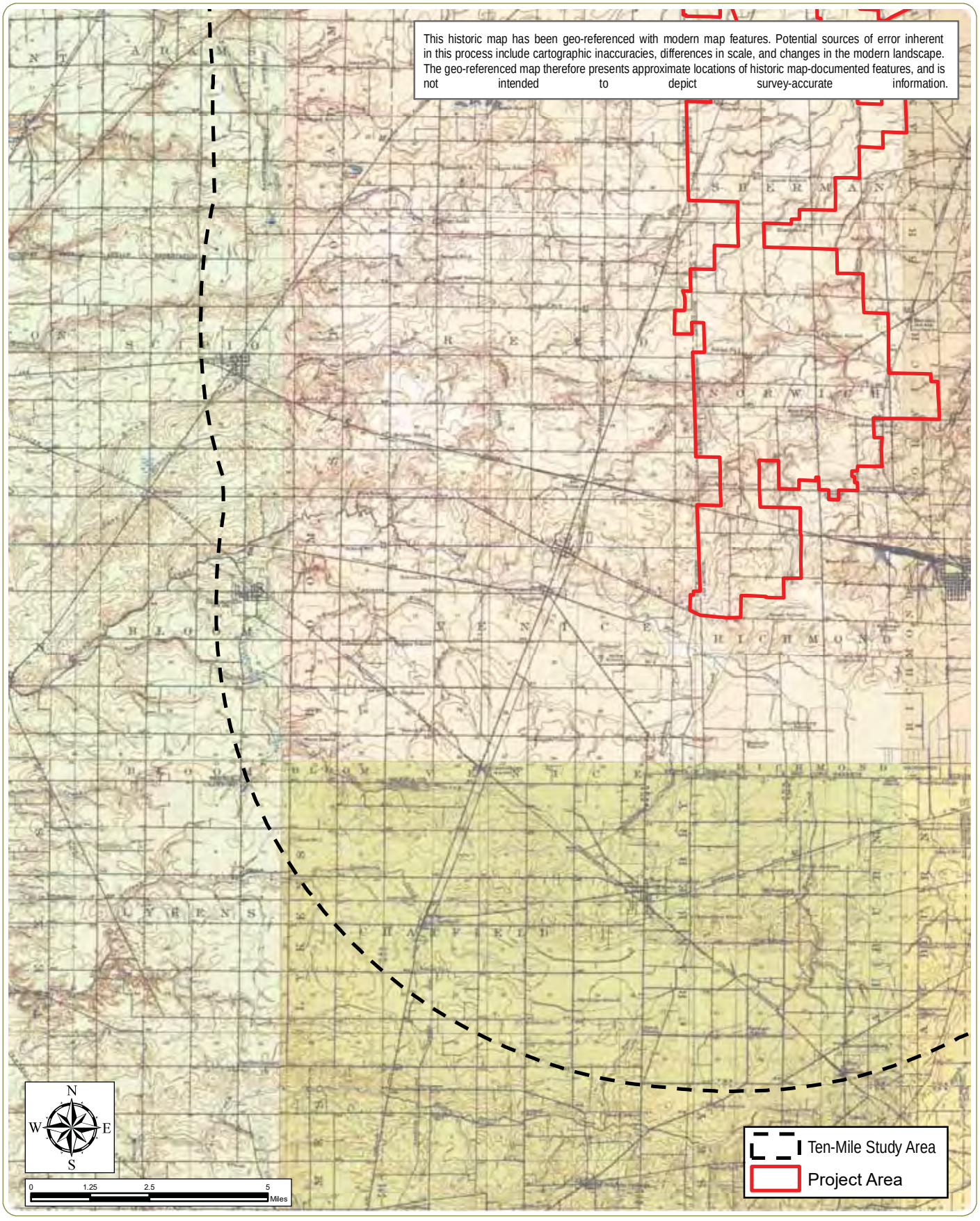

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 6: USGS 1900 *Oak Harbor*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion*; 1904 *Sandusky*; 1906 *Syrcamore, Tiffin*; 1908 *New London, Ashland*; 1915 *Bucyrus, Crestline, Norwalk, Siam*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles - Sheets

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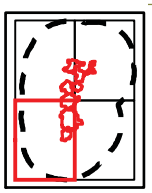

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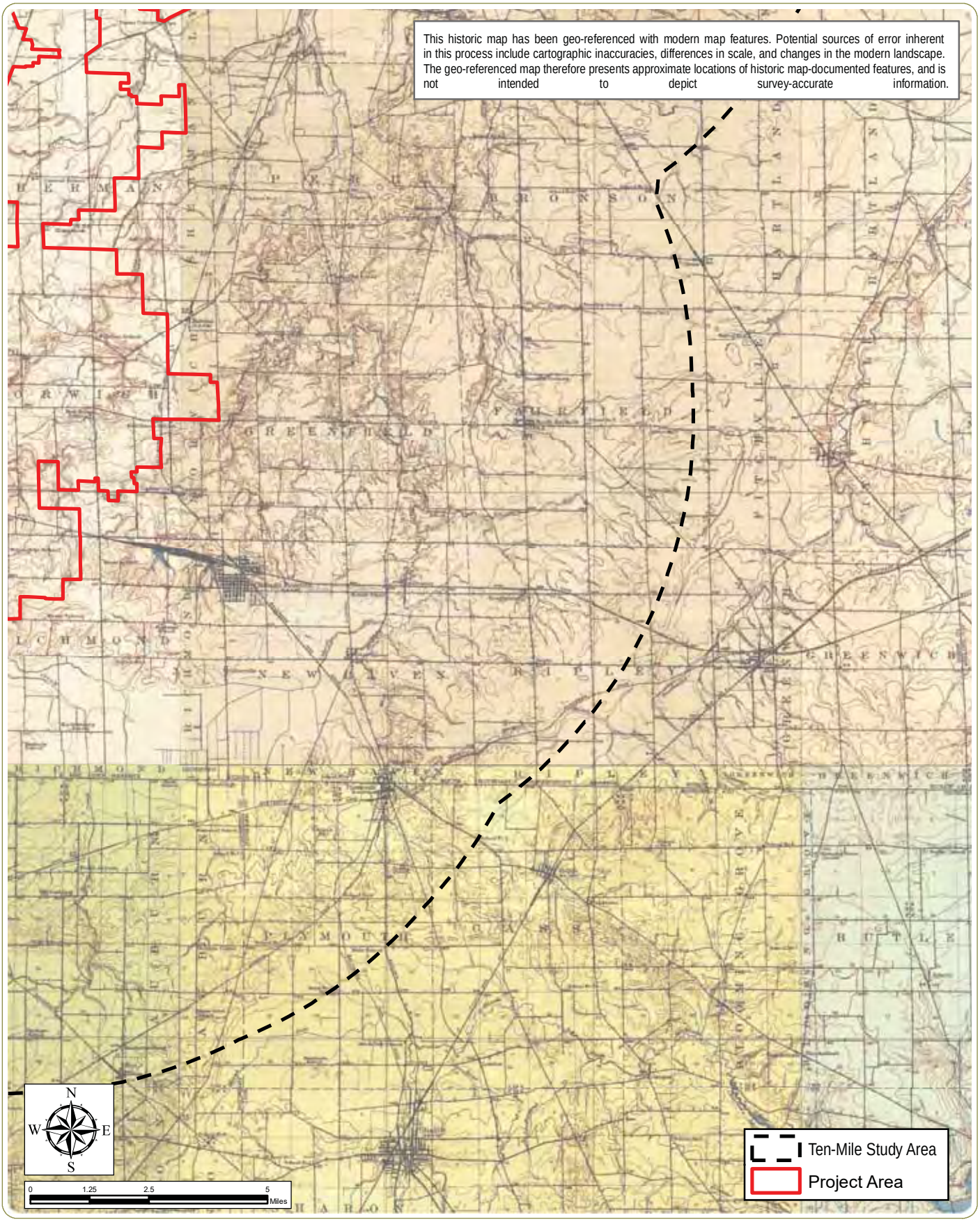

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 6: USGS 1900 *Oak Harbor*; 1903 *Bellevue, Fremont, Put In Bay, Vermillion*; 1904 *Sandusky*; 1906 *Syrcamore, Tiffin*; 1908 *New London, Ashland*; 1915 *Bucyrus, Crestline, Norwalk, Siam*; and 1919 *Kelleys Island, OH* 1:62500 Topographical Quadrangles - Sheets

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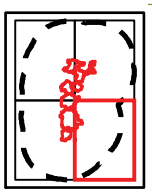

Sheet 4 of 4

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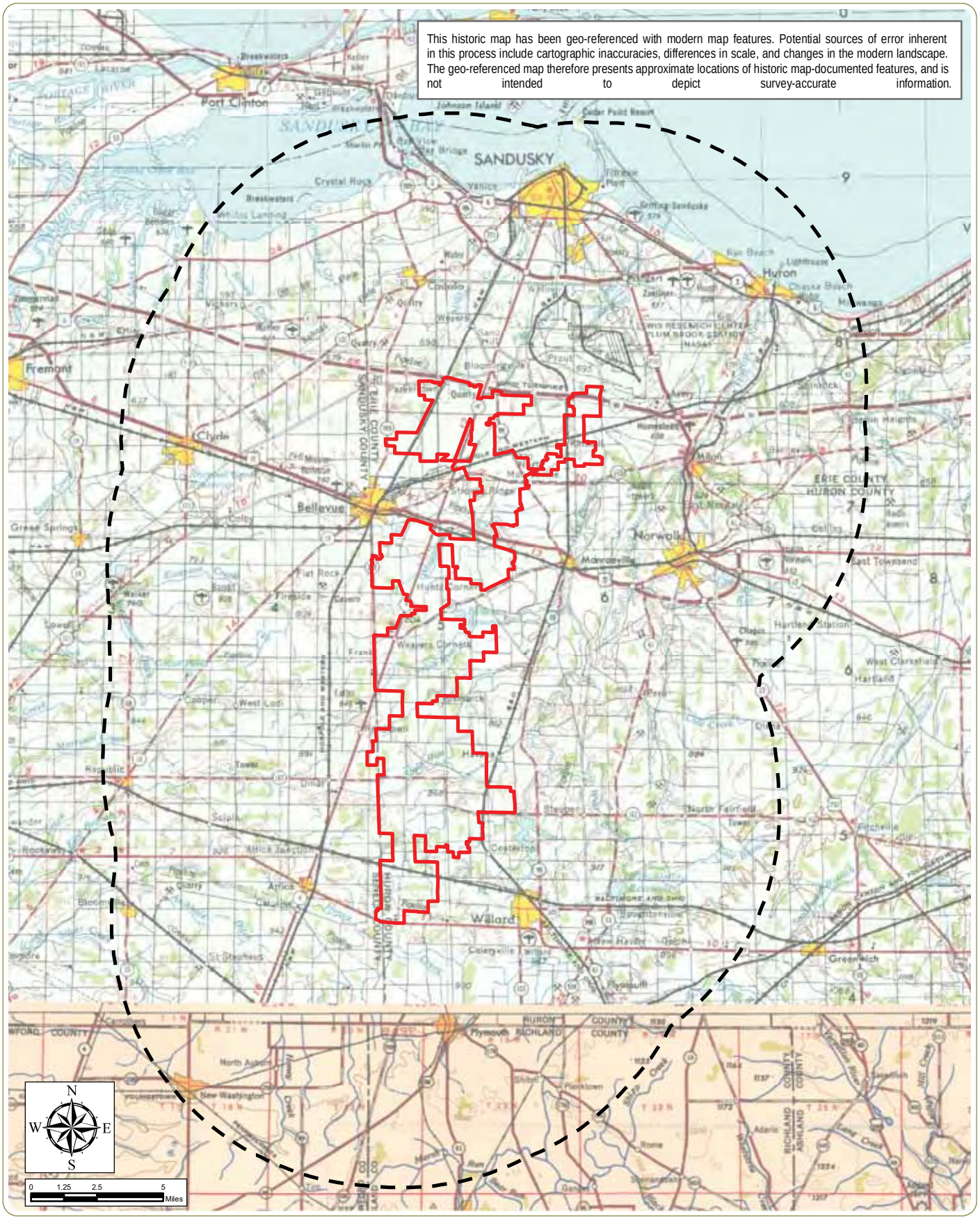

Emerson Creek Wind Farm

Erie, Huron, and Seneca Counties, Ohio

Figure 7: USGS 1950 *Marion, OH*; 1956 *Toledo, OH* 1:250000 Topographical Quadrangles.

Project Area

Ten-Mile Study Area

Notes: 1. USGS 1950 *Marion, OH;* 1956 *Toledo, OH* 1:250000 Topographical Quadrangles. 2. This map was generated in ArcMap on January 10, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Appendix A.

NRHP Listings within the Study Area

Appendix A. NRHP Listings within the Study Area

NRHP ID	RESOURCE NAME	ADDRESS	LOCATION	COUNTY	DISTANCE TO PROJECT AREA (MILES)
93000896	Hunts Corners Historic District	Jct of Sandhill Rd & SR 547	Monroeville	Huron	0.0
79001941	Heter Farm	NW of Bellevue	Bellevue	Seneca	0.7
74001473	Sycamore School	3rd & Sycamore Sts	Sandusky	Erie	1.0
79001828	Melville-Milne, William Gordon, House	319 Lawrence St	Sandusky	Erie	1.0
06000201	Tremont House	101-103 E Main St	Bellevue	Huron	1.4
87000639	Doerzbach, George J, House	1208-1210 Central Ave	Sandusky	Erie	1.4
74001532	Hosford, John, House	64 Sandusky St	Monroeville	Huron	1.7
83001963	Sts Peter & Paul Church and Rectory	Columbus Ave at E Jefferson St	Sandusky	Erie	1.9
74001530	Wright, John, Mansion	SR 113, W of SR 4	Bellevue	Huron	2.0
74001531	Brown, Seth, House	29 Brown St	Monroeville	Huron	2.0
75001440	Phoenix Mills	E of Steuben on Mill Rd	Steuben	Huron	2.7
74001467	Andrews, Ebenezer, House	200 S Main St	Milan	Erie	3.3
75001379	Christ Episcopal Church	Park & Ohio Sts	Huron	Erie	3.5
11000366	Huron School	325 Ohio St	Huron	Erie	3.5
74001468	Jenkins-Perry House	37 W Front St	Milan	Erie	3.5
75001381	Milan Historic District	Main & Church Sts, both sides of Front St, & Edison Dr	Milan	Erie	3.7
75001439	Benedict, Dr. David De Forest, House (DELISTED)	80 Seminary St	Norwalk	Huron	3.7
66000608	Edison, Thomas Alva, Birthplace	Edison Dr	Milan	Erie	3.8
75001382	Mitchell Historic District	115-137 & 118-136 Center St	Milan	Erie	4.6
07000582	Norwalk Memorial Hospital	269 W Main St	Norwalk	Huron	4.7
74001534	Huron County Courthouse And Jail	E Main St & Benedict Ave	Norwalk	Huron	4.7
74001533	Zion Episcopal Church	7 N Ridge St	Monroeville	Huron	4.8
75001392	Water Street Commercial Buildings	101-165 E Water St & 101-231 W Water St	Sandusky	Erie	4.9
82001456	Zion Lutheran Church	501-503 Columbus Ave	Sandusky	Erie	5.2
04001200	Huron County Children's Home	190 Benedict Ave	Norwalk	Huron	5.6
76001417	Engels And Krudwig Wine Company Buildings	220 E Water St	Sandusky	Erie	5.6
76001419	White, Samuel M., House	304 E Adams St	Sandusky	Erie	5.8
75001386	Engine House No. 3	Meigs St & Sycamore Line	Sandusky	Erie	6.1
83001961	Columbus Avenue Historic District	102-162 Columbus Ave	Sandusky	Erie	6.3
100001899	Downtown Sandusky Commercial Historic District	Bound by E. Shoreline, Decator, Washington Row and Hancock Street.	Sandusky	Erie	7.0
75001388	Exchange Hotel (DELISTED)	202-204 E Water St	Sandusky	Erie	7.2
82001426	Muller, Daniel C, Carousel	Midway at Cedar Point	Sandusky	Erie	7.2
74001619	McPherson, Maj. Gen. James B, House	300 E McPherson Hwy	Clyde	Sandusky	7.3
82001430	Old First Church	265 Jackson St	Sandusky	Erie	7.3
82001402	Grace Episcopal Church	315 Wayne St	Sandusky	Erie	7.3
82001388	Converse-Mertz Apartments	301-303 E Washington St	Sandusky	Erie	7.3
82001390	Cooke, Eleutheros, House	410 Columbus Ave	Sandusky	Erie	7.3
82001445	Stone's Block	202 Columbus Ave	Sandusky	Erie	7.4
82001415	Kuebeler-Stang Block	634 Hancock St	Sandusky	Erie	7.4
74001535	West Main Street District	Both sides of W Main St for 6 blocks from W edge of business district	Norwalk	Huron	7.4
82001383	Cable, Laurence, House	910 W Monroe St	Sandusky	Erie	7.4
82001411	Hubbard, Lester, House	134 E Adams St	Sandusky	Erie	7.4
87002506	Cable Park Historic District	1103-1234 Wayne St	Sandusky	Erie	7.4
82001427	Murschel House	1221 N Depot St	Sandusky	Erie	7.5
93000152	Willdred Flats	1116 Columbus Ave	Sandusky	Erie	7.5
79003646	Henny Barn	N side of Country Road 34 E of Northwestern RR tracks	Flat Rock	Seneca	7.5
85002802	Spacecraft Propulsion Research Facility	Lewis Research Center, Plum Brook Station	Sandusky	Erie	7.5
74001469	Lockwood, J C, House	30 Edison Dr	Milan	Erie	7.5
82001413	Jackson Jr High School	414 W Madison St	Sandusky	Erie	7.5
82001395	Erie County Jail	204 W Adams St	Sandusky	Erie	7.6
82001452	Wadsworth, James, House	519 Huron Ave	Sandusky	Erie	7.6
82001382	Cable, Frank, House	809 W Washington St	Sandusky	Erie	7.7
82001378	Bing's Hotel	302 E Water St	Sandusky	Erie	7.7
74001472	Mad River Block	1002-1018 W Adams St	Sandusky	Erie	7.7
99000094	Tubbs--Sourwine House	49 Railroad St	Plymouth	Richland	7.7
82001441	St Stephens' AME Church	312 Neil St	Sandusky	Erie	7.8
82001376	Bates-Cockrem House	325 Lawrence St	Sandusky	Erie	7.8
82001412	Hubbard, S B, House	1205 Columbus Ave	Sandusky	Erie	7.8
82001433	Root, Joseph, House	231 E Adams St	Sandusky	Erie	7.8
82001409	Hinde, James J, House	317 Fulton St	Sandusky	Erie	7.8

83001959	BOECKLING, G.A., (side-paddlewheel steamboat) (DELISTED)	Jackson Street Dock	Sandusky	Erie	7.8
82001424	Monroe School	328 E Monroe St	Sandusky	Erie	7.8
82001423	McKenster-Groff House	334 E Washington St	Sandusky	Erie	7.8
82001414	Kerber's Marine Grocery	1006 Tiffin Ave	Sandusky	Erie	7.8
75001385	Carnegie Library	Adams & Columbus Ave	Sandusky	Erie	7.9
82001443	Stoffel, Henry, Blacksmith Shop	321 E Market St (Rear)	Sandusky	Erie	7.9
82001420	Mallory, Ogden, House	410 Warren St	Sandusky	Erie	7.9
82001437	Simpson, William A., House	230 E Washington St	Sandusky	Erie	7.9
74001471	Follett-Moss-Moss Residences	404, 414, 428 Wayne St	Sandusky	Erie	7.9
75001390	Sloane, Rush R, House	403 E Adams St	Sandusky	Erie	7.9
83001962	Oakland Cemetery Chapel and Superintendent's House & Office	2917 Milan Rd	Sandusky	Erie	7.9
82001399	First Congregational Church	431 Columbus Ave	Sandusky	Erie	7.9
82001455	Wichman's Grocery	1118 W Washington St	Sandusky	Erie	7.9
82001421	March, George, House	532 Wayne St	Sandusky	Erie	7.9
82001438	St Mary's Girls Grade School	514 Decatur St	Sandusky	Erie	7.9
82001450	U S Post Office	West Washington & Jackson Sts	Sandusky	Erie	7.9
82001435	Schine State Theatre	101-109 Columbus Ave	Sandusky	Erie	7.9
82001439	St Mary's Rectory	429 Central Ave	Sandusky	Erie	7.9
82001398	First Church of Christ Scientist	128 E Adams St	Sandusky	Erie	7.9
82001451	Von Schulenburg, Ernst, House	922 W Adams St	Sandusky	Erie	7.9
82001407	Hinde & Dauch Paper Co	401 W Shoreline Dr	Sandusky	Erie	8.0
82001375	Barney, Freeland T., House	215-213 Fulton St	Sandusky	Erie	8.0
82001400	Fox's Brewery-Diamond Wine Co	334 Harrison St	Sandusky	Erie	8.0
82001408	Hinde & Dauch Paper Co	407 Decatur St	Sandusky	Erie	8.0
79001827	Beecher, Lucas, House	215 W Washington Row	Sandusky	Erie	8.0
82001386	Commercial Banking & Trust Co	115 E Washington Row	Sandusky	Erie	8.0
82001454	West Market School	211 Fulton St	Sandusky	Erie	8.0
75001384	Adams Street Double House	106-108 E Adams St	Sandusky	Erie	8.0
82001389	Cooke, Eleutheros, House	1415 Columbus Ave	Sandusky	Erie	8.0
96000116	Plymouth Greenlawn Cemetery Chapel	Greenlawn Cemetery	Plymouth	Richland	8.0
82001418	Lea Block	174-186 E Market St	Sandusky	Erie	8.0
74001470	Erie County Office Building	1202 Sycamore Line	Sandusky	Erie	8.0
82001394	Engine House No 1	901 W Market St	Sandusky	Erie	8.0
75001383	Abbott-Page House	2.5 mi NE of Milan on Mason Rd	Milan	Erie	8.0
82001397	Facer's Store	279 E Market St	Sandusky	Erie	8.0
82001410	Holy Angels Church	West Jefferson St at Tiffin Ave & Clinton St	Sandusky	Erie	8.0
02000061	Second Baptist Church	315 Decatur St	Sandusky	Erie	8.0
82001391	Curtis, William D, House	1411 Hayes Ave	Sandusky	Erie	8.0
82001381	Boy with the Boot Fountain	West Washington St Park	Sandusky	Erie	8.0
76001418	Ohio Soldiers' And Sailors' Home	NE of Sandusky btwn US 250 & S Columbus Ave	Sandusky	Erie	8.1
92001077	Mertz, John, House	610 W Washington St	Sandusky	Erie	8.1
82001447	Third National Bank	220 W Market St	Sandusky	Erie	8.1
91000971	Huron Harbor Light	West breakwater pierhead, end of Main St	Huron	Erie	8.1
82001448	Townsend, William T., House	515 W Washington St	Sandusky	Erie	8.1
82001432	Red Popcorn Wagon, The	102 W Washington Row	Sandusky	Erie	8.1
82001429	Ohio Theatre (DELISTED)	205-211 W Market St	Sandusky	Erie	8.1
82001401	Godfrey-Johnson House	417 Columbus Ave	Sandusky	Erie	8.1
82001374	Barker School	1925 Barker St	Sandusky	Erie	8.1
82001380	Boeckling Building	103-105 W Shoreline Dr	Sandusky	Erie	8.1
82001419	Lotz, Henry, Store	1119 W Washington St	Sandusky	Erie	8.1
82001416	Kuebeler, August, House	1319 Tiffin Ave	Sandusky	Erie	8.1
75001389	Lake Shore And Michigan Southern Railroad Depot	N Depot at Carr St	Sandusky	Erie	8.1
82001453	Wagner Palace	804-806 Hayes Ave	Sandusky	Erie	8.1
82001431	Osborne School	922 W Osborne St	Sandusky	Erie	8.1
03000327	Independent Order of Odd Fellows Temple	231 W Washington Row	Sandusky	Erie	8.1
78002057	Baltimore and Ohio Railroad Company Depot (DELISTED)	Washington and Warren Sts	Sandusky	Erie	8.1
82001393	Engels, Herman, House	117 Hancock St	Sandusky	Erie	8.1
82001385	Coliseum, The	Midway at Cedar Point	Sandusky	Erie	8.1
82001436	Simpson, Walter, House	521 Hancock St	Sandusky	Erie	8.1
05000578	Hotel Reiger	232 Jackson St	Sandusky	Erie	8.2
82001422	Marshall, James E., House	514 Wayne St	Sandusky	Erie	8.2
82001446	Taylor-Frohman House	1315 Columbus Ave	Sandusky	Erie	8.2
82001387	Cooke-Robertson House	412 Columbus Ave	Sandusky	Erie	8.2
82001404	Harper, Rice, House	403 E Washington St	Sandusky	Erie	8.2
82001444	Stoll, Adam J., House	531 Wayne St	Sandusky	Erie	8.2
82001428	No. 5 Fire Station	West Madison & Tiffin Ave	Sandusky	Erie	8.2
82001417	Lane, Ebenezer, House	318 Huron Ave	Sandusky	Erie	8.2
82001403	Graefe, Henry, House	1429 Columbus Ave	Sandusky	Erie	8.2

09000848	Feick Building	158-160 E Market St	Sandusky	Erie	8.2
83001960	Boeckling, G A, House	614 Columbus Ave	Sandusky	Erie	8.2
76001457	Macksville Tavern	Peru Hollow Rd	Peru	Huron	8.2
82001396	Erie County Oil Products Co	649 Tiffin Ave	Sandusky	Erie	8.2
82001405	Hemminger Saloon	333 W Market St	Sandusky	Erie	8.2
82001440	St Mary's School	410 W Jefferson St	Sandusky	Erie	8.3
82001434	Ross Hardware	708 Hancock St	Sandusky	Erie	8.3
82001442	Stang, John, House	629 Columbus Ave	Sandusky	Erie	8.3
82001392	Emmanuel Church	334 Columbus Ave	Sandusky	Erie	8.3
75001391	St Mary's Catholic Church	429 Central Ave	Sandusky	Erie	8.3
75001387	Erie County Infirmary	S of Sandusky on Columbus Rd	Sandusky	Erie	8.3
75002166	Baltimore and Ohio Railroad Depot (DELISTED)	B&O RR jct	Willard	Huron	8.3
82001379	Boalt, John, House	631 Wayne St	Sandusky	Erie	8.3
82001377	Bavarian Brewery	1816-1820 W Jefferson St	Sandusky	Erie	8.3
82001469	Dunton House	130 Benedict Ave	Norwalk	Huron	8.4
82001406	Hinde & Dauch Paper Co	409 W Water St	Sandusky	Erie	8.4
90000626	Great American Racing Derby	Midway, Cedar Point Amusement Park	Sandusky	Erie	9.8
90000625	Dentzel, William H., 1924 Carousel	Kiddieland, Cedar Point Amusement Park	Sandusky	Erie	9.8
82001425	Moss-Foster House	621 Wayne St	Sandusky	Erie	9.8
82001384	Campbell School	1215 Campbell St	Sandusky	Erie	9.8

Appendix B.

NRHP-Eligible Resources within the Study Area

Appendix B. NRHP-Eligible Resources within the Study Area

SERIAL NUMBER	OHPO ID	REFERENCE NUMBER	OHI NUMBER	OAI NUMBER	ADDRESS	LOCATION	COUNTY	DISTANCE TO PROJECT AREA (MILES)
986939					30 north edison	Milan	Erie	1.0
1028763	2009CRA8852		CRA0013203		SWC Third & Sandusky	Chatfield	Crawford	1.8
1007205			HUR0050103		60 East Main St	Norwalk	Huron	2.1
987747					3623 new washington rd	Chatfield	Crawford	2.1
986555					13316 riley rd	Milan	Erie	2.3
971415					232 JACKSON	SANDUSKY	Erie	2.5
958345					129 W MARKET STREET	SANDUSKY	Erie	2.9
938878					56 EAST HAVEN ST.	BLOOMVILLE	Seneca	3.7
0		00000033			131 W Buckeye St	Clyde	Sandusky	3.9
1000740			SAN0042112		1212-1214 W Main St	Bellevue	Sandusky	4.3
969025					48 BENEDICT AVE	NORWALK	Huron	4.7
1023747	2008HUR200		UNK0000000		3309 SR 99	Ridgefield (Township of)	Huron	4.8
1000740			SAN0046612		RT 20	Bellevue	Sandusky	4.8
958339					158 E MARKET ST	SANDUSKY	Erie	4.9
959352					234 COLUMBUS	SANDUSKY	Erie	4.9
1036657	2010ERI12197		UNK0000000		804 Bogart Rd	Huron	Erie	6.1
959740					202 WEST MARKET ST	SANDUSKY	Erie	6.7
1009391			ERI0013803		503 Bardshar Rd	Sandusky	Erie	6.8
1005836			HUR0002203		12 East Main St	Norwalk	Huron	7.2
995177	2002ERI5615	00000011		ER0516		Perkins (Township of)	Erie	7.3
993660					2205 cleveland rd	Sandusky	Erie	7.4
0		83004653			302 Wayne St.	Sandusky	Erie	7.5
959355					152 E MARKET	SANDUSKY	Erie	7.5
959355					154 E MARKET	SANDUSKY	Erie	7.5
0		65004896		ER0282			Erie	7.5
0		65004891		ER0279			Erie	7.5
958345					139 W MARKET STREET	Sandusky	Erie	7.6
1031004	2010ERI10545		ERI0000603		429 Central Ave	Sandusky	Erie	7.9
969025					48 1/2 BENEDICT AVE	NORWALK	Huron	8.1
938876					22 JEFFERSON ST.	BLOOMVILLE	Seneca	8.2
958338			ERI0076303		142 E MARKET ST	SANDUSKY	Erie	8.2
0		00000022	HUR0062008		210 Myrtle Ave	Willard	Huron	8.2
938877					21 JEFFERSON ST.	BLOOMVILLE	Seneca	8.2
0		65005008			Address restricted	Oxford Twnp	Erie	8.2
958335					238 COLUMBUS AVENUE	SANDUSKY	Erie	8.2
0		65007183		ER0280			Erie	8.2
0		65005009			Address restricted	Sandusky	Erie	8.2
959353					237 COLUMBUS	SANDUSKY	Erie	8.2
0		65007658		ER0054			Erie	8.4
958336					236 COLUMBUS AVENUE	SANDUSKY	Erie	9.1
958335					240 COLUMBUS AVENUE	Sandusky	Erie	9.3
958337					130 E MARKET ST	SANDUSKY	Erie	9.3
0		65007181	HUR0061103		16 Whittlesey Ave	Norwalk	Huron	9.9

Appendix C.

Ohio Historic Inventory Properties within the Study Area

Appendix C. Ohio Historic Inventory Properties within the Study Area

OHI ID	RESOURCE NAME	ADDRESS	LOCATION	COUNTY	DISTANCE TO PROJECT AREA (MILES)
ERI0213606		4315 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0213706	Robert Swanson	4409 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0213806	Gerry Schneider	4413 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0213906	Leonard H Barber	4501 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0214006	Ray J Schaefer	4511 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0214106		4515 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0214206	Robert & Janice Wallen	4520 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0214406	Dean Skinner	4603 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0215406	Kyle & Dena Heyman	4102 Higbee Rd	Oxford (Township of)	Erie	0.0
ERI0220106	Nancy Schnee	12206 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0220506		13006 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0220706		13211 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0221806	Tim Dunlap	11202 Ransom Rd	Oxford (Township of)	Erie	0.0
ERI0221906		11407 Ransom Rd	Oxford (Township of)	Erie	0.0
ERI0222006		11911 Ransom Rd	Oxford (Township of)	Erie	0.0
ERI0222106		St Rt 99	Oxford (Township of)	Erie	0.0
ERI0222206		11611 SR 99	Oxford (Township of)	Erie	0.0
ERI0222306		11101 St Rt 99	Oxford (Township of)	Erie	0.0
ERI0222406	Leroy William Clayton	11610 St Rt 99	Oxford (Township of)	Erie	0.0
ERI0222606	Katherine Winslow	7703 St Rt 113 W	Oxford (Township of)	Erie	0.0
ERI0224106	Clair Sargeant	6909 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0224506	Dahs	4516 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0224706		4011 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0224806		3820 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0224906		3711 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0225106		3403 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0227806		6106 Wood Rd	Oxford (Township of)	Erie	0.0
ERI0241106	Arlene H Kaiser	9211 Thomas Rd	Oxford (Township of)	Erie	0.0
ERI0241406	Arlene H Kaiser	9607 Thomas Rd	Oxford (Township of)	Erie	0.0
ERI0241506	Walter Lyons	9703 Thomas Rd	Oxford (Township of)	Erie	0.0
HUR0007201		3715 Prairie Rd	Lyme (Township of)	Huron	0.0
HUR0007301		5392 Opperman Rd	Lyme (Township of)	Huron	0.0
HUR0007401		3337 Sand Hill Rd	Lyme (Township of)	Huron	0.0
HUR0007501		3149 Sand Hill Rd	Hunts Corner	Huron	0.0
HUR0007601	Zion Evan Reformed Church	4552 SR 547	Hunts Corner	Huron	0.0
HUR0035701		6551 Young Rd	Lyme (Township of)	Huron	0.0
HUR0035905		1534 SR 4	Sherman (Township of)	Huron	0.0
HUR0036005		1640 SR 4	Sherman (Township of)	Huron	0.0
HUR0036105		1737 SR 4	Sherman (Township of)	Huron	0.0
HUR0036205		2100 SR 4	Sherman (Township of)	Huron	0.0
HUR0036305		abt 6510 SR 547	Sherman (Township of)	Huron	0.0
HUR0036505		6386 SR 547	Sherman (Township of)	Huron	0.0
HUR0036605		5830 SR 547	Sherman (Township of)	Huron	0.0
HUR0036705	Latham House	5725 SR 547	Sherman (Township of)	Huron	0.0
HUR0037005		2054 Dogtown Rd	Sherman (Township of)	Huron	0.0
HUR0037105	Daniels Road at Mud Run Bridge	Daniels Rd over Mud Run	Norwich (Township)	Huron	0.0
HUR0037908		abt 6500 US 224	Richmond (Township of)	Huron	0.0
HUR0038005	Brown House	6151 SR 162	Norwich (Township of)	Huron	0.0
HUR0038105		5131 N Greenfield Rd	Norwich (Township of)	Huron	0.0
HUR0038405	Link House	4968 Sherman-Norwich Rd	Sherman (Township of)	Huron	0.0
HUR0038505	Lagore House	6372 Sherman-Norwich Rd	Sherman (Township of)	Huron	0.0
HUR0038605		281 Section Line Rd	Norwich (Township of)	Huron	0.0
HUR0039105		1734? Section Line Rd	Sherman (Township of)	Huron	0.0
HUR0039205	J Westwick House	1078 Heyman Rd	Sherman (Township of)	Huron	0.0

HUR0039305		816 Heyman Rd	Sherman (Township of)	Huron	0.0
HUR0039405	Heyman Road at Frink Run Bridge	Heyman Rd over Frink Run	Sherman (Township)	Huron	0.0
HUR0039505	Heyman Rd Log House	across from 527 Heyman Rd	Sherman (Township of)	Huron	0.0
HUR0039605		5495 Greenfield Section Line Rd	Norwich (Township of)	Huron	0.0
HUR0039705	Norwich Twp Bldg	1339 Section Line Rd	Norwich (Township of)	Huron	0.0
HUR0039805		1542 Section Line Rd	Norwich (Township of)	Huron	0.0
HUR0039905		2018 Section Line Rd	Norwich (Township of)	Huron	0.0
HUR0043605		6213 Pontiac Section Line Rd	Sherman (Township of)	Huron	0.0
ERI0214806	Fred D Moffit Sr	4808 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0224006	Susan Py	6920 Strecker Rd	Oxford (Township of)	Erie	0.0
HUR0036405		6594 SR 547	Sherman (Township of)	Huron	0.0
ERI0220606	Jerry & Ann Querin	13207 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0215106	Helen E Tommas	5108 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0224606	Herman Ruben & Homer Stacker	10203 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0222506	Miller	11304 SR 99	Oxford (Township of)	Erie	0.0
ERI0214706	Central Erie & Supply	4617 Delematre Rd	Oxford (Township of)	Erie	0.0
ERI0224206	Carl & Sharon Meinart	6502 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0241206	Robert Justi	9220 Thomas Rd	Oxford (Township of)	Erie	0.0
ERI0225006		3402 Strecker Rd	Oxford (Township of)	Erie	0.0
ERI0242806	Deering Farms Inc	4412 Wood Rd	Oxford (Township of)	Erie	0.0
HUR0065301	Missler Property	2861 SR 4	Lyme (Township of)	Huron	0.0
ERI0222706	County Line Tavern	btwn St Rt 99 & Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0220206	Leroy & Anita Stotz	12511 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0220306	Thomas & Sue Lund	12610 Patten Tract Rd	Oxford (Township of)	Erie	0.0
ERI0220806	Gordon & Patricia Adams	13215 Patten Tract Rd	Oxford (Township of)	Erie	0.1
ERI0214506		Delematre Rd	Oxford (Township of)	Erie	0.1
ERI0241306	Arlene H Kaiser	9510 Thomas Rd	Oxford (Township of)	Erie	0.1
ERI0220406	James P Limbird Sr	12718 Patten Tract	Oxford (Township of)	Erie	0.1
ERI0214606		Delematre Rd	Oxford (Township of)	Erie	0.1
ERI0220906		13217 Patten Tract Rd	Oxford (Township of)	Erie	0.1
HUR0003101	Richard Meginson House	4211 Williams Rd	Lyme (Township of)	Huron	0.1
SEN0113905	Turner Warner Smokehouse	16931 E TR 186	Thompson (Township of)	Seneca	0.1
ERI0214306	Steven M Hurst	4602 Delematre Rd	Oxford (Township of)	Erie	0.1
HUR0038805	St Sebastian Parsonage	5570 Bismark Rd	Sherman (Township of)	Huron	0.1
ERI0221706		Ransom Rd	Oxford (Township of)	Erie	0.1
ERI0242706	Phyllis David	4516 Wood Rd	Oxford (Township of)	Erie	0.1
ERI0221106		13409 Patten Tract Rd	Oxford (Township of)	Erie	0.1
ERI0215006	John Barrett	4906 Delematre Rd	Oxford (Township of)	Erie	0.1
ERI0214906	Herman Stacker	4818 Delematre Rd	Oxford (Township of)	Erie	0.1
ERI0221006		Wside of Patten Tract Rd	Oxford (Township of)	Erie	0.1
ERI0219106	William Watson	9805 Patten Tract Rd	Oxford (Township of)	Erie	0.1
ERI0224406	Donald E & Della F Winkel	4805 Strecker Rd	Oxford (Township of)	Erie	0.2
HUR0038705	St Sebastian Roman Cath Church	5589 Bismark Rd	Sherman (Township of)	Huron	0.2
ERI0241606	Merry School House	Thomas Rd - S of Strecker Rd	Oxford (Township of)	Erie	0.2
ERI0220006	Harriet Schlessman	11917 Patten Tract Rd	Oxford (Township of)	Erie	0.2
HUR0035801		3030 SR 269	Lyme (Township of)	Huron	0.2
HUR0039005		886 Section Line Rd	Sherman (Township of)	Huron	0.2
HUR0036905		2379 Dogtown Rd	Sherman (Township of)	Huron	0.2
HUR0038905		5545 Bismark Rd	Sherman (Township of)	Huron	0.2
ERI0222806		St Rt 113 W	Oxford (Township of)	Erie	0.2
ERI0219906	Harriet Schlessman	11819 Patten Tract Rd	Oxford (Township of)	Erie	0.2
ERI0219006	Sharon Fear	9503 Patten Tract Rd	Oxford (Township of)	Erie	0.2
ERI0242406	Elmer & Betty Lewis	6815 Wood Rd	Oxford (Township of)	Erie	0.2
ERI0224306	Norbert B Wensink	4820 Strecker Rd	Oxford (Township of)	Erie	0.2
SEN0099605	Weber House	SR 269	Thompson (Township of)	Seneca	0.2
ERI0219206	Eugene & Donna Dahs	10211 Rd 1 Patten Tract	Oxford (Township of)	Erie	0.2
ERI0242606	Wensink Farms	4704 Wood Rd	Oxford (Township of)	Erie	0.2
ERI0241006		S Mason E side of Thomas	Oxford (Township of)	Erie	0.2
ERI0218906	Ray & Carolyn Osburn	9304 Patten Tract Rd	Oxford (Township of)	Erie	0.2

ERI0222906		3203 St Rt 113 W	Oxford (Township of)	Erie	0.2
ERI0240906	St Johns United Church of Christ	Cor Mason & Thomas	Oxford (Township of)	Erie	0.3
SEN0079105	Shrine of the Sorrowful Mother	4106 N State St	Thompson (Township of)	Seneca	0.3
ERI0215706		2901 Mason Rd	Oxford (Township of)	Erie	0.3
ERI0215806		3114 Mason Rd	Oxford (Township of)	Erie	0.3
ERI0229710		5144 SR 113	Groton (Township of)	Erie	0.3
ERI0221606	LuAnn Erneyn	9009 Ransom Rd	Oxford (Township of)	Erie	0.3
HUR0003002	M Stotz House	5105 SR 99		Huron	0.3
HUR0036805		2571 Dogtown Rd	Sherman (Township of)	Huron	0.4
HUR0037305	Howard J Smith House	4983 Dogtown Rd	Sherman (Township of)	Huron	0.4
HUR0038205		4440 N Greenfield Rd	Norwich (Township of)	Huron	0.4
ERI0223506	Strong	3413 SR 113 W	Oxford (Township of)	Erie	0.4
HUR0037205		788 Dogtown Rd	Sherman (Township of)	Huron	0.4
ERI0223406	John P Seaman	3508 113 W	Oxford (Township of)	Erie	0.4
HUR0040005		4418 N Greenfield Rd	Norwich (Township of)	Huron	0.4
ERI0223306		3809 113 W	Oxford (Township of)	Erie	0.4
ERI0219306	Melvin C Leonhard	10509 Patten Tract Rd	Oxford (Township of)	Erie	0.4
ERI0216006		3618 Mason Rd	Oxford (Township of)	Erie	0.4
ERI0215906		Mason Rd	Oxford (Township of)	Erie	0.4
ERI0216106		3814 Mason Rd	Oxford (Township of)	Erie	0.4
ERI0221506	Kenneth Chill	8906 Ransom Rd	Oxford (Township of)	Erie	0.4
HUR0044108		3265 Section Line Rd	Richmond (Township of)	Huron	0.5
ERI0219806		11703 Patten Tract Rd	Oxford (Township of)	Erie	0.5
HUR0038305		4376 N Greenfield Rd	Norwich (Township of)	Huron	0.5
ERI0219406	Donald & Miriam Tommas	10605 Patten Tract Rd	Oxford (Township of)	Erie	0.5
ERI0225206		2619 Strecker Rd	Oxford (Township of)	Erie	0.5
HUR0061501	Blankemeier House	abt 950? Monroe St	Bellevue	Huron	0.5
ERI0213506	Scott & Geraldine Schaeffer	3613 Bryan Rd	Oxford (Township of)	Erie	0.5
ERI0225306	Sleepy Knoll Suffolks	2610 Strecker Rd	Oxford (Township of)	Erie	0.5
ERI0219706	Lois Sargeant	11609 Patten Tract Rd	Oxford (Township of)	Erie	0.5
ERI0215206	Eloise Wright	3603 Harris Rd	Oxford (Township of)	Erie	0.5
ERI0223006	Leber	4911 SR 113	Oxford (Township of)	Erie	0.5
ERI0223706	Theodore & Mary Wyar	3103 St Rt 113	Oxford (Township of)	Erie	0.5
ERI0241706	Barn	Thomas Rd	Oxford (Township of)	Erie	0.5
ERI0223106	Greene	4819 SR 113 W	Oxford (Township of)	Erie	0.6
HUR0043705		4675 Egypt Rd	Centerton	Huron	0.6
ERI0223206	Clarence L Graves Jr	4613 SR 113 W	Oxford (Township of)	Erie	0.6
HUR0037405		4778 Dogtown Rd	Sherman (Township of)	Huron	0.6
ERI0221206		4011 Peru Center Rd	Oxford (Township of)	Erie	0.6
HUR0043805		4580 Egypt Rd	Centerton	Huron	0.6
ERI0221406	Jennet Stewart	8711 Ransom Rd	Oxford (Township of)	Erie	0.6
ERI0223606		3203 113 W	Oxford (Township of)	Erie	0.6
ERI0218806	William & Lauren Stanley	9110 Patten Tract Rd	Oxford (Township of)	Erie	0.6
HUR0043905		4572 Egypt Rd	Centerton	Huron	0.6
ERI0241806	Clyde Jr & Diana Boggs	11217 Thomas Rd	Oxford (Township of)	Erie	0.6
SEN0111412	Clinton Beamer House	3124 N SR 4	Reed (Township of)	Seneca	0.6
HUR0061801	Leber Farm Complex	abt 627 Southwest St (SR 629)	Bellevue	Huron	0.7
ERI0241906	Carol Seaman	11219 Thomas Rd	Oxford (Township of)	Erie	0.7
ERI0213406	Ron Cull	3408 Bryan Rd	Oxford (Township of)	Erie	0.7
SEN0054405	Clarence Drown Farm	16327 CR 34	Thompson (Township of)	Seneca	0.7
ERI0215506	Chase & Elizabeth Heyman	12708 Huber Rd	Oxford (Township of)	Erie	0.7
ERI0218706	Kenneth & Elizabeth Tunnel	8920 Patten Tract Rd	Oxford (Township of)	Erie	0.7
ERI0221306	Larry C Stewart	8508 Ransom Rd	Oxford (Township of)	Erie	0.7
ERI0215306	Martha Hutchinson	2512 Higbee Rd	Oxford (Township of)	Erie	0.8
SEN0113505	Walter Dendinger House	16460 E CR 46	Thompson (Township of)	Seneca	0.8
ERI0219506	Scott & Roberta Love	10916 Patten Tract Rd	Oxford (Township of)	Erie	0.8
HUR0031005		1105 SR 99		Huron	0.8
ERI0219606	Lois Schlessman	11209 Patten Tract Rd	Oxford (Township of)	Erie	0.8
HUR0044408		6215 Bull Head Rd	Richmond (Township of)	Huron	0.8

ERI0215606	Chase & Elizabeth Heyman	13017 Huber Rd	Oxford (Township of)	Erie	0.8
ERI0242006	Robert & Ruth Buffenbarger	11316 Thomas Rd	Oxford (Township of)	Erie	0.8
HUR0007001		914 E Main St	Bellevue	Huron	0.8
ERI0225406		2302 Strecker Rd	Oxford (Township of)	Erie	0.9
HUR0037808		5453 US 224	Richmond (Township of)	Huron	0.9
ERI0242106	Richard Leber	11510 Thomas Rd	Oxford (Township of)	Erie	0.9
SEN0098505	Storage Shed	7353 CR 29	Flat Rock	Seneca	0.9
ERI0242206	Ivan & Teri Basic	11902 Thomas Rd	Oxford (Township of)	Erie	0.9
ERI0213206	Robert Raymond Jr & Pam J Raymond	2713 Bryan Rd	Oxford (Township of)	Erie	0.9
ERI0213306	John & Shirley Wallrabenstein	2907 Bryan Rd	Oxford (Township of)	Erie	0.9
SEN0098605	Ralph Newly Admin Bldg	7353 CR 29	Flat Rock	Seneca	0.9
HUR0044308	Richmond United Methodist Church	6034 Bull Head Rd	Richmond (Township of)	Huron	0.9
SEN0098805	Activities Dept	7353 CR 29	Flat Rock	Seneca	1.0
HUR0063601	Betty Schneer House	423 Southwest St	Bellevue	Huron	1.0
SEN0054505	Clarence Drown Barn	8531 N CR 29	Thompson (Township of)	Seneca	1.0
SEN0098305	Steer Barn	7353 CR 29	Flat Rock	Seneca	1.0
SEN0113405	Old St Michael's School	16223 E CR 46	Thompson (Township of)	Seneca	1.0
SEN0113805	Jacob Gerber House	11675 E TR 136	Thompson (Township of)	Seneca	1.0
SEN0098705	Shop	7353 CR 29	Flat Rock	Seneca	1.0
HUR0063501	Pat O'Brien House	421 Southwest St	Bellevue	Huron	1.0
SEN0099005	Oak Manor	7353 CR 29	Flat Rock	Seneca	1.0
SEN0099205	Flat Rock Children's Center	7353 CR 29	Flat Rock	Seneca	1.0
SEN0098205	Flat Rock Children's Ctr Main	7353 CR 29	Flat Rock	Seneca	1.0
SAN0001412	Faith Bible Church	400 S West St	Bellevue	Sandusky	1.0
SEN0054605	Clarence Drown House	8531 N CR 29	Thompson (Township of)	Seneca	1.0
HUR0026305	St Peter's Lutheran Church	1872 Sand Hill Rd	Peru (Township of)	Huron	1.0
HUR0037505	ER Weber House	900 Thomas Rd	Sherman (Township of)	Huron	1.0
SEN0099105	Buckeye Manor	7353 CR 29	Flat Rock	Seneca	1.0
ERI0218606		8612 Patten Tract Rd	Oxford (Township of)	Erie	1.0
SEN0098405	Sunshine Home	7353 CR 29	Flat Rock	Seneca	1.1
HUR0007101		701 E Main St	Bellevue	Huron	1.1
SAN0052312	Brian & Pamela Frost House	302 Southwest St	Bellevue	Sandusky	1.1
SEN0100105	Blacksmith Shop	Main St	Flat Rock	Seneca	1.1
SEN0112605	George F Wetzel House	7816? Main St	Thompson (Township of)	Seneca	1.1
SEN0098905	Brick Duplex	7384 CR 29	Flat Rock	Seneca	1.1
SAN0052212	Marilyn Green House	296 Southwest St	Bellevue	Sandusky	1.1
SEN0099305	Sleeping Quarters	7440 CR 29	Flat Rock	Seneca	1.1
SAN0052112	Gene & Leann Norman House	292 Southwest St	Bellevue	Sandusky	1.1
SAN0001612		276 S West St	Bellevue	Sandusky	1.1
HUR0027405		1830 Sand Hill Rd	Peru (Township of)	Huron	1.1
ERI0223806	Robert & Marjorie Roe	St Rt 113 & Thomas Rd	Oxford (Township of)	Erie	1.1
SAN0001512		280 S West St	Bellevue	Sandusky	1.1
ERI0242306	Jerry & Cynthia Strong	12008 Thomas Rd	Oxford (Township of)	Erie	1.1
ERI0225506		2001 Strecker Rd	Oxford (Township of)	Erie	1.1
ERI0216306	Central Erie & Supply	Central Erie & Supply	Oxford (Township of)	Erie	1.1
SEN0055405	Roman Miller Sr House	16071 E CR 46	Frank	Seneca	1.2
SAN0042612	Vannest House	266 S West St	Bellevue	Sandusky	1.2
SEN0100005	Thomas Miller Farm	16050 E CR 46	Thompson (Township of)	Seneca	1.2
SAN0042512		250 S West St	Bellevue	Sandusky	1.2
ERI0225606	Theodore & Donna Gastier	1902 Strecker Rd	Oxford (Township of)	Erie	1.2
ERI0216206		4220 Mason Rd	Oxford (Township of)	Erie	1.2
HUR0026405	Baltimore & Ohio Viaduct at Slate Run	B&O RR over Slate Run	Peru (Township)	Huron	1.3
ERI0225706		1813 Strecker Rd	Oxford (Township of)	Erie	1.3
SEN0099805	Schneider Farm	5150 N CR 29	Thompson (Township of)	Seneca	1.3
SAN0042912	Seven-Liners Building	233 York St	Bellevue	Sandusky	1.3
SAN0042412		206 S West St	Bellevue	Sandusky	1.3
HUR0061305	SR 99 Bridge	SR 99 (abandoned)	Greenfield (Township)	Huron	1.3

ERI0218506	Faith M Pooch	8419 Patten Tract Rd	Oxford (Township of)	Erie	1.3
SAN0043012	Griffin House	229 York St	Bellevue	Sandusky	1.3
SAN0042812	Day House	223 York St	Bellevue	Sandusky	1.3
ERI0218406	Donald & Joan Finneran	8307 Patten Tract Rd	Bloomingville	Erie	1.3
SAN0037112	Cliff Strecker Garage	205 W Center St	Bellevue	Sandusky	1.3
HUR0062101	US Post Office	140 N Sandusky St	Bellevue	Huron	1.3
SAN0042712	Gibson House	211 York St	Bellevue	Sandusky	1.3
ERI0218306	Barn, Patten Tract Road	Patten Tract Rd		Erie	1.4
SAN0038312	Jacobs House	515 Kilbourne St	Bellevue	Sandusky	1.4
SAN0042312	Cliff Reitz Electric	106 S West St	Bellevue	Sandusky	1.4
SAN0038412	Lilli House	603 Kilbourne St	Bellevue	Sandusky	1.4
SAN0038512	Continental Cablevision	101-103 W Main St	Bellevue	Sandusky	1.4
SEN0112705	Joseph McNitt House	6353 N CR 32	Thompson (Township of)	Seneca	1.4
SAN0038612	Doctor Pifer Bldg & Resco Bldg	105-107 W Main St	Bellevue	Sandusky	1.4
SAN0038812	Mardi Gras Lounge	109 W Main St	Bellevue	Sandusky	1.4
SAN0039012		111-115 W Main St	Bellevue	Sandusky	1.4
SAN0038112		231 Kilbourne St	Bellevue	Sandusky	1.4
SAN0037712	Fennwood Carwash & Laundromat	125 Kilbourne St	Bellevue	Sandusky	1.4
SAN0039112	Lee E Meyers Law Office	117 W Main St	Bellevue	Sandusky	1.4
SAN0038212		504 Kilbourne St	Bellevue	Sandusky	1.4
SAN0038712	Bellevue City Offices	108 W Main St	Bellevue	Sandusky	1.4
SAN0000612		532 Kilbourne St	Bellevue	Sandusky	1.4
SAN0038012		227 Kilbourne St	Bellevue	Sandusky	1.4
SAN0038912		110-114 W Main St	Bellevue	Sandusky	1.4
ERI0225806	Leroy & Anita Stotz	1705 Strecker Rd	Oxford (Township of)	Erie	1.4
ERI0213106	John Dennis Wallrabenstein	2512 Bryan Rd	Oxford (Township of)	Erie	1.4
SAN0042212		109-113 N West St	Bellevue	Sandusky	1.4
ERI0216706		5510 Mason Rd	Oxford (Township of)	Erie	1.4
SAN0037612	Goodwill Store	108-116 Kilbourne St	Bellevue	Sandusky	1.4
SAN0037312	Toni's Discount Center	118-120 Kilbourne St	Bellevue	Sandusky	1.4
SAN0037512		104-106 Kilbourne St	Bellevue	Sandusky	1.4
SAN0037412		100 Kilbourne St	Bellevue	Sandusky	1.4
SAN0037812		136 Kilbourne St	Bellevue	Sandusky	1.4
SAN0039212	Engine House No 1	200 W Main St	Bellevue	Sandusky	1.4
SAN0037912	Val Schmidt Office Bldg	212 Kilbourne St	Bellevue	Sandusky	1.4
ERI0218006	Mayse	6118 Mason Rd	Oxford (Township of)	Erie	1.4
ERI0217806	Walters	6116 Mason Rd	Oxford (Township of)	Erie	1.4
SAN0039612	Fulton & Son Insurance Agency	213-215 W Main St	Bellevue	Sandusky	1.4
SAN0039312	Aigler Bldg	202 W Main St	Bellevue	Sandusky	1.4
ERI0216606	Robert Schwanger Jr	5210 Mason Rd	Oxford (Township of)	Erie	1.4
ERI0218206	Margaret Kelly	6319 Mason Rd	Oxford (Township of)	Erie	1.4
ERI0217406	Schoewe	6104 Mason Rd	Oxford (Township of)	Erie	1.4
HUR0044005		4456 Town Line Rd	Norwich (Township of)	Huron	1.4
SAN0039412	Liberty Post-American Legion	206-208 W Main St	Bellevue	Sandusky	1.4
ERI0218106	David Kelly	6315 Mason Rd	Oxford (Township of)	Erie	1.4
HUR0007702		307 Monroe St	Monroeville	Huron	1.4
SAN0044812	Schoen Stone House	2895 CR 308	York (Township of)	Sandusky	1.4
SAN0039512		210-212 W Main St	Bellevue	Sandusky	1.4
ERI0217906		6117 Mason Rd	Oxford (Township of)	Erie	1.4
SAN0050312	Moyer Stone House	2940 CR 308	York (Township of)	Sandusky	1.4
ERI0217506	Parker	6105 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0216806	Bloomingville Cemetery	Mason Rd by Taylor Rd	Oxford (Township of)	Erie	1.5
ERI0217706		6113 Mason Rd	Oxford (Township of)	Erie	1.5
HUR0044208		5426 Bull Head Rd	New London	Huron	1.5
ERI0216406		5002 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0217606	Edward	6109 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0223906	James H Steiber	2111 SR 113 W	Oxford (Township of)	Erie	1.5
ERI0217306	Danklefsen	6009 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0216906	Muscioni	5811 Mason Rd	Oxford (Township of)	Erie	1.5

ERI0217206		6003 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0217106		5917 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0217006	Ebert	5909 Mason Rd	Oxford (Township of)	Erie	1.5
ERI0216506	Charles & Lisa Ohlemacher	5119 Mason Rd	Oxford (Township of)	Erie	1.5
SAN0039712	Heal House	230 W Main St	Bellevue	Sandusky	1.5
SAN0039812	Steele Pelphrey & Co	243 W Main St	Bellevue	Sandusky	1.5
ERI0225906		5801 Taylor Rd	Oxford (Township of)	Erie	1.5
SAN0000712		250 W Main St	Bellevue	Sandusky	1.5
ERI0262803	Gas Meter House	Jct Ransom & W Scheid Rds	Perkins (Township of)	Erie	1.5
ERI0240706		5715 Taylor Rd	Oxford (Township of)	Erie	1.6
SAN0000912	St Paul's Episcopal Church	W Main St at Atwood Terrace	Bellevue	Sandusky	1.6
SAN0040012	Harris Funeral Home	289 W Main St	Bellevue	Sandusky	1.6
SAN0000812		278 W Main St	Bellevue	Sandusky	1.6
SAN0040112	First Church of Christ Scientist	295 W Main St	Bellevue	Sandusky	1.6
SAN0001012		284 W Main St	Bellevue	Sandusky	1.6
SAN0040212		301 W Main St	Bellevue	Sandusky	1.6
SAN0039912	Stambaugh House	288 W Main St	Bellevue	Sandusky	1.6
SAN0037212	Stein House	727 Gardner St	Bellevue	Sandusky	1.6
ERI0213006	Verna M Crecelius	2202 Bryan Rd	Oxford (Township of)	Erie	1.6
HUR0026205		2106 SR 99	Peru (Township of)	Huron	1.6
ERI0240806	George & Mary Schmidt	5517 Taylor Rd	Oxford (Township of)	Erie	1.6
SAN0001312		309 N West St	Bellevue	Sandusky	1.6
HUR0002902		132 N Ridge St	Monroeville	Huron	1.6
ERI0237503	Magazines/Igloos		Perkins (Township of)	Erie	1.6
SAN0040512	Hickey House	405 W Main St	Bellevue	Sandusky	1.7
HUR0025702	Zion Episcopal Church Parsonage	7 N Ridge St	Monroeville	Huron	1.7
ERI0263603	Gas Analyzer Building	Jct Box Factory & N Magazine Rds	Perkins (Township of)	Erie	1.7
SAN0040312		318 W Main St	Bellevue	Sandusky	1.7
HUR0026602		19 S Ridge St	Monroeville	Huron	1.7
SAN0001112		415 W Main St	Bellevue	Sandusky	1.7
ERI0262303	HTF Substation F/Substation E	Jct N Magazine & Emergency B Rds	Perkins (Township of)	Erie	1.7
ERI0234503	HTF Test Building	Jct Box Factory & N Magazine Rds	Perkins (Township of)	Erie	1.7
SAN0040812	Bellevue Professional Bldg	423 W Main St	Bellevue	Sandusky	1.7
SAN0040412		400 W Main St	Bellevue	Sandusky	1.7
HUR0030905	Bauman Road Bridge	Bauman Rd over Huron River	Greenfield (Township)	Huron	1.7
ERI0262203	HTF Boiler and Electric Switchgear House	Jct N Magazine & Emergency B Rds	Perkins (Township of)	Erie	1.7
SAN0040612	Meyers House	412 W Main St	Bellevue	Sandusky	1.7
SAN0041012		429 W Main St	Bellevue	Sandusky	1.7
HUR0026502	Monroeville Elec Substation	73 S Ridge St	Monroeville	Huron	1.7
HUR0026102		69 S Ridge St	Monroeville	Huron	1.7
ERI0262903	Igloo	S side Center Magazine Rd	Perkins (Township of)	Erie	1.7
SAN0040712		420 W Main St	Bellevue	Sandusky	1.7
SEN0091005	France Stone Quarry	CR 34	Flat Rock	Seneca	1.7
SAN0041112	Stevens House	445 W Main St	Bellevue	Sandusky	1.7
SAN0040912	Biebricher House	426 W Main St	Bellevue	Sandusky	1.7
HUR0027605		3520 Pontiac Section Line Rd	Peru (Township of)	Huron	1.7
SAN0001212		455 W Main St	Bellevue	Sandusky	1.7
HUR0065102	Schug Family Farm	3309 SR 99		Huron	1.8
HUR0037708		4859 US 224	Richmond (Township of)	Huron	1.8
SAN0041212		454 W Main St	Bellevue	Sandusky	1.8
SEN0113605	John Werley House	15437 E CR 46	Thompson (Township of)	Seneca	1.8
SAN0041412		503 W Main St	Bellevue	Sandusky	1.8
SAN0041312		484-486 W Main St	Bellevue	Sandusky	1.8
HUR0045008		5136 Bull Head Rd	Richmond (Township of)	Huron	1.8
ERI0263910	Schaeffer Bank Barn	12411 Portland Rd	Bellevue	Erie	1.9

SAN0041512		525 W Main St	Bellevue	Sandusky	1.9
SAN0041612		533 W Main St	Bellevue	Sandusky	1.9
SAN0041712		537 W Main St	Bellevue	Sandusky	1.9
ERI0263810	Castalia Microwave Repeater Station	NEC Portland Rd & Southwest Rd	Groton (Township of)	Erie	1.9
HUR0007902		77 Monroe St	Monroeville	Huron	2.0
HUR0011102		1513 Jacob Rd		Huron	2.0
HUR0008002		78 Monroe St	Monroeville	Huron	2.0
HUR0007802	Congreg Comm Church	29 Chapel St	Monroeville	Huron	2.0
HUR0003202	St Joseph's Roman Cath Church	66 Chapel St	Monroeville	Huron	2.0
ERI0233503	C Site Shop Building	W side Ransom Rd, N of Taylor Rd	Perkins (Township of)	Erie	2.0
HUR0003302		32 Chapel St	Monroeville	Huron	2.0
HUR0027705	Holloway House	1027 SR 99	Peru (Township of)	Huron	2.0
HUR0027505		2621 SR 99	Peru (Township of)	Huron	2.0
ERI0263003	Sewage Lift Station	N side Box Factory Rd	Perkins (Township of)	Erie	2.1
HUR0008102	Drake Funeral Home	29 N Main St	Monroeville	Huron	2.1
SAN0041912	Bazel House	753 W Main St	Bellevue	Sandusky	2.1
SEN0090705	Rosella Meyer House	15120 CR 46	Thompson (Township of)	Seneca	2.1
SAN0041812		746 W Main St	Bellevue	Sandusky	2.1
HUR0028505		644 SR 99	Peru (Township of)	Huron	2.1
SEN0099405	Isaac Casbeer House	15488 E TR 178	Thompson (Township of)	Seneca	2.1
SAN0042012		754 W Main St	Bellevue	Sandusky	2.1
SEN0113305	Abram Sherck House	5509 N TR 82	Thompson (Township of)	Seneca	2.1
HUR0008202	Main St Comm Blocks	6-10 S Main St	Monroeville	Huron	2.1
HUR0011002	Railroad House	30 S Main St	Monroeville	Huron	2.2
SEN0112805	Emmanuel Good House	6645 N TR 82	Thompson (Township of)	Seneca	2.2
HUR0003402	Coney Hill	161 S Main St (Peru Ctr Rd)	Monroeville	Huron	2.2
HUR0037608	Joseph H Beelman House	4625 US 224	Richmond (Township of)	Huron	2.2
ERI0262703	Gas Meter House	E side Ransom Rd, S of Fox Rd	Perkins (Township of)	Erie	2.2
SEN0099505	Jacob Kern House	14801 E CR 34	Thompson (Township of)	Seneca	2.3
ERI0226707	Alan Hudson House	9510 US 250	Milan (Township of)	Erie	2.3
HUR0025802	Standardsburg Road Bridge	Standardsburg Rd over Huron Rvr	Ridgefield (Township)	Huron	2.3
HUR0027305		2291 Hettle Rd	Peru (Township of)	Huron	2.3
ERI0226807	John E Pruitt House	9410 US 250	Milan (Township of)	Erie	2.3
HUR0011202		4528 Huber Rd		Huron	2.3
SAN0046612		RT 20	Bellevue	Sandusky	2.3
ERI0226907		9312 US 250	Milan (Township of)	Erie	2.3
HUR0044508		4880 Weis Rd	Richmond (Township of)	Huron	2.3
ERI0227007	St John's Lutheren Chruch	110 Scheid Rd	Milan (Township of)	Erie	2.4
ERI0263403		W side Cryogenic Rd	Perkins (Township of)	Erie	2.4
HUR0044608		7___ Coder Rd		Huron	2.4
ERI0263203		N side Fox Rd	Perkins (Township of)	Erie	2.4
ERI0263703	CCL Interconnect Building	W side Cryogenic Rd	Perkins (Township of)	Erie	2.4
ERI0263303	CCL1 South, CCL2 North	W side Cryogenic Rd	Perkins (Township of)	Erie	2.4
ERI0226607		10714 US 250	Milan (Township of)	Erie	2.4
SEN0112905	John M Krauss House	14706 E TR 178	Thompson (Township of)	Seneca	2.4
HUR0003502	Ingleside	2688 US 20	Monroeville	Huron	2.5
HUR0018608		B & O RR right of way	Willard	Huron	2.5
HUR0028402		2831 Peru Center Rd		Huron	2.5
ERI0228107	Gottwald House	11005 Huron Avery Rd	Milan (Township of)	Erie	2.5
HUR0030505		2742 SR 162	Steuben	Huron	2.5
HUR0030605		1123 Peru Center Rd		Huron	2.5
ERI0226507		11004 US 250	Milan (Township of)	Erie	2.5
HUR0027805	Perry House	3452 Snyder Rd	Peru (Township of)	Huron	2.5
ERI0228503		6807 Columbus-Sandusky Rd	Perkins (Township of)	Erie	2.6
HUR0031705		2730 Hanville Corners Rd		Huron	2.6
ERI0226407		11108 US 250	Milan (Township of)	Erie	2.6
HUR0030405	Greenfield Twp Hall	1322 Peru Center Rd	Steuben	Huron	2.6

ERI0238203	Warehouse	Unnamed Rd, S of Maintenance Rd	Perkins (Township of)	Erie	2.6
HUR0030705		926 Peru Center Rd		Huron	2.6
HUR0030805		591 Peru Center Rd		Huron	2.6
SAN0043812	Heter Bank Barn	6374 E CR 113	York (Township of)	Sandusky	2.6
SEN0122417	Village of Attica Waterworks Standpipe	34 Venice St	Attica	Seneca	2.6
ERI0226307	Weilnau House	11206 US 250	Milan (Township of)	Erie	2.6
ERI0237103	Substation B Support Building		Perkins (Township of)	Erie	2.6
ERI0227204	Wilma & Jeanette Walz House	8402 SR 250	Huron (Township of)	Erie	2.6
ERI0238103	Warehouse	Unnamed Rd, S of Maintenance Rd	Perkins (Township of)	Erie	2.6
HUR0018508		27 Washington St	Willard	Huron	2.6
HUR0029905		2680 SR 162	Steuben	Huron	2.6
HUR0018708		302 Maple St	Willard	Huron	2.7
ERI0263103		W side Cryogenic Rd	Perkins (Township of)	Erie	2.7
ERI0238403	Warehouse		Perkins (Township of)	Erie	2.7
ERI0238503	Warehouse		Perkins (Township of)	Erie	2.7
ERI0226207	Certainteed	11519 US 250	Milan (Township of)	Erie	2.7
SEN0112105	Levi Klose House	14484 E CR 62	Thompson (Township of)	Seneca	2.7
SAN0043712	Heter Farmhouse	6374 E CR 113	York (Township of)	Sandusky	2.7
HUR0017708	B&O RR YMCA	200 Woodland Ave	Willard	Huron	2.7
HUR0030005	Church of the Master	2643 SR 162	Steuben	Huron	2.7
HUR0019208		315 Pearl St	Willard	Huron	2.7
HUR0018308		41 Spring St	Willard	Huron	2.7
ERI0236003	Chemical Laboratory		Perkins (Township of)	Erie	2.7
ERI0238303	Warehouse		Perkins (Township of)	Erie	2.7
SEN0118817	MR Moltz House	111 E Tiffin St	Attica	Seneca	2.7
ERI0226107	Schlessman Seed Co	11513 US 250	Milan (Township of)	Erie	2.7
HUR0028302		2697 Peru Center Rd		Huron	2.7
ERI0235603	Locomotive Shop		Perkins (Township of)	Erie	2.7
HUR0017608	Fazio's Restaurant	Front St	Willard	Huron	2.7
ERI0227304	Rimboch House	8116 SR 250	Huron (Township of)	Erie	2.7
ERI0263503	Vehicle Services Station Building	N side Maintenance Rd	Perkins (Township of)	Erie	2.8
ERI0262603	Salt Barn		Perkins (Township of)	Erie	2.8
HUR0018808	Grace United Methodist Church	108 W Maple St	Willard	Huron	2.8
HUR0019308		305 Emerald St	Willard	Huron	2.8
ERI0226007	Frank W Eden House	11508 US 250	Milan (Township of)	Erie	2.8
ERI0235703	Garage		Perkins (Township of)	Erie	2.8
ERI0235503	Carpenter Shop		Perkins (Township of)	Erie	2.8
HUR0019008	1st United Methodist Church	120 Pearl St	Willard	Huron	2.8
HUR0018208		203 Spring St	Willard	Huron	2.8
ERI0235903	Engineering Building		Perkins (Township of)	Erie	2.8
HUR0017508	Willard City Hall	2 Myrtle Ave	Willard	Huron	2.8
ERI0236903	Sewage Lift Station	NEC Maintenance & Ransom Rds	Perkins (Township of)	Erie	2.8
HUR0017808		6-12 Myrtle Ave	Willard	Huron	2.8
HUR0017908	Raymond's	14 Myrtle Ave	Willard	Huron	2.8
HUR0019108	Apartments	124 Pearl St	Willard	Huron	2.8
HUR0030105		2577 SR 162	Steuben	Huron	2.8
ERI0227404	Schlessman Property	8002 SR 250	Huron (Township of)	Erie	2.8
HUR0018408	Chicago City Opera House	102 Myrtle Ave	Willard	Huron	2.8
HUR0018008	IOOF Hall	106-108 Myrtle Ave	Willard	Huron	2.8
HUR0028205		abt 2599 Peru Center Rd	Peru (Township of)	Huron	2.9
HUR0018108	Masonic Temple	117 Myrtle Ave	Willard	Huron	2.9
HUR0062008	US Post Office	210 Myrtle Ave	Willard	Huron	2.9
HUR0030205		2540 SR 162	Steuben	Huron	2.9
HUR0027005		63 Peru Center Rd		Huron	2.9
HUR0018908	Willard Southern Baptist	124 Woodbine St	Willard	Huron	2.9
SEN0099905	Orwig House	CR 32	Thompson (Township of)	Seneca	2.9

SEN0108117	JW Michener House	TR 44	Venice (Township of)	Seneca	3.0
SEN0122517	Village of Attica Water Plant	4901 S SR 4	Attica	Seneca	3.0
SEN0112505	Martin Oliver House	14107 E TR 178	Thompson (Township of)	Seneca	3.0
ERI0264007	City of Norwalk Culvert	SEC Plank & Shaw Mill Rds	Milan (Township of)	Erie	3.0
SEN0109117	L Sach's Store	TR 88 & SR 4	Venice (Township of)	Seneca	3.0
SAN0042112		1212-1214 W Main St	Bellevue	Sandusky	3.1
ERI0228707	Russels Homestead Inn	12014 US 250	Milan (Township of)	Erie	3.1
SEN0112405	Old Thompson Twp District Two	SEC of TR 81 & CR 34	Thompson (Township of)	Seneca	3.1
HUR0019408		528 Myrtle Ave	Willard	Huron	3.1
ERI0238803	Warehouse		Perkins (Township of)	Erie	3.1
SEN0054305	Vacant	TR 81 (North-South Center Rd)	Thompson (Township of)	Seneca	3.1
HUR0030305		2446 SR 162		Huron	3.1
ERI0227504	Brennan Property	7510 SR 250	Huron (Township of)	Erie	3.1
ERI0262403	Plant Protection Boiler House		Perkins (Township of)	Erie	3.1
ERI0236103	Plant Protection Facility	Pentolite Rd at Columbus Ave	Perkins (Township of)	Erie	3.1
ERI0229607		311 SR 113	Milan (Township of)	Erie	3.1
ERI0237703	Warehouse		Perkins (Township of)	Erie	3.2
ERI0237603	Warehouse		Perkins (Township of)	Erie	3.2
SEN0090805	Eli Whitney House	14060 E CR 46	Thompson (Township of)	Seneca	3.2
SEN0113205	Jacob Miller House	5191 N TR 81	Thompson (Township of)	Seneca	3.2
HUR0011302		2045 Washington Rd		Huron	3.2
ERI0227604	Didion Property	7208 SR 250	Huron (Township of)	Erie	3.3
SEN0113705	Old Thompson Twp Brick Schoolhouse	3980 N TR 81	Thompson (Township of)	Seneca	3.3
ERI0237003	Gas Meter House	Columbus Ave, S of Clark Rd	Perkins (Township of)	Erie	3.3
HUR0045108	Carson House	6772 Base Line Rd	Richmond (Township of)	Huron	3.3
HUR0025605	Monroeville Rod & Gun Club	2255 Peru Center Rd	Peru (Township of)	Huron	3.3
ERI0262503	Gas Meter Station		Perkins (Township of)	Erie	3.4
HUR0028105	Adelmann House	2186 Peru Center Rd	Peru (Township of)	Huron	3.4
HUR0011402		4010 Drake Rd		Huron	3.4
HUR0032005		2332 Maple Ridge Rd		Huron	3.5
HUR0000403	Delamater House	4781 Plank Rd	Norwalk	Huron	3.5
HUR0028005		1721 Peru Center Rd	Peru (Township of)	Huron	3.5
SEN0112205	John Heter House	7296 N SR 18	Thompson (Township of)	Seneca	3.5
ERI0002407	Milan Public Library	19 E Church St	Milan (Township of)	Erie	3.5
ERI0228307	Old School House	13106 Mudbrook Rd	Milan (Township of)	Erie	3.5
HUR0027905		1459 Peru Center Rd	Peru (Township of)	Huron	3.5
ERI0228407	Tabellion House	13107 Mudbrook Rd	Milan (Township of)	Erie	3.5
ERI0151607	Kendall & Mary Falke House	25 E Front St	Milan (Township of)	Erie	3.5
HUR0027205		1371 Peru Center Rd	Peru (Township of)	Huron	3.6
HUR0014303		1351 Washington Rd	Norwalk	Huron	3.6
HUR0044708	Base Line Road at Honey Creek Bridge	Base Line Rd over Honey Creek	Richmond (Township)	Huron	3.7
ERI0002007		65 Edison Dr	Milan (Township of)	Erie	3.7
SEN0112305	Philip Miller House	13361 E TR 178	Thompson (Township of)	Seneca	3.8
HUR0044908	Celeryville House	4025 E Broadway St	Celeryville	Huron	3.8
SAN0044712	Lonely Musser's Substation	CR 292 & US 20	York (Township of)	Sandusky	3.8
SAN0044112		5982 CR 175	York (Township of)	Sandusky	3.8
SAN0044512	Hackenburg Farmhouse	1589 CR 228	York (Township of)	Sandusky	3.8
ERI0191903	Richard & Valerie Bressler House	5401 Columbus Ave	Perkins (Township of)	Erie	3.8
HUR0028602		1986 US 20		Huron	3.8
HUR0029505		705 SR 61		Huron	3.9
HUR0029605	Barnett Roe House	1575 SR 61		Huron	3.9
SAN0044612	Wesleyan Bible Holiness Church	2298 CR 292	York (Township of)	Sandusky	3.9
HUR0027105		685 Peru Center Rd	Peru (Township of)	Huron	3.9
SAN0043612		2346 US 20	York (Township of)	Sandusky	4.0
ERI0000407		1417 SR 113	Milan (Township of)	Erie	4.0
SAN0061312	Gallagher Farm	103 Pickle St	Clyde	Sandusky	4.1
ERI0227103	Bogart Bed & Breakfast	1403 Bogart Rd	Perkins (Township of)	Erie	4.1

HUR0029405		237 SR 61		Huron	4.2
HUR0011703	Keller House	2050 Main Rd S	Norwalk	Huron	4.2
SAN0043512	Dr Eaton House	2233 E Mcpherson Hwy (US 20)	York (Township of)	Sandusky	4.2
HUR0029705		2398 SR 61		Huron	4.2
HUR0031905		1832 Hanville Corners Rd		Huron	4.3
ERI0228207	Williams House	1709 SR 113	Milan (Township of)	Erie	4.3
HUR0011603		5173 Old State Rd	Milan	Huron	4.3
HUR0064203	Kenneth Green House	141 Milan Ave	Norwalk	Huron	4.3
ERI0191803	Michael Pasqualini House	4808 Columbus Ave	Perkins (Township of)	Erie	4.3
HUR0004703	St Mary's Roman Cath Church	38 W League St	Norwalk	Huron	4.3
HUR0029305	McFarlin House	119 SR 61		Huron	4.3
HUR0028702		1753 Brown Rd		Huron	4.3
HUR0006603		10 W League St	Norwalk	Huron	4.3
HUR0006803	Church of God	abt 92 Prospect St	Norwalk	Huron	4.4
ERI0191703	Brogle House	4711 Columbus Ave	Perkins (Township of)	Erie	4.4
HUR0029805		2240 Town Line Rd		Huron	4.4
ERI0228907	Haunushek House	1819 Seminary Rd	Milan (Township of)	Erie	4.4
HUR0004603			Norwalk	Huron	4.4
ERI0191603	Eugene & Louise Brogle House	4701 Columbus Ave	Perkins (Township of)	Erie	4.4
SAN0043412		2211 E Mcpherson Hwy	York (Township of)	Sandusky	4.4
HUR0045208	Buckingham Road at March Canal Bridge	Buckingham Rd over marsh canal	New Haven (Township)	Huron	4.4
HUR0031505		1855 Olive Rd		Huron	4.5
HUR0060803	Michael Murray House	24 N West St	Norwalk	Huron	4.5
ERI0228807	Robert Still House	1913 SR 113	Milan (Township of)	Erie	4.5
HUR0047203	Ben & Becky Fleming House	40 Cortland St	Norwalk	Huron	4.5
HUR0052103	Kenneth & Elizabeth Fell House	20 N West St	Norwalk	Huron	4.5
HUR0047103	Donald Bolen House	30 Cortland St	Norwalk	Huron	4.5
HUR0047003	George & June Baicon House	28 Cortland St	Norwalk	Huron	4.5
SEN0100205	Louise A Meyers House	TR 80	Thompson (Township of)	Seneca	4.5
ERI0191503	Paul B & Barbara M List House	4505 Columbus Ave	Perkins (Township of)	Erie	4.5
HUR0046903	James & Penelope Steffani House	26 Cortland St	Norwalk	Huron	4.5
HUR0046803	Norbert & Edna Schafer House	24 Cortland St	Norwalk	Huron	4.6
HUR0046703	Larry Opper House	22 Cortland St	Norwalk	Huron	4.6
HUR0026905		127 SR 61	Peru (Township of)	Huron	4.6
HUR0046603	Steven P Kotz House	20 1/2 Cortland St	Norwalk	Huron	4.6
HUR0006503	The Depot	Penn Central RR at Whittlesey A	Norwalk	Huron	4.6
ERI0191403	Evelyn Staley House	4420 Columbus Ave	Perkins (Township of)	Erie	4.6
HUR0006403	Chamber of Commerce	61 Whittlesey Ave	Norwalk	Huron	4.6
HUR0004803		19 State St	Norwalk	Huron	4.6
HUR0059603	Clifford E Beck House	232 W Main St	Norwalk	Huron	4.6
HUR0059503	Robert H Stang House	230 W Main St	Norwalk	Huron	4.6
HUR0005003	Knights of Columbus	254 W Main St	Norwalk	Huron	4.6
HUR0059203	Adele Andrews Benson House	226 W Main St	Norwalk	Huron	4.6
HUR0059103		224 W Main St	Norwalk	Huron	4.6
HUR0059003		222 W Main St	Norwalk	Huron	4.6
HUR0058903	Richard H Hillis House	220 W Main St	Norwalk	Huron	4.6
HUR0058803	Charles V Prindle House	218 W Main St	Norwalk	Huron	4.6
HUR0058703	Robert W Herner House	216 W Main St	Norwalk	Huron	4.6
HUR0058603	Albert E Miller Jr House	214 W Main St	Norwalk	Huron	4.6
HUR0058503	Roland G Reed House	212 W Main St	Norwalk	Huron	4.6
HUR0058403	John D Allton House	210 W Main St	Norwalk	Huron	4.6
HUR0058303	Gale & Reta Leimbach House	208 W Main St	Norwalk	Huron	4.6
HUR0058103	Laverne Storer House	206 W Main St	Norwalk	Huron	4.6
HUR0057903	Robert Williams	204 W Main St	Norwalk	Huron	4.6
HUR0057703	R Pearl Laycock House	202 W Main St	Norwalk	Huron	4.6
HUR0057503	Frank Messina House	200 W Main St	Norwalk	Huron	4.6
HUR0059403	Freeman Apts	229 W Main St	Norwalk	Huron	4.6
HUR0059303	David H Fisher House	227 W Main St	Norwalk	Huron	4.6

HUR0056703	Kenneth & Dorothy Bauer House	188 W Main St	Norwalk	Huron	4.6
HUR0056603	David P White House	186 W Main St	Norwalk	Huron	4.6
HUR0005103	Shrine of the Sorrowful Mother	276 W Main St	Norwalk	Huron	4.6
HUR0056403	Thomas R Cochran House	184 W Main St	Norwalk	Huron	4.7
HUR0056203	Alice Ford House	180 W Main St	Norwalk	Huron	4.7
HUR0055903		170 W Main St	Norwalk	Huron	4.7
HUR0058203	Paul E Douglas House	207 W Main St	Norwalk	Huron	4.7
HUR0055703	Norbert & Patricia Smith House	166 W Main St	Norwalk	Huron	4.7
HUR0058003	Lawerence S Carpenter House	205 W Main St	Norwalk	Huron	4.7
HUR0056303	Dr Harold W Wackenheim House	176-178 W Main St	Norwalk	Huron	4.7
HUR0057803	Beatrice L Collier House	203 W Main St	Norwalk	Huron	4.7
HUR0044808		4314 Base Line Rd	Richmond (Township of)	Huron	4.7
HUR0057603	Dr Robert Hipp House	201 W Main St	Norwalk	Huron	4.7
HUR0057403	Paul Tyson House	199 W Main St	Norwalk	Huron	4.7
HUR0057303	Michael F Grose House	197 W Main St	Norwalk	Huron	4.7
HUR0057203	James A Smith House	195 W Main St	Norwalk	Huron	4.7
ERI0191303	School House	4315 Columbus Ave	Perkins (Township of)	Erie	4.7
HUR0057103	Scott & Dora Maddocks House	193 1/2 W Main St	Norwalk	Huron	4.7
HUR0057003	John H Packard House	193 W Main St	Norwalk	Huron	4.7
HUR0056903	Arnette Van Horn Eggert House	191 W Main St	Norwalk	Huron	4.7
HUR0056803	James E Martin House	189 W Main St	Norwalk	Huron	4.7
HUR0056503	Maude I Ensminger House	185 W Main St	Norwalk	Huron	4.7
HUR0055003	Don & Geraldine Harris House	146 W Main St	Norwalk	Huron	4.7
HUR0050703	Norwalk Recreation Center	32 W Monroe St	Norwalk	Huron	4.7
HUR0056103	Robert J Meesig House	179 W Main St	Norwalk	Huron	4.7
HUR0004903		6 Newton St	Norwalk	Huron	4.7
HUR0056003	FA Powers House	173 W Main St	Norwalk	Huron	4.7
SAN0044012	Zontini House	5528 CR 175	York (Township of)	Sandusky	4.7
HUR0055803	The Ark	169 W Main St	Norwalk	Huron	4.7
HUR0050603	Bishman Sheet Metal Bldg	18 W Monroe St	Norwalk	Huron	4.7
HUR0055603	Charles E Hall House	165 W Main St	Norwalk	Huron	4.7
HUR0060903	Frederick G Barlow House	7 S West St	Norwalk	Huron	4.7
HUR0055503	Earle H Lowe House	161 W Main St	Norwalk	Huron	4.7
HUR0046503		5 Case Ave	Norwalk	Huron	4.7
HUR0046303		3 Case Ave	Norwalk	Huron	4.7
HUR0054703	Willis Ramsey House	124 W Main St	Norwalk	Huron	4.7
HUR0046403	Firelands Museum	4 Case Ave	Norwalk	Huron	4.7
HUR0047403	Carl Essex Bldg	19-21 N Hester St	Norwalk	Huron	4.7
HUR0061003	Gerald Wiseman House	9 S West St	Norwalk	Huron	4.7
HUR0052803	Gene's Kidee Korner	23 Whittlesey Ave	Norwalk	Huron	4.7
HUR0055403	Wayne L Smith House	153 W Main St	Norwalk	Huron	4.7
HUR0047703	John Harshberger House	6 Jackson St	Norwalk	Huron	4.7
HUR0047303	Norwalk Depot Casual & Western	17 N Hester St	Norwalk	Huron	4.7
HUR0061203	Kelley's Shamrock Realty	19 Whittlesey Ave	Norwalk	Huron	4.7
HUR0055303	Gordon Harrod Sr House	151 W Main St	Norwalk	Huron	4.7
HUR0054903	J Paul Caldwell House	145 W Main St	Norwalk	Huron	4.7
HUR0061103	US Post Office	16 Whittlesey Ave	Norwalk	Huron	4.7
HUR0055203	Duane G Carpenter House	149 W Main St	Norwalk	Huron	4.7
HUR0006903	James Overhuls House	114 W Main St	Norwalk	Huron	4.7
SEN0113005	George Eberhart House	6123 N SR 18	Thompson (Township of)	Seneca	4.7
HUR0054403	Richard Moore House	108 W Main St	Norwalk	Huron	4.7
HUR0054203	John Wilcox House	98 W Main St	Norwalk	Huron	4.7
HUR0048003	Michael Cozmyk House	13 Jackson St	Norwalk	Huron	4.7
HUR0047903	Joseph Englert House	9 Jackson St	Norwalk	Huron	4.7
HUR0053603	Norwalk Public Library	46 W Main St	Norwalk	Huron	4.7
HUR0047803	Carl F Brown House	7 Jackson St	Norwalk	Huron	4.7
HUR0048103	Richard J Jacobs House & Apt	15 Jackson St	Norwalk	Huron	4.7
HUR0053703	Paul Carpenter House	54 W Main St	Norwalk	Huron	4.7
HUR0047603	Gary Thompson House	5 Jackson St	Norwalk	Huron	4.7

HUR0047503	Eva C Werner House	3 Jackson St	Norwalk	Huron	4.7
HUR0049803	Kay's Shoes	10-12 Whittlesey Ave	Norwalk	Huron	4.7
HUR0054503	Henry E Young House	115 W Main St	Norwalk	Huron	4.7
HUR0053303	Perfected Furn	32-36 W Main St	Norwalk	Huron	4.7
HUR0011503		4553 Old State Rd	Norwalk (Township of)	Huron	4.7
HUR0054603	Dr Robert A Weiss House	123 W Main St	Norwalk	Huron	4.7
HUR0053203	Perfected Paint & Furn Co	30 W Main St	Norwalk	Huron	4.7
HUR0053003	Joyce's Baking Shoppe	26-28 W Main St	Norwalk	Huron	4.7
HUR0052903	Bache Insurance	22-24 W Main St	Norwalk	Huron	4.7
HUR0002403	Ebert's Inc	18-20 W Main St	Norwalk	Huron	4.7
HUR0052703	Crider's Jewelers	16 W Main St	Norwalk	Huron	4.7
HUR0055103	Dr Charles S Resseger House	141 W Main St	Norwalk	Huron	4.7
HUR0050503	Whittlesey Academy	2-6 W Main St	Norwalk	Huron	4.7
HUR0031805	Barber House	1509 Walnut Rd		Huron	4.8
HUR0002303	Holman Jewelers	1 E Main St	Norwalk	Huron	4.8
HUR0048203	Tux World	5 E Main St	Norwalk	Huron	4.8
HUR0000103	Gardiner Block	9-15 E Main St	Norwalk	Huron	4.8
HUR0048403	JC Penney Co	19 E Main St	Norwalk	Huron	4.8
HUR0048603	Pohl's	25 E Main St	Norwalk	Huron	4.8
HUR0054003	Brabb House	83 W Main St	Norwalk	Huron	4.8
HUR0053903	Donald Wood House & Apts	81 W Main St	Norwalk	Huron	4.8
HUR0048803	Fabric Post	27 E Main St	Norwalk	Huron	4.8
HUR0049003	Continental Cablevision	29-31 E Main St	Norwalk	Huron	4.8
HUR0054303	Sturges House	99 W Main St	Norwalk	Huron	4.8
HUR0049203	Norwalk Auto Parts Inc	35 E Main St	Norwalk	Huron	4.8
HUR0049403	Norwalk Home Interiors	39 E Main St	Norwalk	Huron	4.8
HUR0049503	Bob's Newsstand	41-45 E Main St	Norwalk	Huron	4.8
HUR0053803	Ralph J Bishop House	55 W Main St	Norwalk	Huron	4.8
HUR0002003	Towne & Country Players Inc	55 E Main St	Norwalk	Huron	4.8
HUR0050003	Towne & Country Theatre	57 E Main St	Norwalk	Huron	4.8
HUR0000203	St Paul's Catholic Church	91 E Main St	Norwalk	Huron	4.8
HUR0053403	Dawley Sheehan Tancer& Makovic	37 W Main St	Norwalk	Huron	4.8
HUR0004503	1st Baptist Church	67 E Main St	Norwalk	Huron	4.8
HUR0054103	Kevin Doyle House	95 W Main St	Norwalk	Huron	4.8
HUR0053103	General Telephone Co of OH Inc	29 W Main St	Norwalk	Huron	4.8
HUR0053503	First Universalist Church	39 W Main St	Norwalk	Huron	4.8
HUR0052503	City Loan & Savings Co	13 W Main St	Norwalk	Huron	4.8
HUR0052603	Berry's Restaurant	15-19 W Main St	Norwalk	Huron	4.8
HUR0052403	Fisher Music	9-11 W Main St	Norwalk	Huron	4.8
HUR0052303	Colonial Flower Shoppe	7 W Main St	Norwalk	Huron	4.8
HUR0050403	Brady Bldg/Amsel Shoes	1-5 W Main St	Norwalk	Huron	4.8
HUR0002203	Citizen's Nat'l Bank of Norwalk	12 E Main St	Norwalk	Huron	4.8
HUR0048303	Home Savings & Loan Co	16 E Main St	Norwalk	Huron	4.8
HUR0048503	FW Woolworth Store	22 E Main St	Norwalk	Huron	4.8
HUR0048703	Tucker Abstract & Title Co	26 E Main St	Norwalk	Huron	4.8
HUR0048903	Nabil's Shoe Store & Clothes P	28-30 E Main St	Norwalk	Huron	4.8
HUR0049103	Peddler's Pack-Curtis Mathes	32-34 E Main St	Norwalk	Huron	4.8
HUR0054803	Robert Price House	133 W Main St	Norwalk	Huron	4.8
HUR0049303	Ed Prack Bldg	36-38 E Main St	Norwalk	Huron	4.8
HUR0049703	Arnie's Cycle Shop	42-44 E Main St	Norwalk	Huron	4.8
HUR0049603	Paul's Hobbies	46 E Main St	Norwalk	Huron	4.8
HUR0002103	Mossman Bros Music	48-50 E Main St	Norwalk	Huron	4.8
HUR0045903	Merritt Block	10-12 Benedict Ave	Norwalk	Huron	4.8
HUR0000603	Huron Co Courthouse	2 E Main St	Norwalk	Huron	4.8
HUR0049903	Hammersmith & Jenkins CPAs	54-58 E Main St	Norwalk	Huron	4.8
HUR0050103	Carpeteria	60 E Main St	Norwalk	Huron	4.8
HUR0050203	Heiser's Camera Shop	66 E Main St	Norwalk	Huron	4.8
HUR0004303		107 E Main St	Norwalk	Huron	4.8
HUR0052003		66 W Seminary St	Norwalk	Huron	4.8

HUR0051903		64 W Seminary St	Norwalk	Huron	4.8
HUR0051803		62 W Seminary St	Norwalk	Huron	4.8
HUR0050303		48 W Seminary St	Norwalk	Huron	4.8
HUR0046203	Haldeman House	8 Church St	Norwalk	Huron	4.8
HUR0051403		42 W Seminary St	Norwalk	Huron	4.8
HUR0051203		36 W Seminary St	Norwalk	Huron	4.8
HUR0004203		117 E Main St	Norwalk	Huron	4.8
HUR0051103		30-32 W Seminary St	Norwalk	Huron	4.8
HUR0046103		14-20 Benedict Ave	Norwalk	Huron	4.8
HUR0006703		10-12 W Seminary St	Norwalk	Huron	4.8
HUR0050803		6-8 W Seminary St	Norwalk	Huron	4.8
HUR0046003	Huron Co Jail	21 Benedict Ave	Norwalk	Huron	4.8
HUR0060103	Courthouse Café	13 E Seminary St	Norwalk (Township of)	Huron	4.8
ERI0191203	Lillian K Druckenmiller House	4201 Columbus Ave	Perkins (Township of)	Erie	4.8
HUR0005203		S Pleasant St	Norwalk	Huron	4.8
HUR0002503	Outdoorsman	19 S Linwood Ave	Norwalk	Huron	4.8
HUR0000303		131 E Main St	Norwalk	Huron	4.8
HUR0051703		61 W Seminary St	Norwalk	Huron	4.8
HUR0004403	Norwalk High School	80 E Main St	Norwalk	Huron	4.8
HUR0051603		59 W Seminary St	Norwalk	Huron	4.8
HUR0060303	Pierce Apts	45 E Seminary St	Norwalk	Huron	4.8
HUR0051503		51 W Seminary St	Norwalk	Huron	4.8
HUR0031108		1955 Town Line Rd		Huron	4.8
HUR0051303		39 W Seminary St	Norwalk	Huron	4.8
HUR0060503	Hart Advertising	69 E Seminary St	Norwalk	Huron	4.8
HUR0051003	Freeman & Laycock Attorneys	9-17 W Seminary St	Norwalk	Huron	4.8
HUR0060203	Kenilee Lanes	14-16 E Seminary St	Norwalk	Huron	4.8
HUR0064303	Norwalk OHARNG Armory	400 W Main St	Norwalk	Huron	4.8
HUR0059803	Mildred E Simon House	320 W Main St	Norwalk	Huron	4.8
HUR0003803		155 E Main St	Norwalk	Huron	4.8
HUR0060403	Evangelene Miller House	48 E Seminary St	Norwalk	Huron	4.8
HUR0004103		132 E Main St	Norwalk	Huron	4.8
HUR0005503		26-48 Benedict Ave	Norwalk	Huron	4.8
HUR0059703	Robert D Biesel House	319 W Main St	Norwalk	Huron	4.8
HUR0006003		94 E Seminary St	Norwalk	Huron	4.9
HUR0004003		146 E Main St	Norwalk	Huron	4.9
HUR0006103		114 E Seminary St	Norwalk	Huron	4.9
HUR0005603	Norfolk & Western Storage Bldg	Norfolk & Western near Benedict	Norwalk	Huron	4.9
HUR0003903		150 E Main St	Norwalk	Huron	4.9
HUR0006203	John A Hirt House	25-25 1/2 Woodlawn Ave	Norwalk	Huron	4.9
HUR0059903	Richard Harwood House	323 W Main St	Norwalk	Huron	4.9
SEN0099705	John Weller House	5919 N SR 18	Thompson (Township of)	Seneca	4.9
HUR0060003	Woodrow Betschman House	327 W Main St	Norwalk	Huron	4.9
HUR0060703		3167 US 61 (rear)	Norwalk	Huron	4.9
SEN0109017	Bartholomew Stout House	12808 CR 6 E	Venice (Township of)	Seneca	4.9
HUR0028903		207 E Main St	Norwalk	Huron	4.9
HUR0060603	Dr W Robert Spettel Jr House	3167 SR 61	Norwalk	Huron	4.9
HUR0008303		7 Maple St	Norwalk	Huron	5.0
ERI0191103	Genevieve Sherer House	3917 Columbus Ave	Perkins (Township of)	Erie	5.0
HUR0029003		249 E Main St	Norwalk	Huron	5.0
HUR0005903		58 S Linwood St	Norwalk	Huron	5.0
HUR0005403		23 Norwood Ave	Norwalk	Huron	5.1
SEN0111512	Old Reed Twp Brick Schoolhouse	Jct SR 162 & CR 27	Reed (Township of)	Seneca	5.1
HUR0000703	Klepper House	4955 SR 601 (?)	Norwalk (Township of)	Huron	5.1
HUR0025902		2973 SR 61		Huron	5.1
HUR0031605	Camp Conger - 4H Camp	2195 Walnut Rd		Huron	5.1
HUR0002603		40 Norwood Ave	Norwalk	Huron	5.1
SEN0111212	Timothy Weed House	TR 124	Reed (Township of)	Seneca	5.1
HUR0031405		2255 Walnut Rd		Huron	5.1

HUR0029103		308 E Main St	Norwalk	Huron	5.1
HUR0005303		130 Benedict Ave	Norwalk	Huron	5.2
HUR0031305		2353 Walnut Rd		Huron	5.2
HUR0029203		326 E Main St	Norwalk	Huron	5.2
HUR0002703	WA Poyer House	61 Norwood Ave	Norwalk	Huron	5.2
SEN0113105	Old Thompson Twp School Dist #1	NWC Jct CR 32 & TR 79	Thompson (Township of)	Seneca	5.3
SEN0118712	William P White House	11926 E TR 24	Reed (Township of)	Seneca	5.3
CRA0071904	Gangluff Property			Crawford	5.3
HUR0031205		2461 Walnut Rd		Huron	5.3
HUR0022506		1285 SR 162		Huron	5.3
SEN0111112	Michael Beard House	11891 E CR 24	Reed (Township of)	Seneca	5.4
SEN0100305	Charles Potts Farm	CR 46 at CR 27	Thompson (Township of)	Seneca	5.4
HUR0000803	Martz House	SR 61 1/2 mi W of Laylin	Norwalk (Township of)	Huron	5.4
ERI0191003	David & Charlene Wikel House	3521 Columbus Ave	Perkins (Township of)	Erie	5.4
HUR0028805		1518 Settlement Rd	Peru (Township of)	Huron	5.4
ERI0190903	Larry Smith House	3519 Columbus Ave	Perkins (Township of)	Erie	5.4
SAN0011505	Warner Farms	6214 CR 294	Townsend (Township of)	Sandusky	5.4
ERI0001403	Assembly Hall	S Columbus Ave	Perkins (Township of)	Erie	5.5
ERI0000703	Hospital	S Columbus Ave	Perkins (Township of)	Erie	5.5
ERI0190803	Classic Care	3423 Columbus Ave	Perkins (Township of)	Erie	5.5
SEN0115217	Carrother's Public School	SR 4-N of RailRoad tracks	Carrothers	Seneca	5.5
ERI0000903	Library	S Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0002803	Huron Co Office Bldg	190 Benedict Ave	Norwalk	Huron	5.6
SAN0049812	Mt Carmel Un Methodist Church	4970 CR 177	York (Township of)	Sandusky	5.6
ERI0190603	James & Marlyn F Stacy	3407 Columbus Ave	Perkins (Township of)	Erie	5.6
SAN0049712	Mount Carmel School	CR 177	York (Township of)	Sandusky	5.6
ERI0001003	Laundry & Bath House	S Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0019708		3904 Center St	New Haven	Huron	5.6
ERI0190703	Jessie E Bailey House	3410 Columbus Ave	Perkins (Township of)	Erie	5.6
ERI0001103	Boiler House	S Columbus Ave	Perkins (Township of)	Erie	5.6
SAN0011405		1750 CR 294	Townsend (Township of)	Sandusky	5.6
HUR0020108		3719 SR 61		Huron	5.6
SAN0043912	Sandusky Co EMS 15 Paramedic	5060 CR 175	York (Township of)	Sandusky	5.6
ERI0000803	Mess Hall	S Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0000503		565 SR 61	East Norwalk	Huron	5.6
ERI0260603	Building G, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.6
ERI0260003	Building F, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0019608	New Haven IOOF Hall	3934 Center St	New Haven	Huron	5.6
ERI0001203	Administration Bldg	S Columbus Ave	Perkins (Township of)	Erie	5.6
ERI0260203	Garage, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Sandusky	5.6
ERI0259603	Building A, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0032106		1989 Ridge Rd		Huron	5.6
ERI0259903	Building D, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.6
HUR0019808	New Haven Methodist Church	2634 Prairie St	New Haven	Huron	5.7
ERI0259703	Building B, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.7
HUR0019508	New Haven Town Hall	2663 Prairie St	New Haven	Huron	5.7
HUR0006303	Woodlawn Cemetery Vault	Woodlawn Ave	Norwalk	Huron	5.7
ERI0259803	Building C, Ohio Veterans Home	3416 Columbus Ave	Perkins (Township of)	Erie	5.7
CRA0013904	Crest Bending Inc	John St	New Washington	Crawford	5.7
HUR0025306	St Alphonsus Roman Cath Church	1340 Settlement Rd	Bronson (Township of)	Huron	5.7
HUR0020008		3997 Center St	New Haven	Huron	5.7
HUR0022406		178 Ridge Rd	Bronson (Township of)	Huron	5.7
ERI0253503	Sandusky OHARNG Armory	117 Woodlawn Ave	Sandusky	Erie	5.7
HUR0019908		3976 East St	New Haven	Huron	5.7
ERI0190503	Mildred Auerbach House	3219 Columbus Ave	Perkins (Township of)	Erie	5.7
HUR0020208		1804 Boughtonville Rd		Huron	5.7
HUR0025505		1567 Peru-Olena Rd	Peru	Huron	5.8
HUR0025405		Peru Hollow Rd	Peru	Huron	5.8
HUR0026005		1567 Peru-Olena Rd	Peru	Huron	5.8

ERI0000503	Dill Cottage	S Columbus Ave	Perkins (Township of)	Erie	5.8
HUR0026706		2350 SR 61	Bronson (Township of)	Huron	5.8
HUR0026806	Shaffer House	2321 SR 61	Bronson (Township of)	Huron	5.8
ERI0211403	Sallie Mae McDonald House	702 Woodlawn Ave	Perkins (Township of)	Erie	5.8
CRA0018404		222 Tiffin St	New Washington	Crawford	5.8
CRA0018304	Pfeiger Barn	SEC Apricot & Monroe	New Washington	Crawford	5.8
CRA0015604	Siefert Block	2nd bldg E of Kibler St	New Washington	Crawford	5.8
CRA0015904		213 E Mansfield St	New Washington	Crawford	5.8
CRA0016004	Michelfelder Block	3rd bldg W of Kibler	New Washington	Crawford	5.8
CRA0016404	White House	118 W Mansfield St	New Washington	Crawford	5.8
CRA0016204	Michelfelder Annex	4th bldg W of Kibner	New Washington	Crawford	5.8
CRA0015804	St John's Lutheran Church	E Mansfield & Center St	New Washington	Crawford	5.8
CRA0015704	Jacobs House	113 E Mansfield St	New Washington	Crawford	5.8
CRA0016504	Michelfelder Shoe Store	2nd bldg E of Monroe	New Washington	Crawford	5.9
CRA0016704	Bernies Barber Shop	Cor W Mansfield & Monroe	New Washington	Crawford	5.9
CRA0017104		206-208 W Mansfield St	New Washington	Crawford	5.9
CRA0016904	Sues Ceramics & Flowers	Cor Monroe & W Mansfield	New Washington	Crawford	5.9
ERI0211503	James Sears House	810 Woodlawn Ave	Perkins (Township of)	Erie	5.9
CRA0017204		210-212 W Mansfield St	New Washington	Crawford	5.9
CRA0014504	Farmers State Bank	SEC Kibler & Mansfield	New Washington	Crawford	5.9
ERI0211603	Angelene Henson House	812 Woodlawn Ave	Perkins (Township of)	Erie	5.9
CRA0017404	New Washington Post Office	2nd bldg E of Franklin St	New Washington	Crawford	5.9
CRA0016104		111 W Mansfield St	New Washington	Crawford	5.9
CRA0016304		3rd bldg W of Kibler	New Washington	Crawford	5.9
CRA0016604	Golden Gems Senior Citizens	5th bldg W of Kibler	New Washington	Crawford	5.9
CRA0016804		Cor W Mansfield & Monroe	New Washington	Crawford	5.9
CRA0017904	St Bernard School	Walnut St & W Mansfield	New Washington	Crawford	5.9
ERI0211703		816 Woodlawn Ave	Perkins (Township of)	Erie	5.9
CRA0017804		320 W Mansfield St	New Washington	Crawford	5.9
CRA0018104	St Bernards Church	2nd bldg E of Poplar	New Washington	Crawford	5.9
CRA0017004	Fox Apartments	2nd bldg W of Monroe St	New Washington	Crawford	5.9
ERI0211803	Elmer & Airy Blakely House	820 Woodlawn Ave	Perkins (Township of)	Erie	5.9
CRA0017304	Village Upholstery	3rd bldg E of Franklin	New Washington	Crawford	5.9
CRA0017504	Buckeye Tavern	2nd bldg E of Franklin St	New Washington	Crawford	5.9
CRA0017604	IGA Store	Cor W Mansfield & Franklin	New Washington	Crawford	5.9
CRA0017704		Cor Franklin & W Mansfield	New Washington	Crawford	5.9
CRA0018204	John Sheetz House	502 W Mansfield St	New Washington	Crawford	5.9
HUR0032206		232 W Main St (SR 162)	North Fairfield	Huron	5.9
CRA0018004		401 W Mansfield St	New Washington	Crawford	5.9
SEN0111312	Moses Bishop House	TR 124	Reed (Township of)	Seneca	5.9
HUR0005803	Youth Group Home	258 Benedict Ave	Norwalk	Huron	5.9
CRA0014704	Rosemary Huggins	130 E Main St	New Washington	Crawford	5.9
CRA0013804	Blacksmith Shop	Franklin St	New Washington	Crawford	5.9
CRA0015204	Ferguson House	Cor Franklin & W Main St	New Washington	Crawford	5.9
CRA0014604	Mathias Kibler House	SEC of Main & Kibler St	New Washington	Crawford	5.9
CRA0015404		300-304 W Main St	New Washington	Crawford	5.9
CRA0014804		203 E Main St	New Washington	Crawford	6.0
CRA0014904	Cecelia Moritz House	SEC of E Main & East St	New Washington	Crawford	6.0
CRA0015004		211 W Main St	New Washington	Crawford	6.0
CRA0015104		217 W Main St	New Washington	Crawford	6.0
CRA0015504	Bishop House	303 W Main St	New Washington	Crawford	6.0
CRA0015304		221 W Main St	New Washington	Crawford	6.0
HUR0000903	Shedd House	4415 Laylin Rd	Norwalk (Township of)	Huron	6.0
HUR0024706		1334 Peru-Olena Rd	Bronson (Township of)	Huron	6.0
ERI0190303		2915 Columbus Ave	Perkins (Township of)	Erie	6.0
ERI0190403		2915 Columbus Ave (rear)	Perkins (Township of)	Erie	6.0
CRA0013504	United Methodist Church	SEC Center & Washington	New Washington	Crawford	6.1
CRA0014004		415 S Kibler St	New Washington	Crawford	6.1
ERI0190203	Erie Co Services Center	2900 Columbus Ave	Perkins (Township of)	Erie	6.1

CRA0014104		423 S Kibler St	New Washington	Crawford	6.1
SEN0109704	George Schwan House	10959 E CR 34	Adams (Township of)	Seneca	6.1
CRA0013604	AC & Y Station	On RR 100 ft W of Center	New Washington	Crawford	6.1
CRA0013704	SJ Kibler & Brother Co	Center St	New Washington	Crawford	6.2
ERI0211303	Rental House	2712 Tremper Ave	Perkins (Township of)	Erie	6.2
ERI0211203	Rental House	2710 Tremper Ave	Perkins (Township of)	Erie	6.2
ERI0211103	Rental House	2708 Tremper Ave	Perkins (Township of)	Erie	6.2
SAN0043305		1034 E Maple (CCR101)	York (Township of)	Sandusky	6.2
ERI0260303	Chapel, Oakland Cemetery and Memorial Park	2917 Milan Rd	Perkins (Township of)	Erie	6.3
ERI0190103		2621 Columbus Ave	Perkins (Township of)	Erie	6.3
ERI0190003		2619 Columbus Ave	Perkins (Township of)	Erie	6.3
HUR0032306	N Fairfield Methodist Church	105 W Main St	North Fairfield	Huron	6.3
ERI0189903	Charles & Barb Troike House	2617 Columbus Ave	Perkins (Township of)	Erie	6.3
ERI0210903	Rental House	2609 Tremper Ave	Perkins (Township of)	Erie	6.3
ERI0211003	Rental House	2610 Tremper Ave	Perkins (Township of)	Erie	6.3
ERI0189803		2611 Columbus Ave	Perkins (Township of)	Erie	6.3
ERI0260403		2917 Milan Rd	Perkins (Township of)	Erie	6.3
ERI0189703		2609 Columbus Ave	Perkins (Township of)	Erie	6.3
ERI0210803	Iona Haskins House	2605 Tremper Ave	Perkins (Township of)	Erie	6.3
ERI0189603		2605 Columbus Ave	Perkins (Township of)	Erie	6.3
ERI0014202	Mantey Vineyards	917 Bardshar Rd	Sandusky	Erie	6.3
ERI0189503	American & Cynthia Sanders House	2601 Columbus Ave	Perkins (Township of)	Erie	6.3
CRA0014204		818 S Kibler St	New Washington	Crawford	6.4
SAN0011605		2868 N CR 306	Townsend (Township of)	Sandusky	6.4
CRA0014304		826 S Kibler St	New Washington	Crawford	6.4
RIC0011001	Knaus House	SR 598 Sec 2	Plymouth (Township of)	Richland	6.4
CRA0014404		832 S Kibler St	New Washington	Crawford	6.4
HUR0022306		931 Ridge Rd	Bronson (Township of)	Huron	6.4
HUR0024006		4 W Main St	North Fairfield	Huron	6.4
SEN0109804	Peter Layton House	10639 E CR 34	Adams (Township of)	Seneca	6.4
HUR0032406		9 N Main St	North Fairfield	Huron	6.4
HUR0022706	N Fairfield Post Office	3 N Main St	North Fairfield	Huron	6.4
HUR0023106		109 N Main St	North Fairfield	Huron	6.4
HUR0022906		105 N Main St	North Fairfield	Huron	6.4
HUR0023006	Chapman House Museum	7 N Main St	North Fairfield	Huron	6.4
HUR0022606		1 W Main St	North Fairfield	Huron	6.4
ERI0189403	Joseph Krebs House	2521 Columbus Ave	Perkins (Township of)	Erie	6.4
SAN0043212	Troike Barn	845 E Maple	York (Township of)	Sandusky	6.4
ERI0189303	Glenn & Jean Bluhm House	2519 Columbus Ave	Perkins (Township of)	Erie	6.4
HUR0023206	Masonic Temple	116 N Main St	North Fairfield	Huron	6.4
HUR0023306		110 N Main St	North Fairfield	Huron	6.4
ERI0014102	Howard Holliday House	815 Bardshar Rd	Sandusky	Erie	6.4
HUR0023406		3 E Main St	North Fairfield	Huron	6.4
HUR0022806	Faith Baptist Church	102 N Main St	North Fairfield	Huron	6.4
SAN0043112	Troike House	845 E Maple	York (Township of)	Sandusky	6.5
ERI0189203	Gary & Laura Knauss House	2511 Columbus Ave	Perkins (Township of)	Erie	6.5
ERI0106303	Barbara May House	1317 E Perkins Ave	Sandusky	Erie	6.5
ERI0189103	David & Amy Keaton House	2509 Columbus Ave	Perkins (Township of)	Erie	6.5
HUR0022206	Martin Kellogg House	2048 Ridge Rd	Bronson (Township of)	Huron	6.5
ERI0106203	Katherine Helfrich House	619 E Perkins Ave	Sandusky	Erie	6.5
HUR0023906		8 E Ashtabula St	North Fairfield	Huron	6.5
SEN0110104	John G Setzler House	10600 E TR 34	Adams (Township of)	Seneca	6.5
HUR0065206	Chandler Farm	1632 New State Rd S	North Fairfield	Huron	6.5
HUR0024106	Adams House	1776 New State Rd		Huron	6.5
HUR0023706		102 E Main St	North Fairfield	Huron	6.6
HUR0023806		103 E Main St	North Fairfield	Huron	6.6
ERI0112303	Wilbert Canfield House	2227 Pipe St	Sandusky	Erie	6.6
ERI0129803	Robert Marschke House	2235 Tiffin Ave	Sandusky	Erie	6.6

ERI0014002	Francis Young House	704 Bardshar Rd	Sandusky	Erie	6.6
ERI0034603		2319 Columbus Ave	Sandusky	Erie	6.6
HUR0023506		107 E Main St	North Fairfield	Huron	6.6
ERI0112403	Elaine Strayer House	2206 Pipe St	Sandusky	Erie	6.6
SEN0110404	Yost Kern House	10589 E CR 32	Adams (Township of)	Seneca	6.6
ERI0089203	Frank Krause House	2432 Milan Rd	Sandusky	Erie	6.6
SEN0110204	Abner Nims House	10442 E CR 34	Adams (Township of)	Seneca	6.6
HUR0035608		4600 SR 61		Huron	6.6
ERI0100103		2225 Olds St	Sandusky	Erie	6.6
ERI0240603	Sausser Property	2312 Hayes Ave	Perkins (Township of)	Erie	6.6
HUR0023606	Hawkshurst House	4 E 2nd St	North Fairfield	Huron	6.6
ERI0089103		2416 Milan Rd	Sandusky	Erie	6.6
ERI0177103	Edward Clay House	231 46th St	Sandusky	Erie	6.6
RIC0010801	Fenner House	Fenner & Baseline Rd	Plymouth (Township of)	Richland	6.6
ERI0101703		29 W Parish St	Sandusky	Erie	6.7
ERI0101603	2 Vanbarg House	325 W Parish St	Sandusky	Erie	6.7
ERI0112203	Robert Carrisalez House	2112 Pipe St	Sandusky	Erie	6.7
ERI0088903		2301 Milan Rd	Sandusky	Erie	6.7
ERI0089003		2308 Milan Rd	Sandusky	Erie	6.7
ERI0019003		2102 Campbell St	Sandusky	Erie	6.7
ERI0046402	Steuk Fruit Farm	1001 Fremont Ave	Sandusky	Erie	6.7
ERI0013902	Harriet Young House	512 Bardshar Rd	Sandusky	Erie	6.8
ERI0088803	Theo C Roth Jr	2212 Milan Rd	Sandusky	Erie	6.8
ERI0013802	Myrtle Brown House	503 Bardshar Rd	Sandusky	Erie	6.8
ERI0123303		2015 Sherman St	Sandusky	Erie	6.8
ERI0013702	Ellen Leidorf House	419 Bardshar Rd	Sandusky	Erie	6.8
ERI0034503	Richard Barrows House	2104 Columbus Ave	Sandusky	Erie	6.8
ERI0117303		1811 Remington Ave	Sandusky	Erie	6.8
ERI0059203	Harold Schaeffer House	2107 Hayes Ave	Sandusky	Erie	6.8
ERI0018903	Larry Eaton Garage	2002 Campbell St	Sandusky	Erie	6.8
HUR0011903	OM & Hannah G Hawes House	4448 SR 601	Norwalk (Township of)	Huron	6.8
ERI0129703	Ophelia Hummel House	2013 Tiffin Ave	Sandusky	Erie	6.9
ERI0025703	Linwood Brown House	2082 Cleveland Rd	Sandusky	Erie	6.9
RIC0011401	Hunter Farm	Fenner Rd at AC&Y RR	Plymouth (Township of)	Richland	6.9
ERI0130802	Anchor Motel	4210 Venice Rd	Sandusky	Erie	6.9
ERI0212904		Huron St at Conrail Railroad	Huron	Erie	6.9
ERI0130702	Cora Brunner House	4112 Venice Rd	Sandusky	Erie	6.9
ERI0018803		1914 Campbell St	Sandusky	Erie	6.9
ERI0059603	Randolph Yancy House	1202 Huntington Ave	Sandusky	Erie	6.9
ERI0034403	Progressive Masonic Temple	2012 Columbus Ave	Sandusky	Erie	6.9
ERI0253403	James & Linda Smith House	534 Pierce St	Sandusky	Erie	6.9
ERI0059503	Lavelle Hunter House	117 Homestead St	Sandusky	Erie	6.9
ERI0059103	Providence Hosp	1912 Hayes Ave	Sandusky	Erie	6.9
ERI0130902	Charles Gallagher House	4520 Venice Rd	Sandusky	Erie	6.9
ERI0130602	Donald Kaman House	3710 Venice Rd	Sandusky	Erie	6.9
ERI0046302	Richard Warren House	310 Fremont Ave	Sandusky	Erie	6.9
ERI0018703		1810 Campbell St	Sandusky	Erie	6.9
ERI0129603	Charles Meggitt House	1745 Tiffin Ave	Sandusky	Erie	7.0
ERI0046202	James Utter House	309 Fremont Ave	Sandusky	Erie	7.0
ERI0046002	Kenneth Wheeler House	302 Fremont Ave	Sandusky	Erie	7.0
ERI0046102	Schonhardt Grocery & Carry Out	303 Fremont Ave	Sandusky	Erie	7.0
ERI0117403	Clyde Glenn House	1723 Sadler St	Sandusky	Erie	7.0
ERI0117503	Thornburgh Sales	1728 Sadler St	Sandusky	Erie	7.0
ERI0045902		219 Fremont Ave	Sandusky	Erie	7.0
ERI0045802	Old Mill	212 Fremont Ave	Sandusky	Erie	7.0
ERI0059003		1815 Hayes Ave	Sandusky	Erie	7.0
ERI0130403	Bertha Coleman House	2930 Venice Rd	Sandusky	Erie	7.0
ERI0131002	James Hall House	4712 Venice Rd	Sandusky	Erie	7.0
ERI0130503		3203 Venice Rd	Sandusky	Erie	7.0

ERI0018603	Roberts Warehouse	1702 Campbell St	Sandusky	Erie	7.0
ERI0106403	Mac Arthur Park	W Perkins Ave	Sandusky	Erie	7.0
ERI0045702	Emma Grahl House	211 Fremont Ave	Sandusky	Erie	7.0
ERI0034303	Lang's Body Shop	1715 Columbus Ave	Sandusky	Erie	7.0
ERI0000104	McCormick School	325 Ohio St	Huron	Erie	7.1
ERI0058903	American Crayon Co	1706 Hayes Ave	Sandusky	Erie	7.1
ERI0025602	Gary Weilnan House	208 Church St	Sandusky	Erie	7.1
ERI0069303		NEC Lane & Hancock	Sandusky	Erie	7.1
ERI0025502	Edwin Weilnan House	206 Church St	Sandusky	Erie	7.1
ERI0131302	Milton Krafty House	4907 Venice Rd	Sandusky	Erie	7.1
ERI0131102	Jack Grahl Barber Shop	4805 Venice Rd	Sandusky	Erie	7.1
ERI0045602	Alden Krafty House	119 Fremont Ave	Sandusky	Erie	7.1
ERI0034203	Jack J Mayer House	1625 Columbus Ave	Sandusky	Erie	7.1
ERI0131202	Doris Grahl House	4809 Venice Rd	Sandusky	Erie	7.1
ERI0034103	Robert B Mitchell House	1621 Columbus Ave	Sandusky	Erie	7.1
ERI0045502		117 Fremont Ave	Sandusky	Erie	7.1
ERI0018503	Alvin L Ostheimer House	1602 Campbell St	Sandusky	Erie	7.1
SEN0109904	John Kistler House	7496 N CR 21	Adams (Township of)	Seneca	7.1
ERI0126603	Gerald W Werner House	204 Taylor St	Sandusky	Erie	7.1
ERI0033903	Eureka Apts	1615 Columbus Ave	Sandusky	Erie	7.1
ERI0126503	Lamounte B Sayers	138 Taylor St	Sandusky	Erie	7.1
ERI0034003	Ivan Amerine House	1616 Columbus Ave	Sandusky	Erie	7.1
ERI0126103	Paul E Stiver House	126 Taylor St	Sandusky	Erie	7.1
SEN0110304	Daniel Whiteman House	6637 N CR 21	Adams (Township of)	Seneca	7.1
ERI0033803	Rev David M Wasmundt House	1607 Columbus Ave	Sandusky	Erie	7.1
ERI0126003	James A Barnum House	120 Taylor St	Sandusky	Erie	7.1
ERI0040303	Betty Crawford House	1231 Filmore St	Sandusky	Erie	7.1
ERI0131402	Henry Nuber House	4911 Venice Rd	Sandusky	Erie	7.1
ERI0177002	Union Chain Div of Litton Sys	1010 Edgewater Ave	Sandusky	Erie	7.1
ERI0025402	Ronald Van Zandt House	115 Church St	Sandusky	Erie	7.1
ERI0025302		111 Church St	Sandusky	Erie	7.1
ERI0099902	Ada Grahl House	118 Niagara St	Sandusky	Erie	7.1
ERI0058803	Ev's Korner Restaurant	1627 Hayes Ave	Sandusky	Erie	7.2
ERI0018403	Ronald Funni House	1522 Campbell St	Sandusky	Erie	7.2
ERI0025202	Gay Wobser House	109 Church St	Sandusky	Erie	7.2
ERI0126403		137 Taylor St	Sandusky	Erie	7.2
ERI0126303	Arthur J Gerold House	135 Taylor St	Sandusky	Erie	7.2
ERI0126203	Virginia M Holz House	127 Taylor St	Sandusky	Erie	7.2
ERI0033603	Bonnie Washburn House	1523 Columbus Ave	Sandusky	Erie	7.2
ERI0018303	Eugene Hessler House	1510 Campbell St	Sandusky	Erie	7.2
ERI0033703	Lester Lee House	1532 Columbus Ave	Sandusky	Erie	7.2
ERI0033503	Richard Morasutti Apts	1517 Columbus Ave	Sandusky	Erie	7.2
ERI0018203	David Uhl House	1504 Campbell St	Sandusky	Erie	7.2
ERI0039303	Terry Hammons House	921 923 925 N Depot St	Sandusky	Erie	7.2
ERI0033403	Bruce O Williams House	1511 Columbus Ave	Sandusky	Erie	7.2
ERI0018103		1501 Campbell St	Sandusky	Erie	7.2
ERI0033203	Ione K Weichel House	1507 Columbus Ave	Sandusky	Erie	7.2
ERI0018003	Sandra Ohlmacher House	1440 Campbell St	Sandusky	Erie	7.2
ERI0033103	Leland J Hoffman House	1503 Columbus Ave	Sandusky	Erie	7.2
ERI0025103	Mary Papenfuss House	1607-16071/2 Central Ave	Sandusky	Erie	7.2
ERI0017803	Alden's Photography	1429 Campbell St	Sandusky	Erie	7.2
ERI0083502	Robert Mix House	5519 McCartney Rd	Sandusky	Erie	7.2
SEN0110704	Abraham Rine House	5949 N CR 21	Adams (Township of)	Seneca	7.2
ERI0113903	Richard Kammer House	1525 Prospect St	Sandusky	Erie	7.2
ERI0039503	Railroad Depot	N Depot St near Carr St	Sandusky	Erie	7.2
HUR0035508		1446 US 224		Huron	7.2
ERI0015103	Gerald Ward House	1022 Bennett Ave	Sandusky	Erie	7.2
ERI0113803	Thomas Haley House	1521 Prospect St	Sandusky	Erie	7.2
ERI0150603	Kenneth Tunnell House	1432 Campbell St	Sandusky	Erie	7.2

ERI0100303	John McCord House	403 W Osborne St	Sandusky	Erie	7.2
ERI0033303	Florence Marquart House	1508 Columbus Ave	Sandusky	Erie	7.2
ERI0086103		1446 McKinley St	Sandusky	Erie	7.2
ERI0100403	James Bryner House	405 W Osborne St	Sandusky	Erie	7.2
ERI0113703	James Seiler House	1516 Prospect St	Sandusky	Erie	7.2
ERI0025003	John Wilkens House	1528 Central Ave	Sandusky	Erie	7.2
ERI0017903	Elliott C Giblert House	1430 Campbell St	Sandusky	Erie	7.2
ERI0100203	Osborne Apts	114 E Osborne St	Sandusky	Erie	7.2
ERI0113603	Bernard Seiler House	1514 Prospect St	Sandusky	Erie	7.2
ERI0033003	Richard H Jeffrey House	1439 Columbus Ave	Sandusky	Erie	7.2
ERI0086003		1438 McKinley St	Sandusky	Erie	7.2
ERI0024903	AW Hargrove House	1524 Central Ave	Sandusky	Erie	7.2
ERI0150403	Helen Mays House	1512 Wayne St	Sandusky	Erie	7.2
ERI0113503	Bobby Dick House	1513 Prospect St	Sandusky	Erie	7.2
HUR0032506	Smith House	246 SR 162		Huron	7.3
ERI0024803	Alton Petersen House	1520 Central Ave	Sandusky	Erie	7.3
ERI0100603		720 W Osborne St	Sandusky	Erie	7.3
ERI0100703	John F Hoffman House	722 W Osborne St	Sandusky	Erie	7.3
ERI0032903	William Karcher House	1433 Columbus Ave	Sandusky	Erie	7.3
ERI0100803	Robert McCarley Jr House	726 W Osborne St	Sandusky	Erie	7.3
ERI0024703	Melvin Pankow House	1517 Central Ave	Sandusky	Erie	7.3
ERI0039403	Murschel House	1221 N Depot St	Sandusky	Erie	7.3
ERI0100903	Lynn Wetzel House	804 W Osborne St	Sandusky	Erie	7.3
ERI0150303	George Hovey House	1502 Wayne St	Sandusky	Erie	7.3
ERI0101003	Fred Lenke Jr House	816 W Osborne St	Sandusky	Erie	7.3
ERI0032803	Dr Gary Romp House	1429 Columbus Ave	Sandusky	Erie	7.3
ERI0026903	Mary Johnson House	1533 Clinton St	Sandusky	Erie	7.3
ERI0017703	Timothy Betton House	1403 Campbell St	Sandusky	Erie	7.3
ERI0024603	Thomas Byington House	1511 Central Ave	Sandusky	Erie	7.3
ERI0024503	James Drumm House	1506 Central Ave	Sandusky	Erie	7.3
ERI0101403	Osborne School	922 W Osborne St	Sandusky	Erie	7.3
ERI0100503	Herbert Lavey House	709 W Osborne St	Sandusky	Erie	7.3
ERI0100003	Dave Riedy House	1340 Olds St	Sandusky	Erie	7.3
ERI0058703		1423 Hayes Ave	Sandusky	Erie	7.3
ERI0058503	Lay Apts	1408 Hayes Ave	Sandusky	Erie	7.3
ERI0032703	Lance C Warner House	1421 Columbus Ave	Sandusky	Erie	7.3
ERI0176803		1420 Columbus Ave	Sandusky	Erie	7.3
ERI0071803	Ronald Ulery House	1407 Lindsley St	Sandusky	Erie	7.3
ERI0101103	Robert Oeder Jr House	817 W Osborne St	Sandusky	Erie	7.3
ERI0017603	Joseph Ferrell House	1402 Campbell St	Sandusky	Erie	7.3
ERI0026803	Elizabeth Wendt House	1530 Clinton St	Sandusky	Erie	7.3
ERI0126703	Mich Toft House	1413 Taylor St	Sandusky	Erie	7.3
ERI0176703		1416 Columbus Ave	Sandusky	Erie	7.3
ERI0085903	Gary Cebull House	1410 McKinley St	Sandusky	Erie	7.3
ERI0058603		1411 Curtis Ave	Sandusky	Erie	7.3
SAN0011005	United Methodist Church of Vickry	5077 High St (CR 291)	Vickery	Sandusky	7.3
ERI0017503	Diane M White House	1328 Campbell St	Sandusky	Erie	7.3
ERI0032603	Eleutheros Cooke House	1415 Columbus Ave	Sandusky	Erie	7.3
ERI0176603		1412 Columbus Ave	Sandusky	Erie	7.3
ERI0058403		1405 Hayes Ave	Sandusky	Erie	7.3
ERI0058303	Ronald Laws House	1403 Hayes Ave	Sandusky	Erie	7.3
ERI0101203	Richard Ramon House	913 W Osborne St	Sandusky	Erie	7.3
ERI0101303	Robert Martin House	917 W Osborne St	Sandusky	Erie	7.3
ERI0032503	Oscar J Ross House	1409 Columbus Ave	Sandusky	Erie	7.3
ERI0026703	Elsie Sifield House	1507 Clinton St	Sandusky	Erie	7.3
HUR0020409		3054 New State Rd	Ripley (Township of)	Huron	7.3
ERI0024403	James Huth House	1419 Central Ave	Sandusky	Erie	7.3
ERI0026603	John Perkinson House	1503 Clinton St	Sandusky	Erie	7.3
ERI0024203	Robert Pitzer House	1414 Central Ave	Sandusky	Erie	7.3

ERI0024303	Howard Drennen House	1415 Central Ave	Sandusky	Erie	7.3
ERI0017203	Wilma Gast House	1523 Camp St	Sandusky	Erie	7.3
ERI0032403	John F Weeks House	1315 Columbus Ave	Sandusky	Erie	7.4
ERI0101503		1113 W Osborne St	Sandusky	Erie	7.4
ERI0024103	Warehouse Gun Shop	1408 Central Ave	Sandusky	Erie	7.4
ERI0090303	Barry Karns House	1408 Mills St	Sandusky	Erie	7.4
ERI0176503		1316 Columbus Ave	Sandusky	Erie	7.4
ERI0088703	Charles McAllister House	1408 Milan Rd	Sandusky	Erie	7.4
ERI0180303	Casino	3129 W Monroe St	Sandusky	Erie	7.4
ERI0106103	Craig Dahnke House	1505 Pearl St	Sandusky	Erie	7.4
ERI0058203	1st Christian Church	1325 Hayes Ave	Sandusky	Erie	7.4
HUR0040204		5097 Medusa Rd	Townsend (Township of)	Huron	7.4
ERI0180203	William H Hansen House	3127 W Monroe St	Sandusky	Erie	7.4
ERI0085803	Donna Stewart House	1421 McDonough St	Sandusky	Erie	7.4
ERI0176403		1312 Columbus Ave	Sandusky	Erie	7.4
ERI0032303	John P Baughman House	1311 Columbus Ave	Sandusky	Erie	7.4
ERI0180103		3121 W Monroe St	Sandusky	Erie	7.4
ERI0088603	Ralph Snyder House	1402 Milan Rd	Sandusky	Erie	7.4
SAN0011105	Nason House	5048 Vickery St	Vickery	Sandusky	7.4
ERI0182403	Paul & CJ Pheiffer House	1231 Wayne St	Sandusky	Erie	7.4
ERI0176303		1308 Columbus Ave	Sandusky	Erie	7.4
ERI0180003	Robert McCormick House	3103 W Monroe St	Sandusky	Erie	7.4
ERI0032203	Thomas C Gallagher House	1305 Columbus Ave	Sandusky	Erie	7.4
ERI0179903	Florence Wadsworth House	3033 W Monroe St	Sandusky	Erie	7.4
ERI0179803	Thomas Landoll House	3031 W Monroe St	Sandusky	Erie	7.4
SAN0046311	General James B McPherson House	300 E McPherson Hwy	Clyde	Sandusky	7.4
ERI0176203		1304 Columbus Ave	Sandusky	Erie	7.4
ERI0182503	Lee Poggiali House	1234 Wayne St	Sandusky	Erie	7.4
ERI0179303	G & C Foundry	2806 W Monroe St	Sandusky	Erie	7.4
ERI0112503	Randolph Laycock House	817 Polk St	Sandusky	Erie	7.4
ERI0113403	L Bates House	1323-1323 1/2 Prospect St	Sandusky	Erie	7.4
ERI0182103	Thomas Murray Jr House	1225 Wayne St	Sandusky	Erie	7.4
ERI0179703	RM Conner House	3015 W Monroe St	Sandusky	Erie	7.4
ERI0017103	Steven McKenzie House	1503 Camp St	Sandusky	Erie	7.4
ERI0106003	Elizabeth Lee House	1434 Pearl St	Sandusky	Erie	7.4
ERI0112703		819 Polk St	Sandusky	Erie	7.4
SAN0045011	Donald & Janice Schrickel House	118 S Church St	Clyde	Sandusky	7.4
ERI0120303	Bickley Upholstery	1511 Seneca St	Sandusky	Erie	7.4
ERI0112603	Lois Minard House	821 Polk St	Sandusky	Erie	7.4
ERI0032103	Barbara Garland House	1221 Columbus Ave	Sandusky	Erie	7.4
ERI0182303	Peter Tuerpitz House	1230 Wayne St	Sandusky	Erie	7.4
ERI0176103		1218 Columbus Ave	Sandusky	Erie	7.4
ERI0179603		3013 W Monroe St	Sandusky	Erie	7.4
ERI0056203	Terry McCarley House	1412 Harrison St	Sandusky	Erie	7.4
ERI0085703		1403 McDonough St	Sandusky	Erie	7.4
ERI0179503		3009 W Monroe St	Sandusky	Erie	7.4
ERI0129503	Erie Co Detention Home	1319 Tiffin Ave	Sandusky	Erie	7.4
ERI0105903	Nora Korbett House	1429 Pearl St	Sandusky	Erie	7.4
ERI0117703	August Arheit House	1818 Sandusky St	Sandusky	Erie	7.4
ERI0179403	Bike Rack	3005 W Monroe St	Sandusky	Erie	7.4
ERI0026503	Estella Swanson House	1415 Clinton St	Sandusky	Erie	7.4
ERI0176003		1214 Columbus Ave	Sandusky	Erie	7.4
ERI0182003	Frederick L Alstaetter House	1221 Wayne St	Sandusky	Erie	7.4
ERI0182203	Mary Fenker House	1226 Wayne St	Sandusky	Erie	7.4
ERI0178803	Howard Mischler House	615 Gartland Ave	Sandusky	Erie	7.4
ERI0105703	John Huelzer House	1425 Pearl St	Sandusky	Erie	7.4
RIC0006701	Ervin House	247 W Broadway	Plymouth (Township of)	Richland	7.4
SAN0044411		4410 York TR 183	York (Township of)	Sandusky	7.4
ERI0117603	Earl Cherry House	1802 Sandusky St	Sandusky	Erie	7.4

SAN0011205		Vickery Rd & TR 299	Vickery	Sandusky	7.4
SAN0045311	Irvine E Kistler House	164 E Forest St	Clyde	Sandusky	7.4
ERI0175903		1210 Columbus Ave	Sandusky	Erie	7.4
ERI0178903	Edna Justice House	616 Gartland Ave	Sandusky	Erie	7.4
ERI0129403	Rex Clark House	1313 Tiffin Ave	Sandusky	Erie	7.4
ERI0056103	Kevin McMonigal House	1406 Harrison St	Sandusky	Erie	7.4
ERI0181903	Robert & Marjorie Grad House	1215 Wayne St	Sandusky	Erie	7.4
HUR0034609		Boughtonville Rd W of New StA	Ripley (Township of)	Huron	7.4
ERI0183904	US Coast Guard Training Detach	112 Wall St	Huron	Erie	7.4
ERI0024003	Larry Bartow House	1323 Central Ave	Sandusky	Erie	7.4
ERI0105803	Gerda Oppat House	1426 Pearl St	Sandusky	Erie	7.4
ERI0023903	Joseph Kreidler House	1322 Central Ave	Sandusky	Erie	7.4
ERI0123203	Paul Cantiberry House	1403 Shelby St	Sandusky	Erie	7.4
ERI0032003	Charles & Julie Steinbrenner	1206 Columbus Ave	Sandusky	Erie	7.4
ERI0023803	Elizabeth Klotz House	1321 Central Ave	Sandusky	Erie	7.4
RIC0007101	Raymond House	233 W Broadway	Plymouth (Township of)	Richland	7.4
ERI0178703		610 Gartland Ave	Sandusky	Erie	7.4
ERI0031803	John Rosino House	1202 Columbus Ave	Sandusky	Erie	7.4
ERI0115603	Mildred Nye House	1332 Putnam St	Sandusky	Erie	7.4
ERI0058103	Wallace Gerald House	1220 Hayes Ave	Sandusky	Erie	7.4
ERI0023703	John H Stephens House	1317 Central Ave	Sandusky	Erie	7.4
ERI0031903	Donald W Lenhart House	1205 Columbus Ave	Sandusky	Erie	7.4
ERI0178503	Alejo Leal House	607 Gartland Ave	Sandusky	Erie	7.4
ERI0181803	Michael J Felter House	1211 Wayne St	Sandusky	Erie	7.4
ERI0026403	Bernard Pfefferle House	1403 Clinton St	Sandusky	Erie	7.4
ERI0105603	Alknupke House	1411 Pearl St	Sandusky	Erie	7.4
SEN0110004	Abraham G Whiteman House	9691 E TR 178	Adams (Township of)	Seneca	7.4
ERI0178603	Warren Feiszli House	608 Gartland Ave	Sandusky	Erie	7.4
ERI0130003	Rolland Westerhold House	820 Tyler St	Sandusky	Erie	7.4
ERI0115503	Ernest Matter House	1328 Putnam St	Sandusky	Erie	7.4
ERI0063503	Oscar Mason House	1301 Jay St	Sandusky	Erie	7.4
ERI0178303	Helen Lenhart House	603 Gartland Ave	Sandusky	Erie	7.4
ERI0088503	Heirlooms Etcetera	1222 Milan Rd	Sandusky	Erie	7.4
ERI0026303	James Koelsch House	1402 Clinton St	Sandusky	Erie	7.4
ERI0178403	William Bingley House	604 Gartland Ave	Sandusky	Erie	7.4
ERI0181703	Kenneth G Miller House	1206 Wayne St	Sandusky	Erie	7.4
ERI0017403	Campbell School	1215 Campbell St	Sandusky	Erie	7.4
HUR0024806		228 Town Line Rd	Bronson (Township of)	Huron	7.4
ERI0056003		1330 Harrison St	Sandusky	Erie	7.4
ERI0178203	Thomas Federkiel House	602 Gartland Ave	Sandusky	Erie	7.4
ERI0181603	Carl Ferdinand Wolf House	1202 Wayne St	Sandusky	Erie	7.4
ERI0016903	Loren Gosser Jr House	1412 Camp St	Sandusky	Erie	7.4
ERI0017003		1413 Camp St	Sandusky	Erie	7.4
ERI0015003		314 Bell St	Sandusky	Erie	7.4
ERI0090203		1306 Mills St	Sandusky	Erie	7.4
SAN0045211	Lillian Slessman House	147 E Forest St	Clyde	Sandusky	7.5
ERI0090003	Walter Roehl House	1301 Mills St	Sandusky	Erie	7.5
ERI0178103	Michael Brown House	530 Gartland Ave	Sandusky	Erie	7.5
ERI0055903		1326 Harrison St	Sandusky	Erie	7.5
ERI0178003	Nicholas Pasqualini House	527 Gartland Ave	Sandusky	Erie	7.5
SEN0110804	Nathan Butz House	9815 E TR 138	Adams (Township of)	Seneca	7.5
ERI0014603	Thomas Smith Jr House	1918 Barker St	Sandusky	Erie	7.5
ERI0090103	David Risk House	1304 Mills St	Sandusky	Erie	7.5
SAN0050011	Sheerer House	142 E Buckeye St	Clyde	Sandusky	7.5
ERI0105503	Daniel Cramer House	1402 Pearl St	Sandusky	Erie	7.5
ERI0014503	Maryellen Birdsell House	1914 Barker St	Sandusky	Erie	7.5
ERI0150203	Tom Steinemann House	1133 Wayne St	Sandusky	Erie	7.5
ERI0177903	William Feiszli	526 Gartland Ave	Sandusky	Erie	7.5
ERI0177703	Gary Byington	523 Gartland Ave	Sandusky	Erie	7.5

ERI0063403	Louis Ross House	1029 Jay St	Sandusky	Erie	7.5
ERI0115403	Milton L Houser House	1310 Putnam St	Sandusky	Erie	7.5
ERI0113203	Walter Burtch House	1221 Prospect St	Sandusky	Erie	7.5
ERI0181503	Amelia D Davlin House	1136 Wayne St	Sandusky	Erie	7.5
ERI0016803	Lucille Lewis House	1405 Camp St	Sandusky	Erie	7.5
ERI0177803	Ferdinand Maloney House	524 Gartland Ave	Sandusky	Erie	7.5
ERI0125603	Virgil Kill House	1303 Sycamore Line St	Sandusky	Erie	7.5
ERI0014803	Thomas Dupler House	133 Bell St	Sandusky	Erie	7.5
ERI0113103	Frank T Fox House	1219 Prospect St	Sandusky	Erie	7.5
ERI0063303	Ralph Frank House	1025 Jay St	Sandusky	Erie	7.5
ERI0016703	BJ Giggs House	1401 Camp St	Sandusky	Erie	7.5
ERI0181403	David Biechele House	1132 Wayne St	Sandusky	Erie	7.5
ERI0129903	Good Samaritan Hosp	703 Tyler St	Sandusky	Erie	7.5
ERI0130103	Richard Killman House	1010 Tyler St	Sandusky	Erie	7.5
ERI0115303		1302 Putman St	Sandusky	Erie	7.5
ERI0058003	Jennie Jordan House	1207 Hayes Ave	Sandusky	Erie	7.5
ERI0129303	Firelands Income Tax	1028 Tiffin Ave	Sandusky	Erie	7.5
ERI0177603	David Miani House	520 Gartland Ave	Sandusky	Erie	7.5
ERI0181103	Sterling & Madeline Riccelli	1123 Wayne St	Sandusky	Erie	7.5
ERI0113303		1215 Prospect St	Sandusky	Erie	7.5
ERI0031703	Willdred Apts	1116 Columbus Ave	Sandusky	Erie	7.5
ERI0014403	Blanche Wyatt House	1816 Barker St	Sandusky	Erie	7.5
ERI0105403	Kenneth Davis House	1329 Pearl St	Sandusky	Erie	7.5
ERI0063203	Ruth Krawetski House	1021 Jay St	Sandusky	Erie	7.5
ERI0181303	David Mehling House	1128 Wayne St	Sandusky	Erie	7.5
ERI0177503	Eugene Parker	518 Gartland Ave	Sandusky	Erie	7.5
ERI0180903	Robert Wessels House	1117 Wayne St	Sandusky	Erie	7.5
ERI0014703	Barker School	1925 Barker St	Sandusky	Erie	7.5
ERI0014903	Carl Brown House	309 Bell St	Sandusky	Erie	7.5
ERI0023603	Doretta Babisek House	1219 Central Ave	Sandusky	Erie	7.5
ERI0083403	Schwerer Construction Co	1208 Maple Ave	Sandusky	Erie	7.5
ERI0177403	Iva Nath House	514 Gartland Ave	Sandusky	Erie	7.5
ERI0177203	Richard Volz House	511 Gartland Ave	Sandusky	Erie	7.5
ERI0181203	Richard Howell House	1124 Wayne St	Sandusky	Erie	7.5
ERI0180803	Rodney Scott House	1113 Wayne St	Sandusky	Erie	7.5
ERI0023503		1216 Central Ave	Sandusky	Erie	7.5
SAN0030011	Collins House	133 Arch St	Clyde	Sandusky	7.5
ERI0023403	James Gallagher House	1215 Central Ave	Sandusky	Erie	7.5
ERI0123103	Laura Webster House	1303 Shelby St	Sandusky	Erie	7.5
ERI0057803	George Snyder House	1104 Hayes Ave	Sandusky	Erie	7.5
ERI0063003	Ray Garza House	1013 Jay St	Sandusky	Erie	7.5
ERI0055803	Thelma Bechtel House	1302 Harrison St	Sandusky	Erie	7.5
HUR0020309		3257 New State Rd	Ripley (Township of)	Huron	7.5
ERI0177303	Joseph Brogle House	512 Gartland Ave	Sandusky	Erie	7.5
SAN0033011	LaDonna Werth House	118 E Forest St	Clyde	Sandusky	7.5
ERI0260503	Erie County Office Building	1200 Sycamore Line St	Sandusky	Erie	7.5
ERI0017303		1107 Campbell St	Sandusky	Erie	7.5
ERI0181003	J Matt Carroll House	1120 Wayne St	Sandusky	Erie	7.5
ERI0063103	Edwin Lochotzki House	1014 Jay St	Sandusky	Erie	7.5
ERI0057903	William Gilbert House	1109 Hayes Ave	Sandusky	Erie	7.5
ERI0023303		1211 Central Ave	Sandusky	Erie	7.5
ERI0130303	Richard Feaga House	514 Van Buren St	Sandusky	Erie	7.5
ERI0132503	Gary Laws House	1218 Vine St	Sandusky	Erie	7.5
ERI0040203	Kenneth Gaydoesh House	1528-1530 5th St	Sandusky	Erie	7.5
ERI0180603	William Poeschel House	1105 Wayne St	Sandusky	Erie	7.5
ERI0040103	Walter Kerber House	1424 5th St	Sandusky	Erie	7.5
ERI0180703	Arnold Oliver House	1112 Charles St	Sandusky	Erie	7.5
ERI0023203	Rodger Doerzbach House	1208-1210 Central Ave	Sandusky	Erie	7.5
ERI0039103	Stamm House	1012 Decatur St	Sandusky	Erie	7.5

ERI0132403		1216 Vine St	Sandusky	Erie	7.5
ERI0049303	Caroline Michel House	1016 Fulton St	Sandusky	Erie	7.5
ERI0180403	FP Waldock House	1103 Wayne St	Sandusky	Erie	7.5
ERI0132303	Georgia Eberwine House	1210 Vine St	Sandusky	Erie	7.5
SAN0032811	June Hamilton House	115 Duane St	Clyde	Sandusky	7.5
ERI0016603	Leo Greenman House	1321 Camp St	Sandusky	Erie	7.5
ERI0130203	James Holzmiller House	1306 Tyler St	Sandusky	Erie	7.5
ERI0023103	RG Garretson House	1204 Central Ave	Sandusky	Erie	7.5
SAN0045111	Raymond Colavincenso House	125 E Forest St	Clyde	Sandusky	7.5
ERI0105303	David Borsick House	1309 Pearl St	Sandusky	Erie	7.5
ERI0055703	Robert Davis House	1029 Harrison St	Sandusky	Erie	7.5
SAN0032911	Charles Horne House	114 E Forest St	Clyde	Sandusky	7.5
ERI0089903	William C Wilson House	1009 Mills St	Sandusky	Erie	7.5
RIC0006401	Webber House	175 W Broadway	Plymouth (Township of)	Richland	7.5
SEN0111611	Jeremiah Neikirk House	SR 18	Scipio (Township of)	Seneca	7.5
ERI0125503	Erie Co Office Bldg	1200 Sycamore Line St	Sandusky	Erie	7.5
SAN0046211	Elizabeth Ramsey House	430 S Main St	Clyde	Sandusky	7.5
ERI0023003	Betty Stoll House	1203 Central Ave	Sandusky	Erie	7.5
ERI0105203	May Fogle House	1305 Pearl St	Sandusky	Erie	7.5
ERI0089803	James Johnson House	1005 Mills St	Sandusky	Erie	7.5
ERI0039203	Valenska Luch House	1015 Decatur St	Sandusky	Erie	7.5
ERI0180503	Richard Maag House	1104 Wayne St	Sandusky	Erie	7.5
ERI0039003	Robert Moran House	1011 Decatur St	Sandusky	Erie	7.5
ERI0022903	Paul Strickfaden House	1201 Central Ave	Sandusky	Erie	7.5
ERI0055603	Dewitt Thompson House	1021 Harrison St	Sandusky	Erie	7.5
SAN0030211	Bennet House	114 E Buckeye St	Clyde	Sandusky	7.5
ERI0129203	Kerber Marine Grocery	1006 Tiffin Ave	Sandusky	Erie	7.5
ERI0038903	Leonard Dahnke House	1007 Decatur St	Sandusky	Erie	7.5
SAN0030111		108-110 E Buckeye St	Clyde	Sandusky	7.5
ERI0105103	Anne Fazekas House	1304 Pearl St	Sandusky	Erie	7.5
ERI0022803	Dennis Georgie House	1012 Central Ave	Sandusky	Erie	7.5
SAN0034411	Louis Hall House	104 E Maple St	Clyde	Sandusky	7.5
SAN0034211	Gill & Sons Carpentry Shop	118 S Main St	Clyde	Sandusky	7.5
ERI0055403	Alma Geason House	1017 Harrison St	Sandusky	Erie	7.5
ERI0038803	Ted Briggs House	1005 Decatur St	Sandusky	Erie	7.5
ERI0055503	Cylesta Meekins House	1020 Harrison St	Sandusky	Erie	7.5
ERI0005503	Steeter's Garage	1018 A St	Sandusky	Erie	7.5
SAN0034711	Erlin Trader	103 E McPherson St	Clyde	Sandusky	7.5
ERI0057703	Rev Rex Ellison House	1016 Hayes Ave	Sandusky	Erie	7.5
SAN0033711	Wadsworth House	610 N Main (at Hamer St)	Clyde	Sandusky	7.5
SAN0045711	Utley House	706 N Main St	Clyde	Sandusky	7.5
ERI0083203	Millott Transfer & Storage Co	1000 Maple Ave	Sandusky	Erie	7.5
SAN0045611	Franks Bldg	310-312 N Main St	Clyde	Sandusky	7.5
ERI0031603	Paul Miller House	1022 Columbus Ave	Sandusky	Erie	7.6
SAN0001811	Union Bank	100 S Main St	Clyde	Sandusky	7.6
RIC0011201	Russell House	S Side Parsel Rd at Fenner Rd	Plymouth (Township of)	Richland	7.6
ERI0150103	Richard Smith House	1032 Wayne St	Sandusky	Erie	7.6
ERI0083303		1004 Maple Ave	Sandusky	Erie	7.6
SAN0033411	Wilson Shoe Store	100 N Main St	Clyde	Sandusky	7.6
ERI0016503	Michael Staskiewicz House	1303 Camp St	Sandusky	Erie	7.6
SAN0034311	Christian Church	206 S Main St	Clyde	Sandusky	7.6
ERI0089703	Etta O Barnum House	629 Mills St	Sandusky	Erie	7.6
SAN0034011	Jennings Pharmacy	102 S Main St	Clyde	Sandusky	7.6
SAN0046511	Gerald Bogner House	230 S Main St	Clyde	Sandusky	7.6
ERI0038703	Robert Babcock Jr House	1004 Decatur St	Sandusky	Erie	7.6
ERI0069103	Terry Johannsen House	713 John St	Sandusky	Erie	7.6
ERI0022703	Thomas Learmonth House	1005 Central Ave	Sandusky	Erie	7.6
ERI0150003	James Mains House	1021 Wayne St	Sandusky	Erie	7.6
ERI0057503	Betty Deyo House	1010 Hayes Ave	Sandusky	Erie	7.6

ERI0057603	Claude Zerbe	1013 Hayes Ave	Sandusky	Erie	7.6
ERI0054403	Nick's Golf & Cycling Shop	1035 Hancock St	Sandusky	Erie	7.6
SAN0046411	Thomas Dewey House	404 S Main St	Clyde	Sandusky	7.6
SAN0033811	Old Armory Bldg	657 N Main St	Clyde	Sandusky	7.6
ERI0069203	Cyril F Good House	805 John St	Sandusky	Erie	7.6
ERI0125403	William Kaiser House	1134 Sycamore Line St	Sandusky	Erie	7.6
ERI0129103		649 Tiffin Ave	Sandusky	Erie	7.6
ERI0054303	William Sike House	1031 Hancock St	Sandusky	Erie	7.6
ERI0149903	Paul Mack House	1019 Wayne St	Sandusky	Erie	7.6
ERI0105003	Fashion Style Salon	1023 Pearl St	Sandusky	Erie	7.6
ERI0022603	Mardell Kimes House	921 Central Ave	Sandusky	Erie	7.6
ERI0113003		605 Porter St	Sandusky	Erie	7.6
ERI0019203	Gary J Hoch House	1017 Carr St	Sandusky	Erie	7.6
ERI0061103		1003 Jackson St	Sandusky	Erie	7.6
ERI0031503		1009 Columbus Ave	Sandusky	Erie	7.6
SAN0045511	Dewey Bldg	101 N Main St	Clyde	Sandusky	7.6
ERI0022503	Rosine Eleanor House	916 Central Ave	Sandusky	Erie	7.6
ERI0038503	John Ginty House	922 Decatur St	Sandusky	Erie	7.6
SAN0033911	Corner Drug Store	101 S Main St (at Buckeye)	Clyde	Sandusky	7.6
ERI0104803	William Barger House	1021 Pearl St	Sandusky	Erie	7.6
ERI0123003		927 Shelby St	Sandusky	Erie	7.6
SAN0033611	Winesburg Antiques & Collectib	605 N Main St	Clyde	Sandusky	7.6
ERI0125303	Robert Fantozz House	1130 Sycamore Line St	Sandusky	Erie	7.6
ERI0149803	James Gardner House	1015 Wayne St	Sandusky	Erie	7.6
SAN0034111	Harkness Davenport Block	113-121 S Main St	Clyde	Sandusky	7.6
ERI0132203	Chester Roesch House	920 Vine St	Sandusky	Erie	7.6
ERI0049203	Sandy Gillam House	903 Fulton St	Sandusky	Erie	7.6
ERI0014303	John Klenk House	1413 Barker St	Sandusky	Erie	7.6
HUR0040304		4690 Medusa Rd	Townsend (Township of)	Huron	7.6
SAN0045911	Patricia Runion House	205 S Main St	Clyde	Sandusky	7.6
SAN0046011	Francis S Jackson House	209 S Main St	Clyde	Sandusky	7.6
ERI0124003	Sharon Pean House	1002 Stone St	Sandusky	Erie	7.6
ERI0026203	Philip Nemitz House	1014 Clinton St	Sandusky	Erie	7.6
SAN0033511	Christopher Knight House	415 N Main St	Clyde	Sandusky	7.6
ERI0031403	Diamond's Electric	1005 Columbus Ave	Sandusky	Erie	7.6
SEN0098111	Cole Family Farm	2483 N SR 18	Republic	Seneca	7.6
ERI0118103	Helen Murphy House	424 Scott St	Sandusky	Erie	7.6
ERI0038403	Sally Brushaber House	919 Decatur St	Sandusky	Erie	7.6
SAN0001711	Old City Hall	131-133 S Main St	Clyde	Sandusky	7.6
ERI0016403	Kenneth Higgins House	1029 Camp St	Sandusky	Erie	7.6
ERI0042703	David George House	720 Fox St	Sandusky	Erie	7.6
ERI0054203	William Knupke House	1021 Hancock St	Sandusky	Erie	7.6
ERI0131803	John Olmor House	905 Vine St	Sandusky	Erie	7.6
ERI0132103		917 Vine St	Sandusky	Erie	7.6
ERI0123903		922 Stone St	Sandusky	Erie	7.6
ERI0125203		1126 Sycamore Line St	Sandusky	Erie	7.6
SAN0045811	Pine-Rose Inn	137 S Main St	Clyde	Sandusky	7.6
SAN0046111	H Kenyon Anderson House	219 S Main St	Clyde	Sandusky	7.6
ERI0104903		1022 Pearl St	Sandusky	Erie	7.6
ERI0031303	Harry Billard House	1003 Columbus Ave	Sandusky	Erie	7.6
RIC0008201	John Dick House	127 W Broadway	Plymouth (Township of)	Richland	7.6
ERI0057403	Jesse Harvey House	927 Hayes Ave	Sandusky	Erie	7.6
ERI0049103	Kugel Flats	829-835 Fulton St	Sandusky	Erie	7.6
ERI0022303		910 Central Ave	Sandusky	Erie	7.6
ERI0149703	Rosaire Desrosiers House	1008-1010 Wayne St	Sandusky	Erie	7.6
ERI0054103	Leslie Hall House	1019 Hancock St	Sandusky	Erie	7.6
ERI0097703	Herman Dendinger House	1823 W Monroe St	Sandusky	Erie	7.6
ERI0131903	Marian Bloxham House	913 Vine St	Sandusky	Erie	7.6
ERI0115203	Dawn M Becker House	630 Putnam St	Sandusky	Erie	7.6

ERI0083103	James Moloney House	904 Maple Ave	Sandusky	Erie	7.6
ERI0097903	Donald Swain House	120 Neil St	Sandusky	Erie	7.6
ERI0149603	Ebert Mowry House	1007 Wayne St	Sandusky	Erie	7.6
ERI0022403	Donald Roten House	911 Central Ave	Sandusky	Erie	7.6
ERI0132003		914 Vine St	Sandusky	Erie	7.6
ERI0016303		1025 Camp St	Sandusky	Erie	7.6
SAN0030311		101-105 W Buckeye St	Clyde	Sandusky	7.6
ERI0118203		436 Scott St	Sandusky	Erie	7.6
ERI0097603		1815 W Monroe St	Sandusky	Erie	7.6
SAN0030511	Gems Unlimited	124 W Buckeye St	Clyde	Sandusky	7.6
ERI0057303	Linwood Dawes House	924 Hayes Ave	Sandusky	Erie	7.6
ERI0053803	Susan Seward House	1015 Hancock St	Sandusky	Erie	7.6
ERI0022203		906 Central Ave	Sandusky	Erie	7.6
RIC0008501		121 W Broadway	Plymouth (Township of)	Richland	7.6
ERI0057203	June Schweinfurth House	923 Hayes Ave	Sandusky	Erie	7.6
ERI0062903	Larry L Likes House	602 Jay St	Sandusky	Erie	7.6
ERI0083003	Edward Reedy House	902 Maple Ave	Sandusky	Erie	7.6
ERI0026103		1002 Clinton St	Sandusky	Erie	7.6
ERI0038303	James Voltz House	907 Decatur St	Sandusky	Erie	7.6
SAN0044211	Manning House	122 Amanda St	Clyde	Sandusky	7.6
ERI0053703	Joe Harvey House	1013 Hancock St	Sandusky	Erie	7.6
ERI0059303	Mary Reiking House	321 High St	Sandusky	Erie	7.6
ERI0055303		634 Harrison St	Sandusky	Erie	7.6
ERI0097803	Life Tabernacle Agape Center	SEC Neil & Columbus	Sandusky	Erie	7.6
ERI0089603	Kirk Miller House	612 Mills St	Sandusky	Erie	7.6
ERI0022003	Cecil Marchky House	902 Central Ave	Sandusky	Erie	7.6
ERI0117803	Lula Tobin House	407 Scott St	Sandusky	Erie	7.6
ERI0122903		918 Shelby St	Sandusky	Erie	7.6
SAN0033111	First United Presbyterian Church	113 W Forest St	Clyde	Sandusky	7.6
ERI0019103		908 Carr St	Sandusky	Erie	7.6
ERI0117903	Harold Nestor House	409 Scott St	Sandusky	Erie	7.6
ERI0016203		1022 Camp St	Sandusky	Erie	7.6
SAN0045411	Gilbert House	140 W Forest St	Clyde	Sandusky	7.6
ERI0229803		913 A St	Sandusky	Erie	7.6
ERI0022103		903-905 Central Ave	Sandusky	Erie	7.6
ERI0057103	Arth Clark House	918 Hayes Ave	Sandusky	Erie	7.6
ERI0118003	Giles John House	413 Scott St	Sandusky	Erie	7.6
ERI0055203	Thomas McCracken House	630 Harrison St	Sandusky	Erie	7.6
ERI0097103	Loren Eschenauer House	1316 W Monroe St	Sandusky	Erie	7.6
ERI0021903	Howard Hanck House	824 Central Ave	Sandusky	Erie	7.6
ERI0089503	Kathleen Canterbury House	608 Mills St	Sandusky	Erie	7.6
ERI0097503	Raymond F Weber	1711 W Monroe St	Sandusky	Erie	7.6
ERI0104603	Jimmy's Bar	1001 Pearl St	Sandusky	Erie	7.6
ERI0097003	Martha Boden House	1310 W Monroe St	Sandusky	Erie	7.6
ERI0096903	Demma's Café	1302 W Monroe St	Sandusky	Erie	7.6
ERI0048903	Amador Gonzales House	823 Fulton St	Sandusky	Erie	7.6
ERI0057003	Lela Harris House	914 Hayes Ave	Sandusky	Erie	7.6
ERI0131703	Thomas Klein House	903 Vine St	Sandusky	Erie	7.6
SAN0028711		123 Amanda St	Clyde	Sandusky	7.6
ERI0049003	Paul Clark House	827 Fulton St	Sandusky	Erie	7.6
ERI0123803		908 Stone St	Sandusky	Erie	7.6
ERI0098103	Ruth Henry House	216 Neil St	Sandusky	Erie	7.6
ERI0021803	Ronald A Baum House	820 Central Ave	Sandusky	Erie	7.6
ERI0054003	Estil Martin House	1003 Hancock St	Sandusky	Erie	7.6
ERI0061003		903 Jackson St	Sandusky	Erie	7.6
ERI0056903	David Taylor House	912 Hayes Ave	Sandusky	Erie	7.6
SAN0028611		122 Amanda St	Clyde	Sandusky	7.6
ERI0149503	Jeff Smith House	921 Wayne St	Sandusky	Erie	7.6
ERI0123703		906 Stone St	Sandusky	Erie	7.6

ERI0104703	NA-RU Craft Shop & Apt	1002 Pearl St	Sandusky	Erie	7.6
ERI0131603	Lester Presse House	812 Vine St	Sandusky	Erie	7.6
ERI0045403	Richard Karbler House	1018 Franklin St	Sandusky	Erie	7.6
ERI0060903		834 Jackson St	Sandusky	Erie	7.6
ERI0053603	Robert Rumford House	1008 Hancock St	Sandusky	Erie	7.6
ERI0133803		1034 Warren St	Sandusky	Erie	7.6
ERI0031203	Pam Burcham House	907 Columbus Ave	Sandusky	Erie	7.6
ERI0055103	Rique Diaz House	622 Harrison St	Sandusky	Erie	7.6
ERI0096603	James Bluhm House	1210 W Monroe St	Sandusky	Erie	7.6
ERI0053903	Yarn Shop	1002 Hancock St	Sandusky	Erie	7.6
ERI0096403	Louis Alexander House	1208 W Monroe St	Sandusky	Erie	7.6
SEN0108911	Jacob Free House	9903 East (US 224)	Scipio (Township of)	Seneca	7.6
ERI0096303		1204 W Monroe St	Sandusky	Erie	7.6
ERI0097403	Huntley Cleaners	1607 W Monroe St	Sandusky	Erie	7.6
ERI0038203	Glen Holzhauser House	824 Decatur St	Sandusky	Erie	7.6
ERI0021703	Harold Higgins House	815 Central Ave	Sandusky	Erie	7.6
SAN0044311	Hintz House	135 Amanda St	Clyde	Sandusky	7.6
ERI0096103	Arthur Hughes House	1202 W Monroe St	Sandusky	Erie	7.6
ERI0131503		808 Vine St	Sandusky	Erie	7.6
ERI0149403	Kenneth Hartley House	917 Wayne St	Sandusky	Erie	7.6
ERI0097303	May T Hyatt House	1601 W Monroe St	Sandusky	Erie	7.6
ERI0128003	Jeanette Herhold House	1424 3rd St	Sandusky	Erie	7.6
ERI0115103	Alton Fox House	601 Putnam St	Sandusky	Erie	7.6
ERI0096003	Delbert Wobser House	1116 W Monroe St	Sandusky	Erie	7.6
ERI0098403		309 Neil St	Sandusky	Erie	7.6
ERI0055003	Ronald Jolly House	618 Harrison St	Sandusky	Erie	7.6
ERI0045303	Nancy Giblin House	1014 Franklin St	Sandusky	Erie	7.6
ERI0133703	Ford Eversole House	1021 Warren St	Sandusky	Erie	7.6
ERI0038103	Adrian Fox House	821-823 Decatur St	Sandusky	Erie	7.6
ERI0059403	Richard Bauer House	401 High St	Sandusky	Erie	7.6
ERI0098503	St Stephens AME Church	312 Neil St	Sandusky	Erie	7.6
ERI0074403		W Madison St & Tiffin Ave	Sandusky	Erie	7.6
ERI0038003	Helen Ruth House	820 Decatur St	Sandusky	Erie	7.6
HUR0040404		4568 Medusa Rd	Townsend (Township of)	Huron	7.6
SAN0030411	Dee Ann Davenport House	136 W Buckeye St	Clyde	Sandusky	7.6
ERI0095803	Koch Realty	1022 W Monroe St	Sandusky	Erie	7.6
ERI0098003	Lawrence Riedy House	213 Neil St	Sandusky	Erie	7.6
ERI0031103	Craft Cottage	904 Columbus Ave	Sandusky	Erie	7.6
ERI0095703	Stanley Bennett House	1016 W Monroe St	Sandusky	Erie	7.6
ERI0098203	David Andres House	217 Neil St	Sandusky	Erie	7.6
ERI0054903	Laura Shatzer House	614 Harrison St	Sandusky	Erie	7.6
ERI0056803	Verrnard Englehart House	823 Hayes Ave	Sandusky	Erie	7.6
ERI0095603	Donna Dellinger House	1014 W Monroe St	Sandusky	Erie	7.6
ERI0048803	Mark Delp House	809 Fulton St	Sandusky	Erie	7.6
ERI0112103	Steven Ruff House	1031 Perry St	Sandusky	Erie	7.6
ERI0149203	Beverly Bartish House	410 Wayne St	Sandusky	Erie	7.6
ERI0104503	Ellsworth Brubbe House	634 Pearl St	Sandusky	Erie	7.6
ERI0038603	Wilma Garloch House	1003 Decatur St	Sandusky	Erie	7.6
ERI0075903	Charles Andres House	1927 W Madison St	Sandusky	Erie	7.6
ERI0149303	John Costello House	916 Wayne St	Sandusky	Erie	7.6
ERI0095503	Angelo Lamarca House	1008 W Monroe St	Sandusky	Erie	7.6
ERI0026003	Carlos C Calderon House	615 Clinton St	Sandusky	Erie	7.6
ERI0015203	Cleve Sandusky Brewing Co	505 Broadway St	Sandusky	Erie	7.6
ERI0098303	Esther Ruse House	225 Neil St	Sandusky	Erie	7.6
ERI0096803	Charles Peters House	1233 W Monroe St	Sandusky	Erie	7.6
ERI0056703	Ronald Gruhlke House	821 Hayes Ave	Sandusky	Erie	7.7
ERI0053503		917 Hancock St	Sandusky	Erie	7.7
ERI0095403	Sharlene Ryan house	1004 W Monroe St	Sandusky	Erie	7.7
ERI0056303		804-806 Hayes Ave	Sandusky	Erie	7.7

SAN0035711	Brenda Hackenburg House	136 Washington Ave	Clyde	Sandusky	7.7
ERI0075803	Harold Klein House	1923 W Madison St	Sandusky	Erie	7.7
ERI0040003	Dennis Kluding House	903 5th St	Sandusky	Erie	7.7
ERI0048703	Bill Bowden House	807 Fulton St	Sandusky	Erie	7.7
ERI0039603		116 Division St	Sandusky	Erie	7.7
ERI0112003	Byron Aldrich House	1025 Perry St	Sandusky	Erie	7.7
ERI0097203	Geraldine D Lonz House	1413 W Monroe St	Sandusky	Erie	7.7
SAN0032211	Newhouse House	128 W Cherry St	Clyde	Sandusky	7.7
ERI0037903	Lenore Guckert House	809 Decatur St	Sandusky	Erie	7.7
ERI0039903	Anthony Kluding House	809 5th St	Sandusky	Erie	7.7
ERI0056603		819 Hayes Ave	Sandusky	Erie	7.7
ERI0075703	Charles V Ryan House	1913 W Madison St	Sandusky	Erie	7.7
ERI0095003	Thomas Layton House	918 W Monroe St	Sandusky	Erie	7.7
ERI0096703		1213 W Monroe St	Sandusky	Erie	7.7
ERI0020203		228 Center St	Sandusky	Erie	7.7
ERI0094803	Peter Spore House	910 W Monroe St	Sandusky	Erie	7.7
ERI0096503	Edward K Stenger House	1209-1209 1/2 W Monroe St	Sandusky	Erie	7.7
ERI0115003	John H Slaughter House	533 Putnam St	Sandusky	Erie	7.7
ERI0056503	Martha Fawcett House	817 Hayes Ave	Sandusky	Erie	7.7
ERI0096203	Irene Smith House	1203 W Monroe St	Sandusky	Erie	7.7
ERI0098803	Roy Johnson House	410 Neil St	Sandusky	Erie	7.7
ERI0122803	Toni England House	632 Shelby St	Sandusky	Erie	7.7
SAN0049911	Riegal House	144 Amanda St	Clyde	Sandusky	7.7
ERI0053403	John W Costello House	916 Hancock St	Sandusky	Erie	7.7
SAN0035811	Helice Hafemeister Dining House	143 Washington Ave	Clyde	Sandusky	7.7
ERI0020603	Charles Brennan House	406 Center St	Sandusky	Erie	7.7
ERI0020503	Paul Warrer House	402 Center St	Sandusky	Erie	7.7
SAN0032311	Blum House	132 W Cherry St	Clyde	Sandusky	7.7
SAN0034811	Lighthouse	147 W McPherson Hwy (US 20)	Clyde	Sandusky	7.7
ERI0025903	Florence D Martin House	609 Clinton St	Sandusky	Erie	7.7
ERI0020303	Elsie Gaines House	302 Center St	Sandusky	Erie	7.7
ERI0053103		909 Hancock St	Sandusky	Erie	7.7
ERI0149103	Craig Miller House	908 Wayne St	Sandusky	Erie	7.7
ERI0098903	Dorothy Rienhart House	414 Neil St	Sandusky	Erie	7.7
ERI0053203	Dining Room Restaurant	917 Hancock St	Sandusky	Erie	7.7
SAN0028811		143 Amanda St	Clyde	Sandusky	7.7
ERI0127903		1419 3rd St	Sandusky	Erie	7.7
ERI0042403	Valerie Ortez House	1006 4th St	Sandusky	Erie	7.7
ERI0099003	Bill M Phipps House	426 Neil St	Sandusky	Erie	7.7
ERI0095903	Koehler House	1105 W Monroe St	Sandusky	Erie	7.7
ERI0053303	Ethel Jackson House	914 Hancock St	Sandusky	Erie	7.7
ERI0037803	Judith Hutchinson House	806 Decatur St	Sandusky	Erie	7.7
HUR0024306		937 Old State Rd		Huron	7.7
ERI0042603	John McChesney House	1127 4th St	Sandusky	Erie	7.7
ERI0098603		315 Neil St	Sandusky	Erie	7.7
ERI0133603	Eugene Hale house	1001 Warren St	Sandusky	Erie	7.7
ERI0075603	Frank Lagrass House	1823 W Madison St	Sandusky	Erie	7.7
ERI0056403	Worthmore Furn	809-813 Hayes Ave	Sandusky	Erie	7.7
SAN0035511		1012 Vine St	Clyde	Sandusky	7.7
ERI0127803	Florian Perla House	1411 3rd St	Sandusky	Erie	7.7
ERI0111903	Marguerite Sheets House	1022 Perry St	Sandusky	Erie	7.7
ERI0125103	Frank DeGrande House	1025 Sycamore Line St	Sandusky	Erie	7.7
ERI0075503	Arvel D Hill House	1819 W Madison St	Sandusky	Erie	7.7
SAN0033311	Jewett House	670 George St	Clyde	Sandusky	7.7
ERI0053003	Bobby Haney House	905-905 1/2 Hancock St	Sandusky	Erie	7.7
SAN0035411	Carl A Riegel House	948 Vine St	Clyde	Sandusky	7.7
ERI0094603	Eugene Marriotti House	718 W Monroe St	Sandusky	Erie	7.7
ERI0042303	Campbell House	910 4th St	Sandusky	Erie	7.7
ERI0016103	Harold Ramey House	625 Camp St	Sandusky	Erie	7.7

ERI0111703	Joyce Denney House	1015 Perry St	Sandusky	Erie	7.7
ERI0094503	Harold Good House	712 W Monroe St	Sandusky	Erie	7.7
ERI0114903	William C Shafer House	525 Putnam St	Sandusky	Erie	7.7
ERI0122703	Agnes L Hendrickson House	628 Shelby St	Sandusky	Erie	7.7
ERI0098703	Ruby Agee House	331 Neil St	Sandusky	Erie	7.7
ERI0016003	Angie's Beauty Shop	623 Camp St	Sandusky	Erie	7.7
ERI0075403		1815 W Madison St	Sandusky	Erie	7.7
ERI0095303	Michael Hasenmeier House	931 W Monroe St	Sandusky	Erie	7.7
ERI0111803	Joseph Poskonka House	1018 Perry St	Sandusky	Erie	7.7
ERI0052803	Aline Gambrell House	903 Hancock St	Sandusky	Erie	7.7
SAN0033211	St Paul Lutheran Church	147 W Forest St	Clyde	Sandusky	7.7
ERI0095203	Heyer Music Co Inc	925 W Monroe St	Sandusky	Erie	7.7
SAN0050111	Maines House	204 W Cherry St	Clyde	Sandusky	7.7
ERI0149003	Jeffrey Krabill House	810 Wayne St	Sandusky	Erie	7.7
ERI0085603	Julia A Feick House	627 McDonough St	Sandusky	Erie	7.7
SAN0030611	Clyde Masonic Temple	160 W Buckeye St	Clyde	Sandusky	7.7
ERI0095103		919 W Monroe St	Sandusky	Erie	7.7
ERI0114803		521 Putnam St	Sandusky	Erie	7.7
ERI0122503	Grace M Quinn House	619 Shelby St	Sandusky	Erie	7.7
ERI0102503	Park View Motel	740 E Park St	Sandusky	Erie	7.7
SAN0032411	Louis Hall House	205 Cherry St	Clyde	Sandusky	7.7
ERI0148403	Salem United Methodist Church	NWC Wayne St & Division St	Sandusky	Erie	7.7
ERI0015903	Paul A Farrar House	621 Camp St	Sandusky	Erie	7.7
ERI0094403	Cameo Bar & Restaurant	706 W Monroe St	Sandusky	Erie	7.7
ERI0094303	Eula Lune House	614 W Monroe St	Sandusky	Erie	7.7
ERI0122603	Paul A Mantey House	622 Shelby St	Sandusky	Erie	7.7
ERI0094903	Edwin E Ackerman House	911 W Monroe St	Sandusky	Erie	7.7
ERI0127703	Lindsey House	1206 3rd St	Sandusky	Erie	7.7
SAN0034511	Lynn & beverly Nagy House	157 W Maple (at George St)	Clyde	Sandusky	7.7
ERI0111603	Charles Bostater House	1009 Perry St	Sandusky	Erie	7.7
ERI0094703	William Ehrnsberger House	909 W Monroe St	Sandusky	Erie	7.7
ERI0045203	Jessie Pearson House	907 Franklin St	Sandusky	Erie	7.7
ERI0052903	Ira Gilmore House	904 Hancock St	Sandusky	Erie	7.7
ERI0094203		608 W Monroe St	Sandusky	Erie	7.7
ERI0102803		739 W Park St	Sandusky	Erie	7.7
ERI0071603	Jack W Hunt House	631 Lawrence St	Sandusky	Erie	7.7
ERI0099303	Larry Wren House	524 Neil St	Sandusky	Erie	7.7
ERI0042503	Harold J Linden House	1025 4th St	Sandusky	Erie	7.7
ERI0125003	John S Hill House	1015 Sycamore Line St	Sandusky	Erie	7.7
ERI0104403	Russell Wade House	605 Pearl St	Sandusky	Erie	7.7
ERI0124803	Louise Sanderson House	1004 Sycamore Line St	Sandusky	Erie	7.7
ERI0075303	Robert L Wilson House	1717 W Madison St	Sandusky	Erie	7.7
ERI0045103	Dennis Kurtz House	905 Franklin St	Sandusky	Erie	7.7
SAN0035611	Helen E Lowe House	1029 Vine St	Clyde	Sandusky	7.7
ERI0102403	Robert Sherman House	736 E Park St	Sandusky	Erie	7.7
ERI0085503		621 McDonough St	Sandusky	Erie	7.7
ERI0094003	Peter Dubois House	512 W Monroe St	Sandusky	Erie	7.7
ERI0037703	Gregory Ogle House	710 Decatur St	Sandusky	Erie	7.7
ERI0104303	William R Gilbert House	603 Pearl St	Sandusky	Erie	7.7
SAN0030711	Creative Childcare Center	203 W Buckeye St	Clyde	Sandusky	7.7
ERI0020403	Marjorie Johnson House	401 Center St	Sandusky	Erie	7.7
ERI0133503	Lee House	915 Warren St	Sandusky	Erie	7.7
ERI0129003	Ken Wolber State Farm Ins	534 Tiffin Ave	Sandusky	Erie	7.7
ERI0093903	Irvin Munson House	508 W Monroe St	Sandusky	Erie	7.7
ERI0148903		802 Wayne St	Sandusky	Erie	7.7
ERI0052703	Prince Williams House	807 Hancock St	Sandusky	Erie	7.7
ERI0093803	Delmar Rose Jr House	506 W Monroe St	Sandusky	Erie	7.7
ERI0115803	Ernest Pettis House	222 Reese St	Sandusky	Erie	7.7
ERI0102303	Frank Woods Jr House	734 E Park St	Sandusky	Erie	7.7

ERI0124903	Richard Ward House	1011 Sycamore Line St	Sandusky	Erie	7.7
ERI0114703	Charles Lipp House	513 Putnam St	Sandusky	Erie	7.7
ERI0094103	Marijune Binko House	516 W Monroe St	Sandusky	Erie	7.7
SAN0028911	Patrick M Archer House	203 Amanda St	Clyde	Sandusky	7.7
ERI0127503	George Cobb House	1118 3rd St	Sandusky	Erie	7.7
ERI0037603	Ermie Turner House	706 Decatur St	Sandusky	Erie	7.7
ERI0045003	Annie Meredith House	903 Franklin St	Sandusky	Erie	7.7
ERI0075003		1232 W Madison St	Sandusky	Erie	7.7
ERI0071503	Robert J Daniel House	627 Lawrence St	Sandusky	Erie	7.7
ERI0127403	Eugene Wobser House	1114 3rd St	Sandusky	Erie	7.7
ERI0039803		916 Erie St	Sandusky	Erie	7.7
ERI0102203	Marvin Reinhart House	730 E Park St	Sandusky	Erie	7.7
ERI0074903		1228 W Madison St	Sandusky	Erie	7.7
ERI0122403	Mildred A Wirsch House	609 Shelby St	Sandusky	Erie	7.7
ERI0099503	Margie Houghtling House	604 Neil St	Sandusky	Erie	7.7
ERI0074803	Kenneth R Jesberger House	1220 W Madison St	Sandusky	Erie	7.7
ERI0074603	Ernest P Gast House	1216 W Madison St	Sandusky	Erie	7.7
ERI0052603	Grace Church Thrift Shop	801 Hancock St	Sandusky	Erie	7.7
SAN0031011	Clyde Public Library	222 W Buckeye St	Clyde	Sandusky	7.7
ERI0148703	Judith Cotton House	733 Wayne St	Sandusky	Erie	7.7
ERI0114603	Kathleen Lombardy House	509 Putnam St	Sandusky	Erie	7.7
ERI0102103	Kathleen Young House	728 E Park St	Sandusky	Erie	7.7
ERI0074503	Robert S Byington House	1210 W Madison St	Sandusky	Erie	7.7
ERI0099103	Harold Strong House	511 Neil St	Sandusky	Erie	7.7
SAN0032511	William Smila House	305 W Cherry St	Clyde	Sandusky	7.7
SAN0034911	Camie's Restaurant	222 W McPherson Hwy	Clyde	Sandusky	7.7
ERI0099703	George Ritzenthaler House	616 Neil St	Sandusky	Erie	7.7
ERI0093703	Rolland Cronk House	402 W Monroe St	Sandusky	Erie	7.7
ERI0114503	Warren Davlin House	505 Putnam St	Sandusky	Erie	7.7
ERI0102703		707 W Park St	Sandusky	Erie	7.7
ERI0099203	Frank Casali House	515 Neil St	Sandusky	Erie	7.7
ERI0102003	Arthur Neidler House	724 E Park St	Sandusky	Erie	7.7
HUR0024206		1633 Old State Rd		Huron	7.7
ERI0093603	Maybelle Rhode House	316 W Monroe St	Sandusky	Erie	7.7
ERI0122303		603 Shelby St	Sandusky	Erie	7.7
ERI0148803		734 Wayne St	Sandusky	Erie	7.7
ERI0127603	Richard Everett House	1137 3rd St	Sandusky	Erie	7.7
ERI0054803	Charles Griffin House	513 Harrison St	Sandusky	Erie	7.7
ERI0102603		705 W Park St	Sandusky	Erie	7.7
RIC0008401		Bell St	Plymouth (Township of)	Richland	7.7
ERI0093503	Irma Brien House	314 W Monroe St	Sandusky	Erie	7.7
ERI0127203	Michael Gerald House	1024 3rd St	Sandusky	Erie	7.7
ERI0115903	Jerry Shafer House	318 Reese St	Sandusky	Erie	7.7
ERI0093403		310 W Monroe St	Sandusky	Erie	7.7
ERI0099403		525 Neil St	Sandusky	Erie	7.7
ERI0114303	Carl A Noftz House	503 Putnam St	Sandusky	Erie	7.7
ERI0101903	Beryl Reamer House	720 E Park St	Sandusky	Erie	7.7
ERI0093103	Anna Damko House	306 W Monroe St	Sandusky	Erie	7.7
ERI0093003	Lee Rush House	304 W Monroe St	Sandusky	Erie	7.7
SAN0030811	Thomas Cullen House	213 W Buckeye St	Clyde	Sandusky	7.7
ERI0133403	Charles Olsen House	908 Warren St	Sandusky	Erie	7.7
ERI0115703	Michael Gowdy House	221 Reese St	Sandusky	Erie	7.7
ERI0114403		504 Putnam St	Sandusky	Erie	7.7
ERI0148503	Atwell Garries House	719 Wayne St	Sandusky	Erie	7.7
ERI0052403	Arnold Massie House	733 Hancock St	Sandusky	Erie	7.7
ERI0104003		529 Pearl St	Sandusky	Erie	7.7
SAN0030911	James Allbery House	219 W Buckeye St	Clyde	Sandusky	7.7
ERI0112903	Hugh I Dewey House	624 Popular St	Sandusky	Erie	7.7
ERI0104203	Terrence L Welfle House	534 Pearl St	Sandusky	Erie	7.7

SEN0110504	John M Slessman House	9144 E TR 178	Adams (Township of)	Seneca	7.7
ERI0074303	James T Marlsbury House	1012 W Madison St	Sandusky	Erie	7.7
ERI0128903	George Liphart House	512 Tiffin Ave	Sandusky	Erie	7.7
ERI0069003		1816-1820 W Jefferson St	Sandusky	Erie	7.7
ERI0075103	Jacks Feltner House	1309 W Madison St	Sandusky	Erie	7.7
ERI0127303	Carl Stonerook House	1109 3rd St	Sandusky	Erie	7.7
ERI0085403		605 McDonough St	Sandusky	Erie	7.7
ERI0052503		NEC Hancock St & Reese St	Sandusky	Erie	7.7
ERI0044903	Lewis Knight House	808 Franklin St	Sandusky	Erie	7.7
ERI0068903	Frank Goblish House	1812 W Jefferson St	Sandusky	Erie	7.7
ERI0101803	Hugh P Kilgore House	716 E Park St	Sandusky	Erie	7.7
ERI0103903	George Gillingham House	527 Pearl St	Sandusky	Erie	7.7
ERI0075203	Daniel L Miller House	1409 W Madison St	Sandusky	Erie	7.7
ERI0104103	Stella McLoughlin House	530 Pearl St	Sandusky	Erie	7.7
ERI0025803	Harry M Peless Jr House	518 Clinton St	Sandusky	Erie	7.7
ERI0099603	Marjorie Hipp House	611 Neil St	Sandusky	Erie	7.7
SAN0032611	Kenneth Ray Lacy House	328 W Cherry St	Clyde	Sandusky	7.7
ERI0124703	Erie Day Treatment Center	912 Sycamore Line St	Sandusky	Erie	7.7
ERI0068803		1802 W Jefferson St	Sandusky	Erie	7.7
ERI0148603	Richard Garvin House	722 Wayne St	Sandusky	Erie	7.7
ERI0074703	Donald P Rotsinger House	1219 W Madison St	Sandusky	Erie	7.7
ERI0116003	Jacquelyn Kiser House	404 Reese St	Sandusky	Erie	7.7
HUR0040104		Wells Rd E of Medusa Rd	Townsend (Township of)	Huron	7.7
RIC0007301	B & O Depot	Bell St	Plymouth (Township of)	Richland	7.7
ERI0122103	William Williamson House	533 Shelby St	Sandusky	Erie	7.7
ERI0092903	Charity Free Will Baptist Church	301 W Monroe St	Sandusky	Erie	7.7
ERI0133303	Franklin Burmeister House	809 Warren St	Sandusky	Erie	7.7
ERI0037503	Kenneth Gessner House	623 Decatur St	Sandusky	Erie	7.7
ERI0099803	Lee Weyer House	619 Neil St	Sandusky	Erie	7.7
ERI0093303	Raymond Sanders House	309 W Monroe St	Sandusky	Erie	7.7
ERI0103703	Edward Chapman House	515 Pearl St	Sandusky	Erie	7.7
ERI0089403	Terry Pitzer House	426 Mills St	Sandusky	Erie	7.8
ERI0116103	Carpenter's Local 940	410 Reese St	Sandusky	Erie	7.8
ERI0093203	Jean A Dunkel House	307 W Monroe St	Sandusky	Erie	7.8
SAN0031111	John McConn House	225 W Buckeye St	Clyde	Sandusky	7.8
RIC0006301	Thomas House Public Library	23 W Broadway	Plymouth	Richland	7.8
ERI0122203	Norbert F Mehling House	534 Shelby St	Sandusky	Erie	7.8
ERI0120203	Marjorie Loe House	1202 2nd St	Sandusky	Erie	7.8
ERI0114203	Francisco Chavarria House	432 Putnam St	Sandusky	Erie	7.8
ERI0052303	Knotty Pine Bar	728 Hancock St	Sandusky	Erie	7.8
ERI0037403	Carl Green Jr House	621 Decatur St	Sandusky	Erie	7.8
RIC0008701	Sourwine House	49 RailRoad	Plymouth (Township of)	Richland	7.8
ERI0127103	William L Miller House	1011 3rd St	Sandusky	Erie	7.8
SAN0034611	Carl & Helen Smith House	104 Mechanic St	Clyde	Sandusky	7.8
ERI0133203		807 Warren St	Sandusky	Erie	7.8
ERI0148303	Dr Robert Kromer House	714 Wayne St	Sandusky	Erie	7.8
RIC0006501	Dr PE Havers Office	13 W Broadway	Plymouth (Township of)	Richland	7.8
ERI0037203	Mary Gerold House	619 Decatur St	Sandusky	Erie	7.8
ERI0116203	Katherine Voltz House	426 Reese St	Sandusky	Erie	7.8
ERI0054703	Genevieve Baaske House	433 Harrison St	Sandusky	Erie	7.8
ERI0127003	Estell Amison House	1003 3rd St	Sandusky	Erie	7.8
RIC0011301	Beck Farm	Parsel Rd	Plymouth (Township of)	Richland	7.8
ERI0089303	Florence Brown House	424 Mills St	Sandusky	Erie	7.8
ERI0074203	Elizabeth J Braun House	1011 W Madison St	Sandusky	Erie	7.8
ERI0052103	Joseph Alexander House	719 Hancock St	Sandusky	Erie	7.8
SAN0031211	Wendel D Williams House	231 W Buckeye St	Clyde	Sandusky	7.8
ERI0133103	George Santoric House	801 Warren St	Sandusky	Erie	7.8
ERI0103803	James Kollman House	518 Pearl St	Sandusky	Erie	7.8
ERI0126903		919 3rd St	Sandusky	Erie	7.8

ERI0124603	Scott Montelaure House	903 Sycamore Line St	Sandusky	Erie	7.8
ERI0037003	Paul Lesley House	615 Decatur St	Sandusky	Erie	7.8
ERI0119803	Rita Spoa House	1116 2nd St	Sandusky	Erie	7.8
ERI0015703	Wilbur Opp House	519 Camp St	Sandusky	Erie	7.8
ERI0037303		620 Decatur St	Sandusky	Erie	7.8
SAN0032711	William F Cox House	333 Cherry St	Clyde	Sandusky	7.8
ERI0068703	Armbruster Bakery	1614 W Jefferson St	Sandusky	Erie	7.8
ERI0148203	Gary Ellis House	708 Wayne St	Sandusky	Erie	7.8
ERI0068603	Earl Layhue House	1610 W Jefferson St	Sandusky	Erie	7.8
ERI0052203		722 Hancock St	Sandusky	Erie	7.8
ERI0085303	White Cross Beauty Shop	527 McDonough St	Sandusky	Erie	7.8
ERI0036903	David Gibson House	611 Decatur St	Sandusky	Erie	7.8
SAN0031311	Norma Weisheit House	235 W Buckeye St	Clyde	Sandusky	7.8
ERI0068503		1606 W Jefferson St	Sandusky	Erie	7.8
ERI0062803	Peter Pappas House	624-626 Jackson St	Sandusky	Erie	7.8
ERI0037103	Jackson JHS Maintenance Garage	616 Decatur St	Sandusky	Erie	7.8
ERI0119703	Donald C Albert House	1032 2nd St	Sandusky	Erie	7.8
ERI0126803	Mary Long House	815 3rd St	Sandusky	Erie	7.8
ERI0074103	Roger A Brown House	925 W Madison St	Sandusky	Erie	7.8
ERI0111503	Harold Guendelsberger House	807 Perry St	Sandusky	Erie	7.8
ERI0062503	Jackson JR High-Caswell Garage	615-621 Jackson St	Sandusky	Erie	7.8
ERI0103603	Michael Ross House	510 Pearl St	Sandusky	Erie	7.8
ERI0074003	Franklin J Johnson House	919 W Madison St	Sandusky	Erie	7.8
ERI0122003		515 Shelby St	Sandusky	Erie	7.8
ERI0148103	Parkwood Apts	702 Wayne St	Sandusky	Erie	7.8
ERI0031003	William F Burger House	629 Columbus Ave	Sandusky	Erie	7.8
ERI0124403	Emma Schnecke House	817 Sycamore Line St	Sandusky	Erie	7.8
ERI0071403	Carolyn M Matson House	529 Lawrence St	Sandusky	Erie	7.8
ERI0015803	Stasia Gagen House	522 Camp St	Sandusky	Erie	7.8
ERI0090703		220 E Monroe St	Sandusky	Erie	7.8
ERI0119603		1016 2nd St	Sandusky	Erie	7.8
ERI0090403	Richard Davis House	111 E Monroe St	Sandusky	Erie	7.8
RIC0006601	Kosers Royal Blue Mkt & Webber	57 W Broadway	Plymouth (Township of)	Richland	7.8
SAN0031411	Thomas Beier House	253 W Buckeye St	Clyde	Sandusky	7.8
ERI0119503		1010 2nd St	Sandusky	Erie	7.8
RIC0006901	Dr Liem Office	18 Plymouth St	Plymouth (Township of)	Richland	7.8
ERI0120103	Howard Sisson House	1133 2nd St	Sandusky	Erie	7.8
ERI0090903	Irene Thiel House	226 E Monroe St	Sandusky	Erie	7.8
ERI0090503	David Scheid House	115 E Monroe St	Sandusky	Erie	7.8
ERI0071303	Julian E Ruh House	527 Lawrence St	Sandusky	Erie	7.8
ERI0111403	Robert J Myers House	806 Perry St	Sandusky	Erie	7.8
ERI0051803	John Klee & Sons Plumbers	705 Hancock St	Sandusky	Erie	7.8
ERI0120003	Florence Fields House	1129 2nd St	Sandusky	Erie	7.8
ERI0062703	Mike Pappas House	618-620 Jackson St	Sandusky	Erie	7.8
ERI0121903	Edward M Naufel House	512 Shelby St	Sandusky	Erie	7.8
SAN0031511	Bruce Hirt House	301 W Buckeye St	Clyde	Sandusky	7.8
ERI0054503	Cholera Cemetery	Harrison St	Sandusky	Erie	7.8
ERI0030903	Mariner Apts	628 Columbus Ave	Sandusky	Erie	7.8
ERI0124303		813 Sycamore Line St	Sandusky	Erie	7.8
ERI0119303	Edwin Schwerer House	1002 2nd St	Sandusky	Erie	7.8
ERI0044803	Flossie Woodruff House	724 Franklin St	Sandusky	Erie	7.8
ERI0124503	Frederick Hiss House	820 Sycamore Line St	Sandusky	Erie	7.8
ERI0114103	Ellsworth Hacker House	412 Putnam St	Sandusky	Erie	7.8
ERI0119903	Joseph Rudolph House	1117 2nd St	Sandusky	Erie	7.8
ERI0111303	Lou Debanjak House	804 Perry St	Sandusky	Erie	7.8
ERI0051903	CAC Offices	708 Hancock St	Sandusky	Erie	7.8
ERI0068203	Edwin P Mayer House	1420 W Jefferson St	Sandusky	Erie	7.8
ERI0062603	Thomas Pappas House	616 Jackson St	Sandusky	Erie	7.8
ERI0119203	Walter Pfaff House	926 2nd St	Sandusky	Erie	7.8

ERI0067903	Cue to Ale Pub	1310 W Jefferson St	Sandusky	Erie	7.8
ERI0052003	Family Planning	710 Hancock St	Sandusky	Erie	7.8
ERI0128803	Holy Angels Church	428 Tiffin Ave	Sandusky	Erie	7.8
SAN0031611	William Jones House	304 W Buckeye St	Clyde	Sandusky	7.8
ERI0090603	Mark Loretta House	123 E Monroe St	Sandusky	Erie	7.8
ERI0116603	June Moore House	612 Reese St	Sandusky	Erie	7.8
RIC0009401	McQuates Furniture	26 Plymouth St	Plymouth (Township of)	Richland	7.8
ERI0044703	Donnie J Smith House	720 Franklin St	Sandusky	Erie	7.8
ERI0073703	Jackson Junior High School	310-402 Madison St	Sandusky	Erie	7.8
ERI0067803	David F Davis House	1308 W Jefferson St	Sandusky	Erie	7.8
ERI0119103	Clarence McCoy House	916 2nd St	Sandusky	Erie	7.8
ERI0147903	1st Baptist Church	630 Wayne St	Sandusky	Erie	7.8
ERI0151802		1114 Willow Ave W	White's Landing	Erie	7.8
RIC0009301	Bobs Cafe Pool Hall Rays Shop	SE Side Sq on Rt 61	Plymouth (Township of)	Richland	7.8
ERI0148003	William & Judith Hill House	631 Wayne St	Sandusky	Erie	7.8
ERI0085203	Mary E Miller House	516 McDonough St	Sandusky	Erie	7.8
ERI0128703	Vincent J Cardella House	437 Tiffin Ave	Sandusky	Erie	7.8
ERI0067703	Deborah A Marty House	1724 W Jefferson St	Sandusky	Erie	7.8
ERI0030803	Larry Findley House	620 Columbus Ave	Sandusky	Erie	7.8
ERI0068403	Holy Angels Rectory	1605 W Jefferson St	Sandusky	Erie	7.8
ERI0116903	Paul Borsick House	620 Reese St	Sandusky	Erie	7.8
ERI0091003		310 E Monroe St	Sandusky	Erie	7.8
ERI0116303	Myron Mather House	515 Reese St	Sandusky	Erie	7.8
ERI0044603	Kent Dilgart House	716 Franklin St	Sandusky	Erie	7.8
ERI0068303	Holy Angels School	1601 W Jefferson St	Sandusky	Erie	7.8
ERI0015603	Carl E Skaggs House	503 Camp St	Sandusky	Erie	7.8
ERI0118803	Robert Zuck House	908 2nd St	Sandusky	Erie	7.8
ERI0117003		624 Reese St	Sandusky	Erie	7.8
ERI0067603	Karen Doerner House	1720 W Jefferson St	Sandusky	Erie	7.8
ERI0091203	Monroe School	328 E Monroe St	Sandusky	Erie	7.8
ERI0114003	Arnold Robinson House	405 Putnam St	Sandusky	Erie	7.8
ERI0030703	Rev Murschel Jr House	615 Columbus Ave	Sandusky	Erie	7.8
ERI0090803	H & S Bakery Offices	221 E Monroe St	Sandusky	Erie	7.8
ERI0117103	Anthony Caponi House	630 Reese St	Sandusky	Erie	7.8
SAN0011305	Bartels' Tufa Rock House	1118 Rainbow Ave	Townsend (Township of)	Sandusky	7.8
ERI0117203		634 Reese St	Sandusky	Erie	7.8
ERI0091103	Edgar Castle House	316 E Monroe St	Sandusky	Erie	7.8
ERI0073903		509 W Madison St	Sandusky	Erie	7.8
ERI0118403	Helen Hansen House	814 2nd St	Sandusky	Erie	7.8
ERI0030603	Knights of Columbus	614 Columbus Ave	Sandusky	Erie	7.8
ERI0068003	Mary Curtin House	1407-1409 W Jefferson St	Sandusky	Erie	7.8
SAN0031711	Sayles House	305 W Buckeye St	Clyde	Sandusky	7.8
ERI0042103	Cochran's Tavern	1136 1st St	Sandusky	Erie	7.8
ERI0147603	Edward Johnson House	621 Wayne St	Sandusky	Erie	7.8
ERI0048603	Howard J Notestine House	523 Fulton St	Sandusky	Erie	7.8
ERI0044503		710 Franklin St	Sandusky	Erie	7.8
ERI0067303	William E Spayd House	1016 W Jefferson St	Sandusky	Erie	7.8
SAN0050211	Laurendeau House	426 W Cherry St	Clyde	Sandusky	7.8
ERI0147803	Erie Residential Living	628 Wayne St	Sandusky	Erie	7.8
RIC0009001	Masonic Bldg Webers Cafe	10-16 Main	Plymouth (Township of)	Richland	7.8
ERI0119403		1007 2nd St	Sandusky	Erie	7.8
ERI0067203	Loretta Lawrence House	1010 W Jefferson St	Sandusky	Erie	7.8
ERI0116403	James Burress House	609 Reese St	Sandusky	Erie	7.8
ERI0068103	Mario Barone House	1413 W Jefferson St	Sandusky	Erie	7.8
ERI0015503	Magdalen Lafene House	446 Camp St	Sandusky	Erie	7.8
SAN0031811	Beebee House	320 W Buckeye St	Clyde	Sandusky	7.8
ERI0071203	Emily A Piper House	509 Lawrence St	Sandusky	Erie	7.8
ERI0111103	Ervin Miller House	725 Perry St	Sandusky	Erie	7.8
ERI0041903	Nora Ohlemacher House	1114 1st St	Sandusky	Erie	7.8

ERI0116503	Edward Ruff House	611 Reese St	Sandusky	Erie	7.8
ERI0041803	Robert D Klotz House	1110 1st St	Sandusky	Erie	7.8
ERI0051703	Hancock Elm Bldg	634 Hancock St	Sandusky	Erie	7.8
ERI0111203	Thelma Blair House	730 Perry St	Sandusky	Erie	7.8
ERI0116703	Conley Sluss House	617 Reese St	Sandusky	Erie	7.8
ERI0147703	Rose Mavros House	622 Wayne St	Sandusky	Erie	7.8
SAN0031911	Rogers House	324 W Buckeye St	Clyde	Sandusky	7.8
ERI0091303	Leonard Kessler House	414 E Monroe St	Sandusky	Erie	7.8
ERI0067503	Glenn J Gerold House	1215 W Jefferson St	Sandusky	Erie	7.8
ERI0116803	Wayne Cooper House	619 Reese St	Sandusky	Erie	7.8
ERI0041603	Dallas O McDonald House	1102 1st St	Sandusky	Erie	7.8
ERI0119003		915 2nd St	Sandusky	Erie	7.8
SAN0044911	Smith House	436 W Cherry St	Clyde	Sandusky	7.8
ERI0111003	Agnes Tracy House	721 Perry St	Sandusky	Erie	7.8
ERI0067403	Arth F Gerold House	1203 W Jefferson St	Sandusky	Erie	7.8
ERI0021603	Carol A Westerhold House	528 Central Ave	Sandusky	Erie	7.8
RIC0008601	Sourwine Hotel	Main & Rt 603	Plymouth (Township of)	Richland	7.8
ERI0103503	Mary Sterling House	421 Pearl St	Sandusky	Erie	7.8
ERI0147203	Nicholas Levine House	609 Wayne St	Sandusky	Erie	7.8
ERI0150803	Robert Krueger House	434 Shelby St	Sandusky	Erie	7.8
ERI0118903	Rance Snyder House	911 2nd St	Sandusky	Erie	7.8
ERI0030503	Amelia Penn House	604 Columbus Ave	Sandusky	Erie	7.8
ERI0231802	Osborne Tufa Rock House	1107 Rainbow Ave	White's Landing	Erie	7.8
ERI0036603	Kelly Fletcher House	521 Decatur St	Sandusky	Erie	7.8
ERI0091403	Joseph Zippay House	420 E Monroe St	Sandusky	Erie	7.8
SAN0035311	St Mary's Catholic Church	609 Vine St	Clyde	Sandusky	7.8
ERI0021503	Loretta L Huth House	524 Central Ave	Sandusky	Erie	7.8
ERI0147503	Kenneth Spector House	616 Wayne St	Sandusky	Erie	7.8
ERI0118703	Dennis Dietenbeck House	905 2nd St	Sandusky	Erie	7.8
ERI0110903	Robert Bruni House	719 Perry St	Sandusky	Erie	7.8
ERI0041503	Robert L Gagen House	1022 1st St	Sandusky	Erie	7.8
ERI0042203	Harold Goodsite House	1221 1st St	Sandusky	Erie	7.8
ERI0121803	Ethel Keeling house	430 Shelby St	Sandusky	Erie	7.8
ERI0051603	Attic Antiques	628 Hancock St	Sandusky	Erie	7.8
ERI0073803	Jackson Junior High School	414 W Madison St	Sandusky	Erie	7.8
ERI0041303	Bess M Lawrence House	1018 1st St	Sandusky	Erie	7.8
ERI0147303	John Routh House	610 Wayne St	Sandusky	Erie	7.8
ERI0048503	James E Davis House	513 Fulton St	Sandusky	Erie	7.8
ERI0051503	James Ruthsatz House	623 Hancock St	Sandusky	Erie	7.8
ERI0036503	Arlene L Erney House	519 Decatur St	Sandusky	Erie	7.8
ERI0128603	David Butler Tax Svc	415 Tiffin Ave	Sandusky	Erie	7.8
ERI0118603	Ruth McPeek House	821 2nd St	Sandusky	Erie	7.8
ERI0103403		417 Pearl St	Sandusky	Erie	7.8
RIC0007001	Donnenwirth House	51 Plymouth St	Plymouth (Township of)	Richland	7.8
ERI0041203	Lawrence C Wightman House	1014 1st St	Sandusky	Erie	7.8
ERI0110803	Edward Andres Jr House	717 Perry St	Sandusky	Erie	7.8
ERI0042003		1123 1st St	Sandusky	Erie	7.8
ERI0147403	Leroy Leidorf House	614 Wayne St	Sandusky	Erie	7.8
ERI0118503	Homer Hurlbert House	817 2nd St	Sandusky	Erie	7.8
ERI0112803	Greater Robinson Temple	Cor Poplar & W Jefferson	Sandusky	Erie	7.8
SAN0035211	Ramon Davis House	526 Vine St	Clyde	Sandusky	7.8
ERI0088103	Robert Selby House	727 Meigs St	Sandusky	Erie	7.8
ERI0121603	Evelyn Hacker House	423 Shelby St	Sandusky	Erie	7.8
ERI0118303	Robert Krause House	811 2nd St	Sandusky	Erie	7.8
ERI0121703	Jerry Burns House	428 Shelby St	Sandusky	Erie	7.8
ERI0036403	Rev James E Barnes	515 Decatur St	Sandusky	Erie	7.8
ERI0073603	Randolph Skaggs House	205 W Madison St	Sandusky	Erie	7.9
ERI0103303	Roberta Williams House	412 Pearl St	Sandusky	Erie	7.9
ERI0073503	Arthur L Keller House	115 W Madison St	Sandusky	Erie	7.9

ERI0121403	Milton T White House	421 Shelby St	Sandusky	Erie	7.9
ERI0036303	St Mary's Convent	514 Decatur St	Sandusky	Erie	7.9
ERI0110703	Paul Schaub House	716 Perry St	Sandusky	Erie	7.9
ERI0048403	Esther CB	507 Fulton St	Sandusky	Erie	7.9
ERI0091503	Victor Hammond House	508 E Monroe St	Sandusky	Erie	7.9
ERI0067103		927 W Jefferson St	Sandusky	Erie	7.9
ERI0036203	Leo New House	511 Decatur St	Sandusky	Erie	7.9
ERI0124203	Richard Scheufler House	718-720 Sycamore Line St	Sandusky	Erie	7.9
ERI0066503	St Mary's Central Cath High	410 W Jefferson St	Sandusky	Erie	7.9
ERI0147003	William Murray House	603 Wayne St	Sandusky	Erie	7.9
ERI0085103	Clarence Lilje House	427 McDonough St	Sandusky	Erie	7.9
SAN0032011	Ferrel House	329 W Buckeye St	Clyde	Sandusky	7.9
ERI0121503	David Olds House	422 Shelby St	Sandusky	Erie	7.9
ERI0110403	Eddie Dunsil House	709 Perry St	Sandusky	Erie	7.9
ERI0041103	Terry Sowards House	1002 1st St	Sandusky	Erie	7.9
ERI0110603	Robert Stacy	714 Perry St	Sandusky	Erie	7.9
ERI0147103	Edward J Baxter House	606 Martin St	Sandusky	Erie	7.9
ERI0071103	George Krueger House	431 Lawrence St	Sandusky	Erie	7.9
ERI0128503	Katharine Ransom House	405 Tiffin Ave	Sandusky	Erie	7.9
ERI0041703		1107 1st St	Sandusky	Erie	7.9
ERI0041003	Bruce Ferguson House	920 1st St	Sandusky	Erie	7.9
ERI0036103	Kathy Damschroeder House	509 Decatur St	Sandusky	Erie	7.9
ERI0067003	Isaac Aldridge House	909 W Jefferson St	Sandusky	Erie	7.9
ERI0015403	Candace Crittendon House	415 Camp St	Sandusky	Erie	7.9
ERI0091603	Phyllis Williams House	520 E Monroe St	Sandusky	Erie	7.9
ERI0085003		423 McDonough St	Sandusky	Erie	7.9
ERI0124103	Engine House #3	Meigs St & Sycamore Line	Sandusky	Erie	7.9
ERI0121303	Oswald House	418 Shelby St	Sandusky	Erie	7.9
ERI0066903	Richard Lentz House	905 W Jefferson St	Sandusky	Erie	7.9
ERI0071903		214 E Madison St	Sandusky	Erie	7.9
HUR0034509		3572 New State Rd	Ripley (Township of)	Huron	7.9
ERI0121203	Joseph Davidson House	415 Shelby St	Sandusky	Erie	7.9
ERI0040903	Mark L Bullard House	912 1st St	Sandusky	Erie	7.9
ERI0021403		508 Central Ave	Sandusky	Erie	7.9
ERI0030303	Desmon Fernandez House	527 Columbus Ave	Sandusky	Erie	7.9
ERI0088403	Clyde Williams House	441 Melville St	Sandusky	Erie	7.9
ERI0088003	Jack Harpst House	717 Meigs St	Sandusky	Erie	7.9
ERI0091803	Voltz Furnace & Sheet Metal Wo	526 E Monroe St	Sandusky	Erie	7.9
ERI0110503	William Haynes House	710 Perry St	Sandusky	Erie	7.9
ERI0066603	Irvin J Betz House	606 W Jefferson St	Sandusky	Erie	7.9
ERI0021303	Louis M Janell Jr House	501 Central Ave	Sandusky	Erie	7.9
ERI0072003		220 E Madison St	Sandusky	Erie	7.9
ERI0071003	James Damm House	429 Lawrence St	Sandusky	Erie	7.9
ERI0051303	Charles Dudzik House	609 Hancock St	Sandusky	Erie	7.9
ERI0121003	Prince Perdue House	411 Shelby St	Sandusky	Erie	7.9
ERI0040803	William J Darling House	902 1st St	Sandusky	Erie	7.9
ERI0070903	Ron Ryerson House	427 Lawrence St	Sandusky	Erie	7.9
ERI0030103	Ursula Dempsey House	525 Columbus Ave	Sandusky	Erie	7.9
ERI0041403		1019 1st St	Sandusky	Erie	7.9
ERI0084903	Petrina Nielson House	422 McDonough St	Sandusky	Erie	7.9
ERI0051103		603 Hancock St	Sandusky	Erie	7.9
ERI0087903	Harry Ward House	713 Meigs St	Sandusky	Erie	7.9
ERI0084703	Ronald Wilson House	417 McDonough St	Sandusky	Erie	7.9
ERI0110303	Ivous Schwanger House	706 Perry St	Sandusky	Erie	7.9
ERI0066803		805 W Jefferson St	Sandusky	Erie	7.9
ERI0030403	Elmer Sommers	530 Columbus Ave	Sandusky	Erie	7.9
ERI0051403		612 Hancock St	Sandusky	Erie	7.9
ERI0121103	CA Hacker House	414 Shelby St	Sandusky	Erie	7.9
ERI0103203	Ruth Winland House	402-404 Pearl St	Sandusky	Erie	7.9

ERI0120903	Bernard O'Reilly House	409 Shelby St	Sandusky	Erie	7.9
ERI0146803	Hospitality Care Centers Inc	531 Wayne St	Sandusky	Erie	7.9
ERI0066703	Gerald Gardner House	709 W Jefferson St	Sandusky	Erie	7.9
ERI0040503		806 1st St	Sandusky	Erie	7.9
ERI0084803	Ronald Harple House	418 McDonough St	Sandusky	Erie	7.9
ERI0051003	Mary Will House	601 Hancock St	Sandusky	Erie	7.9
ERI0040403	Robert Pooch House	802 1st St	Sandusky	Erie	7.9
ERI0030203	Dr Robert Kieffer Office	526 Columbus Ave	Sandusky	Erie	7.9
ERI0048303	James Wozniak House	431 Fulton St	Sandusky	Erie	7.9
ERI0013503	Linda Ortner House	1220 W Adams St	Sandusky	Erie	7.9
ERI0092303	Eva Smith House	622 E Monroe St	Sandusky	Erie	7.9
ERI0062403	Hazel Lemon House	505 Jackson St	Sandusky	Erie	7.9
ERI0051203	Whole Hardware Store	600-604 Hancock St	Sandusky	Erie	7.9
ERI0013403		1218 W Adams St	Sandusky	Erie	7.9
ERI0070703	Charles Ward House	421 Lawrence St	Sandusky	Erie	7.9
ERI0070803	Dennis Platte House	424 Lawrence St	Sandusky	Erie	7.9
ERI0092503	Earl Carpenter House	626 E Monroe St	Sandusky	Erie	7.9
ERI0128103		3__ Tiffin Ave at Adams	Sandusky	Erie	7.9
ERI0029903	Zion Luth Church Parsonage	513 Columbus Ave	Sandusky	Erie	7.9
ERI0054603	Peerless Stove Co	334 Harrison St	Sandusky	Erie	7.9
ERI0146903	James Dwyre House	532 Wayne St	Sandusky	Erie	7.9
ERI0072303	John L Rieger House	310 E Madison St	Sandusky	Erie	7.9
ERI0084603	Dean Pavia House	414 McDonough St	Sandusky	Erie	7.9
ERI0066403	Larry L Kessler House	308 W Jefferson St	Sandusky	Erie	7.9
SAN0032111		402 W Buckeye St	Clyde	Sandusky	7.9
RIC0007201	Cobes House	101 Plymouth St	Plymouth (Township of)	Richland	7.9
ERI0092803	Robert Walls House	632 E Monroe St	Sandusky	Erie	7.9
ERI0070603	Frank Freda House	417 Lawrence St	Sandusky	Erie	7.9
ERI0091703	Doris Tyler House	525 E Monroe St	Sandusky	Erie	7.9
ERI0066303	Saints Peter & Paul School	514 Jackson St	Sandusky	Erie	7.9
ERI0000603	St Mary's Cath Church	429 Central Ave	Sandusky	Erie	7.9
ERI0091903	Vernon Chill House	527 E Monroe St	Sandusky	Erie	7.9
ERI0013603	Arrah Creager House	630 Anderson St	Sandusky	Erie	7.9
ERI0030003		516 Columbus Ave	Sandusky	Erie	7.9
ERI0012903	James Dale House	1104 W Adams St	Sandusky	Erie	7.9
ERI0092003	Julius Pasqualini House	531 E Monroe St	Sandusky	Erie	7.9
ERI0048203	Frank Newman House	423 Fulton St	Sandusky	Erie	7.9
ERI0151702		7818-7824 Wahl Rd	White's Landing	Erie	7.9
ERI0013203	John Seiler House	1114 W Adams St	Sandusky	Erie	7.9
ERI0072203	Susan Dunn House	233 E Madison St	Sandusky	Erie	7.9
ERI0013103	Winters House	1106 W Adams St	Sandusky	Erie	7.9
ERI0015303	Robert Windan House	337 Camp St	Sandusky	Erie	7.9
ERI0072103		223 E Madison St	Sandusky	Erie	7.9
ERI0012703	Brick Block	1002-1018 W Adams St	Sandusky	Erie	7.9
ERI0110203		634 Perry St	Sandusky	Erie	7.9
ERI0133003	Ronald Beese House	622 Warren St	Sandusky	Erie	7.9
ERI0040703	Reece House	821 1st St	Sandusky	Erie	7.9
ERI0040603	Donald Willeson House	817 1st St	Sandusky	Erie	7.9
ERI0029803	Sts Peter & Paul Rectory	510 Columbus Ave	Sandusky	Erie	7.9
ERI0092103	Lynn Holdren House	607 E Monroe St	Sandusky	Erie	7.9
ERI0146703	George Fresch House	519 Wayne St	Sandusky	Erie	7.9
ERI0029703	Zion Lutheran Church	501-503 Columbus Ave	Sandusky	Erie	7.9
SAN0035111	Vine St Elem School	521 Vine St	Clyde	Sandusky	7.9
ERI0012503	Dan Q Brown House	930 W Adams St	Sandusky	Erie	7.9
ERI0013303	John's Body Shop	1209 W Adams St	Sandusky	Erie	7.9
ERI0092703	Maria Schrechengost House	621 E Monroe St	Sandusky	Erie	7.9
ERI0012303	Helen Balduff House	926 W Adams St	Sandusky	Erie	7.9
ERI0036003		432 Decatur St	Sandusky	Erie	7.9
ERI0050903	Michael Dunn House	527 Hancock St	Sandusky	Erie	7.9

ERI0146603	Corrine Martin House	517 Wayne St	Sandusky	Erie	7.9
ERI0128403		330 Tiffin Ave	Sandusky	Erie	7.9
ERI0132903	Richard & Mary Roesch House	618 Warren St	Sandusky	Erie	7.9
ERI0048103	Joseph DuBois House	415 Fulton St	Sandusky	Erie	7.9
ERI0070503		410 Lawrence St	Sandusky	Erie	7.9
ERI0012103	David Painter House	922 W Adams St	Sandusky	Erie	7.9
ERI0092203	Lela Giles House	619 E Monroe St	Sandusky	Erie	7.9
ERI0021103	St Mary's Rectory	429 Central Ave	Sandusky	Erie	7.9
ERI0050703	Alan Bartholomew House	523 Hancock St	Sandusky	Erie	7.9
ERI0062303	Linda Layton House	431 Jackson St	Sandusky	Erie	7.9
ERI0146403	Robert Egger House	513 Wayne St	Sandusky	Erie	7.9
ERI0092403	Henrietta Beatty House	625 E Monroe St	Sandusky	Erie	7.9
ERI0072403		315 E Madison St	Sandusky	Erie	7.9
ERI0029603	Sts Peter & Paul Church	510 Columbus Ave	Sandusky	Erie	7.9
ERI0128303	Richard Myers House	328 Tiffin Ave	Sandusky	Erie	7.9
ERI0048003	Juan Chavarria House	413 Fulton St	Sandusky	Erie	7.9
ERI0072503	Albert O Appell Sr House	323 E Madison St	Sandusky	Erie	7.9
ERI0092603	Cora Justi House	629 E Monroe St	Sandusky	Erie	7.9
ERI0062103		429 Jackson St	Sandusky	Erie	7.9
ERI0050803	Helen & Elza Ohlemacher House	526 Hancock St	Sandusky	Erie	7.9
ERI0120803	Elda Shaw House	334 Shelby St	Sandusky	Erie	7.9
ERI0146503	Celestina Sheldon House	514 Wayne St	Sandusky	Erie	7.9
ERI0146303	Paul Eishen House	511 Wayne St	Sandusky	Erie	7.9
ERI0110103		615 Perry St	Sandusky	Erie	7.9
ERI0062203	Charles W Lauer House	430 Jackson St	Sandusky	Erie	7.9
ERI0011703	Marjorie Crouch House	816 W Adams St	Sandusky	Erie	7.9
ERI0011803	Ehnsberger's Tavern	902 W Adams St	Sandusky	Erie	7.9
ERI0011603	Robert Pitsenbarger House	814 W Adams St	Sandusky	Erie	7.9
ERI0050603	Charlotte Morris House	521 Hancock St	Sandusky	Erie	7.9
ERI0047903	David Singler House	411 Fulton St	Sandusky	Erie	7.9
ERI0088203	Calvary Episcopal Church	NEC Meigs & 1st	Sandusky	Erie	7.9
ERI0128203	Hobbs Lock & Key Shop	318 Tiffin Ave	Sandusky	Erie	7.9
ERI0063703	Robert Windan House	124 E Jefferson St	Sandusky	Erie	7.9
ERI0062003	Mary Rogers House	427 Jackson St	Sandusky	Erie	7.9
ERI0072603	June Hemrick House	504 E Madison St	Sandusky	Erie	7.9
ERI0012803	Beatrice Smith House	1013 W Adams St	Sandusky	Erie	7.9
ERI0061903	Charles Andres & Sons Funeral	423 Jackson St	Sandusky	Erie	7.9
ERI0120503	Donald Gruelich House	325 Shelby St	Sandusky	Erie	7.9
ERI0120703	Ronald Johnson House	328 Shelby St	Sandusky	Erie	7.9
ERI0035903	Klueg Drugs	422 Decatur St	Sandusky	Erie	7.9
ERI0013003	Corrine Tremaine House	1105 W Adams St	Sandusky	Erie	7.9
ERI0035803	Harrison Pratt Off	415 Central Ave	Sandusky	Erie	7.9
ERI0146203	Colonial Manor Nursing Home	507 Wayne St	Sandusky	Erie	7.9
ERI0072703	Priscilla Farris House	510 E Madison St	Sandusky	Erie	7.9
ERI0072903	Gertrude Kusser House	516 E Madison St	Sandusky	Erie	7.9
ERI0084503	Elmer Beverick House	332 McDonough St	Sandusky	Erie	7.9
ERI0021003	Bryce York House	424 Central Ave	Sandusky	Erie	7.9
ERI0060803	Willie G Staley House	527 Huron Ave	Sandusky	Erie	7.9
ERI0087803	Walter Hart House	623 Meigs St	Sandusky	Erie	7.9
ERI0047803	Bill Cobb House	403 Fulton St	Sandusky	Erie	7.9
ERI0088303		301-303 Melville St	Sandusky	Erie	7.9
ERI0012003		909 W Adams St	Sandusky	Erie	7.9
ERI0012603	Albert L Ringle House	931 W Adams St	Sandusky	Erie	7.9
ERI0012403		927 W Adams St	Sandusky	Erie	7.9
ERI0029503	1st Congregational Church	431 Columbus Ave	Sandusky	Erie	7.9
ERI0011903	James Koehler House	907 W Adams St	Sandusky	Erie	7.9
ERI0084403		327 McDonough St	Sandusky	Erie	7.9
ERI0012203	Lillian J Snyder House	925 W Adams St	Sandusky	Erie	7.9
ERI0087703	Robert Herkner Jr House	620 Meigs St	Sandusky	Erie	7.9

ERI0150703	Spencer Cook House	416 Central Ave	Sandusky	Erie	8.0
ERI0060703	Sherill Spurlock House	519 Huron Ave	Sandusky	Erie	8.0
ERI0011003	Raymond Schiller House	604 W Adams St	Sandusky	Erie	8.0
ERI0010803	Sebbo House	602 W Adams St	Sandusky	Erie	8.0
ERI0110003	Luella Glassner House	608 Perry St	Sandusky	Erie	8.0
ERI0109803	Lilah M Burd House	601 Perry St	Sandusky	Erie	8.0
ERI0011303	Daniel Haley House	612 W Adams St	Sandusky	Erie	8.0
ERI0120603	Melvin Wolcott House	327 Shelby	Sandusky	Erie	8.0
ERI0063603	Ron Gum House	109 E Jefferson St	Sandusky	Erie	8.0
ERI0035703	Sandusky Bd of Ed	407 Decatur St	Sandusky	Erie	8.0
ERI0084303	Isabel Groot House	326 McDonough St	Sandusky	Erie	8.0
ERI0044403	Myron Trowbridge House	524 Franklin St	Sandusky	Erie	8.0
ERI0061803	Madeleine Lillie House	413 Jackson St	Sandusky	Erie	8.0
HUR0024406		260 Old State Rd	Bronson (Township of)	Huron	8.0
ERI0060403	Charles Miller House	509 Huron Ave	Sandusky	Erie	8.0
ERI0050503	Doris McGill House	505 Hancock St	Sandusky	Erie	8.0
ERI0109903	Mildred Wadsworth House	602 Perry St	Sandusky	Erie	8.0
ERI0084103	William Biliard House	317-321 McDonough St	Sandusky	Erie	8.0
ERI0044303	John & Ann Steiert House	518 Franklin St	Sandusky	Erie	8.0
ERI0103103	Theresa Carmella House	306 Pearl St	Sandusky	Erie	8.0
ERI0073203	John Lindsley House	614 E Madison St	Sandusky	Erie	8.0
ERI0060603	Rosemary Andres House	518 Huron Ave	Sandusky	Erie	8.0
ERI0063803	Doris McGill House	230 E Jefferson St	Sandusky	Erie	8.0
ERI0070403	Bates-Cockrem House	325 Lawrence St	Sandusky	Erie	8.0
ERI0029403	Godfrey House	417 Columbus Ave	Sandusky	Erie	8.0
ERI0084203	Lillina Gerfen House	318 McDonough St	Sandusky	Erie	8.0
ERI0011503	Charles Singler House	807 W Adams St	Sandusky	Erie	8.0
ERI0060503	Kelly Collins House	514 Huron Ave	Sandusky	Erie	8.0
ERI0047703	Joan Rowley House	331 Fulton St	Sandusky	Erie	8.0
ERI0120403	Elise Bahnsen House	312 Shelby St	Sandusky	Erie	8.0
ERI0011403	Robert Fitz House	803 W Adams St	Sandusky	Erie	8.0
ERI0073403	William Gray House	626 E Madison St	Sandusky	Erie	8.0
ERI0072803	Jess Gordon House	513 E Madison St	Sandusky	Erie	8.0
ERI0083903	Gerald Roth House	315 McDonough St	Sandusky	Erie	8.0
RIC0006801	Dick House	223 Springmill Rd	Plymouth (Township of)	Richland	8.0
ERI0047603	Cecil Cronenberger House	330 Fulton St	Sandusky	Erie	8.0
ERI0084003	Donald Curtis House	316 McDonough St	Sandusky	Erie	8.0
ERI0073003	August Maschari House	519 E Madison St	Sandusky	Erie	8.0
ERI0020903	Feick Apts	406 Central Ave	Sandusky	Erie	8.0
ERI0010603		308 W Adams St	Sandusky	Erie	8.0
ERI0029303	Lorry Lazarony Real Estate Office	413 Columbus Ave	Sandusky	Erie	8.0
ERI0044203	Bertha Henkelman House	512-514 Franklin St	Sandusky	Erie	8.0
ERI0070203	John Daniel House	319 Lawrence St	Sandusky	Erie	8.0
ERI0061703	Winnie Hayes Realty	401-403 Jackson St	Sandusky	Erie	8.0
ERI0044103	Roger Chambers House	508-510 Franklin St	Sandusky	Erie	8.0
ERI0146103	Arthur Pierce House	428 Wayne St	Sandusky	Erie	8.0
ERI0060303		502 Huron Ave	Sandusky	Erie	8.0
ERI0029203		412-414 Columbus Ave	Sandusky	Erie	8.0
ERI0073103	Ralph Bryant House	529 E Madison St	Sandusky	Erie	8.0
ERI0142103	Wichman's Food Market	1118 W Washington St	Sandusky	Erie	8.0
ERI0083803	Arthur Tanchon House	312 McDonough St	Sandusky	Erie	8.0
ERI0142003		1108-1110 W Washington St	Sandusky	Erie	8.0
ERI0047503	Marshall Cronenberger House	328 Fulton St	Sandusky	Erie	8.0
ERI0039703	Robert & Shelley Kaufman House	513 Elm St	Sandusky	Erie	8.0
ERI0010503		214 W Adams St	Sandusky	Erie	8.0
ERI0141803	James W Cattell House	1018 W Washington St	Sandusky	Erie	8.0
ERI0011203	Jack Weber House	607 W Adams St	Sandusky	Erie	8.0
ERI0047303	Marcia Levellen House	323 Fulton St	Sandusky	Erie	8.0
ERI0071703	Eral Johnston House	1416 Lincoln St	Sandusky	Erie	8.0

ERI0029003	Bliss Bldg	409 Columbus Ave	Sandusky	Erie	8.0
ERI0010403	Midland Title Co	210 W Adams St	Sandusky	Erie	8.0
RIC0009701	Caretakers Storehouse	Greenlawn Cemetery	Plymouth (Township of)	Richland	8.0
ERI0141603		1014 W Washington St	Sandusky	Erie	8.0
ERI0141503	Robert W Butler House	1010 W Washington St	Sandusky	Erie	8.0
ERI0011103	ML Reed House	605 W Adams St	Sandusky	Erie	8.0
ERI0146003	DB Cuthbertson House	421 Wayne St	Sandusky	Erie	8.0
ERI0029103	William Schmidt House	410 Columbus Ave	Sandusky	Erie	8.0
ERI0010903	Ronald Martin House	603 W Adams St	Sandusky	Erie	8.0
ERI0010703	Bd of Ed Storeroom	415 W Adams St	Sandusky	Erie	8.0
ERI0047103	Classiccare North	317 Fulton St	Sandusky	Erie	8.0
SEN0109304	John Petticord House	9244 E TR 148	Adams (Township of)	Seneca	8.0
ERI0047403	Freda Singler House	324 Fulton St	Sandusky	Erie	8.0
ERI0070103	Felicitas Weigel House	316 Lawrence St	Sandusky	Erie	8.0
ERI0083703	Mary Stoll House	308 McDonough St	Sandusky	Erie	8.0
ERI0010303		204 W Adams St	Sandusky	Erie	8.0
ERI0141003	Maurice Rinderly House	922 W Washington St	Sandusky	Erie	8.0
ERI0070003	James Kleinschmidt House	313-315 Lawrence St	Sandusky	Erie	8.0
ERI0140903	Vincent Fedele House	920 W Washington St	Sandusky	Erie	8.0
ERI0070303		320-322 Lawrence St	Sandusky	Erie	8.0
ERI0064003	John Bartzen House	416 E Jefferson St	Sandusky	Erie	8.0
ERI0047203	Eloran Buck House	320 Fulton St	Sandusky	Erie	8.0
ERI0140803		914 W Washington St	Sandusky	Erie	8.0
ERI0060203	Golden Era Coin-Recreation Center	440-444 Huron Ave	Sandusky	Erie	8.0
ERI0109703		528 Perry St	Sandusky	Erie	8.0
ERI0064103	Sally Cole House	420 E Jefferson St	Sandusky	Erie	8.0
SEN0111811	Henry Hopple House	1675 N SR 18	Republic	Seneca	8.0
ERI0020803	Flo-Mar Apts	335 Central Ave	Sandusky	Erie	8.0
ERI0001903	Sandusky Public Library	114 W Adams St	Sandusky	Erie	8.0
ERI0140603		908-910 W Washington St	Sandusky	Erie	8.0
ERI0064303	Leanard Reiff House	426 E Jefferson St	Sandusky	Erie	8.0
ERI0073303	George Hudson House	621 E Madison St	Sandusky	Erie	8.0
ERI0145903	George Gilbert House	414 Wayne St	Sandusky	Erie	8.0
ERI0141203	Factory Furniture Outlet	932 W Washington St	Sandusky	Erie	8.0
ERI0109503	Geneva S Golden House	517 Perry St	Sandusky	Erie	8.0
ERI0064403	Herbert Guss House	428 E Jefferson St	Sandusky	Erie	8.0
ERI0230103		116-118 E Adams St	Sandusky	Erie	8.0
ERI0047003	Clarence Armstrong House	311 Fulton St	Sandusky	Erie	8.0
ERI0035603	Richard Cockrell House	828 Decatur St	Sandusky	Erie	8.0
ERI0044003	Allan Wersche House	435 Franklin St	Sandusky	Erie	8.0
ERI0035503	John Feick House	321 Decatur St	Sandusky	Erie	8.0
ERI0103003	John Reyna House	207 Pearl St	Sandusky	Erie	8.0
ERI0050403		421-423 Hancock St	Sandusky	Erie	8.0
ERI0230003		104-108 E Adams St	Sandusky	Erie	8.0
ERI0060103	Jack Hartley House	421 Huron Ave	Sandusky	Erie	8.0
ERI0142203	Cronin's Tavern	1119 W Washington St	Sandusky	Erie	8.0
ERI0020703	Rose Bechtel House	329 Central Ave	Sandusky	Erie	8.0
ERI0230303	Killoran Bldg	134 E Adams St	Sandusky	Erie	8.0
ERI0230203		128 E Adams St	Sandusky	Erie	8.0
ERI0064703	James Sharpe House	508 E Jefferson St	Sandusky	Erie	8.0
ERI0109103	Gladys Skiver House	508 Perry St	Sandusky	Erie	8.0
ERI0102903	Joyce A Ruffin House	201-201 1/2 Pearl St	Sandusky	Erie	8.0
ERI0109203	Clifford Richard House	511 Perry St	Sandusky	Erie	8.0
ERI0109403	Lawrence Payne House	516 Perry St	Sandusky	Erie	8.0
ERI0043903	Lenor Meyer House	434 Franklin St	Sandusky	Erie	8.0
ERI0065103	Walter Hart Jr House	518 E Jefferson St	Sandusky	Erie	8.0
ERI0141403	Raymond Montgomery House	1001 W Washington St	Sandusky	Erie	8.0
ERI0109603	Clarence H Jessee House	520 E Jefferson St	Sandusky	Erie	8.0
ERI0109303	Estella A Japsen House	514 Perry St	Sandusky	Erie	8.0

ERI0141903	Randy Weaver House	1105 W Washington St	Sandusky	Erie	8.0
ERI0141103	Wasco Enterprises	927 W Washington St	Sandusky	Erie	8.0
ERI0140203		714-720 W Washington St	Sandusky	Erie	8.0
ERI0140003	Pascoe Kock Agency	610 W Washington St	Sandusky	Erie	8.0
ERI0063903	Fred Goff House	413 E Jefferson St	Sandusky	Erie	8.0
ERI0087603	Ezell Hunter House	524 Meigs St	Sandusky	Erie	8.0
ERI0145803	Follett House Museum	404 Wayne St	Sandusky	Erie	8.0
ERI0082903	Donald Natestine House	1408 W Market St	Sandusky	Erie	8.0
ERI0176903	2nd Baptist Church	315 Decatur St	Sandusky	Erie	8.0
ERI0028903	Emmanuel United Church/Christ	334 Columbus Ave	Sandusky	Erie	8.0
ERI0139903	Frey-Groff Funeral Home	604 W Washington St	Sandusky	Erie	8.0
ERI0141703	Lehrer Clinic	1015 W Washington St	Sandusky	Erie	8.0
ERI0043703	Ronald Ogle House	421 Franklin St	Sandusky	Erie	8.0
ERI0139703	Lucille Deist House	516 W Washington St	Sandusky	Erie	8.0
ERI0082803	Joseph Swain House	1404 W Market St	Sandusky	Erie	8.0
ERI0230503	Charles Blackburn House	214 E Adams St	Sandusky	Erie	8.0
ERI0006003	Thomas Coughlan House	210 E Adams St	Sandusky	Erie	8.0
ERI0064203	Edna Birmingham House	425 E Jefferson St	Sandusky	Erie	8.0
RIC0011901	Sponseller House	Henry Rd Sec 13	Plymouth (Township of)	Richland	8.0
ERI0141303	OH State Liquor State #181	937 W Washington St	Sandusky	Erie	8.0
ERI0064503	John Atkinson House	429 E Jefferson St	Sandusky	Erie	8.0
ERI0140103	Lahoma Schulz Realty	618 W Washington St	Sandusky	Erie	8.0
ERI0060003	Couglan House	600 E Adams St	Sandusky	Erie	8.0
ERI0064803	Olen & Gay Pitsenbarger House	509-511 E Jefferson St	Sandusky	Erie	8.0
ERI0043603		419 Franklin St	Sandusky	Erie	8.0
ERI0064603	Harry E Keel Jr House	433 E Jefferson St	Sandusky	Erie	8.0
ERI0050303	Tony Gonzales House	412 Hancock St	Sandusky	Erie	8.0
ERI0028803	Erie Co Courthouse	323 Columbus Ave	Sandusky	Erie	8.0
ERI0140503	Wanda Zippay House	817-817 1/2 W Washington St	Sandusky	Erie	8.0
ERI0139403	Helen Andres House	508 W Washington St	Sandusky	Erie	8.0
ERI0125803	Lucille Roth House	724 Sycamore St	Sandusky	Erie	8.0
ERI0065403	Lake Burkhart House	612 E Jefferson St	Sandusky	Erie	8.0
ERI0043803	John Knapp House	422 Franklin St	Sandusky	Erie	8.1
ERI0140703	Ohio Company House	913 W Washington St	Sandusky	Erie	8.1
ERI0139503	Robert Gray House	512 W Washington St	Sandusky	Erie	8.1
ERI0230703	William W Till House	304 E Adams St	Sandusky	Erie	8.1
ERI0064903	Richard J Pitsenbarger House	515 E Jefferson St	Sandusky	Erie	8.1
ERI0132803	Erma Philon	426 Warren St	Sandusky	Erie	8.1
ERI0065003	Janice McCourt House	517 E Jefferson St	Sandusky	Erie	8.1
ERI0043503	Alena Moore House	418 Franklin St	Sandusky	Erie	8.1
ERI0139303	Muehlhauser Local & Pfefferl	502 W Washington St	Sandusky	Erie	8.1
ERI0252203	Timothy Rogers House	1114 W Market St	Sandusky	Erie	8.1
ERI0230803	Howard Collins House	312 E Adams St	Sandusky	Erie	8.1
ERI0065203	Gertrude O Birchfield House	519 E Jefferson St	Sandusky	Erie	8.1
ERI0231003	Don Nath House	318 E Adams St	Sandusky	Erie	8.1
ERI0065303	Valerie Siebel House	523 E Jefferson St	Sandusky	Erie	8.1
ERI0065903	Betty Hoelzer House	630 E Jefferson St	Sandusky	Erie	8.1
ERI0069403	Betty Turney House	206 Lawrence St	Sandusky	Erie	8.1
ERI0069903	AC Jefferson House	230 Lawrence St	Sandusky	Erie	8.1
ERI0133903	Alphia Montgomery House	217 Washington Ct	Sandusky	Erie	8.1
ERI0134403	Adams Junior High School	E Washington St	Sandusky	Erie	8.1
ERI0066003	James L Young House	632 E Jefferson St	Sandusky	Erie	8.1
ERI0140403	Eugene R Taylor House	809 W Washington St	Sandusky	Erie	8.1
ERI0231103	Richard Poggiali House	322 E Adams St	Sandusky	Erie	8.1
ERI0069803	Grace Smith House	225 Lawrence St	Sandusky	Erie	8.1
ERI0140303	George Reber House	803 W Washington St	Sandusky	Erie	8.1
ERI0252103	Michael and Teresa Romell House	1110 W Market St	Sandusky	Erie	8.1
ERI0231303	Randall Bromm House	326 E Adams St	Sandusky	Erie	8.1
ERI0108803	Mattie Hamilton House	429 Perry St	Sandusky	Erie	8.1

ERI0125703	Theodore Corbin House	721 Sycamore St	Sandusky	Erie	8.1
ERI0183804	Huron Harbor Light	W Pierhead Huron Harbor	Huron	Erie	8.1
ERI0231403	Ellen Raymont House	330 E Adams St	Sandusky	Erie	8.1
ERI0139203	US Post Office	SWC W Washington St & Jackson St	Sandusky	Erie	8.1
ERI0251903	Wm. C. Wright Trustee House	1106 W Market St	Sandusky	Erie	8.1
ERI0065703	Gregory Ezsel House	621 E Jefferson St	Sandusky	Erie	8.1
ERI0231503	AL Close House	336 E Adams St	Sandusky	Erie	8.1
ERI0139603	Elizabeth Apts	515 W Washington St	Sandusky	Erie	8.1
ERI0065503	Esther Lilie	615 E Jefferson St	Sandusky	Erie	8.1
ERI0108703	Willard E Sick House	427 Perry St	Sandusky	Erie	8.1
ERI0069703	Herman Moore House	219 Lawrence St	Sandusky	Erie	8.1
ERI0139103	Boy with a Boot Fountain	W Washington St	Sandusky	Erie	8.1
ERI0230603	Universalist Church	231 E Adams St	Sandusky	Erie	8.1
ERI0251603	Juan Antonio Colon House	1102 W Market St	Sandusky	Erie	8.1
SAN0035011	Thomas J & Nancy Huss House	312 Race St	Clyde	Sandusky	8.1
ERI0109003	Joseph A Meade House	432 Perry St	Sandusky	Erie	8.1
ERI0108403		423 Perry St	Sandusky	Erie	8.1
ERI0252403	Glen Waterfield Residence	1115 W Market St	Sandusky	Erie	8.1
ERI0132703	Ernest E Jones House	416 Warren St	Sandusky	Erie	8.1
ERI0251303	Cross Country Investment Ltd.	1014 W Market St	Sandusky	Erie	8.1
ERI0069503	Theodis Fisher House	215 Lawrence St	Sandusky	Erie	8.1
ERI0066203	Frankie's Rec Center	637 E Jefferson St	Sandusky	Erie	8.1
ERI0231703	Mary Hughes House	406 E Adams St	Sandusky	Erie	8.1
ERI0108903	David Coy House	430 Perry St	Sandusky	Erie	8.1
ERI0252303	Lebus and Kay Holbrook House	1113 W Market St	Sandusky	Erie	8.1
ERI0065603	Stephen & Sharon Klos	617 E Jefferson St	Sandusky	Erie	8.1
ERI0059903		326 Huron Ave	Sandusky	Erie	8.1
ERI0050203	Dr William Semon House	334 Hancock St	Sandusky	Erie	8.1
ERI0108303	Corliss F Crandall House	421 Perry St	Sandusky	Erie	8.1
ERI0145703	Grace Episcopal Church	315 Wayne St	Sandusky	Erie	8.1
ERI0251203	Thomas and Mary Hayes	1010 W Market St	Sandusky	Erie	8.1
ERI0069603	Russell Bates House	216 Lawrence St	Sandusky	Erie	8.1
ERI0007403	Cleo Mullins House	408 E Adams St	Sandusky	Erie	8.1
ERI0252003	Richard J. Dennis House	1109 W Market St	Sandusky	Erie	8.1
ERI0007703	Steve Olenek House	424 E Adams St	Sandusky	Erie	8.1
ERI0050003	Lavina Swierenga House	327 Hancock St	Sandusky	Erie	8.1
ERI0108603		426 Perry St	Sandusky	Erie	8.1
ERI0139803	Francis Schnurr House	603 W Washington St	Sandusky	Erie	8.1
ERI0059803	James Quilter House	322 Huron Ave	Sandusky	Erie	8.1
ERI0007903	Herman Davison House	426 E Adams St	Sandusky	Erie	8.1
ERI0252703	Benjamin and Alrie Matthews House	1002-1004 W Market St	Sandusky	Erie	8.1
ERI0108203	James L Cline House	419 Perry St	Sandusky	Erie	8.1
ERI0132603	Violet Taylor House	410 Warren St	Sandusky	Erie	8.1
ERI0065803	Timothy M Stokes	627 E Jefferson St	Sandusky	Erie	8.1
ERI0125903	Thomas Lilje House	735 Sycamore St	Sandusky	Erie	8.1
ERI0251803	Nellie B. Thomas House	1103 W Market St	Sandusky	Erie	8.1
ERI0049903	Paul J Blake House	325 Hancock St	Sandusky	Erie	8.1
ERI0108503	Viola Hipp House	424 Perry St	Sandusky	Erie	8.1
ERI0253203	Deedra Chaney	936 W Market St	Sandusky	Erie	8.1
ERI0066103		633 E Jefferson St	Sandusky	Erie	8.1
ERI0061603	1st Presbyterian Church	265 Jackson St	Sandusky	Erie	8.1
ERI0251703	Chester Yanushewski	928 W Market St	Sandusky	Erie	8.1
ERI0008103		430 E Adams St	Sandusky	Erie	8.1
ERI0082303	Leonard Mitchell House	926 W Market St	Sandusky	Erie	8.1
ERI0251503	Bryan Bauman and Agnes Smith	1101 W Market St	Sandusky	Erie	8.1
ERI0082203	Jason Ninke	920 W Market St	Sandusky	Erie	8.1
ERI0046903	Velma Runyan House	218 Fulton St	Sandusky	Erie	8.1
ERI0254103	Allen Rental Company, LTD	916 W Market St	Sandusky	Erie	8.1

ERI0046703	Freeland T Barney House	213-215 Fulton St	Sandusky	Erie	8.1
ERI0059703	Fireland Apts	318 Huron Ave	Sandusky	Erie	8.1
ERI0179103		330 Hancock St	Sandusky	Erie	8.1
ERI0230903	Lucy McCune House	317 E Adams St	Sandusky	Erie	8.1
ERI0251403	Ronald Gangwisch	1015 W Market St	Sandusky	Erie	8.1
ERI0049803	Irene Black House	321 Hancock St	Sandusky	Erie	8.1
ERI0254003	Wm and Catheree Conway Residence	914 W Market St	Sandusky	Erie	8.1
ERI0253903	Tony and Judith Conrad	910 W Market St	Sandusky	Erie	8.1
ERI0046503		211 Fulton St	Sandusky	Erie	8.1
ERI0046603	Earl Whitmore House	212 Fulton St	Sandusky	Erie	8.1
ERI0046803	Luther Schroeder House	216 Fulton St	Sandusky	Erie	8.1
ERI0253303	T & D Hayes Group LTD	906 W Market St	Sandusky	Erie	8.1
ERI0050103	Leo Brandle House	332 Hancock St	Sandusky	Erie	8.1
ERI0231203	Myrtle Schaefer House	323 E Adams St	Sandusky	Erie	8.1
ERI0082703		1011 W Market St	Sandusky	Erie	8.1
ERI0108103	Rev Donald E Owens	416 Perry St	Sandusky	Erie	8.1
ERI0034703	Jesse Stewart House	728 Curran St	Sandusky	Erie	8.1
ERI0035303		213 Decatur St	Sandusky	Erie	8.1
ERI0087503	Rosa M Morine House	421 Meigs St	Sandusky	Erie	8.1
ERI0254203	Leora Land	816 W Market St	Sandusky	Erie	8.1
ERI0043403	Robert Sibley House	329 Franklin St	Sandusky	Erie	8.1
ERI0007603	Cloyd Likes House	421 E Adams St	Sandusky	Erie	8.1
ERI0082603	Robert Riedy	1009 W Market St	Sandusky	Erie	8.1
ERI0108003	Jack A Crum House	414 Perry St	Sandusky	Erie	8.1
ERI0082103	Alan Washek	812 W Market St	Sandusky	Erie	8.1
ERI0034803	Henry Rattunde House	730 Curran St	Sandusky	Erie	8.1
ERI0082003	Ronald Brady House	810 W Market St	Sandusky	Erie	8.1
ERI0179003	Henry Johnson House	322 Hancock St	Sandusky	Erie	8.1
ERI0008703	Russell Adams House	528 E Adams St	Sandusky	Erie	8.1
ERI0107703	Laura Singleton House	405 Perry St	Sandusky	Erie	8.1
ERI0008303	Georgia Solowey House	516 E Adams St	Sandusky	Erie	8.1
ERI0082503	Mary Rose and Thomas Hayes	1003 W Market St	Sandusky	Erie	8.1
HUR0003704		1405 SR 18	Townsend (Township of)	Huron	8.1
ERI0081903	Bonnie Holliday House	804-804 1/2 W Market St	Sandusky	Erie	8.1
ERI0081803	Erie Metro Housing Authority	800-802 W Market St	Sandusky	Erie	8.1
ERI0034903		738 Curran St	Sandusky	Erie	8.1
ERI0008003	Jeffrey Smith House	429 E Adams St	Sandusky	Erie	8.1
ERI0107903	Edgar E Grimminger House	410 Perry St	Sandusky	Erie	8.1
ERI0231603	Victorian Manor Rest Home	403 E Adams St	Sandusky	Erie	8.1
ERI0081703	Tackle Box Bait Shop	716 W Market St	Sandusky	Erie	8.1
ERI0082403		933 W Market St	Sandusky	Erie	8.1
ERI0008803	Ruth Layton House	532 E Adams St	Sandusky	Erie	8.1
ERI0007503	Gary Peterson House	413 E Adams St	Sandusky	Erie	8.1
ERI0008903	Myers TV	536 E Adams St	Sandusky	Erie	8.1
ERI0035403	Ethel Singler House	216 Decatur St	Sandusky	Erie	8.1
ERI0081603	L and T Props, LLC	710 W Market St	Sandusky	Erie	8.1
ERI0081503	Joshua Losey	708 W Market St	Sandusky	Erie	8.1
ERI0035103	Charles Corbin House	207 Decatur St	Sandusky	Erie	8.1
ERI0107803	Sam W Brown House	406 Perry St	Sandusky	Erie	8.1
ERI0081403		614 W Market St	Sandusky	Erie	8.1
ERI0134103	Popcorn Wagon	Washington St	Sandusky	Erie	8.1
ERI0081303	Irvin Phillips House	612 W Market St	Sandusky	Erie	8.1
ERI0145603	Masonic Temple	302 Wayne St	Sandusky	Erie	8.1
ERI0252803	James and Linda Hayes House	131 McDonough St	Sandusky	Erie	8.1
ERI0043203	Paul McCallister House	317 Franklin St	Sandusky	Erie	8.1
ERI0035203	Amelia Martins House	212 Decatur St	Sandusky	Erie	8.1
ERI0007803	Matthew Work House	425 E Adams St	Sandusky	Erie	8.1
ERI0134303	Reynolds Bldg	225-237 W Washington St	Sandusky	Erie	8.1

ERI0134903	Laddrick Bickley House	226 E Washington St	Sandusky	Erie	8.1
ERI0254303	Sandusky Central Fire Station	600 W Market St	Sandusky	Erie	8.1
ERI0081203	Apostolic Church	602 W Market St	Sandusky	Erie	8.1
ERI0134203	Lucas Beecher House	215 W Washington St	Sandusky	Erie	8.1
ERI0009003	Barbara A Spiecer House	604 E Adams St	Sandusky	Erie	8.1
ERI0135103	Walter Wagner House	230 E Washington St	Sandusky	Erie	8.1
ERI0083603	Jose L. Rodriguez House	129 McDonough St	Sandusky	Erie	8.1
ERI0000203	Sireco III, Inc	901 W Market St	Sandusky	Erie	8.1
ERI0008403	Audrey Meiseter House	519 E Adams St	Sandusky	Erie	8.1
ERI0009303	Martha L White House	616 E Adams St	Sandusky	Erie	8.1
ERI0134503		214 E Washington St	Sandusky	Erie	8.1
ERI0135303	Ruel Flint House	234 E Washington St	Sandusky	Erie	8.1
ERI0087403	Virginia Coffey House	411 Meigs St	Sandusky	Erie	8.1
ERI0009503	Barbara A Watkins House	618 E Adams St	Sandusky	Erie	8.1
ERI0043303	Paul Ward House	322 Franklin St	Sandusky	Erie	8.1
ERI0134703		218 E Washington St	Sandusky	Erie	8.1
ERI0081103	Steuk Bldg	504 W Market St	Sandusky	Erie	8.1
ERI0008203	Wanda G Jones House	513 E Adams St	Sandusky	Erie	8.1
ERI0081003	Milton Tremmel House	502 W Market St	Sandusky	Erie	8.1
ERI0043103	Beatrice Smith House	315 Franklin St	Sandusky	Erie	8.1
ERI0008603	Tina Carte House	525 E Adams St	Sandusky	Erie	8.1
ERI0135503	Edith Ryan House	304 E Washington St	Sandusky	Erie	8.1
ERI0087303	Thomas O Brady House	407 Meigs St	Sandusky	Erie	8.1
ERI0135603	Ronald Milburn House	308 E Washington St	Sandusky	Erie	8.1
ERI0135703	Elisa Baker House	310 E Washington St	Sandusky	Erie	8.1
ERI0252503	Wm Gundelsberger House	128 McDonough St	Sandusky	Erie	8.1
ERI0009703	Doris R Roth House	624 E Adams St	Sandusky	Erie	8.1
ERI0250803	Benny B's Barber Shop	434 W Market St	Sandusky	Erie	8.1
ERI0135803	Kenneth Wahl House	316 E Washington St	Sandusky	Erie	8.1
ERI0135903	Thelma Leder House	320 E Washington St	Sandusky	Erie	8.1
ERI0009803	Steward Williams House	628 E Adams St	Sandusky	Erie	8.1
ERI0250703	Payne Nickles and Company	422 W Market St	Sandusky	Erie	8.1
ERI0134003	Calvary Temple	115 E Washington St	Sandusky	Erie	8.1
ERI0136003		324 E Washington St	Sandusky	Erie	8.1
ERI0009903	Willie & Louella McCarty	632 E Adams St	Sandusky	Erie	8.2
ERI0250603	Southern Title	416 W Market St	Sandusky	Erie	8.2
ERI0008503		521 E Adams St	Sandusky	Erie	8.2
ERI0010103		636 E Adams St	Sandusky	Erie	8.2
ERI0134603	Needlecraft World	215 E Washington St	Sandusky	Erie	8.2
RIC0008801	Schodorf House	Plymouth-Springmill Rd	Plymouth (Township of)	Richland	8.2
HUR0035409		796 US 224	Ripley (Township of)	Huron	8.2
ERI0253103	Lake Fish Company	1014 W Water St	Sandusky	Erie	8.2
ERI0009203	Freewill Baptist Church	613 E Adams St	Sandusky	Erie	8.2
ERI0136303	Dr Russell Taylor House	334 E Washington St	Sandusky	Erie	8.2
ERI0107203	Elsie Ross House	323 Perry St	Sandusky	Erie	8.2
ERI0028703	Manhattan Clothing Co	238-240 Columbus Ave	Sandusky	Erie	8.2
ERI0028503	Preis Store	229 Columbus Ave	Sandusky	Erie	8.2
ERI0135203	Evelyn McCullough House	231 E Washington St	Sandusky	Erie	8.2
ERI0009403	Ione Metzger House	617 E Adams St	Sandusky	Erie	8.2
ERI0107603	Thomas A Pusateri House	334 Perry St	Sandusky	Erie	8.2
ERI0080303	Sandusky Register Building	314 W Market St	Sandusky	Erie	8.2
ERI0107403	David E McChesney House	327 Perry St	Sandusky	Erie	8.2
ERI0061503	Erie Inn	232 Jackson St	Sandusky	Erie	8.2
ERI0135403		301-303 E Washington St	Sandusky	Erie	8.2
ERI0009103	Teddy Otedsoe House	609 E Adams St	Sandusky	Erie	8.2
ERI0028603	Hey's Yamaha Music Store	232-234 Columbus Ave	Sandusky	Erie	8.2
ERI0080103	K. Ronald Bailey and Associates Law Office	220 W Market St	Sandusky	Erie	8.2
ERI0080003	Snap Shots Photography	214 W Market St	Sandusky	Erie	8.2

ERI0079903	Crowbar	208-210 W Market St	Sandusky	Erie	8.2
ERI0134803	Dr Donald Miller House	221 E Washington St	Sandusky	Erie	8.2
ERI0080903	Goodwill Industires	433 W Market St	Sandusky	Erie	8.2
ERI0079703	Second Hand Rose	202 W Market St	Sandusky	Erie	8.2
ERI0135003	Pierre Lacombe House	227 E Washington St	Sandusky	Erie	8.2
ERI0009603		621 E Adams St	Sandusky	Erie	8.2
ERI0136903	Marie-Victoria Pfanner House	422 E Washington St	Sandusky	Erie	8.2
ERI0080803	Goodwill Industries	419 W Market St	Sandusky	Erie	8.2
ERI0107303	Julia M Patterson House	324 Perry St	Sandusky	Erie	8.2
ERI0107503	Wesley Till House	330 Perry St	Sandusky	Erie	8.2
ERI0137003	Willie Tompkins House	428 E Washington St	Sandusky	Erie	8.2
ERI0049703	Frederick Bertschi House	218 Hancock St	Sandusky	Erie	8.2
ERI0107003	Charles Salinski	317 Perry St	Sandusky	Erie	8.2
ERI0080703	Now and Then Coin and Card Shop	403 W Market St	Sandusky	Erie	8.2
ERI0010003		635 E Adams St	Sandusky	Erie	8.2
ERI0080603	Now and Then Shoppe	333 W Market St	Sandusky	Erie	8.2
ERI0080503	Vacant	327 W Market St	Sandusky	Erie	8.2
ERI0080403	Port Sandusky Restaurant	325 W Market St	Sandusky	Erie	8.2
ERI0028303	Gray Drug	201 Columbus Ave	Sandusky	Erie	8.2
ERI0107103		322 Perry St	Sandusky	Erie	8.2
ERI0087203	Amelia H Lacher House	329 Meigs St	Sandusky	Erie	8.2
ERI0106903	Carole Ging House	315 Perry St	Sandusky	Erie	8.2
ERI0086703	Gloria A Jones House	313 Meigs St	Sandusky	Erie	8.2
ERI0080203	Jacob Baubach Saloon	301-309 W Market St	Sandusky	Erie	8.2
ERI0049603	Howard Mann House	216 Hancock St	Sandusky	Erie	8.2
ERI0028403	Jupiter Discount Store	202 Columbus Ave	Sandusky	Erie	8.2
ERI0145503	Bay Townhomes	236 Wayne St	Sandusky	Erie	8.2
ERI0076103	Roberts Jewelers	124-130 E Market St	Sandusky	Erie	8.2
ERI0087103		325 Meigs St	Sandusky	Erie	8.2
ERI0106803	Glenn Smith House	313 Perry St	Sandusky	Erie	8.2
ERI0252903	Ad Writer Offices	165 Jackson St	Sandusky	Erie	8.2
ERI0145003	Sireco, III Inc.	615 W Market St	Sandusky	Erie	8.2
ERI0076203	Peddler's Cart	136 E Market St	Sandusky	Erie	8.2
ERI0250903	Sireco III, Inc.	916 W Water St	Sandusky	Erie	8.2
ERI0076303	Spector's Juvenile Furn Store	142 E Market St	Sandusky	Erie	8.2
ERI0076403	Spector's Junior Dept Store	144 E Market St	Sandusky	Erie	8.2
ERI0145403	John Carroll House	226 Wayne St	Sandusky	Erie	8.2
ERI0076503	Les Peacock Boutique	148 E Market St	Sandusky	Erie	8.2
ERI0076603		152 E Market St	Sandusky	Erie	8.2
ERI0049503		214 Hancock St	Sandusky	Erie	8.2
ERI0035003	BJ's	112 Decatur St	Sandusky	Erie	8.2
ERI0136103	Jack Huber House	327 E Washington St	Sandusky	Erie	8.2
ERI0087003	Joyce C Christian House	323 Meigs St	Sandusky	Erie	8.2
ERI0076703	Feick Building	158-160 E Market St	Sandusky	Erie	8.2
ERI0079803	Ohio Theater Bldg	205-211 W Market St	Sandusky	Erie	8.2
ERI0137103	Ted H Schreck House	512 E Washington St	Sandusky	Erie	8.2
ERI0137503	Charles Feaga House	520 E Washington St	Sandusky	Erie	8.2
ERI0079603	City Loan	201-203 W Market St	Sandusky	Erie	8.2
ERI0106703	Russell A Knisely House	309 Perry St	Sandusky	Erie	8.2
HUR0024506	Easting House	775 Old State Rd	Bronson (Township of)	Huron	8.2
ERI0150503	E. F. Doerflinger House	324 Meigs St	Sandusky	Erie	8.2
ERI0145303	Wassner's Tire Service	222-224 Wayne St	Sandusky	Erie	8.2
ERI0077503		246 E Market St (rear)	Sandusky	Erie	8.2
ERI0137303	James Harkness House	514 E Washington St	Sandusky	Erie	8.2
ERI0137703	Mary Bryant House	524 E Washington St	Sandusky	Erie	8.2
ERI0136203	Kenneth Tone House	333 E Washington St	Sandusky	Erie	8.2
ERI0079503	Yesteryears Restaurant	139 W Market St	Sandusky	Erie	8.2
ERI0137403	Patricia A Luck House	516 E Washington St	Sandusky	Erie	8.2
ERI0076803		174-186 E Market St	Sandusky	Erie	8.2

ERI0079403	Floral Design Shop	127 W Market St	Sandusky	Erie	8.2
ERI0061303	Nichols Hotel Group	137-143 Jackson St	Sandusky	Erie	8.2
ERI0137903		530 E Washington St	Sandusky	Erie	8.2
ERI0079303	Dancer's Bag	123-125 W Market St	Sandusky	Erie	8.2
ERI0086903	Pat R Matthews House	319 Meigs St	Sandusky	Erie	8.2
ERI0254403	James Bertsch Jewelers	101 W Market St	Sandusky	Erie	8.2
ERI0136403	Jack C Mineo Jr House	403 E Washington St	Sandusky	Erie	8.2
ERI0138103	Angeline Henson House	536 E Washington St	Sandusky	Erie	8.2
ERI0136503		409 E Washington St	Sandusky	Erie	8.2
ERI0076903	Bing's Furniture Store	202 E Market St	Sandusky	Erie	8.2
ERI0086803	Counter Hanley House	315 Meigs St	Sandusky	Erie	8.2
ERI0136603	Joseph & Sally Ryan House	413 E Washington St	Sandusky	Erie	8.2
ERI0138303	John & Marg Feicht House	606 E Washington St	Sandusky	Erie	8.2
ERI0061403	Bogert's Gun Store	140 Jackson St	Sandusky	Erie	8.2
ERI0136703	Judge Cooper Watson House	417 E Washington St	Sandusky	Erie	8.2
ERI0028103	Musicians Alley/Johnson Photograph	151-157 Columbus Ave	Sandusky	Erie	8.2
ERI0076003		119 E Market St	Sandusky	Erie	8.2
ERI0136803	Sandusky Youth Referral Serv	421 E Washington St	Sandusky	Erie	8.2
ERI0077403	Wagner Quarries	242-246 E Market St	Sandusky	Erie	8.2
ERI0043003	Tri-Co Alcoholism Center Inc	235 Franklin St	Sandusky	Erie	8.2
ERI0138403	Estelle Cobb House	614 E Washington St	Sandusky	Erie	8.2
ERI0028203	Cooke Building	154-162 Columbus Ave	Sandusky	Erie	8.2
ERI0061203	Willoughby Bldg	134 Jackson St	Sandusky	Erie	8.2
ERI0086603	Donald R Stowers House	309 Meigs St	Sandusky	Erie	8.2
ERI0138703	Paul Borsick House	622 E Washington St	Sandusky	Erie	8.2
ERI0027803	Mona's Pizza and Crush Winebar	135-145 Columbus Ave	Sandusky	Erie	8.2
ERI0138903	William Keller House	624 E Washington St	Sandusky	Erie	8.2
ERI0139003	James E Corley House	630 E Washington St	Sandusky	Erie	8.2
ERI0137803	Herschel E Garton House	525 E Washington St	Sandusky	Erie	8.2
ERI0042803	Franklin House	208-210 Franklin St	Sandusky	Erie	8.2
ERI0251003	Hohler Furnace and Sheet Metal, Inc.	110 Decatur St	Sandusky	Erie	8.2
ERI0138003		535 Washington St	Sandusky	Erie	8.2
ERI0042903		216-218 Franklin St	Sandusky	Erie	8.2
ERI0027703	Gary and Diane Ackerman	129 Columbus Ave	Sandusky	Erie	8.2
ERI0250503	Nielsen Graphics and Flags	805 W Water St	Sandusky	Erie	8.2
ERI0028003	Zinc Brasserie Restaurant	142 Columbus Ave	Sandusky	Erie	8.2
ERI0144603	Ethel M McGurk Apts	406 W Water St	Sandusky	Erie	8.2
ERI0077003	Rathke's Tailoring	215 E Market St	Sandusky	Erie	8.2
ERI0144503	Klotz Machine	318 W Water St	Sandusky	Erie	8.2
ERI0145103	Sireco III, Inc.	703 W Water St	Sandusky	Erie	8.2
ERI0077103		223 E Market St	Sandusky	Erie	8.2
ERI0253003	Sandusky Glass Co. Building	121 Jackson St	Sandusky	Erie	8.2
ERI0003403	Chessie System Depot	Warren St	Sandusky	Erie	8.2
ERI0077203	American Shoe Repair	231 E Market St	Sandusky	Erie	8.2
ERI0077303	Imperial Placement	243 E Market St	Sandusky	Erie	8.2
ERI0027903	Mr. Smith's Coffee House	136 Columbus Ave	Sandusky	Erie	8.2
ERI0144303	Club Excentricities Bar	306 W Water St	Sandusky	Erie	8.2
ERI0077603	Belmont Lunch	249 E Market St	Sandusky	Erie	8.2
ERI0137603	William Armbruster House	521 E Washington St	Sandusky	Erie	8.2
ERI0144903	Sireco III, Inc.	607 W Water St	Sandusky	Erie	8.2
ERI0027503	Trophy World Avoc Finance	119-123 Columbus Ave	Sandusky	Erie	8.2
ERI0027603	Vacant (Former Admiral's Daughter Store)	126 Columbus Ave	Sandusky	Erie	8.2
ERI0078203		328 E Market St	Sandusky	Erie	8.3
ERI0077703	Garden Market	279 E Market St	Sandusky	Erie	8.3
ERI0137203	Sandusky Metal Products	513 E Washington St	Sandusky	Erie	8.3
ERI0144803		501 W Water St	Sandusky	Erie	8.3
ERI0027403	Acme Barber Shop	114-124 Columbus Ave	Sandusky	Erie	8.3
ERI0138203	Robert Merkle House	605 E Washington St	Sandusky	Erie	8.3

HUR0042204	Henry W Shaw House	1500 Old SR 18	Townsend (Township of)	Huron	8.3
ERI0077803	Central Feed & Supply Co	301 E Market St	Sandusky	Erie	8.3
ERI0078303	Ruby Garratt House	410 E Market St	Sandusky	Erie	8.3
ERI0138503	John S Fenton House	617 E Washington St	Sandusky	Erie	8.3
ERI0027003	State Theatre	101-109 Columbus Ave	Sandusky	Erie	8.3
ERI0027303	Daly's Bar and Restaurant	110 Columbus Ave	Sandusky	Erie	8.3
ERI0138603	Edward J Aust House	619 E Washington St	Sandusky	Erie	8.3
ERI0106603	James Newell House	223 Perry St	Sandusky	Erie	8.3
ERI0145203		131 Wayne St	Sandusky	Erie	8.3
ERI0144703	The Keller Building	409 W Water St	Sandusky	Erie	8.3
ERI0077903		313 E Market St	Sandusky	Erie	8.3
ERI0138803	Nelson C Uhl House	623 E Washington St	Sandusky	Erie	8.3
ERI0078003		315 E Market St	Sandusky	Erie	8.3
ERI0027203	Daly's Bar and Restaurant	104-106 Columbus Ave	Sandusky	Erie	8.3
ERI0144403	H.T. Investments	309 W Water St	Sandusky	Erie	8.3
ERI0144203	Marvin Miller Property	307 W Water St	Sandusky	Erie	8.3
ERI0144103	James Hart	303 W Water St	Sandusky	Erie	8.3
ERI0106503		219 Perry St	Sandusky	Erie	8.3
ERI0144003	Feddersen Pizza Dough, Inc.	301 W Water St	Sandusky	Erie	8.3
ERI0027103	Daly's Bar and Restaurant	102 Columbus Ave	Sandusky	Erie	8.3
ERI0182603	James and Martha Bertsch Building	225-231 W Water St	Sandusky	Erie	8.3
ERI0049403	Herman Engels House	117 Hancock St	Sandusky	Erie	8.3
ERI0183203	James Bertsch Building	223 W Water St	Sandusky	Erie	8.3
ERI0078103	Attila Stuffel Garage	321 E Market St (rear)	Sandusky	Erie	8.3
ERI0183103	Knupke Construction	217 W Water St	Sandusky	Erie	8.3
ERI0183003	RFP Properties	207-211 W Water St	Sandusky	Erie	8.3
ERI0182903	John and Pam Roesch Apartment Building	201-205 W Water St	Sandusky	Erie	8.3
ERI0182803	Water's Edge Apartments, Ltd.	121 W Water St	Sandusky	Erie	8.3
ERI0182703	Erie Bay Company	115 W Water St	Sandusky	Erie	8.3
ERI0143903	Hubbard Block	101-109 W Water St	Sandusky	Erie	8.3
ERI0143003	Porterhouse	202-204 E Water St	Sandusky	Erie	8.3
ERI0143103	RB Mfg	206 E Water St	Sandusky	Erie	8.3
ERI0078503	John & Mary Fedlam House	530 E Market St	Sandusky	Erie	8.3
ERI0143203	Commercial Printing Co	212 E Water St	Sandusky	Erie	8.3
ERI0142303		101 E Water St	Sandusky	Erie	8.3
ERI0078603	Ralph W Smith House	532 E Market St	Sandusky	Erie	8.3
ERI0142403	Roberts Typewriter Service	109 E Water St	Sandusky	Erie	8.3
ERI0078703	Conrad Bowe House	534 E Market St	Sandusky	Erie	8.3
ERI0142503	Volunteers of America	121 E Water St	Sandusky	Erie	8.3
ERI0143403	Winery	220-236 E Water St	Sandusky	Erie	8.3
ERI0142603	Simon & Herzog Plumbing & Heat	127-131 E Water St	Sandusky	Erie	8.3
ERI0078803	James Brown/Ida M Wardle House	604 E Market St	Sandusky	Erie	8.3
ERI0142703	Kelly's New & Used Furniture	133-143 E Water St	Sandusky	Erie	8.3
ERI0086403		211 Meigs St	Sandusky	Erie	8.3
ERI0142803	Lake Erie Rusco	149 E Water St	Sandusky	Erie	8.3
ERI0142903	TW Steinemann & Associates	163-165 E Water St	Sandusky	Erie	8.3
ERI0143703	Universal Elec/Fast Print & Co	300-306 E Water St	Sandusky	Erie	8.3
ERI0123503	Office of Costal Management	103-105 W Shoreline Dr	Sandusky	Erie	8.3
ERI0143803	Bay Front Hotel	314 E Water St	Sandusky	Erie	8.3
ERI0143303	Bay Meats Inc	217 E Water St	Sandusky	Erie	8.3
ERI0078403	Busch & Thiem Co	509 E Market St	Sandusky	Erie	8.3
ERI0143503	Windau Heating & Air Condition	221 E Water St	Sandusky	Erie	8.3
ERI0123603	Chesapeake Lofts	401 W Shoreline Dr	Sandusky	Erie	8.3
ERI0143603	C &C Terrazzo & Tile Co	231 E Water St	Sandusky	Erie	8.3
ERI0079203	Anthony Apts	630 E Market St	Sandusky	Erie	8.3
ERI0079103	Hazel B Stockdale House	629 E Market St	Sandusky	Erie	8.3
ERI0123403	Cedar Point Dock	103-105 Shoreline Dr (rear)	Sandusky	Erie	8.3
ERI0086203		128 Meigs St	Sandusky	Erie	8.4

ERI0078903	Helen Dantes & C Grenzebach H	623 E Market St	Sandusky	Erie	8.4
ERI0079003	Ronald C Johnson House	627 E Market St	Sandusky	Erie	8.4
ERI0086303	Charles O Schiefley House	131 Meigs St	Sandusky	Erie	8.4
CRA0013403	Eagle Nest Poultry	2nd St	Chatfield	Crawford	8.4
CRA0013203		3rd & Sandusky Ave	Chatfield	Crawford	8.4
ERI0179203	Norfolk & Southern Coal Pier	2333 W Monroe St	Sandusky	Erie	8.4
HUR0042706		721 Zenobia Rd	Bronson (Township of)	Huron	8.4
HUR0024606	Parker House	1238 Old State Rd	Bronson (Township of)	Huron	8.4
ERI0086503	Drawbridge	off Meigs St	Sandusky	Erie	8.4
CRA0013103		100-110 W Washington Sq	Chatfield	Crawford	8.5
HUR0020509		39 Boughtonville Rd	Ripley (Township of)	Huron	8.6
CRA0013003		6874 SR 4	Chatfield	Crawford	8.6
HUR0024906	Hester House	1888 Fairfield Angling Rd		Huron	8.6
SEN0103511		Jefferson St & Town Line	Republic	Seneca	8.6
SAN0054305	Packhurst Farm	1979 CR 260	Vickery	Sandusky	8.6
SEN0109504	Charles Shellhammer House	8508 E TR 178	Adams (Township of)	Seneca	8.6
HUR0034409		4255 New State Rd	Ripley (Township of)	Huron	8.7
SEN0111711	Christiano Ransburg House	8608 E CR 38	Republic	Seneca	8.7
CRA0012803	Buckeye West Elem School	Chatfield Center Rd	Chatfield	Crawford	8.7
CRA0012903		6804 SR 4	Chatfield	Crawford	8.7
HUR0043406	Culbertson House	551 SR 162		Huron	8.7
SEN0114611	Scipio-Republic Area Historicl	309 E Jefferson	Republic	Seneca	8.7
SEN0114211		7250 TR 8	Republic	Seneca	8.8
CRA0013303		6781 SR 4	Chatfield	Crawford	8.8
RIC0009801	Studer House	Updyke Rd at Rt61	Plymouth (Township of)	Richland	8.8
HUR0025006		2020 Fairfield Angling Rd		Huron	8.9
HUR0043506		456 Peru-Olena Rd	Bronson (Township of)	Huron	8.9
SEN0103411	Ohlen Hippler House	201 E St (at North St)	Republic	Seneca	9.0
SEN0114711	Charles Shock House	106 East St (at Jefferson)	Republic	Seneca	9.0
SEN0114811	Florence Shock House	108 East St	Republic	Seneca	9.0
SEN0103311	John G Miller House	102 East St	Republic	Seneca	9.0
SEN0114911	Joyce Neikirk Dysard House	210 East St	Republic	Seneca	9.0
HUR0009804		1867 SR 18	Townsend (Township of)	Huron	9.0
SEN0114411	Peddler's Point	106 N Kilbourne	Republic	Seneca	9.0
SEN0105211	Seneca East Junior High School & Republ	Madison St & Park St	Republic	Seneca	9.0
SEN0105011	Hildreth Lodge #165 AF & AM	Madison St & Center St	Republic	Seneca	9.1
SEN0104911	Gladys Riffel House	206 Madison St	Republic	Seneca	9.1
SEN0105111	United Church of Christ	312 Madison St	Republic	Seneca	9.1
SEN0105611	William Ringle House	201 Park St	Republic	Seneca	9.1
SEN0105411	Albert C Trott Barn/Carriage H	202 North St	Republic	Seneca	9.1
SEN0105311	Delpha R Maye House	610 Madison St	Republic	Seneca	9.1
HUR0025106	Treddwell House	2157 Fairfield Angling Rd		Huron	9.1
SEN0106011	Olds-Pancoast Funeral Home	107 Washington St	Republic	Seneca	9.1
SEN0106311	Pat & Eddie's Bar & Grill	205 Washington St	Republic	Seneca	9.1
SEN0106211	Wayne Powell House	203 Washington St (and North St)	Republic	Seneca	9.1
SEN0106411	Town Hall	213 Washington St	Republic	Seneca	9.1
SEN0106611	Beard's Hardware Store	215 Washington St	Republic	Seneca	9.1
SEN0106911	Young Florine House	225 Washington St	Republic	Seneca	9.1
SEN0107111	Ned & Edith Hawk House	311 Washington St	Republic	Seneca	9.2
SEN0105711	Mae Eckert House	207 Park St	Republic	Seneca	9.2
SEN0107411	Herbert C Hoover House	405 Washington St	Republic	Seneca	9.2
SEN0107611	Loretta J Corfman House	509 Washington St	Republic	Seneca	9.2
SEN0104011	Walter D Miller House	104 Kilbourne St	Republic	Seneca	9.2
SEN0106511	Stickney Block	212 Washington St	Republic	Seneca	9.2
SEN0107711	Edwin & Marilyn Porter House	511 Washington St	Republic	Seneca	9.2
SEN0106111	Republic Banking Co	204 Washington St	Republic	Seneca	9.2
SEN0102216	Olds-Pancoast Funeral Home	43 E New Haven St	Bloomville	Seneca	9.2
SEN0106711	Reiter & Young Bldg	216-220 Washington St	Republic	Seneca	9.2

SEN0107011	Cole Bldg	302 Washington St	Republic	Seneca	9.2
SEN0106811	Doris Ann Moss Beauty Salon	206 Washington St	Republic	Seneca	9.2
SEN0107211	Doyle A Neikirk House	312 Washington St	Republic	Seneca	9.2
SEN0107311	Frank & Laura Brodman House	402 Washington St (at Park St)	Republic	Seneca	9.2
SEN0103611	Neva M Stahl House	308 Jefferson St	Republic	Seneca	9.2
SEN0107511	Robert M & Carolyn A Norcross	502 Washington St	Republic	Seneca	9.2
SEN0103711	Mrs Claude Benfer	310 Jefferson St	Republic	Seneca	9.2
HUR0025206	Tilton House	2170 Fairfield Angling Rd		Huron	9.2
SEN0105511	Eveline Ternocky House	304 North St	Republic	Seneca	9.2
SEN0103211	Frank Hippler House	306 Center St	Republic	Seneca	9.2
SEN0103811	Francis Nitecki House	312 Jefferson St	Republic	Seneca	9.2
SEN0102411	Loyal Cole House	101 Broadway St	Republic	Seneca	9.2
SEN0102711	Ralph & Lorna House	Broadway St & Center St	Republic	Seneca	9.2
SEN0102811	Ronald E & Christine M Trott H	309 Broadway St	Republic	Seneca	9.2
SEN0102911	Clark R & Ethel M House	311 Broadway St	Republic	Seneca	9.2
SEN0105811	Virginia Lee Care Center	303 Park St	Republic	Seneca	9.2
SEN0103911	Alvin & Donna Neikirk House	Jefferson St & Broadway St	Republic	Seneca	9.2
SEN0105911	Ralph & Eileen Lewis House	305 South St	Republic	Seneca	9.2
SEN0102511	Rick D & Donna Prenzlin House	110 Broadway St	Republic	Seneca	9.3
SEN0102611	Trinity Evangelical United Bre	Broadway St & North St	Republic	Seneca	9.3
SEN0103011	Anselmo VeChurchio House	412 Broadway St	Republic	Seneca	9.3
SEN0103111	Franklin Hawk House	Broadway & South St	Republic	Seneca	9.3
SEN0102116	United Methodist Church	33 E New Haven St	Bloomville	Seneca	9.3
SEN0114511	Alvin Neikirk Barn	410 W Jefferson St	Republic	Seneca	9.3
SEN0104111	Noble & Mildren Auble House	306 Kilbourne St	Republic	Seneca	9.3
SEN0104311	Bruce & Mary Runion House	Kilbourne St & Park St	Republic	Seneca	9.3
SEN0104211	Roy E & Alice R Dietrich House	310 Kilbourne St	Republic	Seneca	9.3
SEN0104611	Anna Golling House	407 Kilbourne St	Republic	Seneca	9.3
SEN0102316	Alberta Kowpak House	20 Jefferson St	Bloomville	Seneca	9.3
ERI0229408		39 South St	Berlin Heights	Erie	9.4
SEN0104411	Beverly K Shock House	402 Kilbourne St	Republic	Seneca	9.4
SEN0102016	David & Carrie LeCrone House	15 E New Haven St	Bloomville	Seneca	9.4
ERI0228008		2-4 E Main St	Berlin Heights	Erie	9.4
HUR0034709		3960 Old State Rd	Ripley (Township of)	Huron	9.4
HUR0034809		12 US 224	Ripley (Township of)	Huron	9.4
SEN0104511	Clarence & Rebecca House	406 Kilbourne St	Republic	Seneca	9.4
ERI0002208		6 South St	Berlin Heights	Erie	9.4
ERI0002308		5 E Main St	Berlin Heights	Erie	9.4
ERI0002108	Hinman Funeral Home	38 South St	Berlin Heights	Erie	9.4
SEN0101416	Fire Department	S Marion St	Bloomville	Seneca	9.4
SEN0104711	Rock Creek Farms Bldg	419 Kilbourne St	Republic	Seneca	9.4
SEN0101316	Township Trustees & Jail	33 S Marion St	Bloomville	Seneca	9.4
ERI0229208	Berlin Twp Fire Dept	abt 11 E Main St	Berlin Heights	Erie	9.4
SEN0101216	Bloomville Carryout	11-13 S Marion St	Bloomville	Seneca	9.4
ERI0229308		98 South St	Berlin (Township of)	Erie	9.4
SEN0101016	Glenna Musselman House	38 S Marion St	Bloomville	Seneca	9.4
SEN0100416	Bloomfield Gazette Bldg	15 N Marion St	Bloomville	Seneca	9.4
SEN0100916	Clair & M A Forrest Bldg	S Marion St	Bloomville	Seneca	9.4
SEN0100816	Flowers & Gifts by Van Del's	26 S Marion St	Bloomville	Seneca	9.4
SEN0101116	Howard & Carol Hiet House	40 S Marion St	Bloomville	Seneca	9.4
SEN0100716	Seneca Transportation	16 1/2-18 S Marion St	Bloomville	Seneca	9.4
SEN0100516	United Church of Christ	31 N Marion St	Bloomville	Seneca	9.4
ERI0229508	Berlin Hts Bank	24 E Main St	Berlin Heights	Erie	9.4
SEN0100616	Lucy Fleet House	37 N Marion St	Bloomville	Seneca	9.4
ERI0229108	AB Phillips & Sons Friut Farm	30 E Main St	Berlin Heights	Erie	9.4
SEN0104811	Ronald Bowerman House	503 Kilbourne St	Republic	Seneca	9.4
SEN0101516	Tom & Linda Gernert House	13 W New Haven St	Bloomville	Seneca	9.5
HUR0034309	Jones House	4848 New State Rd	Ripley (Township of)	Huron	9.5
SEN0101816	Betty Ruehle House	22-22 1/2 W New Haven St	Bloomville	Seneca	9.5

HUR0041304		4781 Hartland Center Rd	Townsend (Township of)	Huron	9.6
HUR0034209		4900 New State Rd	Ripley (Township of)	Huron	9.6
ERI0019903	Marjorie Newcomb House	2311 Cedar Pt Rd	Sandusky	Erie	9.6
SEN0101916	Margaret A Reiff House	34 W New Haven St	Bloomville	Seneca	9.6
SEN0101616	John O & Linda Bloodsworth	35 W New Haven St	Bloomville	Seneca	9.6
CRA0019605		314 N Main St	Tiro	Crawford	9.6
SEN0101716	Frederick & Anne McClelland House	37 W New Haven St	Bloomville	Seneca	9.6
ERI0019303	William H Dentzel Carousel	Midway	Sandusky	Erie	9.7
HUR0040604		4507 Hartland Center Rd	Collins	Huron	9.7
CRA0019505	Barn	216 N Main St	Tiro	Crawford	9.7
CRA0019405		216 N Main St	Tiro	Crawford	9.7
HUR0040504		4483 Hartland Center Rd	Collins	Huron	9.7
CRA0019305		214 N Main St	Tiro	Crawford	9.7
SAN0035911		1285 W McPherson Hwy (US 20)	Clyde	Sandusky	9.7
ERI0183503	Cedar Downs Racing Derby	Cedar Pt Midway	Sandusky	Erie	9.8
ERI0183703	Kiddieland Carousel	Kiddieland Cedar Pt	Sandusky	Erie	9.8
CRA0019105		116 N Main St	Tiro	Crawford	9.8
SEN0108216	Simon Keller House	7566 E TR 163	Bloom (Township of)	Seneca	9.8
CRA0019205	Tiro Town Hall	SEC Homer & Main	Tiro	Crawford	9.8
CRA0019005		112 N Main St	Tiro	Crawford	9.8
ERI0019603	Cedars	Cedar Pt Dock at Bay Shore	Sandusky	Erie	9.8
ERI0019403	Coliseum	Cedar Pt Midway	Sandusky	Erie	9.8
CRA0018905	Tiro Tavern & Post Office	NWC SR 39 & Hilborn	Tiro	Crawford	9.8
HUR0042304	Collins Apts	4306 Hartland Center Rd	Collins	Huron	9.8
CRA0018605	Store No 1	Main St	Tiro	Crawford	9.9
ERI0019803	Coral Dining Room	btw Lake & Bay	Sandusky	Erie	9.9
CRA0018505	Village Market	High St	New Washington	Crawford	9.9
CRA0018705		117 S Main St	Tiro	Crawford	10.0
HUR0003604	Townsend Town Hall	2776 US 20	East Townsend	Huron	10.0

Appendix D.

Ohio Archaeological Inventory Sites within the Study Area

Appendix D. Ohio Archaeological Inventory Sites within the Study Area

OAI ID	RESOURCE NAME	PERIOD	SITE TYPE	DISTANCE FROM PROJECT AREA (MILES)
ER0086	Unnamed	Prehistoric	Unknown	0.0
ER0087	Unnamed	Prehistoric	Unknown	0.0
ER0088	Unnamed	Prehistoric	Unknown	0.0
ER0089	Unnamed	Prehistoric	Unknown	0.0
HU0007	Sell Site	Prehistoric	Unknown	0.0
HU0014	Martin Site	Prehistoric	Unknown	0.0
HU0017	Unnamed	Prehistoric	Unknown	0.0
HU0021	Unnamed	Prehistoric	Unknown	0.0
HU0023	Unnamed	Prehistoric	Unknown	0.0
HU0024	Herner Site	Prehistoric	Unknown	0.0
HU0025	Unnamed	Prehistoric	Unknown	0.0
HU0036	Werner Quarry	Prehistoric	Quarry	0.0
HU0038	Unnamed	Prehistoric	Unknown	0.0
HU0039	Unnamed	Prehistoric	Unknown	0.0
HU0040	Didion Site II	Prehistoric	Unknown	0.0
HU0041	Lepley Site	Prehistoric	Habitation	0.0
HU0043	Unnamed	Prehistoric	Unknown	0.0
HU0045	Unnamed	Prehistoric	Unknown	0.0
HU0046	Unnamed	Prehistoric	Unknown	0.0
HU0047	Unnamed	Prehistoric	Quarry	0.0
HU0048	Unnamed	Prehistoric	Quarry	0.0
HU0049	Unnamed	Prehistoric	Unknown	0.0
HU0096	Unnamed	Prehistoric	Unknown	0.0
HU0097	Unnamed	Prehistoric	Unknown	0.0
HU0098	Unnamed	Prehistoric	Unknown	0.0
HU0099	Unnamed	Prehistoric	Unknown	0.0
HU0153	Unnamed	Historic	Unknown	0.0
HU0181	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0182	Unnamed	Prehistoric	Camp	0.0
HU0183	Unnamed	Prehistoric	Quarry/ Workshop	0.0
HU0184	Unnamed	Prehistoric	Quarry/ Workshop	0.0
HU0185	Unnamed	Prehistoric	Unknown	0.0
HU0201	Unnamed	Prehistoric	Unknown	0.0
HU0202	Unnamed	Prehistoric	Unknown	0.0
HU0203	Unnamed	Prehistoric	Unknown	0.0
HU0204	Unnamed	Prehistoric	Unknown	0.0
HU0206	Unnamed	Prehistoric	Unknown	0.0
HU0209	Unnamed	Prehistoric	Unknown	0.0
HU0210	Unnamed	Prehistoric	Unknown	0.0
HU0211	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0212	Unnamed	Prehistoric	Unknown	0.0

HU0213	Unnamed	Prehistoric	Unknown	0.0
HU0214	Unnamed	Prehistoric	Unknown	0.0
HU0215	Unnamed	Prehistoric	Unknown	0.0
HU0216	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0218	Unnamed	Prehistoric	Quarry	0.0
HU0220	Unnamed	Prehistoric	Unknown	0.0
HU0222	Unnamed	Prehistoric	Unknown	0.0
HU0223	Lepley 7	Prehistoric	Workshop	0.0
HU0224	Unnamed	Prehistoric	Unknown	0.0
HU0225	Unnamed	Prehistoric	Unknown	0.0
HU0226	Unnamed	Prehistoric	Unknown	0.0
HU0227	Sawyer burial site	Historic	Unknown	0.0
HU0228	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0231	Unnamed	Prehistoric	Unknown	0.0
HU0232	Unnamed	Prehistoric	Unknown	0.0
HU0233	Unnamed	Prehistoric	Unknown	0.0
HU0234	Unnamed	Prehistoric	Unknown	0.0
HU0238	Unnamed	Prehistoric	Unknown	0.0
HU0239	Unnamed	Prehistoric	Unknown	0.0
HU0241	Unnamed	Prehistoric	Unknown	0.0
HU0250	Unnamed	Prehistoric	Unknown	0.0
HU0252	Unnamed	Prehistoric	Unknown	0.0
HU0253	Unnamed	Prehistoric	Unknown	0.0
HU0254	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0255	Unnamed	Prehistoric	Unknown	0.0
HU0256	Unnamed	Prehistoric	Unknown	0.0
HU0257	Unnamed	Prehistoric	Unknown	0.0
HU0259	Unnamed	Prehistoric	Unknown	0.0
HU0261	Unnamed	Prehistoric	Unknown	0.0
HU0262	Unnamed	Prehistoric	Unknown	0.0
HU0263	Unnamed	Prehistoric	Unknown	0.0
HU0264	Unnamed	Prehistoric	Unknown	0.0
HU0265	Unnamed	Prehistoric	Unknown	0.0
HU0266	Unnamed	Prehistoric	Unknown	0.0
HU0268	Unnamed	Prehistoric	Unknown	0.0
HU0270	Unnamed	Prehistoric	Unknown	0.0
HU0271	Unnamed	Prehistoric	Unknown	0.0
HU0273	Unnamed	Prehistoric	Unknown	0.0
HU0274	Unnamed	Prehistoric	Unknown	0.0
HU0275	Unnamed	Prehistoric	Unknown	0.0
HU0279	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0346	Unnamed	Prehistoric	Unknown	0.0
HU0347	Unnamed	Prehistoric	Unknown	0.0
HU0348	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0349	Unnamed	Prehistoric	Unknown	0.0
HU0350	Unnamed	Prehistoric	Unknown	0.0
HU0351	Unnamed	Historic	Unknown	0.0

HU0355	Unnamed	Prehistoric	Unknown	0.0
HU0419	Unnamed	Prehistoric	Workshop	0.0
HU0420	Unnamed	Prehistoric	Unknown	0.0
HU0422	Unnamed	Prehistoric	Unknown	0.0
HU0423	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0424	Unnamed	Historic	Unknown	0.0
HU0230	Unnamed	Prehistoric	Unknown	0.0
HU0205	Unnamed	Prehistoric	Unknown	0.0
HU0244	Unnamed	Prehistoric	Unknown	0.0
HU0012	Fen #1 Site	Prehistoric	Unknown	0.0
HU0458	Unnamed	Historic	Unknown	0.0
HU0095	Unnamed	Prehistoric	Unknown	0.0
HU0177	Unnamed	Prehistoric	Unknown	0.0
HU0235	Unnamed	Prehistoric	Unknown	0.0
HU0219	Unnamed	Prehistoric	Unknown	0.0
HU0221	Unnamed	Prehistoric and Historic	Unknown	0.0
HU0269	Unnamed	Prehistoric	Unknown	0.0
HU0180	Unnamed	Prehistoric	Unknown	0.0
HU0020	Unnamed	Prehistoric	Unknown	0.0
HU0245	Unnamed	Prehistoric	Unknown	0.0
HU0042	Beiler Site	Prehistoric	Unknown	0.1
HU0050	Unnamed	Prehistoric	Unknown	0.1
HU0237	Unnamed	Prehistoric	Unknown	0.1
HU0173	Unnamed	Prehistoric	Unknown	0.1
HU0175	Unnamed	Prehistoric	Unknown	0.1
HU0243	Unnamed	Prehistoric	Unknown	0.1
HU0229	Unnamed	Prehistoric	Unknown	0.1
SE0312	Unnamed	Prehistoric	Quarry	0.1
HU0015	Unnamed	Prehistoric	Unknown	0.1
ER0451	Unnamed	Prehistoric	Unknown	0.1
HU0052	Unnamed	Prehistoric	Unknown	0.1
ER0159	Unnamed	Prehistoric	Unknown	0.1
HU0053	Unnamed	Prehistoric	Unknown	0.1
HU0249	Unnamed	Prehistoric and Historic	Unknown	0.1
HU0285	Unnamed	Prehistoric	Unknown	0.1
ER0626	Unnamed	Prehistoric	Unknown	0.1
HU0258	Unnamed	Prehistoric	Unknown	0.1
SE0313	Unnamed	Prehistoric	Unknown	0.1
HU0051	Unnamed	Prehistoric	Unknown	0.1
HU0044	Unnamed	Prehistoric	Unknown	0.1
HU0247	Unnamed	Prehistoric	Unknown	0.1
HU0054	Unnamed	Prehistoric	Unknown	0.1
ER0452	Unnamed	Prehistoric	Unknown	0.1
HU0055	Unnamed	Prehistoric	Unknown	0.1
SE0284	Unnamed	Prehistoric	Unknown	0.1
HU0179	Unnamed	Prehistoric	Unknown	0.1
HU0286	Unnamed	Prehistoric	Unknown	0.1

HU0016	Unnamed	Prehistoric	Unknown	0.1
ER0157	Unnamed	Prehistoric	Unknown	0.1
HU0176	Unnamed	Prehistoric	Unknown	0.1
HU0246	Unnamed	Prehistoric	Unknown	0.2
HU0174	Unnamed	Prehistoric	Unknown	0.2
HU0236	Unnamed	Prehistoric	Unknown	0.2
ER0158	Unnamed	Prehistoric and Historic	Unknown	0.2
HU0022	Unnamed	Prehistoric	Unknown	0.2
HU0242	Unnamed	Prehistoric	Unknown	0.2
HU0343	Unnamed	Prehistoric	Unknown	0.2
SE0466	Unnamed	Prehistoric	Quarry/ Workshop	0.2
HU0240	Unnamed	Prehistoric	Unknown	0.2
ER0617	Unnamed	Prehistoric	Unknown	0.2
HU0013	Horn Site	Prehistoric	Unknown	0.2
HU0200	Unnamed	Prehistoric	Unknown	0.2
HU0251	Unnamed	Prehistoric and Historic	Unknown	0.2
HU0178	Unnamed	Prehistoric	Unknown	0.3
ER0616	Unnamed	Prehistoric	Unknown	0.3
HU0208	Unnamed	Prehistoric	Unknown	0.3
ER0551	Unnamed	Prehistoric	Unknown	0.3
ER0371	Unnamed	Prehistoric	Unknown	0.3
HU0332	Unnamed	Prehistoric	Unknown	0.3
HU0018	Unnamed	Prehistoric	Unknown	0.3
SE0648	Unnamed	Prehistoric	Unknown	0.3
SE0647	Unnamed	Prehistoric	Unknown	0.3
HU0248	Unnamed	Prehistoric	Unknown	0.4
HU0019	Unnamed	Prehistoric	Unknown	0.4
HU0207	Unnamed	Prehistoric	Unknown	0.4
HU0026	Unnamed	Prehistoric	Unknown	0.4
ER0618	Unnamed	Prehistoric	Unknown	0.4
ER0392	Unnamed	Historic	Unknown	0.4
ER0568	(See also 33 ER 621)	Prehistoric	Unknown	0.4
ER0395	Unnamed	Prehistoric	Unknown	0.4
HU0116	Unnamed	Prehistoric	Unknown	0.4
ER0268	Unnamed	Prehistoric	Unknown	0.4
ER0620	Unnamed	Prehistoric	Unknown	0.4
HU0280	Unnamed	Prehistoric	Unknown	0.4
SE0642	Unnamed	Prehistoric	Unknown	0.4
ER0621	(See also 33 ER 568)	Prehistoric	Unknown	0.4
ER0393	Unnamed	Prehistoric	Unknown	0.4
ER0611	Unnamed	Prehistoric	Unknown	0.5
ER0229	Unnamed	Prehistoric and Historic	Unknown	0.5
HU0118	Unnamed	Prehistoric	Unknown	0.5
ER0004	Oxford Village Site (historic name - see Comments)	Prehistoric	Habitation	0.5
ER0394	Unnamed	Prehistoric	Unknown	0.5
HU0267	Unnamed	Prehistoric	Unknown	0.5

HU0281	Unnamed	Prehistoric	Unknown	0.5
ER0619	Unnamed	Historic	Unknown	0.5
HU0117	Unnamed	Prehistoric	Unknown	0.5
ER0614	Unnamed	Prehistoric	Unknown	0.5
ER0267	Unnamed	Prehistoric	Unknown	0.5
HU0362	Unnamed	Prehistoric	Habitation	0.5
SA0268	Unnamed	Prehistoric	Unknown	0.5
HU0344	Unnamed	Prehistoric	Unknown	0.5
HU0089	Unnamed	Prehistoric	Unknown	0.5
HU0090	Unnamed	Prehistoric	Unknown	0.5
ER0615	Unnamed	Prehistoric	Unknown	0.5
SE0641	Unnamed	Prehistoric and Historic	Unknown	0.5
SA0273	Unnamed	Prehistoric	Unknown	0.5
ER0233	Unnamed	Prehistoric and Historic	Unknown	0.5
HU0087	Unnamed	Prehistoric	Unknown	0.5
ER0230	Unnamed	Prehistoric	Unknown	0.5
HU0088	Unnamed	Prehistoric	Unknown	0.5
ER0227	Unnamed	Prehistoric	Unknown	0.5
SE0695	Unnamed	Historic	Unknown	0.5
HU0119	Unnamed	Prehistoric	Unknown	0.6
ER0226	Unnamed	Prehistoric	Unknown	0.6
HU0278	Unnamed	Prehistoric	Unknown	0.6
ER0225	Unnamed	Prehistoric and Historic	Unknown	0.6
SA0275	Unnamed	Prehistoric and Historic	Unknown	0.6
SE0696	Unnamed	Historic	Unknown	0.6
HU0217	Unnamed	Prehistoric	Unknown	0.6
SE0728	Unnamed	Prehistoric	Unknown	0.6
SA0270	Unnamed	Prehistoric	Unknown	0.6
SA0272	Unnamed	Prehistoric and Historic	Unknown	0.6
SA0269	Unnamed	Prehistoric and Historic	Unknown	0.6
HU0276	Unnamed	Prehistoric	Unknown	0.6
HU0120	Unnamed	Prehistoric and Historic	Unknown	0.6
ER0290	Unnamed	Historic	Unknown	0.7
ER0137	Unnamed	Prehistoric	Unknown	0.7
ER0228	Unnamed	Prehistoric	Unknown	0.7
ER0315	Unnamed	Prehistoric	Unknown	0.7
SA0271	Unnamed	Prehistoric	Unknown	0.7
ER0231	Unnamed	Prehistoric and Historic	Unknown	0.7
SA0274	Unnamed	Prehistoric	Unknown	0.7
HU0324	Unnamed	Prehistoric	Unknown	0.7
ER0313	Unnamed	Prehistoric	Unknown	0.7
HU0029	Unnamed	Prehistoric	Unknown	0.7
ER0300	Unnamed	Prehistoric	Unknown	0.7
HU0418	Unnamed	Prehistoric and Historic	Unknown	0.7
SA0276	Unnamed	Prehistoric	Unknown	0.7
ER0534	Unnamed	Historic	Unknown	0.7
ER0298	Unnamed	Prehistoric	Unknown	0.7

SE0693	Unnamed	Prehistoric	Unknown	0.7
HU0121	Unnamed	Prehistoric	Unknown	0.7
HU0027	Unnamed	Prehistoric	Unknown	0.7
HU0030	Unnamed	Prehistoric	Unknown	0.7
ER0138	Unnamed	Prehistoric	Unknown	0.7
ER0301	Unnamed	Prehistoric	Unknown	0.7
HU0028	Unnamed	Prehistoric and Historic	Unknown	0.7
ER0299	Unnamed	Prehistoric	Unknown	0.7
ER0312	Unnamed	Prehistoric	Workshop	0.7
HU0031	Unnamed	Prehistoric	Unknown	0.7
ER0302	Unnamed	Prehistoric	Unknown	0.8
SE0694	Unnamed	Prehistoric	Unknown	0.8
HU0352	Unnamed	Prehistoric	Unknown	0.8
ER0232	Unnamed	Prehistoric	Unknown	0.8
SA0355	Unnamed	Prehistoric	Unknown	0.8
ER0453	Unnamed	Historic	Unknown	0.8
ER0291	Unnamed	Historic	Unknown	0.8
SA0356	Unnamed	Prehistoric	Unknown	0.8
ER0454	Unnamed	Prehistoric	Unknown	0.8
HU0359	Unnamed	Prehistoric	Unknown	0.8
ER0535	Unnamed	Prehistoric	Unknown	0.8
ER0303	Unnamed	Prehistoric	Unknown	0.8
SA0357	Unnamed	Prehistoric	Unknown	0.8
HU0158	Unnamed	Prehistoric	Unknown	0.8
ER0154	Unnamed	Prehistoric	Unknown	0.8
HU0358	Unnamed	Prehistoric	Unknown	0.8
ER0151	Milk Carton	Prehistoric	Workshop	0.8
ER0306	Unnamed	Prehistoric	Unknown	0.8
ER0293	Unnamed	Prehistoric	Unknown	0.9
ER0493	Unnamed	Prehistoric	Habitation/ Workshop	0.9
ER0305	Unnamed	Prehistoric	Unknown	0.9
ER0304	Unnamed	Prehistoric	Unknown	0.9
ER0310	Unnamed	Prehistoric	Unknown	0.9
SA0354	Unnamed	Prehistoric	Unknown	0.9
ER0307	Unnamed	Prehistoric	Unknown	0.9
ER0309	Unnamed	Prehistoric	Unknown	0.9
HU0357	Unnamed	Prehistoric	Unknown	0.9
ER0294	Unnamed	Prehistoric	Unknown	0.9
SA0360	Unnamed	Prehistoric	Unknown	0.9
ER0295	Unnamed	Prehistoric	Unknown	0.9
HU0457	02_HU_021_02	Prehistoric	Unknown	0.9
ER0297	Unnamed	Prehistoric	Unknown	0.9
HU0159	Unnamed	Prehistoric	Unknown	0.9
SA0358	Unnamed	Prehistoric	Unknown	0.9
ER0308	Unnamed	Prehistoric	Unknown	0.9
ER0311	Unnamed	Prehistoric	Unknown	0.9

ER0296	Unnamed	Prehistoric	Unknown	0.9
SE0283	Unnamed	Prehistoric	Unknown	0.9
ER0494	Unnamed	Prehistoric	Unknown	1.0
ER0487	Unnamed	Prehistoric	Unknown	1.0
SA0359	Unnamed	Prehistoric	Unknown	1.0
HU0356	Unnamed	Prehistoric	Camp	1.0
HU0107	Unnamed	Prehistoric	Unknown	1.0
HU0417	Unnamed	Prehistoric	Unknown	1.0
SE0282	Unnamed	Prehistoric	Unknown	1.0
ER0050	Meyers Site	Prehistoric	Unknown	1.0
HU0333	Unnamed	Prehistoric	Unknown	1.0
ER0314	Unnamed	Prehistoric	Unknown	1.0
ER0085	Seaman's Fort	Prehistoric	Hilltop Fortification/ Habitation & Cemetery	1.0
ER0223	Unnamed	Prehistoric	Unknown	1.0
HU0101	Unnamed	Prehistoric	Unknown	1.0
ER0540	Unnamed	Historic	Unknown	1.0
SE0281	Unnamed	Prehistoric	Unknown	1.1
ER0536	Unnamed	Prehistoric	Unknown	1.1
HU0105	Unnamed	Prehistoric	Unknown	1.1
HU0360	Unnamed	Prehistoric	Unknown	1.1
ER0495	Unnamed	Prehistoric and Historic	Unknown	1.1
HU0008	Unnamed	Prehistoric	Unknown	1.1
ER0541	Unnamed	Prehistoric	Unknown	1.1
HU0104	Unnamed	Prehistoric	Unknown	1.1
ER0510	Unnamed	Prehistoric	Unknown	1.1
HU0287	Unnamed	Prehistoric	Unknown	1.1
SE0280	Unnamed	Prehistoric	Unknown	1.1
ER0153	Unnamed	Prehistoric	Unknown	1.2
HU0144	Unnamed	Prehistoric	Unknown	1.2
HU0003	Pontiac	Prehistoric	Unknown	1.2
ER0374	Unnamed	Prehistoric	Unknown	1.2
ER0537	Unnamed	Prehistoric	Unknown	1.2
HU0143	Unnamed	Prehistoric	Unknown	1.2
HU0102	Unnamed	Prehistoric	Unknown	1.2
SA0361	Unnamed	Prehistoric	Unknown	1.2
HU0033	Marble Site	Prehistoric	Unknown	1.2
HU0416	Unnamed	Prehistoric and Historic	Unknown	1.2
ER0544	Unnamed	Prehistoric	Unknown	1.2
HU0147	Unnamed	Prehistoric	Unknown	1.2
ER0221	Unnamed	Prehistoric	Unknown	1.2
ER0552	Unnamed	Prehistoric	Unknown	1.2
ER0545	Unnamed	Historic	Unknown	1.2
ER0538	Unnamed	Historic	Unknown	1.3
ER0220	Unnamed	Historic	Unknown	1.3

HU0106	Unnamed	Prehistoric	Unknown	1.3
SE0485	Unnamed	Prehistoric	Unknown	1.3
HU0103	Unnamed	Prehistoric	Unknown	1.3
SE0770	Unnamed	Prehistoric	Unknown	1.3
HU0277	Unnamed	Prehistoric	Unknown	1.3
SE0479	Unnamed	Prehistoric	Unknown	1.3
ER0222	Unnamed	Prehistoric	Unknown	1.3
ER0016	Sawmill Site	Prehistoric	Unknown	1.3
SE0760	Unnamed	Prehistoric	Unknown	1.3
ER0539	Unnamed	Historic	Unknown	1.4
ER0543	Unnamed	Prehistoric	Unknown	1.4
ER0216	Unnamed	Prehistoric	Unknown	1.4
ER0373	Unnamed	Prehistoric	Unknown	1.4
ER0239	Unnamed	Prehistoric	Unknown	1.4
ER0542	Unnamed	Prehistoric	Unknown	1.4
SE0769	Unnamed	Prehistoric	Unknown	1.4
SE0761	Unnamed	Prehistoric and Historic	Unknown	1.4
ER0214	Unnamed	Prehistoric	Unknown	1.5
HU0011	C.F. Brown Site	Prehistoric	Unknown	1.5
SE0759	Unnamed	Historic	Unknown	1.5
HU0145	Unnamed	Prehistoric	Unknown	1.5
ER0140	Scheid Road # 1	Prehistoric and Historic	Workshop	1.5
ER0218	Unnamed	Prehistoric	Unknown	1.5
ER0139	Unnamed	Prehistoric	Unknown	1.5
ER0202	Unnamed	Prehistoric	Unknown	1.5
ER0215	Unnamed	Prehistoric	Unknown	1.5
ER0141	Unnamed	Prehistoric	Unknown	1.5
SE0279	Unnamed	Prehistoric	Unknown	1.6
HU0146	Unnamed	Prehistoric	Unknown	1.6
ER0142	Unnamed	Prehistoric	Unknown	1.6
SE0599	Unnamed	Historic	Unknown	1.6
ER0506	Unnamed	Prehistoric	Unknown	1.6
SE0278	Unnamed	Prehistoric	Unknown	1.6
HU0414	Unnamed	Prehistoric	Unknown	1.6
HU0115	Unnamed	Historic	Unknown	1.6
ER0292	Unnamed	Historic	Unknown	1.6
HU0282	Unnamed	Prehistoric	Unknown	1.6
ER0143	Unnamed	Prehistoric and Historic	Unknown	1.6
ER0319	Unnamed	Prehistoric	Unknown	1.6
HU0415	Unnamed	Prehistoric	Unknown	1.6
HU0160	Unnamed	Prehistoric	Unknown	1.7
ER0219	NASA Survey Site # 64	Prehistoric	Workshop	1.7
ER0205	NASA Survey Site # 47	Prehistoric	Camp	1.7
ER0199	Unnamed	Prehistoric	Unknown	1.7
ER0318	Unnamed	Prehistoric	Unknown	1.7
ER0198	Unnamed	Prehistoric	Unknown	1.7
ER0213	Unnamed	Prehistoric	Unknown	1.7

HU0456	Unnamed	Prehistoric	Unknown	1.7
ER0217	Unnamed	Prehistoric and Historic	Unknown	1.7
ER0320	Unnamed	Prehistoric	Unknown	1.7
ER0608	Unnamed	Prehistoric	Unknown	1.7
ER0147	Big Tree Site	Prehistoric	Workshop	1.7
ER0201	Unnamed	Prehistoric	Unknown	1.7
SA0694	Unnamed	Prehistoric	Unknown	1.7
SA0522	Unnamed	Historic	Unknown	1.7
ER0321	Unnamed	Prehistoric	Unknown	1.7
SA0181	Unnamed	Prehistoric	Unknown	1.7
ER0317	Unnamed	Prehistoric	Unknown	1.7
ER0197	NASA Survey Site # 36	Prehistoric	Workshop	1.8
ER0204	Unnamed	Prehistoric	Unknown	1.8
ER0316	Unnamed	Prehistoric	Unknown	1.8
SA0183	Unnamed	Prehistoric	Unknown	1.8
ER0195	Unnamed	Prehistoric	Unknown	1.8
ER0512	Unnamed	Prehistoric	Unknown	1.8
SA0521	Unnamed	Historic	Unknown	1.8
ER0194	Unnamed	Prehistoric	Unknown	1.8
ER0144	Unnamed	Prehistoric	Unknown	1.8
ER0244	NASA Survey Site # 89	Prehistoric	Workshop	1.8
ER0200	NASA Survey Site # 40	Prehistoric	Workshop	1.8
SA0182	Unnamed	Prehistoric	Unknown	1.8
SA0180	Unnamed	Prehistoric	Unknown	1.8
ER0203	Unnamed	Prehistoric	Unknown	1.8
ER0196	Unnamed	Prehistoric	Unknown	1.8
ER0607	Unnamed	Prehistoric	Unknown	1.8
HU0100	Unnamed	Prehistoric	Unknown	1.8
ER0207	Unnamed	Prehistoric	Unknown	1.8
ER0146	Destroyed Dune Site	Prehistoric	Workshop	1.8
SE0277	Unnamed	Prehistoric	Unknown	1.8
ER0240	Unnamed	Prehistoric	Unknown	1.8
ER0606	Unnamed	Prehistoric	Unknown	1.8
ER0375	Unnamed	Prehistoric	Unknown	1.8
ER0242	NASA Survey Site # 87	Prehistoric	Camp	1.8
ER0206	Unnamed	Historic	Unknown	1.9
HU0161	Unnamed	Prehistoric	Unknown	1.9
ER0145	Unnamed	Prehistoric and Historic	Unknown	1.9
ER0212	Unnamed	Prehistoric	Unknown	1.9
ER0250	Unnamed	Prehistoric	Unknown	1.9
ER0241	Unnamed	Prehistoric	Unknown	1.9
SE0276	Unnamed	Prehistoric	Unknown	1.9
HU0187	Unnamed	Prehistoric	Unknown	1.9
ER0245	Unnamed	Prehistoric	Unknown	1.9
ER0208	Unnamed	Prehistoric	Unknown	2.0
HU0455	Unnamed	Prehistoric	Unknown	2.0
ER0210	NASA Survey Site # 53	Prehistoric	Workshop	2.0

ER0238	Unnamed	Prehistoric	Unknown	2.0
SA0611	Unnamed	Historic	Unknown	2.0
ER0224	NASA Survey Site # 69	Prehistoric	Workshop	2.0
ER0507	Unnamed	Prehistoric and Historic	Workshop	2.0
ER0246	Unnamed	Prehistoric	Unknown	2.0
ER0152	South Ridge	Prehistoric	Workshop	2.0
ER0209	Unnamed	Prehistoric and Historic	Unknown	2.0
HU0138	Unnamed	Prehistoric	Unknown	2.0
ER0011	Unnamed	Historic	Unknown	2.0
HU0037	Schaffer Village	Prehistoric	Village	2.0
ER0148	Campbell West Site	Prehistoric	Workshop	2.0
HU0056	Unnamed	Prehistoric	Unknown	2.1
HU0140	Unnamed	Prehistoric	Unknown	2.1
SA0200	Unnamed	Prehistoric and Historic	Unknown	2.1
ER0559	Unnamed	Prehistoric and Historic	Habitation	2.1
ER0054	Unnamed	Prehistoric	Unknown	2.1
ER0055	Unnamed	Prehistoric	Unknown	2.1
ER0211	NASA Survey Site # 54	Prehistoric	Workshop	2.1
HU0413	Unnamed	Prehistoric	Unknown	2.1
HU0148	Unnamed	Prehistoric	Unknown	2.1
HU0345	Unnamed	Prehistoric and Historic	Unknown	2.1
ER0248	Unnamed	Prehistoric	Unknown	2.1
ER0502	Unnamed	Prehistoric	Workshop	2.1
SE0771	Unnamed	Prehistoric	Unknown	2.1
ER0372	Unnamed	Prehistoric	Unknown	2.1
ER0376	Unnamed	Prehistoric	Unknown	2.1
ER0249	Unnamed	Prehistoric	Unknown	2.1
SE0275	Unnamed	Prehistoric	Unknown	2.1
SE0772	Unnamed	Prehistoric	Unknown	2.1
HU0412	Unnamed	Prehistoric	Unknown	2.2
HU0137	Unnamed	Prehistoric	Unknown	2.2
ER0149	Stump Site	Prehistoric and Historic	Workshop	2.2
SA0199	Unnamed	Prehistoric and Historic	Unknown	2.2
ER0247	NASA Survey Site # 92	Prehistoric	Workshop	2.2
ER0186	NASA Survey Site # 24	Prehistoric	Workshop	2.2
HU0133	Unnamed	Prehistoric	Unknown	2.2
HU0453	Unnamed	Prehistoric	Unknown	2.2
ER0191	Unnamed	Prehistoric and Historic	Unknown	2.2
SE0274	Unnamed	Prehistoric	Unknown	2.2
ER0446	Unnamed	Prehistoric	Unknown	2.2
ER0503	Unnamed	Prehistoric	Workshop	2.2
ER0447	Unnamed	Prehistoric	Unknown	2.2
SA0198	Unnamed	Prehistoric	Unknown	2.2
ER0182	Unnamed	Prehistoric	Unknown	2.2
HU0134	3 F Site	Prehistoric	Camp	2.2
SA0197	Unnamed	Prehistoric	Unknown	2.2
ER0185	Unnamed	Prehistoric	Unknown	2.2

ER0190	NASA Survey Site # 28	Prehistoric and Historic	Workshop	2.2
HU0142	Unnamed	Prehistoric	Unknown	2.2
HU0162	Unnamed	Prehistoric	Unknown	2.2
ER0505	Unnamed	Prehistoric	Unknown	2.3
SE0773	Unnamed	Prehistoric	Camp	2.3
SA0201	Unnamed	Prehistoric and Historic	Unknown	2.3
HU0325	Unnamed	Historic	Unknown	2.3
ER0189	Unnamed	Prehistoric	Unknown	2.3
SE0762	Unnamed	Prehistoric	Unknown	2.3
ER0183	NASA Survey Site # 21	Prehistoric	Workshop	2.3
ER0188	Unnamed	Prehistoric	Unknown	2.3
HU0092	Unnamed	Prehistoric	Unknown	2.3
ER0605	Unnamed	Prehistoric	Unknown	2.3
ER0192	Unnamed	Prehistoric	Unknown	2.3
SA0516	Unnamed	Prehistoric and Historic	Unknown	2.3
HU0136	Unnamed	Prehistoric	Unknown	2.3
ER0181	NASA Survey Site # 19	Prehistoric and Historic	Camp	2.3
ER0501	Unnamed	Prehistoric and Historic	Workshop	2.3
HU0135	Unnamed	Prehistoric and Historic	Unknown	2.3
ER0184	Unnamed	Prehistoric	Unknown	2.3
ER0008	Raccoon Farm Earthworks	Prehistoric	Hilltop Earthworks	2.3
ER0511	Unnamed	Prehistoric and Historic	Workshop	2.3
HU0139	Unnamed	Prehistoric	Unknown	2.4
ER0509	Unnamed	Historic	Unknown	2.4
ER0187	Unnamed	Prehistoric	Unknown	2.4
ER0014	Heckleman Site	Prehistoric	Unknown	2.4
ER0094	Unnamed	Prehistoric	Unknown	2.4
SA0515	Unnamed	Prehistoric	Unknown	2.4
SA0517	Unnamed	Prehistoric and Historic	Unknown	2.4
HU0326	Unnamed	Prehistoric	Unknown	2.4
SE0273	Unnamed	Prehistoric	Unknown	2.4
SA0514	Unnamed	Historic	Unknown	2.4
ER0180	NASA Survey Site # 18	Prehistoric and Historic	Camp	2.4
ER0177	NASA Survey Site # 15	Prehistoric	Workshop	2.4
HU0454	Unnamed	Prehistoric	Unknown	2.4
ER0178	Unnamed	Prehistoric	Unknown	2.4
ER0445	Unnamed	Prehistoric	Unknown	2.4
SE0763	Unnamed	Prehistoric	Unknown	2.4
HU0004	St Joseph Cemetery	Prehistoric	Unknown	2.4
HU0328	Unnamed	Historic	Unknown	2.5
ER0091	Unnamed	Prehistoric	Unknown	2.5
HU0057	Unnamed	Prehistoric	Unknown	2.5
HU0327	Unnamed	Historic	Unknown	2.5
ER0179	NASA Survey Site # 17	Prehistoric and Historic	Workshop	2.5
HU0329	Unnamed	Prehistoric	Unknown	2.5
ER0193	NASA Survey Site # 31	Prehistoric	Workshop	2.5

ER0492	Unnamed	Prehistoric	Unknown	2.5
ER0136	Unnamed	Prehistoric	Quarry	2.5
ER0176	NASA Survey Site # 14	Prehistoric and Historic	Workshop	2.5
ER0442	Unnamed	Prehistoric and Historic	Unknown	2.5
SE0774	Unnamed	Prehistoric	Unknown	2.5
ER0174	Unnamed	Prehistoric	Unknown	2.6
ER0409	De Muth #8 / Welinau Site	Prehistoric	Habitation	2.6
ER0443	Unnamed	Prehistoric and Historic	Unknown	2.6
SE0467	Unnamed	Prehistoric	Unknown	2.6
HU0149	Unnamed	Prehistoric	Unknown	2.6
HU0058	Unnamed	Prehistoric	Unknown	2.6
ER0444	Unnamed	Prehistoric and Historic	Unknown	2.6
HU0408	Unnamed	Prehistoric	Unknown	2.6
ER0175	NASA Survey Site # 13	Prehistoric	Camp	2.6
SE0272	Unnamed	Prehistoric	Unknown	2.6
SA0608	Unnamed	Prehistoric	Unknown	2.6
SA0196	Unnamed	Prehistoric	Unknown	2.6
ER0504	Unnamed	Prehistoric	Unknown	2.6
SA0195	Unnamed	Prehistoric	Unknown	2.6
ER0489	Unnamed	Prehistoric	Unknown	2.6
SA0513	Unnamed	Prehistoric and Historic	Habitation	2.6
HU0163	Unnamed	Prehistoric	Unknown	2.6
SE0626	Unnamed	Prehistoric	Unknown	2.7
HU0411	Unnamed	Prehistoric	Unknown	2.7
ER0604	Unnamed	Prehistoric	Unknown	2.7
ER0173	NASA Survey Site # 11	Prehistoric	Camp	2.7
ER0483	Unnamed	Prehistoric	Unknown	2.7
ER0171	NASA Survey Site # 9	Prehistoric	Camp	2.7
SA0194	Unnamed	Prehistoric	Unknown	2.7
ER0602	Unnamed	Prehistoric	Unknown	2.7
SE0629	Unnamed	Prehistoric	Unknown	2.7
SE0775	Unnamed	Prehistoric	Unknown	2.7
HU0410	Unnamed	Prehistoric	Unknown	2.7
ER0172	Unnamed	Prehistoric and Historic	Unknown	2.7
ER0411	Unnamed	Prehistoric	Unknown	2.7
ER0603	Unnamed	Prehistoric	Unknown	2.7
SE0271	Unnamed	Prehistoric	Unknown	2.7
ER0170	Unnamed	Prehistoric	Unknown	2.7
ER0092	Unnamed	Prehistoric	Unknown	2.8
ER0601	Unnamed	Prehistoric	Unknown	2.8
ER0448	Unnamed	Prehistoric	Unknown	2.8
ER0508	Unnamed	Prehistoric	Unknown	2.8
ER0031	Unnamed	Prehistoric	Unknown	2.8
ER0169	Unnamed	Prehistoric	Unknown	2.8
SE0598	Unnamed	Prehistoric	Unknown	2.8
SA0428	Unnamed	Prehistoric	Unknown	2.8
ER0490	Unnamed	Prehistoric	Unknown	2.8

ER0150	Fox Hill Site	Prehistoric	Workshop	2.8
SA0429	Unnamed	Prehistoric	Unknown	2.8
SA0427	Unnamed	Prehistoric	Unknown	2.8
SE0545	Unnamed	Historic	Unknown	2.8
SE0270	Unnamed	Prehistoric	Unknown	2.8
HU0288	Unnamed	Prehistoric	Unknown	2.8
SA0350	Unnamed	Historic	Unknown	2.8
HU0409	Unnamed	Prehistoric	Unknown	2.8
SE0544	Unnamed	Historic	Unknown	2.9
ER0441	Unnamed	Prehistoric	Unknown	2.9
HU0407	Unnamed	Prehistoric	Unknown	2.9
ER0269	Unnamed	Prehistoric	Unknown	2.9
HU0452	Unnamed	Prehistoric	Unknown	2.9
ER0491	Unnamed	Prehistoric	Unknown	2.9
ER0257	Unnamed	Prehistoric	Unknown	2.9
ER0253	Unnamed	Prehistoric and Historic	Unknown	2.9
ER0168	Unnamed	Prehistoric and Historic	Unknown	2.9
ER0030	Dillon Village Site #1	Prehistoric	Habitation	2.9
ER0252	NASA Survey Site # 97	Prehistoric and Historic	Workshop	2.9
SA0490	Unnamed	Historic	Unknown	2.9
HU0406	Unnamed	Prehistoric	Unknown	2.9
ER0270	Unnamed	Prehistoric	Unknown	2.9
SA0348	Unnamed	Historic	Unknown	2.9
SA0433	Unnamed	Historic	Unknown	2.9
HU0405	Unnamed	Prehistoric	Unknown	3.0
ER0167	Unnamed	Prehistoric	Unknown	3.0
ER0271	Unnamed	Prehistoric	Unknown	3.0
SA0489	Unnamed	Prehistoric and Historic	Unknown	3.0
SA0437	Unnamed	Prehistoric	Unknown	3.0
SE0470	Unnamed	Prehistoric	Unknown	3.0
ER0258	Unnamed	Prehistoric	Unknown	3.0
SA0491	Unnamed	Historic	Unknown	3.0
ER0256	Unnamed	Prehistoric	Unknown	3.0
ER0254	NASA Survey Site # 99	Prehistoric	Workshop	3.0
HU0451	Unnamed	Prehistoric	Unknown	3.0
SA0431	Unnamed	Prehistoric	Unknown	3.0
SA0362	Unnamed	Prehistoric	Unknown	3.0
SA0430	Unnamed	Prehistoric	Unknown	3.0
ER0251	NASA Survey Site # 96	Prehistoric and Historic	Habitation	3.0
ER0500	Unnamed	Prehistoric and Historic	Unknown	3.0
SA0432	Unnamed	Prehistoric	Unknown	3.0
HU0449	Unnamed	Prehistoric	Unknown	3.0
SA0436	Unnamed	Prehistoric	Unknown	3.0
HU0404	Unnamed	Prehistoric	Unknown	3.0
ER0166	Unnamed	Prehistoric	Unknown	3.0
SA0613	Unnamed	Prehistoric	Unknown	3.0
HU0403	Unnamed	Prehistoric	Workshop	3.0

HU0450	Unnamed	Prehistoric	Unknown	3.0
ER0449	Unnamed	Prehistoric and Historic	Unknown	3.0
SA0492	Unnamed	Prehistoric and Historic	Unknown	3.0
ER0255	Unnamed	Prehistoric	Unknown	3.0
SE0764	Unnamed	Prehistoric	Unknown	3.1
ER0260	Unnamed	Prehistoric	Unknown	3.1
SA0434	Unnamed	Prehistoric	Unknown	3.1
HU0059	Unnamed	Prehistoric	Unknown	3.1
SA0435	Unnamed	Prehistoric	Unknown	3.1
ER0165	Unnamed	Prehistoric and Historic	Unknown	3.1
ER0164	Unnamed	Prehistoric and Historic	Unknown	3.1
ER0259	NASA Survey Site # 104	Prehistoric and Historic	Workshop	3.1
ER0272	Unnamed	Prehistoric and Historic	Unknown	3.1
HU0109	Unnamed	Prehistoric	Unknown	3.1
ER0237	Unnamed	Prehistoric	Unknown	3.1
SA0493	Unnamed	Prehistoric	Unknown	3.1
ER0262	Unnamed	Prehistoric	Unknown	3.2
ER0236	NASA Site # 81	Prehistoric	Unknown	3.2
ER0243	Unnamed	Prehistoric	Unknown	3.2
ER0160	Unnamed	Prehistoric	Unknown	3.2
HU0402	Unnamed	Prehistoric	Unknown	3.2
ER0261	NASA Survey Site # 106	Prehistoric	Workshop	3.2
HU0401	Unnamed	Prehistoric	Unknown	3.2
ER0287	Unnamed	Prehistoric	Unknown	3.2
ER0548	Unnamed	Prehistoric	Unknown	3.2
ER0263	Unnamed	Prehistoric and Historic	Unknown	3.2
ER0547	Unnamed	Prehistoric	Unknown	3.2
SA0322	Unnamed	Prehistoric	Unknown	3.2
SA0488	Unnamed	Prehistoric	Unknown	3.2
ER0264	Unnamed	Prehistoric	Unknown	3.2
SA0512	Unnamed	Prehistoric	Unknown	3.3
HU0448	Unnamed	Prehistoric	Unknown	3.3
ER0265	Unnamed	Prehistoric and Historic	Unknown	3.3
ER0234	Unnamed	Prehistoric	Unknown	3.3
SA0323	Unnamed	Prehistoric	Unknown	3.3
ER0546	Unnamed	Prehistoric	Unknown	3.3
HU0447	Unnamed	Prehistoric	Unknown	3.3
ER0266	Unnamed	Prehistoric	Unknown	3.3
SA0321	Unnamed	Prehistoric	Unknown	3.3
SA0511	Unnamed	Prehistoric	Unknown	3.3
SE0269	Unnamed	Prehistoric	Unknown	3.3
ER0156	Unnamed	Prehistoric	Unknown	3.3
ER0532	Unnamed	Prehistoric	Unknown	3.3
SA0520	Unnamed	Historic	Unknown	3.3
ER0235	Unnamed	Prehistoric	Unknown	3.3
HU0400	Unnamed	Prehistoric	Unknown	3.4
ER0063	Unnamed	Prehistoric	Unknown	3.4

ER0550	Unnamed	Prehistoric	Unknown	3.4
SE0597	Unnamed	Historic	Unknown	3.4
ER0482	Unnamed	Prehistoric	Unknown	3.4
ER0065	Unnamed	Prehistoric	Unknown	3.4
ER0554	Milan Canal Basin	Historic	Unknown	3.4
ER0064	Unnamed	Prehistoric	Unknown	3.4
HU0032	Unnamed	Prehistoric	Unknown	3.4
ER0066	Unnamed	Prehistoric	Unknown	3.5
SA0510	Unnamed	Prehistoric	Unknown	3.5
SA0487	Unnamed	Prehistoric	Unknown	3.6
SE0733	Unnamed	Prehistoric	Unknown	3.6
SE0730	Unnamed	Prehistoric	Unknown	3.6
HU0445	Unnamed	Prehistoric	Unknown	3.6
ER0059	Unnamed	Prehistoric	Unknown	3.6
SE0734	Unnamed	Prehistoric	Unknown	3.6
SE0735	Unnamed	Prehistoric	Unknown	3.6
SE0731	Unnamed	Prehistoric	Unknown	3.6
HU0446	Unnamed	Prehistoric	Unknown	3.6
ER0531	Unnamed	Prehistoric	Unknown	3.7
SE0732	Unnamed	Prehistoric	Unknown	3.7
ER0067	Unnamed	Prehistoric	Unknown	3.7
SA0156	Unnamed	Prehistoric	Unknown	3.7
SA0494	Unnamed	Prehistoric and Historic	Unknown	3.7
ER0069	Unnamed	Prehistoric	Unknown	3.7
SE0729	Unnamed	Prehistoric	Unknown	3.7
HU0318	Unnamed	Prehistoric	Unknown	3.8
HU0194	Unnamed	Prehistoric	Unknown	3.8
ER0068	Unnamed	Prehistoric	Unknown	3.8
SA0509	Unnamed	Prehistoric and Historic	Unknown	3.8
SA0495	Unnamed	Prehistoric and Historic	Unknown	3.8
ER0070	Unnamed	Prehistoric	Unknown	3.8
HU0319	Unnamed	Prehistoric	Unknown	3.8
HU0110	Unnamed	Prehistoric	Unknown	3.8
SA0519	Unnamed	Historic	Unknown	3.8
SA0486	Unnamed	Prehistoric and Historic	Unknown	3.9
ER0570	Unnamed	Prehistoric	Camp	3.9
ER0074	Unnamed	Prehistoric	Unknown	3.9
SA0485	Unnamed	Prehistoric	Unknown	3.9
ER0471	Unnamed	Historic	Unknown	3.9
SA0398	Unnamed	Historic	Unknown	3.9
ER0472	Unnamed	Prehistoric	Habitation	3.9
SA0496	Unnamed	Historic	Unknown	3.9
SE0145	Unnamed	Historic	Unknown	3.9
HU0114	Unnamed	Prehistoric	Unknown	3.9
ER0005	Work Site	Prehistoric	Unknown	3.9
ER0073	Unnamed	Prehistoric	Unknown	3.9
SA0397	Unnamed	Prehistoric	Unknown	4.0

SA0400	Unnamed	Historic	Unknown	4.0
SE0268	Unnamed	Prehistoric	Unknown	4.0
SA0399	Unnamed	Prehistoric	Unknown	4.0
HU0112	Craig # 4	Prehistoric	Earthen Mound	4.0
ER0369	Unnamed	Prehistoric	Unknown	4.0
SA0401	Unnamed	Prehistoric	Unknown	4.0
SA0403	Unnamed	Prehistoric	Unknown	4.0
HU0111	Unnamed	Prehistoric	Unknown	4.0
ER0530	Unnamed	Prehistoric	Unknown	4.1
SA0402	Gallagher	Prehistoric	Unknown	4.1
SA0484	Unnamed	Prehistoric	Unknown	4.1
SA0093	Cornith/Ensign Site	Prehistoric	Unknown	4.1
SE0499	Unnamed		Unknown	4.1
SA0416	Wade XI	Prehistoric	Habitation	4.1
SA0422	Unnamed	Historic	Unknown	4.1
SA0408	Unnamed	Prehistoric	Unknown	4.1
SA0404	Unnamed	Prehistoric	Unknown	4.1
SE0267	Unnamed	Prehistoric	Unknown	4.1
SE0144	Unnamed	Prehistoric and Historic	Unknown	4.1
SA0413	Unnamed	Prehistoric	Unknown	4.1
SA0414	Unnamed	Prehistoric	Unknown	4.1
HU0113	Unnamed	Prehistoric	Unknown	4.1
HU0195	Unnamed	Prehistoric	Unknown	4.1
SA0407	Unnamed	Prehistoric	Unknown	4.1
SE0500	Unnamed		Unknown	4.1
SA0410	Unnamed	Prehistoric and Historic	Unknown	4.1
SA0412	Unnamed	Prehistoric	Unknown	4.1
SE0497	Unnamed		Unknown	4.1
HU0197	Unnamed	Prehistoric	Unknown	4.1
SA0421	Unnamed	Prehistoric	Unknown	4.1
HU0196	Unnamed	Prehistoric	Unknown	4.1
ER0384	Unnamed	Prehistoric	Unknown	4.2
SA0409	Unnamed	Prehistoric	Unknown	4.2
SA0420	Unnamed	Prehistoric	Unknown	4.2
SA0415	Unnamed	Prehistoric	Unknown	4.2
SE0607	Unnamed	Historic	Unknown	4.2
ER0529	Unnamed	Prehistoric	Unknown	4.2
SE0498	Unnamed		Unknown	4.2
HU0198	Unnamed	Historic	Unknown	4.2
SA0406	Unnamed	Prehistoric	Unknown	4.2
SA0411	Unnamed	Historic	Unknown	4.2
HU0260	Unnamed	Prehistoric	Unknown	4.2
ER0524	Unnamed	Prehistoric	Unknown	4.2
ER0523	Unnamed	Prehistoric	Unknown	4.2
ER0520	Unnamed	Prehistoric	Unknown	4.2
SA0419	Unnamed	Prehistoric	Habitation	4.2

ER0528	Unnamed	Prehistoric	Unknown	4.2
HU0010	Willard Mastodon Site	Prehistoric	Unknown	4.2
SA0589	Unnamed	Prehistoric	Unknown	4.3
ER0163	Unnamed	Prehistoric	Unknown	4.3
ER0077	Williams # 1 Site	Prehistoric	Habitation	4.3
HU0006	Bores Site	Prehistoric	Unknown	4.3
HU0289	Unnamed	Prehistoric and Historic	Unknown	4.3
ER0516	Unnamed	Prehistoric and Historic	Workshop	4.3
HU0290	Unnamed	Historic	Unknown	4.3
ER0517	Unnamed	Prehistoric	Unknown	4.3
SA0405	Unnamed	Prehistoric and Historic	Unknown	4.4
SE0687	Unnamed	Prehistoric	Unknown	4.4
ER0007	Kurtz Site	Prehistoric	Habitation	4.4
HU0199	Unnamed	Prehistoric	Unknown	4.4
ER0514	Unnamed	Prehistoric	Unknown	4.4
ER0076	Jenkins Site	Prehistoric	Unknown	4.4
HU0060	Unnamed	Prehistoric and Historic	Unknown	4.4
ER0515	Unnamed	Prehistoric	Unknown	4.4
SA0423	Unnamed	Historic	Unknown	4.4
ER0513	Unnamed	Prehistoric	Unknown	4.4
ER0518	Unnamed	Prehistoric	Unknown	4.4
SE0150	Unnamed	Prehistoric	Unknown	4.4
ER0078	Unnamed	Prehistoric	Unknown	4.4
SE0120	Unnamed	Prehistoric	Unknown	4.4
SA0518	Unnamed	Prehistoric and Historic	Unknown	4.4
ER0519	Unnamed	Prehistoric	Unknown	4.4
SE0578	Unnamed	Historic	Unknown	4.4
ER0368	Unnamed	Prehistoric	Unknown	4.5
ER0009	Pete Williams Earthworks Group	Prehistoric	Hilltop Earthworks	4.5
ER0062	Unnamed	Prehistoric	Unknown	4.5
SE0579	Unnamed	Prehistoric	Unknown	4.5
ER0071	Sandusky # 9	Prehistoric	Unknown	4.5
ER0549	Unnamed	Prehistoric	Quarry	4.5
ER0083	Williams # 2 Site	Prehistoric	Habitation	4.5
SE0776	Unnamed	Prehistoric	Unknown	4.5
SE0686	Unnamed	Prehistoric	Unknown	4.5
SE0151	Unnamed	Prehistoric	Unknown	4.6
SA0096	Unnamed	Prehistoric	Unknown	4.6
SA0483	Unnamed	Prehistoric and Historic	Unknown	4.6
ER0023	Paul Site	Prehistoric	Unknown	4.6
HU0156	Unnamed	Prehistoric	Unknown	4.6
ER0098	Hemminger Burial Site	Prehistoric	Habitation & Cemetery	4.6
SA0482	Unnamed	Prehistoric	Unknown	4.6
ER0013	Bluff Site	Prehistoric	Unknown	4.7
ER0072	Unnamed	Prehistoric	Unknown	4.7

HU0061	Unnamed	Prehistoric and Historic	Unknown	4.7
HU0108	Unnamed	Prehistoric	Unknown	4.7
ER0057	Campbell Street # 2	Prehistoric and Historic	Habitation	4.7
SE0767	Unnamed	Prehistoric	Workshop	4.7
SE0765	Unnamed	Prehistoric	Unknown	4.7
SE0147	Unnamed	Prehistoric	Unknown	4.7
ER0097	Unnamed	Prehistoric	Unknown	4.7
ER0084	Unnamed	Prehistoric	Unknown	4.7
SA0418	Unnamed	Prehistoric	Unknown	4.7
SA0497	Unnamed	Historic	Unknown	4.7
SE0684	Unnamed	Prehistoric	Unknown	4.7
ER0056	Campbell Street # 1	Prehistoric	Habitation	4.7
HU0291	Unnamed	Prehistoric	Unknown	4.7
SE0146	Unnamed	Prehistoric	Unknown	4.8
SA0066	Unnamed	Prehistoric and Historic	Unknown	4.8
HU0399	Unnamed	Prehistoric	Unknown	4.8
SE0766	Unnamed	Prehistoric and Historic	Unknown	4.8
HU0294	Unnamed	Prehistoric	Unknown	4.8
ER0015	Mixter Site Complex	Prehistoric	Habitation	4.8
SE0577	Unnamed	Prehistoric	Unknown	4.8
SA0481	Unnamed	Historic	Unknown	4.8
HU0361	Unnamed	Prehistoric	Unknown	4.8
SE0576	Unnamed	Prehistoric and Historic	Unknown	4.8
SE0266	Unnamed	Prehistoric	Unknown	4.8
HU0292	Unnamed	Prehistoric	Unknown	4.8
SE0130	Unnamed	Historic	Unknown	4.8
HU0398	Unnamed	Historic	Unknown	4.9
SA0067	Unnamed	Historic	Unknown	4.9
SE0685	Unnamed	Prehistoric	Unknown	4.9
SE0575	Unnamed	Prehistoric and Historic	Unknown	4.9
ER0600	Unnamed	Prehistoric	Camp	4.9
HU0293	Unnamed	Prehistoric	Unknown	4.9
SE0152	Unnamed	Prehistoric	Unknown	4.9
SE0127	Unnamed	Historic	Unknown	4.9
SA0070	Unnamed	Prehistoric	Unknown	4.9
HU0157	Unnamed	Prehistoric	Unknown	4.9
SE0153	Unnamed	Prehistoric	Unknown	4.9
SE0678	Unnamed	Prehistoric	Unknown	4.9
HU0155	Unnamed	Prehistoric	Unknown	4.9
ER0099	Unnamed	Prehistoric	Unknown	4.9
HU0283	Unnamed	Prehistoric	Unknown	4.9
HU0062	Unnamed	Prehistoric	Unknown	4.9
ER0096	Unnamed	Prehistoric	Unknown	4.9
SA0480	Unnamed	Prehistoric and Historic	Unknown	4.9
SA0125	Unnamed	Prehistoric	Unknown	5.0
SA0477	Unnamed	Historic	Unknown	5.0
HU0001	Norwalk Works	Prehistoric	Unknown	5.0

SA0479	Unnamed	Prehistoric	Unknown	5.0
HU0063	Unnamed	Prehistoric	Unknown	5.0
SE0126	Unnamed	Historic	Unknown	5.0
ER0090	Unnamed	Prehistoric	Unknown	5.0
SE0265	Unnamed	Prehistoric	Unknown	5.0
HU0141	Unnamed	Prehistoric	Unknown	5.0
ER0058	Unnamed	Prehistoric	Unknown	5.0
SA0478	Unnamed	Prehistoric and Historic	Unknown	5.1
SE0683	Unnamed	Prehistoric	Unknown	5.1
ER0079	Unnamed	Prehistoric	Unknown	5.1
HU0188	Unnamed	Prehistoric	Unknown	5.1
SE0677	Unnamed	Prehistoric	Unknown	5.1
HU0064	Unnamed	Prehistoric	Unknown	5.1
HU0444	Unnamed	Prehistoric	Unknown	5.1
HU0295	Unnamed	Prehistoric	Unknown	5.1
SE0125	Unnamed	Historic	Unknown	5.1
ER0061	Unnamed	Prehistoric	Unknown	5.1
SA0111	Unnamed	Historic	Unknown	5.1
SA0126	Unnamed	Prehistoric	Unknown	5.1
SE0679	Unnamed	Prehistoric	Unknown	5.1
ER0555	Unnamed	Prehistoric	Unknown	5.1
SE0676	Unnamed	Prehistoric	Unknown	5.1
HU0189	Unnamed	Prehistoric	Unknown	5.1
SA0417	Unnamed	Prehistoric	Unknown	5.1
SE0264	Unnamed	Prehistoric	Unknown	5.1
HU0065	Unnamed	Prehistoric	Unknown	5.2
SE0013	Unnamed	Prehistoric	Unknown	5.2
SE0118	Unnamed	Historic	Unknown	5.2
SE0680	Unnamed	Prehistoric	Unknown	5.2
SE0441	Unnamed	Prehistoric	Unknown	5.2
HU0297	Unnamed	Historic	Unknown	5.2
SE0664	Unnamed	Prehistoric	Unknown	5.2
SE0644	Unnamed	Prehistoric	Unknown	5.2
SE0148	Unnamed	Prehistoric	Unknown	5.2
SE0263	Unnamed	Prehistoric	Unknown	5.2
SE0129	Unnamed	Historic	Unknown	5.2
ER0366	Unnamed	Prehistoric	Unknown	5.2
SE0436	Unnamed	Prehistoric	Unknown	5.2
SA0203	Unnamed	Prehistoric	Unknown	5.3
ER0397	Unnamed	Prehistoric	Unknown	5.3
SE0014	Unnamed	Prehistoric	Unknown	5.3
SE0131	Unnamed	Historic	Unknown	5.3
SE0119	Unnamed	Historic	Unknown	5.3
SE0183	Unnamed	Prehistoric	Unknown	5.3
SE0117	Unnamed	Historic	Unknown	5.3
HU0397	Unnamed	Historic	Unknown	5.3
SE0643	Unnamed	Prehistoric	Unknown	5.3

ER0367	Unnamed	Prehistoric	Unknown	5.3
HU0066	Unnamed	Prehistoric	Unknown	5.3
ER0599	Unnamed	Prehistoric	Unknown	5.3
HU0186	Unnamed	Prehistoric	Unknown	5.3
HU0296	Unnamed	Prehistoric	Unknown	5.3
SE0132	Unnamed	Prehistoric	Unknown	5.3
ER0398	Unnamed	Prehistoric	Unknown	5.3
SE0139	West Lodi Grave	Historic	Unknown	5.3
SE0138	Unnamed	Prehistoric	Unknown	5.3
SE0006	Unnamed	Prehistoric	Unknown	5.3
ER0278	Unnamed	Prehistoric	Unknown	5.3
SE0681	Unnamed	Prehistoric	Unknown	5.4
SE0262	Unnamed	Prehistoric	Unknown	5.4
SA0476	Unnamed	Historic	Unknown	5.4
SE0184	Unnamed	Prehistoric	Unknown	5.4
SE0645	Unnamed	Prehistoric	Unknown	5.4
ER0277	Unnamed	Prehistoric	Unknown	5.4
SE0116	Unnamed	Historic	Unknown	5.4
ER0401	Mall East / Speers Brothers / Sandusky Mall Site	Prehistoric	Habitation	5.4
SE0133	Unnamed	Historic	Unknown	5.4
SE0682	Unnamed	Prehistoric	Unknown	5.4
ER0598	Unnamed	Prehistoric	Unknown	5.4
SE0115	Unnamed	Prehistoric	Unknown	5.4
SE0136	Unnamed	Historic	Unknown	5.4
ER0474	Unnamed	Prehistoric	Unknown	5.4
SE0134	Unnamed	Prehistoric	Unknown	5.4
SE0007	Unnamed	Prehistoric	Unknown	5.4
SE0128	Unnamed	Prehistoric	Unknown	5.4
SE0574	Unnamed	Prehistoric and Historic	Unknown	5.5
SE0097	Unnamed	Prehistoric	Unknown	5.5
SE0004	Westerhouse Ditch Site	Prehistoric and Historic	Unknown	5.5
SE0543	Unnamed	Prehistoric	Unknown	5.5
SA0530	Unnamed	Prehistoric	Unknown	5.5
SE0135	Unnamed	Prehistoric	Unknown	5.5
SA0202	Unnamed	Prehistoric	Unknown	5.5
SA0614	Unnamed	Prehistoric and Historic	Unknown	5.5
SE0261	Unnamed	Prehistoric and Historic	Unknown	5.5
SE0114	Unnamed	Prehistoric	Unknown	5.5
HU0443	Unnamed	Prehistoric	Unknown	5.5
SE0137	Unnamed	Prehistoric	Unknown	5.5
SE0122	Unnamed	Prehistoric	Unknown	5.5
SE0572	Unnamed	Prehistoric	Unknown	5.5
ER0485	Unnamed	Prehistoric	Unknown	5.5
SA0616	Unnamed	Prehistoric	Unknown	5.6
SE0580	Unnamed	Prehistoric and Historic	Unknown	5.6
SA0615	Unnamed	Historic	Unknown	5.6
SE0260	Unnamed	Prehistoric	Unknown	5.6

SE0121	Unnamed	Prehistoric	Unknown	5.6
SE0573	Unnamed	Historic	Unknown	5.6
SE0496	Unnamed	Prehistoric	Unknown	5.6
SA0475	Unnamed	Prehistoric	Unknown	5.6
SE0141	Unnamed	Prehistoric	Unknown	5.6
SE0688	Unnamed	Prehistoric	Unknown	5.6
SE0542	Unnamed	Prehistoric	Unknown	5.6
SE0689	Unnamed	Prehistoric	Unknown	5.7
HU0154	Unnamed	Prehistoric	Unknown	5.7
ER0010	New Salem Site	Historic	Unknown	5.7
SA0109	Unnamed	Prehistoric	Unknown	5.7
SE0123	Unnamed	Historic	Unknown	5.7
SE0142	Unnamed	Historic	Unknown	5.7
SE0541	Unnamed	Prehistoric	Unknown	5.7
SE0341	Unnamed	Prehistoric	Unknown	5.7
SE0690	Unnamed	Prehistoric	Unknown	5.7
SA0106	Unnamed	Historic	Unknown	5.7
SE0540	Unnamed	Unknown	Unknown	5.7
ER0364	Unnamed	Prehistoric	Unknown	5.7
ER0562	Unnamed	Prehistoric	Camp	5.7
HU0396	Unnamed	Prehistoric	Unknown	5.7
SA0107	Unnamed	Historic	Unknown	5.7
ER0560	Unnamed	Prehistoric	Unknown	5.7
SA0617	Unnamed	Prehistoric	Unknown	5.7
SE0768	Unnamed	Prehistoric	Unknown	5.7
ER0563	Unnamed	Prehistoric and Historic	Camp	5.7
SE0259	Unnamed	Prehistoric	Unknown	5.8
ER0365	Unnamed	Prehistoric	Unknown	5.8
SE0008	Unnamed	Prehistoric	Unknown	5.8
SA0474	Unnamed	Historic	Unknown	5.8
ER0561	Unnamed	Prehistoric	Unknown	5.8
HU0124	Unnamed	Prehistoric	Unknown	5.8
SA0102	Unnamed	Prehistoric	Unknown	5.9
SA0108	Unnamed	Historic	Unknown	5.9
ER0525	Unnamed	Historic	Unknown	5.9
ER0002	Heimberger Site	Prehistoric	Unknown	5.9
ER0003	Taylor Site	Prehistoric	Habitation	5.9
HU0125	Unnamed	Prehistoric	Unknown	5.9
ER0363	Unnamed	Prehistoric	Unknown	5.9
SE0571	Unnamed	Prehistoric	Unknown	5.9
HU0442	Unnamed	Prehistoric	Unknown	5.9
SA0110	Unnamed	Historic	Unknown	5.9
SE0140	Unnamed	Prehistoric	Unknown	5.9
ER0469	Unnamed	Prehistoric	Unknown	5.9
ER0470	Unnamed	Prehistoric and Historic	Unknown	5.9
CR1008	James Niedermier Farm Site VI	Prehistoric	Unknown	5.9
ER0527	Unnamed	Prehistoric	Unknown	5.9

HU0122	Unnamed	Prehistoric	Unknown	5.9
ER0001	Esch Mounds and Village Site	Prehistoric	Mound Group/ Habitation	5.9
HU0441	Unnamed	Prehistoric	Unknown	5.9
HU0126	Unnamed	Prehistoric	Unknown	5.9
ER0276	Unnamed	Prehistoric	Unknown	6.0
SA0077	Unnamed	Historic	Unknown	6.0
HU0123	Unnamed	Prehistoric	Unknown	6.0
CR1004	James Niedermier Site II	Prehistoric	Unknown	6.0
SE0403	Unnamed	Prehistoric	Unknown	6.0
HU0190	Unnamed	Prehistoric	Unknown	6.0
ER0526	Unnamed	Prehistoric	Unknown	6.0
SE0124	Unnamed	Prehistoric	Unknown	6.0
CR1003	James Niedermier Site I	Prehistoric	Camp	6.1
HU0475	Unnamed	Prehistoric	Unknown	6.1
HU0472	Unnamed	Prehistoric	Unknown	6.1
SE0437	Unnamed	Prehistoric	Unknown	6.1
HU0471	Unnamed	Prehistoric	Unknown	6.1
CR1020	Unnamed	Prehistoric	Unknown	6.1
CR1007	James Niedermier Farm Site V	Prehistoric	Unknown	6.1
SE0570	Unnamed	Prehistoric	Unknown	6.1
SA0074	Unnamed	Prehistoric	Unknown	6.1
SE0438	Unnamed	Prehistoric	Unknown	6.1
CR1006	James Niedermier Farm Site IIII	Prehistoric and Historic	Unknown	6.1
ER0060	Unnamed	Prehistoric	Unknown	6.1
SA0014	Unnamed	Prehistoric and Historic	Unknown	6.1
HU0009	Unnamed	Prehistoric	Unknown	6.1
CR1012	James Niedermier Farm Site X	Prehistoric and Historic	Unknown	6.1
ER0466	Unnamed	Historic	Unknown	6.2
CR1005	James Niedermier Farm Site lll	Prehistoric	Unknown	6.2
CR1019	Unnamed	Prehistoric	Unknown	6.2
SA0206	Unnamed	Prehistoric	Unknown	6.2
HU0473	Unnamed	Prehistoric	Unknown	6.2
SE0606	Unnamed	Historic	Unknown	6.2
ER0412	Unnamed	Prehistoric	Unknown	6.2
SE0143	Unnamed	Prehistoric	Unknown	6.2
HU0127	Unnamed	Prehistoric	Unknown	6.2
SE0605	Unnamed	Prehistoric	Unknown	6.2
CR1010	James Niedermier Site VIII	Prehistoric	Unknown	6.3
SE0181	Unnamed	Historic	Unknown	6.3
HU0128	Unnamed	Prehistoric	Unknown	6.3
SA0529	Unnamed	Prehistoric	Unknown	6.3
SE0258	Unnamed	Prehistoric	Unknown	6.3
SE0656	Unnamed	Prehistoric	Unknown	6.3
HU0353	Unnamed	Prehistoric	Unknown	6.3
SA0473	Unnamed	Prehistoric	Unknown	6.3

SA0472	Unnamed	Prehistoric	Unknown	6.3
SA0470	Unnamed	Prehistoric	Unknown	6.3
HU0354	Unnamed	Prehistoric	Unknown	6.3
SA0528	Unnamed	Prehistoric	Unknown	6.3
CR1009	James Niedermier Site VII	Prehistoric	Unknown	6.3
HU0131	Unnamed	Historic	Unknown	6.4
HU0476	Unnamed	Prehistoric	Unknown	6.4
HU0129	Unnamed	Historic	Unknown	6.4
HU0474	Unnamed	Historic	Unknown	6.4
SE0180	Unnamed	Prehistoric	Unknown	6.4
ER0273	Unnamed	Prehistoric	Unknown	6.4
SA0469	Unnamed	Prehistoric	Unknown	6.4
ER0082	Enderle Site	Prehistoric and Historic	Unknown	6.4
SA0618	Unnamed	Prehistoric and Historic	Unknown	6.4
SE0655	Unnamed	Prehistoric	Unknown	6.4
SE0003	Unnamed	Prehistoric	Unknown	6.4
ER0274	Unnamed	Prehistoric	Unknown	6.4
ER0436	Unnamed	Prehistoric	Unknown	6.5
ER0024	Unnamed	Prehistoric	Unknown	6.5
ER0440	Unnamed	Prehistoric	Unknown	6.5
SE0182	Unnamed	Historic	Unknown	6.5
ER0533	Unnamed	Prehistoric	Unknown	6.5
ER0498	Unnamed	Prehistoric	Unknown	6.5
SE0096	Unnamed	Prehistoric	Unknown	6.5
HU0132	Unnamed	Historic	Unknown	6.5
HU0395	Unnamed	Historic	Unknown	6.5
CR1011	James Niedermier Farm Site VIIII	Prehistoric	Unknown	6.5
ER0497	Unnamed	Prehistoric	Unknown	6.5
SA0536	Unnamed	Prehistoric	Unknown	6.5
SA0619	Unnamed	Prehistoric	Unknown	6.5
HU0394	Unnamed	Prehistoric	Unknown	6.6
SA0205	Unnamed	Prehistoric	Unknown	6.6
ER0100	Unnamed	Prehistoric	Unknown	6.6
ER0434	Unnamed	Prehistoric	Unknown	6.6
SE0657	Unnamed	Prehistoric	Camp	6.6
HU0130	Unnamed	Prehistoric	Unknown	6.6
CR0152	Unnamed	Prehistoric	Unknown	6.6
HU0191	Unnamed	Prehistoric	Unknown	6.7
ER0399	Unnamed	Prehistoric	Unknown	6.7
SE0658	Unnamed	Prehistoric	Unknown	6.7
SA0471	Unnamed	Prehistoric	Unknown	6.8
SA0020	Unnamed	Prehistoric	Unknown	6.8
ER0385	Unnamed	Prehistoric	Unknown	6.9
HU0067	Unnamed	Prehistoric	Unknown	6.9
SA0089	Unnamed	Prehistoric	Unknown	6.9
HU0192	Unnamed	Prehistoric	Unknown	6.9
SE0756	Unnamed	Prehistoric	Unknown	6.9

ER0467	Unnamed	Prehistoric and Historic	Unknown	6.9
SE0112	Unnamed	Prehistoric	Unknown	6.9
ER0553	Unnamed	Prehistoric	Unknown	7.0
SE0185	Unnamed	Historic	Unknown	7.0
SE0539	Unnamed	Prehistoric	Unknown	7.0
ER0396	Unnamed	Prehistoric	Unknown	7.0
ER0465	Unnamed	Prehistoric and Historic	Unknown	7.0
SA0395	Unnamed	Prehistoric and Historic	Unknown	7.0
ER0464	Unnamed	Prehistoric	Unknown	7.0
SE0113	Unnamed	Historic	Unknown	7.0
SA0015	Unnamed	Prehistoric and Historic	Unknown	7.0
ER0462	Unnamed	Prehistoric and Historic	Unknown	7.0
SA0088	Unnamed	Prehistoric	Unknown	7.0
SA0090	Unnamed	Prehistoric	Unknown	7.0
CR0213	Unnamed	Prehistoric	Unknown	7.0
SA0394	Unnamed	Prehistoric	Unknown	7.0
SA0527	Unnamed	Prehistoric	Habitation	7.0
ER0486	Unnamed	Prehistoric	Unknown	7.0
SA0668	Unnamed	Prehistoric	Unknown	7.0
ER0012	Huron Site/Flemmond Trading Post	Prehistoric and Historic	Unknown	7.1
SA0016	Unnamed	Prehistoric	Unknown	7.1
ER0468	Unnamed	Prehistoric and Historic	Unknown	7.1
SE0257	Unnamed	Prehistoric	Unknown	7.1
SE0002	Unnamed	Prehistoric	Unknown	7.1
SA0027	Unnamed	Prehistoric	Unknown	7.1
CR0212	Unnamed	Prehistoric	Unknown	7.1
ER0463	Unnamed	Prehistoric	Unknown	7.1
CR0211	Shull Mound I	Prehistoric	Unknown	7.1
ER0284	Unnamed	Prehistoric	Unknown	7.2
ER0051	Barlett Village Site	Prehistoric and Historic	Unknown	7.2
HU0439	Unnamed	Prehistoric	Unknown	7.2
SE0602	Unnamed	Historic	Unknown	7.2
SE0654	Unnamed	Prehistoric	Unknown	7.2
SE0601	Unnamed	Prehistoric	Unknown	7.2
ER0280	Harbour Site	Prehistoric	Habitation	7.2
ER0458	Unnamed	Historic	Unknown	7.2
ER0400	Unnamed	Prehistoric	Unknown	7.2
ER0457	Unnamed	Historic	Unknown	7.3
ER0286	Unnamed	Prehistoric and Historic	Unknown	7.3
HU0284	Unnamed	Prehistoric	Unknown	7.3
SE0604	Unnamed	Prehistoric	Unknown	7.3
SA0502	Unnamed	Historic	Unknown	7.3
HU0193	Unnamed	Prehistoric	Unknown	7.3
SA0396	Unnamed	Historic	Unknown	7.3
ER0281	Emmy Site	Prehistoric and Historic	Unknown	7.3
SA0500	Unnamed	Historic	Unknown	7.3

ER0456	Unnamed	Historic	Unknown	7.3
ER0285	Unnamed	Prehistoric and Historic	Unknown	7.3
SA0028	Unnamed	Prehistoric	Unknown	7.3
SE0538	Unnamed	Historic	Unknown	7.3
ER0275	Unnamed	Prehistoric	Unknown	7.3
SE0603	Unnamed	Historic	Unknown	7.3
ER0282	Rainstorm Site	Prehistoric	Habitation	7.3
ER0455	Unnamed	Historic	Unknown	7.3
ER0283	Unnamed	Prehistoric	Unknown	7.3
HU0298	Unnamed	Prehistoric	Unknown	7.4
CR1021	Unnamed	Prehistoric	Unknown	7.4
ER0093	Unnamed	Prehistoric	Unknown	7.4
ER0279	Pipe Creek Site	Prehistoric	Habitation	7.4
CR1069	Unnamed	Prehistoric	Unknown	7.4
ER0484	Unnamed	Prehistoric	Unknown	7.4
SA0017	Unnamed	Prehistoric and Historic	Unknown	7.4
SE0256	Unnamed	Prehistoric and Historic	Unknown	7.4
SA0091	Unnamed	Prehistoric	Unknown	7.4
SE0552	Unnamed	Prehistoric	Unknown	7.5
ER0025	Eckoff Site	Prehistoric	Habitation	7.5
ER0026	Unnamed	Prehistoric	Unknown	7.5
SA0019	Unnamed	Prehistoric	Unknown	7.5
SA0601	Unnamed	Historic	Unknown	7.6
SA0157	Unnamed	Prehistoric	Unknown	7.6
SA0018	Unnamed	Prehistoric	Unknown	7.6
ER0325	Unnamed	Prehistoric	Unknown	7.6
CR1140	Unnamed	Historic	Unknown	7.7
CR1162	Unnamed	Prehistoric	Unknown	7.7
CR1139	Unnamed	Prehistoric	Unknown	7.7
CR1163	Unnamed	Prehistoric	Unknown	7.7
CR1049	Unnamed	Prehistoric	Camp	7.7
HU0068	Unnamed	Prehistoric	Unknown	7.7
ER0324	Unnamed	Prehistoric	Unknown	7.7
SE0255	Unnamed	Prehistoric	Unknown	7.7
CR1050	Unnamed	Historic	Unknown	7.7
CR1099	Unnamed	Prehistoric	Unknown	7.8
SA0371	Unnamed	Prehistoric	Unknown	7.8
SA0099	Unnamed	Prehistoric	Unknown	7.8
CR1098	Unnamed	Prehistoric	Unknown	7.8
SA0468	Unnamed	Historic	Unknown	7.8
SA0084	Unnamed	Prehistoric	Unknown	7.9
SA0026	Unnamed	Prehistoric	Unknown	7.9
CR1141	Unnamed	Prehistoric	Unknown	7.9
SA0021	Unnamed	Prehistoric	Unknown	7.9
HU0315	Unnamed	Historic	Unknown	7.9
SA0029	Unnamed	Prehistoric	Unknown	7.9
RI0443	Unnamed	Prehistoric	Unknown	7.9

CR1058	Unnamed	Prehistoric	Unknown	7.9
SA0071	Unnamed	Prehistoric	Unknown	7.9
HU0317	Unnamed	Prehistoric	Unknown	8.0
CR1100	Unnamed	Prehistoric	Unknown	8.0
ER0450	Unnamed	Prehistoric	Unknown	8.0
CR0215	Unnamed	Prehistoric	Unknown	8.0
HU0393	Unnamed	Prehistoric	Unknown	8.0
CR1123	Unnamed	Prehistoric	Unknown	8.0
HU0316	Unnamed	Historic	Unknown	8.0
CR1044	Unnamed	Prehistoric	Unknown	8.0
CR1122	Unnamed	Prehistoric	Unknown	8.0
CR0214	Burger Mound I	Prehistoric	Earthen Mound	8.0
CR1077	Unnamed	Prehistoric	Unknown	8.0
SE0254	Unnamed	Prehistoric	Unknown	8.0
CR1094	Unnamed	Prehistoric	Unknown	8.0
SE0600	Unnamed	Prehistoric	Unknown	8.0
CR1059	Unnamed	Prehistoric	Unknown	8.1
SA0100	Unnamed	Prehistoric	Unknown	8.1
CR1093	Unnamed	Prehistoric	Unknown	8.1
HU0392	Unnamed	Prehistoric and Historic	Unknown	8.1
CR1078	Unnamed	Prehistoric	Unknown	8.1
SA0030	Unnamed	Prehistoric	Unknown	8.1
HU0069	Unnamed	Prehistoric and Historic	Unknown	8.1
CR1079	Unnamed	Prehistoric	Unknown	8.1
SA0310	Unnamed	Historic	Unknown	8.1
CR1060	Unnamed	Prehistoric	Unknown	8.1
CR1061	Unnamed	Prehistoric	Camp	8.2
ER0388	Unnamed	Prehistoric	Unknown	8.2
CR1161	Unnamed	Prehistoric	Unknown	8.2
SA0306	Unnamed	Historic	Unknown	8.2
SA0311	Unnamed	Historic	Unknown	8.2
HU0536	Unnamed	Prehistoric	Unknown	8.3
SA0309	Unnamed	Historic	Unknown	8.3
HU0537	Unnamed	Prehistoric	Unknown	8.3
CR1046	Unnamed	Prehistoric	Unknown	8.3
HU0438	Unnamed	Prehistoric	Unknown	8.3
CR1045	Unnamed	Prehistoric	Unknown	8.3
CR1062	Unnamed	Prehistoric and Historic	Unknown	8.3
SE0628	Unnamed	Prehistoric	Unknown	8.4
SE0253	Unnamed	Prehistoric	Unknown	8.4
SA0023	Unnamed	Prehistoric	Unknown	8.4
SA0304	Unnamed	Historic	Unknown	8.4
SA0305	Unnamed	Historic	Unknown	8.4
CR1063	Unnamed	Prehistoric	Unknown	8.4
SE0704	Unnamed	Prehistoric	Camp	8.4
CR1174	Unnamed	Prehistoric	Unknown	8.4

HU0391	Unnamed	Prehistoric	Unknown	8.4
CR1047	Unnamed	Prehistoric	Unknown	8.4
HU0299	Unnamed	Historic	Unknown	8.4
RI0234	Unnamed	Prehistoric	Unknown	8.4
SE0554	Unnamed	Prehistoric	Unknown	8.5
SA0308	Unnamed	Historic	Unknown	8.5
ER0386	Unnamed	Prehistoric	Unknown	8.5
ER0564	Unnamed	Prehistoric	Unknown	8.5
SA0312	Unnamed	Historic	Unknown	8.5
CR1095	Unnamed	Prehistoric	Unknown	8.5
CR1048	Unnamed	Prehistoric	Unknown	8.5
SE0553	Unnamed	Prehistoric	Unknown	8.5
SA0467	Unnamed	Historic	Unknown	8.5
ER0580	W. R. Stafford (shipwreck)	Historic	Unknown	8.5
SA0595	Unnamed	Prehistoric	Unknown	8.5
SA0082	Unnamed	Prehistoric	Unknown	8.6
SA0307	Unnamed	Historic	Unknown	8.6
SA0594	Unnamed	Prehistoric	Unknown	8.6
ER0075	Anderson Site	Prehistoric	Habitation	8.6
CR1073	Unnamed	Prehistoric	Unknown	8.6
SA0526	Unnamed	Prehistoric	Unknown	8.6
ER0625	Unnamed	Prehistoric	Unknown	8.6
CR1056	Unnamed	Historic	Unknown	8.7
SA0593	Unnamed	Prehistoric	Unknown	8.7
ER0081	W. Jenkins Site	Prehistoric	Unknown	8.7
CR1051	Unnamed	Prehistoric	Unknown	8.7
SE0537	Unnamed	Prehistoric	Unknown	8.7
SA0204	Unnamed	Prehistoric	Unknown	8.7
CR1072	Unnamed	Prehistoric	Unknown	8.7
SA0092	Unnamed	Prehistoric	Unknown	8.7
CR1053	Unnamed	Prehistoric	Unknown	8.7
SA0592	Unnamed	Prehistoric	Unknown	8.7
SA0313	Unnamed	Historic	Unknown	8.8
ER0597	Unnamed	Prehistoric	Unknown	8.8
CR1052	Unnamed	Prehistoric	Unknown	8.8
SA0022	Unnamed	Prehistoric	Unknown	8.8
SA0591	Unnamed	Prehistoric	Unknown	8.8
SA0669	Unnamed	Historic	Unknown	8.8
SA0590	Unnamed	Prehistoric	Unknown	8.8
SE0252	Unnamed	Prehistoric	Unknown	8.8
ER0377	(Unnamed Mound)	Prehistoric	Earthen Mound	8.8
SE0379	Unnamed	Prehistoric	Unknown	8.9
CR1173	Unnamed	Prehistoric	Unknown	8.9
CR1124	Unnamed	Prehistoric	Unknown	8.9
CR1071	Unnamed	Prehistoric	Unknown	8.9
CR1075	Unnamed	Prehistoric	Unknown	8.9

CR1074	Unnamed	Prehistoric	Unknown	8.9
CR1070	Unnamed	Prehistoric	Unknown	8.9
CR1125	Unnamed	Prehistoric	Unknown	8.9
ER0565	Jenkins Site	Prehistoric and Historic	Unknown	8.9
SE0188	Unnamed	Prehistoric	Unknown	8.9
SE0189	Unnamed	Prehistoric	Unknown	9.0
SE0251	Unnamed	Prehistoric	Unknown	9.0
HU0390	Unnamed	Prehistoric	Unknown	9.0
RI0623	Unnamed	Prehistoric	Unknown	9.0
SA0620	Unnamed	Prehistoric	Unknown	9.0
HU0070	Unnamed	Prehistoric	Unknown	9.0
CR1076	Unnamed	Prehistoric	Unknown	9.0
HU0437	Unnamed	Prehistoric	Unknown	9.0
SA0670	Unnamed	Prehistoric	Unknown	9.0
SA0098	Unnamed	Prehistoric	Unknown	9.0
SA0025	Stull Earthwork	Prehistoric and Historic	Hilltop Village	9.1
HU0300	Unnamed	Historic	Unknown	9.1
RI0624	Unnamed	Prehistoric	Unknown	9.1
HU0389	Unnamed	Prehistoric	Unknown	9.1
CR1096	Unnamed	Prehistoric	Unknown	9.1
HU0314	Unnamed	Historic	Unknown	9.1
CR1057	Unnamed	Prehistoric	Unknown	9.1
ER0566	Unnamed	Prehistoric	Unknown	9.1
SA0097	Unnamed	Prehistoric and Historic	Unknown	9.1
SA0024	Unnamed	Prehistoric	Unknown	9.1
ER0370	Erie # 8	Prehistoric	Unknown	9.1
ER0596	Unnamed	Prehistoric	Unknown	9.2
SA0638	Unnamed	Historic	Unknown	9.2
SA0207	Fox F	Prehistoric	Unknown	9.2
RI0603	Unnamed	Prehistoric	Unknown	9.2
CR1126	Unnamed	Prehistoric	Unknown	9.2
HU0388	Unnamed	Prehistoric	Unknown	9.3
SE0250	Unnamed	Prehistoric	Unknown	9.3
RI0444	Unnamed	Prehistoric	Unknown	9.3
CR1054	Unnamed	Prehistoric	Unknown	9.3
HU0387	Unnamed	Prehistoric	Unknown	9.3
SA0122	Unnamed	Prehistoric	Unknown	9.4
SE0378	Unnamed	Prehistoric	Unknown	9.4
SA0120	Unnamed	Prehistoric	Unknown	9.4
RI0609	Unnamed	Prehistoric	Unknown	9.4
CR1097	Unnamed	Prehistoric	Unknown	9.4
SA0031	Unnamed	Prehistoric and Historic	Unknown	9.4
SE0451	Unnamed	Historic	Unknown	9.4
SE0447	Unnamed	Prehistoric	Unknown	9.4
SE0446	Unnamed	Prehistoric	Unknown	9.5
SE0448	Unnamed	Historic	Unknown	9.5
SE0450	Unnamed	Prehistoric	Unknown	9.5

SE0449	Unnamed	Prehistoric	Unknown	9.5
SE0445	Unnamed	Historic	Unknown	9.5
SA0341	Unnamed	Prehistoric	Unknown	9.5
SA0246	Unnamed	Prehistoric	Unknown	9.5
SA0639	Unnamed	Prehistoric	Unknown	9.5
SE0444	Unnamed	Prehistoric and Historic	Unknown	9.5
SE0586	Unnamed	Historic	Unknown	9.5
RI0606	Unnamed	Prehistoric	Unknown	9.5
CR1080	Unnamed	Prehistoric	Unknown	9.5
RI0612	Unnamed	Prehistoric	Unknown	9.5
SE0585	Unnamed	Historic	Unknown	9.5
SA0121	Unnamed	Prehistoric	Unknown	9.5
SA0011	Unnamed	Prehistoric	Unknown	9.5
SA0123	Gilbert VI	Prehistoric	Unknown	9.5
RI0613	Unnamed	Prehistoric	Camp	9.5
SE0646	Unnamed	Prehistoric	Unknown	9.6
RI0618	Unnamed	Prehistoric	Unknown	9.6
RI0605	Unnamed	Prehistoric	Unknown	9.6
SA0068	Unnamed	Prehistoric	Unknown	9.6
SE0591	Unnamed	Prehistoric	Unknown	9.6
ER0379	Unnamed	Prehistoric	Unknown	9.6
RI0604	Unnamed	Prehistoric	Unknown	9.6
SA0118	Unnamed	Prehistoric	Unknown	9.6
SE0587	Unnamed	Historic	Unknown	9.6
RI0617	Unnamed	Prehistoric	Unknown	9.6
SA0119	Unnamed	Prehistoric	Unknown	9.6
RI0625	Unnamed	Prehistoric	Unknown	9.6
RI0608	Unnamed	Prehistoric	Unknown	9.7
RI0626	Unnamed	Prehistoric	Unknown	9.7
SA0124	Unnamed	Prehistoric	Unknown	9.7
SE0590	Unnamed	Prehistoric and Historic	Unknown	9.7
SE0589	Unnamed	Historic	Unknown	9.8
CR1068	Unnamed	Prehistoric	Unknown	9.8
SA0012	Unnamed	Prehistoric and Historic	Unknown	9.8
RI0610	Unnamed	Prehistoric	Unknown	9.8
RI0611	Unnamed	Prehistoric	Camp	9.8
RI0598	Unnamed	Prehistoric	Unknown	9.8
SE0588	Unnamed	Prehistoric	Unknown	9.8
CR1067	Unnamed	Prehistoric	Unknown	9.9
CR1101	Unnamed	Prehistoric	Unknown	9.9
CR1066	Unnamed	Prehistoric	Unknown	9.9
RI0600	Unnamed	Prehistoric	Unknown	9.9
HU0436	Unnamed	Prehistoric	Unknown	9.9
SA0640	Unnamed	Prehistoric	Unknown	10.0
SA0524	Unnamed	Prehistoric	Unknown	10.0
SA0525	Unnamed	Prehistoric	Habitation	10.0
HU0434	Unnamed	Prehistoric	Unknown	10.0

HU0435	Unnamed	Prehistoric	Unknown	10.0

Appendix E.

Ohio Genealogical Society Cemeteries within the Study Area

Appendix E. Ohio Genealogical Society Cemeteries within the Study Area

OGS NUMBER	CEMETERY NAME	CITY/TOWNSHIP	COUNTY	DISTANCE TO FACILITY SITE (MILES)
5793	SAINT PAUL GERMAN LUTHERAN-(SAINT PAULS)	Lyme	Huron	<0.1
5833	BETHEL-RICHMOND TOWNSHIP	Richmond	Huron	<0.1
5841	NORTH MONROEVILLE	Ridgefield	Huron	<0.1
5794	SPARROW FARM	Lyme	Huron	0.0
5826	BANKS OF MUD RUN	Norwich	Huron	0.0
5827	BOUGHTON-NORTH NORWICH	Norwich	Huron	0.0
5835	HIGLEY FARM	Richmond	Huron	0.0
5854	JONES-SHERMAN FARM	Sherman	Huron	0.0
14759	WURTS	Norwich	Huron	0.0
5792	RAYMOND-(LYME)	Lyme	Huron	0.2
5855	SAINT SEBASTIAN CATHOLIC	Sherman	Huron	0.2
3026	SAINT JOHNS UNITED CHURCH OF CHRIST-ST JOHNS EVANGELICAL AND REFORMED-ST JOHANNES EVANGELICAL SOCIETY-OXFORD LUTHERAN	Oxford	Erie	0.3
5796	TRINITY EPISCOPAL	Lyme	Huron	0.5
5790	HEYMAN-HUNTS CORNERS-SUTTON	Lyme	Huron	0.5
5828	CENTERTON	Norwich	Huron	0.6
5842	PAGE FARM	Ridgefield	Huron	0.7
5795	STRONGS RIDGE-LYMES GRANGE	Lyme	Huron	0.7
14986	SAINT MICHAELS/MICHAEL	Thompson	Seneca	0.7
5789	BELLEVUE	Lyme	Huron	0.8
5791	IMMACULATE CONCEPTION CATHOLIC-BELLEVUE CATHOLIC	Lyme	Huron	0.8
5831	PONTIAC-SAINT PETERS LUTHERAN	Peru	Huron	1.0
5839	DRAKE	Ridgefield	Huron	1.1
5840	LITTLEFIELD FARM	Ridgefield	Huron	1.1
10751	AVERY-WICKWIRE	York	Sandusky	1.3
5832	WILSON	Peru	Huron	1.4
2997	DEYO-BOLLES	Groton	Erie	1.4
11142	OMAR	Reed	Seneca	1.4
10749	SAINT PAUL UNITED CHURCH OF CHRIST-REFORMED	Bellevue, City Of	Sandusky	1.4
3023	BLOOMINGVILLE	Oxford	Erie	1.5
3009	SAND HILL	Margaretta	Erie	1.5
11140	ASSUMPTION	Reed	Seneca	1.5
3027	PIPE CREEK	Oxford	Erie	1.5
5834	BULLHEAD-FACKLER-MOORE-RICHMOND TOWNSHIP	Richmond	Huron	1.6
11160	(FLAT ROCK)-BISHOP SEYBERT	Thompson	Seneca	1.8
5836	TRINITY LUTHERAN-LUTHERAN	Richmond	Huron	1.8
5846	OLD SAINT JOSEPH CATHOLIC-(SAINT JOSEPH)	Ridgefield	Huron	2.0
3006	GRAVES-WHITE	Margaretta	Erie	2.1
5837	MENNONITE	Bloom	Huron	2.2
5844	RUGGLES	Ridgefield	Huron	2.2
11161	UNDERHILL	Thompson	Seneca	2.2
3019	SAINT JOHNS UNION CORNERS-SAINT JOHNS	Milan	Erie	2.4
5843	RIVERSIDE	Ridgefield	Huron	2.4
5845	NEW SAINT JOSEPH CATHOLIC-(SAINT JOSEPH)	Ridgefield	Huron	2.4
11165	SAINTS PETER AND PAUL	Venice	Seneca	2.5
5838	SAINT JOSEPH CATHOLIC-(SAINT JOSEPHS)	Richmond	Huron	2.5
5820	JACOBSBURG-SHAWS MILLS-RICE	Norwalk	Huron	2.5
11162	ATTICA-VENICE-VENICE TOWNSHIP	Venice	Seneca	2.6
5847	WEBB	Ridgefield	Huron	2.6
14758	SLOAT BURIAL LOT	Norwalk	Huron	2.6
5775	STEUBEN	Greenfield	Huron	2.7
11167	SWAMP-UNION PISGAH	Venice	Seneca	2.7

5798	NEW GREENWOOD-GREENWOOD	New Haven	Huron	2.9
5799	OLD GREENWOOD	New Haven	Huron	2.9
15767	RICHARDS	New Haven	Huron	2.9
14554	ENTERPRISE	Milan	Erie	3.0
11163	CAROLINE LUTHERAN	Venice	Seneca	3.1
14987	UNIDENTIFIED #1	Venice	Seneca	3.2
11164	EAST CAROLINE REFORMED	Venice	Seneca	3.2
10736	TEW	Townsend	Sandusky	3.2
3031	FISCHER/FISHER	Perkins	Erie	3.2
3034	KNAUER	Perkins	Erie	3.3
3028	BAUM	Perkins	Erie	3.4
14753	WEST FARM BURYING GROUND-OLD ALONZO WEST	Peru	Huron	3.4
11158	DUNKIRK-(THOMPSON CENTER)	Thompson	Seneca	3.4
14751	VANTINE	Peru	Huron	3.5
5830	PERU CENTER-SCHOOL HOUSE	Peru	Huron	3.5
11159	FIRESIDE	Thompson	Seneca	3.6
3032	JAMES	Perkins	Erie	3.6
5774	SPENCER FARM	Greenfield	Huron	3.6
10735	PARKHURST	Townsend	Sandusky	3.6
3015	NORTH MILAN HILL-MILAN NORTH	Milan	Erie	3.7
3005	CASTALIA	Margaretta	Erie	3.7
11166	SMITH	Venice	Seneca	3.7
11139	ARMSTRONG	Reed	Seneca	3.8
3020	SCOTTS	Milan	Erie	3.8
3021	SWEET	Milan	Erie	3.8
10750	WALES CORNERS	York	Sandusky	3.8
5829	ADAMS FARM	Peru	Huron	3.8
10752	YORK FREE CHAPEL-YORK CHAPEL	York	Sandusky	3.9
3014	MILAN	Milan	Erie	3.9
3018	SAINT ANTHONYS	Milan	Erie	4.0
3029	BOGART-OLD STONE HOUSE-BEATTY	Perkins	Erie	4.1
5816	COMSTOCK FARM	Norwalk	Huron	4.3
3038	PERKINS-BOGART	Perkins	Erie	4.3
3041	WILMER-WITTMER	Perkins	Erie	4.4
15421	MEADOW GREEN	Huron	Erie	4.6
5824	SAINT PETER CATHOLIC	Norwalk	Huron	4.6
3039	RESTLAWN MEMORIAL-RESTLAWN-(RESTLAWN MEMORIAL PARK)	Huron	Erie	4.6
10747	GILBERT-CHOLERA-COLLINS-PORTLAND ROAD	York	Sandusky	4.7
15789	SAINT JOHNS	Milan	Erie	4.7
5823	SAINT PAUL EPISCOPAL-SAINT PAULS CATHOLIC	Norwalk	Huron	4.8
5773	CONGER FARM-MAXWELL/MAXFIELD	Greenfield	Huron	4.9
15428	GERHARDSTEIN-GOLDEN HILL	York	Sandusky	4.9
5822	SAINT PAUL CATHOLIC-(SAINT PAULS)	Norwalk	Huron	5.0
3011	FORT/PORT AVERY	Milan	Erie	5.0
11141	MEYER-ZIMMERMAN	Reed	Seneca	5.0
5800	GUINEA CORNERS	New Haven	Huron	5.1
14972	UNIDENTIFIED #1	Milan	Erie	5.1
14379	KLEINOEDER FAMILY	York	Sandusky	5.1
10748	ELLSWORTH	York	Sandusky	5.2
2998	HINDE	Huron	Erie	5.2
3002	SAINT JOHN	Huron	Erie	5.3
5765	HOYT	Fairfield	Huron	5.3
5821	SAINT MARYS CATHOLIC-(SAINT MARYS)	Norwalk	Huron	5.4
5815	COLE FARM	Norwalk	Huron	5.4
2407	NORTH AUBURN-OUR MOTHER OF SORROWS-SAINT MARYS-HONEY CREEK	Auburn	Crawford	5.4
3036	OHIO VETERANS HOME-OHIO SOLDIERS AND SAILORS HOME	Perkins	Erie	5.4
2445	SAINT BERNARD-CATHOLIC	Cranberry	Crawford	5.5

3033	JEWISH-OHEB SHALOM	Perkins	Erie	5.6
3030	ERIE COUNTY HOME-INFIRMARY	Perkins	Erie	5.6
5758	SAINT ALPHONSUS CATHOLIC	Bronson	Huron	5.6
2444	SAINT JOHNS LUTHERAN-LUTHERAN-SAINT JOHNS-GERMAN LUTHERAN-GERMAN EVANGELICAL	Cranberry	Crawford	5.7
10734	FULLER	Townsend	Sandusky	5.7
5763	DAY	Fairfield	Huron	5.7
5825	WOODLAWN	Norwalk	Huron	5.7
10746	BIRDSEYE	York	Sandusky	5.8
15462	ROBINSON	Fairfield	Huron	5.8
5753	BRIGHTMAN-(BRONSON)	Bronson	Huron	5.8
11143	CLAY-GROSOCOST	Scipio	Seneca	5.8
3016	O'DELL	Milan	Erie	5.9
2432	BUCHMAN	Chatfield	Crawford	5.9
5819	HURON COUNTY HOME/INFIRMARY	Norwalk	Huron	6.0
5813	AXE FACTORY-MESNARD-(TOWNSHIP)	Norwalk	Huron	6.0
2408	SWAIL-CORY-HERTZLER-MILLER	Auburn	Crawford	6.0
5797	FULLMER FARM	New Haven	Huron	6.0
3047	SANDUSKY-OAKLAND	Perkins	Erie	6.1
2447	SWABB/SCHWABB	Cranberry	Crawford	6.1
11146	REFORMED CHURCH-REFORMED	Bloom	Seneca	6.2
5801	MAPLE GROVE-NEW HAVEN MAPLE GROVE	New Haven	Huron	6.2
11067	BLOCK	Adams	Seneca	6.3
5817	EAST NORWALK	Norwalk	Huron	6.3
5802	NEW HAVEN	New Haven	Huron	6.4
14746	NORTH FAIRFIELD MUSEUM CENOTAPH	Fairfield	Huron	6.4
2446	UNION-NEW WASHINGTON	Cranberry	Crawford	6.4
5756	HESTER	Bronson	Huron	6.4
15791	OAKLAND	Perkins	Erie	6.4
2440	SMITH-EULISS-MAYS FARM-HAYNES FARM	Chatfield	Crawford	6.5
11064	ADAMS LUTHERAN-ZION LUTHERAN	Adams	Seneca	6.5
10745	AMES	York	Sandusky	6.5
3008	VENICE-OAKLAWN-OAK HILL-TOAD HILL-TOAD HOLE	Margaretta	Erie	6.7
2435	COLLEGE HILL REFORMED	Chatfield	Crawford	6.7
2999	HURON CITY-OLD HURON-HURON MAIN STREET-HURON-HURON TOWNSHIP	Huron	Erie	6.7
5767	NEW NORTH FAIRFIELD-NORTH FAIRFIELD	Fairfield	Huron	6.8
5768	OLD NORTH FAIRFIELD	Fairfield	Huron	6.8
11065	ALBRIGHT-(UNION)-UNION CHURCH	Adams	Seneca	6.8
11071	PAYNE	Adams	Seneca	6.8
2436	DIESLER	Chatfield	Crawford	6.8
5814	BROWN-PUCKRINS CORNERS	Norwalk	Huron	6.9
3042	CALVARY CATHOLIC	Sandusky, City Of	Erie	6.9
5818	FIVE POINTS	Norwalk	Huron	7.0
2409	GOODWILL-METHODIST EPISCOPAL CHURCH	Auburn	Crawford	7.0
10263	TRAUGER	Plymouth	Richland	7.0
3000	MCMILLEN/MCMILLAN	Huron	Erie	7.1
11084	SAINT STEPHENS	Bloom	Seneca	7.1
10693	MCPHERSON-EVERGREEN	Green Creek	Sandusky	7.1
10697	TUTTLE	Green Creek	Sandusky	7.2
14745	MISSEY BURIAL	Bronson	Huron	7.2
2433	BURGBACHER	Chatfield	Crawford	7.2
13415	GRIFFIN-VANBENSCHOTER	Berlin	Erie	7.2
3044	SAINT JOSEPHS CATHOLIC-(SAINT JOSEPHS)	Sandusky, City Of	Erie	7.3
11081	MENNONITE	Richmond	Seneca	7.3
3045	SAINT MARYS	Sandusky, City Of	Erie	7.3
11147	SCIPIO TOWNSHIP	Scipio	Seneca	7.3
5754	COLE-PARKER-COLE FARM	Bronson	Huron	7.3

5850	BURLINGHAM	Ripley	Huron	7.3
5764	HINKLEY/HINCKLEY-MCDONALD	Fairfield	Huron	7.4
2431	BRILLHART-NORTH UNION-TABOR	Chatfield	Crawford	7.4
11068	BUTTERNUT RIDGE-(LAY)	Adams	Seneca	7.4
5859	MILLIMAN	Townsend	Huron	7.4
11144	FAREWELL RETREAT	Scipio	Seneca	7.5
10691	COLDWELL/COWELL-MAPLE GROVE	Green Creek	Sandusky	7.5
14760	STOTTS	Ripley	Huron	7.6
2443	WINDFALL LUTHERAN	Chatfield	Crawford	7.7
5848	AUSTIN FARM	Ripley	Huron	7.8
2406	BAPTIST	Auburn	Crawford	7.8
3043	CHOLERA-HARRISON STREET	Sandusky, City Of	Erie	7.8
10696	SAINT MARYS CATHOLIC	Green Creek	Sandusky	7.9
5856	BARBER SETTLEMENT-CHURCH-WHITMAN	Townsend	Huron	7.9
2984	BERLINVILLE	Berlin	Erie	7.9
10262	PIONEER REST	Plymouth	Richland	7.9
10259	GREENLAWN-PLYMOUTH	Plymouth	Richland	7.9
13419	FIRST	Sandusky, City Of	Erie	8.1
11077	BLOOM GRANGE-(DUNKARD)	Bloom	Seneca	8.2
5852	DELPHI-LOT 18	Ripley	Huron	8.2
15790	UNNAMED	Sandusky, City Of	Erie	8.3
11078	BLOOMVILLE QUARRY-PISGAH-(BLOOOMVILLE)	Bloom	Seneca	8.3
2987	WEATHERLOW TRACT	Berlin	Erie	8.4
10264	TYSON FARM-TYSON	Plymouth	Richland	8.5
5857	BURDUE	Townsend	Huron	8.5
2411	HANNA-AUBURN	Auburn	Crawford	8.7
11083	REFORMED CHURCH-REFORMED	Scipio	Seneca	8.8
2434	CHATFIELD VILLAGE-TOWNSHIP	Chatfield	Crawford	8.8
2410	HANDLEY	Auburn	Crawford	8.9
5766	MCCORD	Fairfield	Huron	8.9
2448	SWALE-UNION CHURCH	Cranberry	Crawford	8.9
5851	CHRISTIAN CHURCH-HOUPSTATER/HOPPSTETTER/HOPSTATER-(TOWNSHIP)	Ripley	Huron	9.0
5757	HULL FARM	Bronson	Huron	9.1
10261	OPDYKE	Plymouth	Richland	9.1
5803	FENNER	Plymouth	Richland	9.1
2983	WEST END-BERLIN HEIGHTS WEST END	Berlin	Erie	9.2
2439	NAZARETH LUTHERAN-GERMAN EVANGELICAL LUTHERAN CHURCH	Chatfield	Crawford	9.2
2982	RIVERSIDE-NEW BERLIN HEIGHTS	Berlin	Erie	9.2
2442	OLD CHATFIELD-LUTHERAN	Chatfield	Crawford	9.3
2437	DURR	Chatfield	Crawford	9.3
2430	BRENNER	Chatfield	Crawford	9.4
14377	RILEY	Riley	Sandusky	9.4
11066	BEANHILL-LEE-RAYMOND	Adams	Seneca	9.4
2413	TIRO MAUSOLEUM	Auburn	Crawford	9.4
2412	OAKLAND-TIRO	Auburn	Crawford	9.4
2981	BERLIN HEIGHTS BAPTIST-OLD BERLIN HEIGHTS	Berlin	Erie	9.5
10690	BAKERTOWN-HURD	Green Creek	Sandusky	9.6
14376	PEARSON	Riley	Sandusky	9.8
5858	COLLINS	Townsend	Huron	9.9
11080	EAST BASELINE BAPTIST	Bloom	Seneca	9.9
5755	EAST BRONSON-OLENA	Bronson	Huron	9.9
10694	GREENLAWN MEMORY GARDENS	Green Creek	Sandusky	9.9
10716	DANIELS-MCCREERY/MCCREARY FARM-TUTTLE-MINIER	Riley	Sandusky	10.0
2481	KENNEDY	Lykens	Crawford	10.0
2986	PEAKE/PEAKES	Berlin	Erie	10.0

Appendix F.

Previous Cultural Resource Surveys within the Study Area

Appendix F: Previous Cultural Resources Surveys within the Study Area

NATIONAL ARCHAEOLOGY DATABASE NUMBER	OHPO ID NUMBER	COUNTY	TITLE	AUTHOR	DATE	COMPANY	PHASE OF INVESTIGATION	SIZE (ACRES)
HISTORICAL ARCHITECTURE								
	H00220	Huron	Phase I History/Architecture Survey Report Bellevue Grade Separation HUR-269-6.29 (PID 23065)	Mannik & Smith Group	2002	Mannik & Smith Group	Historic Architectural Survey	12.1
ARCHAEOLOGICAL								
12529	--	Cuyahoga	The Archaeological Resources of the Ohio Turnpike - Phase II Investigations at Existing and Proposed Interchanges	Bush, David R.	1981	Case Western Reserve University	Phase 1	2007.2
12878	--	Erie	Onsite Archeological Survey Methodology, Ohio Edison Company's Erie Nuclear Plant, Erie County, Ohio	Prahl, Earl J.	1977	Commonwealth Cultural Resources Group	Phase 1	1699.6
12880	--	Erie	The Archaeological Resources within the Proposed Huron Facilities Plan, Erie County, Ohio	Bush, David R.	1979	Cleveland Museum of Natural History	Phase 1	90.3
12881	--	Erie	A Phase II Archaeological Survey of the Nasa Plum Brook Station Excess Property Parcel, Erie County, Ohio	Pratt, G. Michael	1981	University of Toledo	Phase 1	139.4
12882	--	Erie	The Preliminary Archaeological Survey for Proposed Improvements To U.S. Route 250 in Erie County, Ohio (Eri-250-4.24)	Skinner, Shaune	1981	OHS (Ohio Historical Society)	Phase 1	284.7
12883	--	Erie	Huron Apartments Archaeological Survey in Huron (Erie County) Ohio	Morse, David R.	1980	David R. Morse	Phase 1	8.1
12885	--	Erie	Old Woman Creek Estuarine Sanctuary Facilities Archaeological Survey Near Oberlin Beach (Erie County), Ohio	Morse, David R.	1981	David R. Morse	Phase 1	3.7
12887	--	Erie	Erie Village 1982 Archaeological Survey, Huron (Erie County), Ohio	Morse, David R.	1982	David R. Morse	Phase 1	6.4
12888	--	Erie	U.S. Route 6 - State Route 2 Improvement and Bypass Archaeological Survey Near Sandusky (Erie County), Ohio	Morse, David R.	1982	Independent Archaeological Consultants, Inc.	Phase 1	155.6
12890	--	Erie	The Archaeology of the Harbour: A Phase I, II, and III Archaeological Survey of the Harbour Development Project Area, Sandusky, Erie County, Ohio	Pratt, G. Michael	1982	G. Michael Pratt	Phase 1	126.8
12891	--	Erie	Results of a Phase I and II Archaeological Survey of N.A.S.A. Parcels No. 61 & 62, Plum Brook Station, Erie County, Ohio	Blank, John Edward	1984	Cleveland State University	Phase 1	142.4
12892	--	Erie	Report on Additional Phase II Archaeological Investigations Along the Ohio Turnpike	Bush, David R.	1981	Case Western Reserve University	Phase 1	204.5
12893	--	Erie	Phase I and II Archaeological Survey of Sites I and II for the Proposed Milan, Ohio Facilities Plan	Immel, Elsie A.	1983	OHS (Ohio Historical Society)	Phase 1	8.6
12894	--	Erie	Addendum To Phase I and II Archaeological Survey of Sites I and II for the Proposed Milan, Ohio Facilities Plan	Immel, Elsie A.	1983	OHS (Ohio Historical Society)	Phase 1	2.8
12895	--	Erie	Reconnaissance Survey for the Proposed AT&T Medina-Whitehouse Fiber Optics Cable Through Medina, Lorain, Erie, Sandusky, Ottawa, Wood and Lucas County, Ohio	Sprague, Rae Norris	1989	ASC Group, Inc.	Phase 1	719.6
12902	--	Erie	Phase I Cultural Resource Survey of the Proposed Foxborough Commons Park in the City of Sandusky, Erie County, Ohio	Ellis, J. Grace	1995	ASC Group, Inc.	Phase 1	6.2
12903	--	Erie	Field Check of Parcel 33 of the Former Plum Brook Station, Oxford Township, Erie County, Ohio	Pratt, G. Michael	1994	Heidelberg College	Phase 1	9.5
13236	--	Erie	A Phase I Literature Survey and Archaeological Field Reconnaissance of A, Margaretta System, Willow Point Wildlife Area, Magaretta Township, Erie County, Ohio	Murphy, James L.	1996	James L. Murphy	Phase 1	98.8
13331	--	Huron	An Assessment of the Prehistoric Cultural Resources within the Proposed Corridor Location for the Republic Street Extension Project, City of Norwalk, Ohio	Bush, David R.	1977	Cleveland Museum of Natural History	Phase 1	3.7
13333	--	Huron	Final Report For: Preliminary Reconnaissance Archaeological Survey for Peterchurch Development Site, City of Norwalk, Huron County, Ohio	Blank, John Edward	1980	Cleveland State University	Phase 1	15.0

13334	--	Sandusky	A Phase I and II Cultural Resource Survey for a Proposed 10 Acre Housing Development in Bellevue, Sandusky, Co. Ohio	McDaniel, Gary	1987	ASC Group, Inc.	Phase 1	6.4
13335	--	Huron	Phase I and II Cultural Resource Survey of a Proposed Housing Development in Bellevue, Lyme Twp., Huron Co., Ohio	McDaniel, Gary	1988	ASC Group, Inc.	Phase 1	2.9
13336	--	Huron	Phase I and II Cultural Resource Survey: Proposed 42 Acre Industrial Development in the Vicinity of Bellevue, Lyme Township, Huron County, Ohio	Wright, John Roger	1989	ASC Group, Inc.	Phase 1	42.6
13337	--	Huron	Phase I and II Cultural Resource Survey: Proposed Eight Acre Housing Development in Willard, Richmond Township, Huron County, Ohio	McDaniel, Gary	1989	ASC Group, Inc.	Phase 1	8.4
13339	--	Huron	A Cultural Resource Survey for the Proposed North Coast Aerospace Waterline Project (Section A) in Norwalk Township, Huron County, Ohio	Bush, David R	1990	David R. Bush, Inc..	Phase 1	244.7
13340	--	Huron	Literature Review and Reconnaissance Survey of the Proposed Neal Zick Road Relocation in New Haven Township, Huron County, Ohio	Corso, Robert A.	1991	ASC Group, Inc.	Phase 1	63.3
13514	--	Erie	Phase I Cultural Resources Survey for the Eri-River Road Reconstruction Located in Huron Township, Erie County, Ohio (PID 14433)	Baker, Stanley W.	1997	ODOT	Phase 1	23.7
13560	--	Sandusky	Literature Review and Reconnaissance Survey for a 61.6 Acre Development Tract Near Bellevue, York Township, Sandusky County, Ohio	Sprague, Rae Norris	1991	ASC Group, Inc.	Phase 1	64.8
13663	--	Erie	Phase I Cultural Resource Reconnaissance of the Eri-250-5.53 Project Area, Erie County, Ohio	Glenn, Jonathan	1995	Center for Cultural Resource Research, Pittsburgh	Phase 1	78.9
14110	--	Huron	A Phase I Archaeological Literature Review and Reconnaissance Survey for the Proposed City of Willard Sewer Improvements in New Haven Township, Huron County, Ohio	Gibbs, Kevin	1998	ASC Group, Inc.	Phase 1	6.5
14247	--	Sandusky	Phase I Cultural Resources Survey for the Proposed Community Park Walkway in the City of Clyde, Green Creek Township, Sandusky County, Ohio	Haywood, Norman A.	1999	Haywood Archaeological Services	Phase 1	6.5
14323	--	Seneca	Phase I Cultural Resources Survey of Approximately 28 Acres of Land for the Development of a Wastewater Lagoon for the Village of Republic, Scipio Township, Seneca County, Ohio	Haywood, Norman A.	2000	Haywood Archaeological Services	Phase 1	28.7
14430	--	Sandusky	Phase I Cultural Resources Survey for the Proposed Industrial Development in the City of Clyde, Green Creek Township, Sandusky County, Ohio	Haywood, Norman A.	2000	Haywood Archaeological Services	Phase 1	204.1
14543	--	Huron	Phase I Cultural Resources Survey of 86 acres of Land for the Proposed Industrial Park and Roadway in the Village of Monroeville, Ridgefield Township, Huron County, Ohio	Haywood, Norman A.	2001	Haywood Archaeological Services	Phase 1	81.7
14567	--	Huron	Phase I Archaeological Survey for the Proposed Huron County Park District Parking Area and bus Turn-around in Norfolk Township, Huron County, Ohio	Mustain, Chuck	2000	ASC Group, Inc.	Phase 1	0.6
14783	--	Huron	Phase I Cultural Resources Survey for the Proposed Frank S. Clark Park in the village of Monroeville, Ridgefield Township, Huron County, Ohio	Haywood, Norman A.	2000	Haywood Archaeological Services	Phase 1	22.0
14966	--	Huron	Letter Report: Archaeological Records Review and Photolog for the Proposed Improvements to SR 269 in the Vicinity of Bellevue, Lyme Township, Huron County, Ohio. (HUR-269-6.29; PID 23065)	Schneider, Andrew M.	2001	Mannik & Smith Group, Inc.	Phase 1	16.5
15084	--	Erie	Phase I Cultural Resources Management Investigations for the approximately 31.8 ha (78.5 a.) Crossings of Sandusky Development in Perkins Township, Erie County, Ohio	Brown, Joel	2002	EMH&T, Inc.	Phase 1	64.2

15163	--	Erie	Phase I Archaeology Survey of the Beaver-Greenfield Transmission Line Proposed Corridor and Laydown Area in Erie and Lorain Counties, Ohio	Kreinbrink, Jeannine	2002	Natural & Ethical Environmental Systems	Phase 1	28.1
15166	--	Huron	Phase I Archaeological Survey of Verizon Wireless Site No. 1602 - Monroeville, 2819 Dogtown Road, Lyme Township, Huron County, Ohio	Bennison, Christopher J.	2002	Heritage Archaeological Services, Mt. Pleasant, MI	Phase 1	0.2
15257	--	Erie	Phase I Cultural Resources Investigations of the East Sandusky Bay Hydrology Restoration Project in Huron Township, Erie County, Ohio	Pritchard, James C.	2001	Gray & Pape, Inc.	Phase 1	2.9
15594	--	Sandusky	Phase I and II Cultural Resource Survey of Two Proposed Industrial Development Sites in the Vicinity, of Bellevue, Sandusky County, Ohio.	McDaniel, Gary	1988	ASC Group, Inc.	Phase 1	38.2
15598	--	Sandusky	Phase I and II Cultural Resource Survey: Proposed Leber Farm Industrial Tract in York Township, Sandusky County, Ohio.	McDaniel, Gary	1990	ASC Group, Inc.	Phase 1	63.0
15600	--	Sandusky	A Cultural Resource Survey for a Proposed Wetland Restoration Project at the Pickerel Creek Wildlife Area in Townsend Township, Sandusky County, Ohio.	Bush, David R	1991	David R. Bush	Phase 1	303.2
15602	--	Sandusky	Phase I and II Cultural Resource Survey of the Proposed Quarry Development Site in the Vicinity of Bellevue, Sandusky County, Ohio.	Skinner, Shaune	1988	ASC Group, Inc.	Phase 1	23.2
15608	--	Sandusky	A Literature Review and Reconnaissance Survey for the Proposed City of Clyde Water Treatment Plant, Green Creek Township, Sandusky County, Ohio.	Church, Flora	1994	ASC Group, Inc.	Phase 1	14.8
15713	--	Seneca	Phase I-III Cultural Resources Investigations of Proposed Line D-233 Replacement in Bloom Township, Seneca County, Ohio	Bennett, Patrick M.	1992	Gray & Pape, Inc.	Phase 1	22.4
15933	--	Sandusky	Phase I Archaeological Reconnaissance Survey for the Proposed Bellevue Hospital, Section 22, York Township, Sandusky County, Ohio	Cameron, Erica L.	2003	Mannik & Smith Group, Inc.	Phase 1	125.2
15949	--	Erie	Phase I Archaeological Survey of the 2.75-Acre Foxborough Commons, City of Sandusky, Erie County, Ohio	Schneider, Andrew M.	2003	Mannik & Smith Group, Inc.	Phase 1	4.0
15951	--	Ashland	Interim Report on Archeological Survey of the Proposed Independence Pipeline Corridor through Defiance, Henry, Wood, Seneca, Huron, Ashland, Wayne, Stark, Summit, and Columbiana Counties, Ohio. Volume I: Literature Review and Research Design.	Maymon, Jeffrey H.	1998	R. Christopher Goodwin and Associates, Inc.	Phase 1	1672.2
15983	--	Huron	Phase I Archaeological Survey of the Proposed Commons of Norwalk Housing Development in Norwalk Township, Huron County, Ohio	Pecora, Albert M.	2003	Ohio Valley Archaeological Consultants	Phase 1	18.0
15987	--	Sandusky	Phase I Archaeological Survey of the Proposed Commons of Clyde Housing Development in Sections 15 and 22, Green Creek Township, Sandusky County, Ohio	Pecora, Albert M.	2003	Ohio Valley Archaeological Consultants	Phase 1	15.9
15990	--	Erie	Phase I Archaeological Survey for the 78.5 acre Crossings of Sandusky Development in Section 2, Perkins Township, Erie County, Ohio	Pecora, Albert M.	2002	Ohio Valley Archaeological Consultants	Phase 1	90.9
16183	--	Seneca	Phase I Archaeology Survey Report for Proposed Water Treatment Plant Site, Village of Attica, Venice Township, Seneca County, Ohio	Kreinbrink, Jeannine	2003	Natural & Ethical Environmental Solutions	Phase 1	29.0
16214	--	Seneca	Phase I Archaeology Survey Report for Proposed Water Treatment Plant Site, Village of Attica, Venice Township, Seneca County, Ohio.	Kreinbrink, Jeannine	2003	Natural & Ethical Environmental Solutions	Phase 1	28.6
16338	--	Richland	Cultural Resources Documentation Packet for Verizon Wireless, Inc.'s "Plymouth/Wilson" Site, 3994 Opdyke Road, Plymouth Township, Richland County, Ohio	Manson, Joni L.	2004	Heritage Education & Research Services	Phase 1	0.2
16358	--	Sandusky	Phase I Archaeological Reconnaissance Survey of 56 KM (35 Miles) for the Proposed Northern Ohio Rural Water Pipeline Corridor in Green Creek, Riley, Sandusky, and Townsend Townships, Sandusky County, Ohio	Schneider, Andrew M.	2004	Mannik & Smith Group, Inc.	Phase 1	145.2

16487	--	Sandusky	Phase I Cultural Resource Survey for the Proposed Wastewater Treatment Plant for the Village of Helena, Jackson Township, Sandusky County, Ohio	Haywood, Norman A.	2004	Haywood Archaeological Services	Phase 1	22.7
16598	--	Huron	Phase I Cultural Resources Survey of Three Acres of Land for the Proposed Development of the Fuller Drive Subdivision in the City of Norwalk, Norwalk Township, Huron County, Ohio	Haywood, Norman	2005	Haywood Archaeological Services	Phase 1	3.6
16630	--	Erie	Phase I Cultural Resources Management Investigations for the 9.9 ha (24.4 ac) Ostheimer Parcel in Perkins Township, Erie County, Ohio	Brown, Joel	2005	EMH&T, Inc.	Phase 1	28.5
16657	--	Erie	Cultural Resources Phase I Archaeological Survey Volumes I & II for the Plum Brook Air National Guard Station, Oxford Township, Erie County, Ohio	Cameron, Erica L.	2005	Mannik & Smith Group, Inc.	Phase 1	305.0
16660	--	Sandusky	Proposed Sprint PCS Tower Missler's Acres (DE70XC054-A) 8974 West Main Street (SR 20), City of Bellevue, Sandusky County, Ohio	Weir, Donald J.	2005	Ramaker & Associates, Inc.	Phase 1	0.2
16687	--	Erie	A Phase I Literature Review and Archaeological Survey for the Verizon Wireless "Sandusky DT / Schell" Cell Site (SNDS-027) in Sandusky, Erie County, Ohio	Manson, Joni L.	2005	Heritage Education & Research Services	Phase 1	0.2
16751	--	Crawford	A Phase I Cultural Resources Management Survey for the Proposed Chatfield PCS/Wood Wireless Cellular Tower in Chatfield Township, Crawford County, Ohio	Workman, Keith	2005	EMH&T, Inc.	Phase 1	0.2
16772	--	Crawford	A Phase I Cultural Resources Management Survey for an Approximately 17.7 km (9 mi.) Water System Improvements in Liberty, Sandusky, Whetstone, Jefferson, Cranberry, and Auburn Townships, Crawford County, Ohio	Weller, Ryan J.	2004	Weller & Associates, Inc.	Phase 1	96.1
16877	--	Huron	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (CLE-872- North Norwalk) in Norwalk Township, Huron County, Ohio	Nye, Kevin A.	2005	Professional Archaeological Services Team	Phase 1	0.2
16879	--	Erie	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (CLE-868-Berlinville) in Berlin Township, Erie County, Ohio	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.2
16881	--	Huron	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (CLE-875-Ridgefield) in Ridgefield Township, Huron County, Ohio	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.2
16884	--	Huron	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (CLE-877-Monroeville West) in Ridgefield Township, Huron County, Ohio	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.2
16905	--	Sandusky	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (TOL-115-Sunset Harbor) in Townsend Township, Sandusky County, Ohio	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.2
16965	--	Sandusky	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (TOL-119-Sandy Ridge) in Green Creek Township, Sandusky County, Ohio	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.2
17022	--	Sandusky	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (TOL-119-Sandy Ridge) in Green Creek Township, Sandusky County, Ohio.	Keener, Craig S.	2005	Professional Archaeological Services Team	Phase 1	0.3
17179	--	Sandusky	Phase I Archaeological Reconnaissance Survey of 32 KM (20 Miles) for the Proposed Northern Ohio Rural Water Pipeline Corridor in Green Creek, Riley, and York Townships, Sandusky County, Ohio	Cameron, Erica L.	2006	Mannik & Smith Group, Inc.	Phase 1	243.3
17337	--	Erie	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (Gildenmeister RL TO003628D) in Groton Township, Erie County, Ohio	Nye, Kevin A.	2006	Professional Archaeological Services Team	Phase 1	0.2
17367	--	Erie	Phase I Cultural Resources Management Survey for the Proposed Sandusky West / Fitz Wireless Cellular Tower in Margaretta Township, Erie County, Ohio	Workman, Keith	2006	EMH&T, Inc.	Phase 1	0.2

17397	--	Huron	Phase I Cultural Resource Management Survey of a Proposed Cell Tower (Site SY03514B Schaeffer Farm RL) in Norwalk Township, Huron County, Ohio	Keener, Craig S.	2006	Professional Archaeological Services Team	Phase 1	0.2
17490	--	Sandusky	Phase I Cultural Resource Management Survey of a Proposed .16 ha (.4 a.) Hog Facilities in Townsend Township, Sandusky County, Ohio	Keener, Craig S.	2007	Professional Archaeological Services Team	Phase 1	0.5
17564	--	Huron	Phase I Culture Resource Management Survey of a Proposed 14.13 ha (34.91 a.) Development in Norwalk Township, Huron County, Ohio	Nye, Kevin A.	2006	Professional Archaeological Services Team	Phase 1	34.7
17956	--	Huron	Bellevue East/Veterans of Foreign Wars Post 1238 Wireless Cellular Tower in Lyme Township, Huron County, Ohio	Meyer, Elaine	2008	EMH&T, Inc.	Phase 1	0.2
18169	7608	Crawford	Phase I Cultural Resources Survey for the Proposed Village of Tiro Water System Project in Sharon Township, Richland County, and Vernon and Auburn Townships, Crawford County, Ohio	Haywood, Norman A.	2009	Haywood Archaeological Services	Phase 1	103.2
18220	6931	Crawford	Phase I Archaeological Investigation for an Approx. 56.3 km (35 mi) Northern Ohio Rural Water Pipeline Extensions in Reed Twp., Seneca County; Norwich and Richmond Twps., Huron County; and New Washington and Cranberry Twp., Crawford County Ohio.	Weller, Ryan J.	2009	Weller & Associates, Inc	Phase 1	54.0
18224	8852	Crawford	FCC Form 620 for the Chatfield/Wood Wireless Cellular Tower in Chatfield Township, Crawford County, Ohio.	Meyer, Elaine	2009	EMH&T, Inc.	Phase 1	0.4
18300	--	Huron	Phase I and II Archaeological Investigations of the Proposed Line D-454 Replacement Project in New Haven Township, Huron County, Ohio	Jackson, Kenneth E.	1993	Gray & Pape, Inc.	Phase 1	5.5
18309	--	Sandusky	A Literature Review and Reconnaissance Survey for the Propose Development Tract Near Bellevue in York Township, Sandusky County, Ohio	Gibbs, Kevin	1993	ASC Group, Inc.	Phase 1	35.9
18310	--	Sandusky	A Phase I (Literature Review) Archaeological Survey of the Proposed Sandusky County Airport in Green Creek Township, Sandusky County, Ohio	Pratt, G. Michael	1993	Heidelburg Archaeological Survey	Phase 1	479.5
18439	12579	Erie	Phase I Archaeological Survey and Documentation for Sheldon Marsh State Nature Preserve in Huron Township, Erie	Haag, Crista	2005	BHE Environmental, Inc.	Phase 1	25.4
18468	13715	Crawford	Phase I Archaeological Survey for the 26.6 km (16.5 mi) Northern Ohio Rural Water Tiro Extension in Cranberry and Auburn	Weller, Ryan J.	2010	Weller & Associates, Inc	Phase 1	62.1
18606	--	Huron	As Assessment of the Potential for Prehistoric and/or Historic Archaeological Cultural Resources of the Bill Baines Park Project (in the City of) Norwalk, Norwalk Township, Huron County, Ohio	Pratt, G. Michael	1980	G. Michael Pratt	Phase 1	19.9
18615	--	Erie	A Determination of Eligibility Archaeological Survey of Three Prehistoric Sites (33 ER 50/54/55) on the Excess Property Parcel of the N.A.S.A. Lewis Research Center, Perkins and Oxford Townships, Erie County, Ohio	Pratt, G. Michael	1980	G. Michael Pratt	Phase 1	6.5
18713	13192	Erie	Predictive Model and Ground-Truthing Survey of Prehistoric and Historic Archaeological Resources at the NASA Plum Brook Station, Perkins, Huron, Milan, and Oxford Townships, Erie County, Ohio	Newhard, James M.L.	2002	Gray & Pape, Inc.	Phase 1	6812.4
18714	3082	Huron	Phase I Cultural Resources Survey for the Proposed Holiday Lakes Electric Substation in Richmond Township, Huron County, Ohio	Haywood, Norman A.	2009	Haywood Archaeological Services	Phase 1	1.4
18772		Huron	Blossom Estates Apartments Archaeological Survey, (City of) Willard, (Huron County), Ohio	Morse, David R.	1979	David R. Morse	Phase 1	19.8
18787		Erie	Phase I Archaeology Survey for the Bellevue Yard Expansion and Improvement Project in Groton Township, Erie County, and Lyme Township, Huron County, Ohio	Cunning, Bryan	2011	Baker & Associates	Phase 1	95.5
18817	19921	Huron	FCC Form 620 for the North Fairfield SNDS-049 Wireless Cellular Tower in the Village of Fairfield, Fairfield Township, Huron County, Ohio	Meyer, Elaine	2012	EMH&T, Inc.	Phase 1	0.2
19018	21404	Erie	Phase I Cultural Resources Survey of the Hayes Substation Project in Perkins Township, Erie County, Ohio	Leary, Christopher G.	2013	URS Corp., Cincinnati	Phase 1	5.9

19024	20349	Erie	Phase I Archaeological Field Reconnaissance for the Proposed Improvements to the NASA Glenn Research Center-Plum Brook Station Facility, Huron, Milan, Oxford, and Perkins Townships, Erie County, Ohio	Meece, Jamie S.	2011	Cultural Resource Analysts, Inc.	Phase 1	90.1
19049	13448	Erie	Phase I Archaeological Survey for the Proposed Improvements to the NASA Glenn Research Center - Plum Brook Station Facility, Huron, Milan, Oxford and Perkins Townships, Erie County, Ohio	Meece, Jamie S.	2011	Cultural Resource Analysts, Inc.	Phase 1	15.6
19071	15582	Erie	Phase I Archaeological Survey for the Approximately 11.5 ha (28.4 ac) Strickfaden Park Project in Perkins Township, Erie County, Ohio	Zink, Justin	2013	Weller & Associates, Inc	Phase 1	28.8
19390	26748	Erie	Phase I Archaeological Survey and Viewshed Analysis for the Proposed Heckelman Radio Tower Project, Milan Township, Erie County, Ohio	Davis, Jamie	2014	Ohio Valley Archaeology, Inc. (aka OVAC)	Phase 1	16.3
19391	26748	Erie	Archaeological Magnetic Gradient Survey Within Site 33 ER 570, the Proposed Heckelman Radio Tower Project, Milan Township, Erie County.	Burks, Jarrod	2014	Ohio Valley Archaeology, Inc. (aka OVAC)	Phase 1	16.3
19523		Erie	(Draft Report on) The Dillon Site - 33 ER 30 (Milan Township, Erie County, Ohio)	DeMuth, George B.	2014	George DeMuth	Phase 1	1.3
19529	28710	Erie	Phase I Archaeological Survey for the Proposed Huron II Wireless Cellular Tower in Huron Township, Erie County, Ohio	Weller, Ryan J.	2014	Weller & Associates, Inc	Phase 1	0.5
19535	31731	Huron	Phase I Archaeological Survey for the Havana/SNDS-069/Mahl Wireless Cellular Tower in Peru Township, Huron County, Ohio (CTL#15510109COLA)	Gullett, Catherine	2015	EMH&T, Inc.	Phase 1	0.2
19540	19877	Erie	Phase I Archaeological Survey for the Plank Road (Mi-411) Bridge Replacement Project, Milan Township, Erie County, Ohio	Chidester, Robert C.	2014	The Mannik & Smith Group, Inc.	Phase 1	1.3
19624	29184	Crawford	Phase I Archaeological Survey for the New Washington SE Wireless Cellular Tower in the Village of New Washington, Crawford County, Ohio	Lawhon, Cassandra	2014	EMH&T, Inc.	Phase 1	0.2
19647	28177	Seneca	Phase I Cultural Resource Management Investigations for the Proposed 17.8 ha (44 ac) Attica Wastewater Treatment Lagoon in Venice Township, Seneca County, Ohio	Weller, Ryan J.	2014	Weller & Associates, Inc	Phase 1	44.0
19648	29809	Huron	Phase I Cultural Resources Management Survey for the Proposed Huron County EMA Radio Tower in Greenfield Township, Huron	Nelson, Christopher	2014	Weller & Associates, Inc	Phase 1	0.1
19728	29246	Seneca	A Phase I Archaeological Survey of the Proposed OH-08871 Bellevue South SNDS-063 Telecommunications Tower, Thompson Township, Seneca County, Ohio	Finney, Fred A.	2014	Upper Midwest Archaeology	Phase 1	0.3
19857	31609	Erie	Phase I Archaeological Survey for the Downtown Sandusky East SNDS-057 Wireless Antenna Collocation in the City of Sandusky, Erie County, Ohio (CTL# 145 10685 COLa; EnSite No. 22403)	Gullett, Catherine	2015	EMH&T, Inc.	Phase 1	0.2
19880	31671	Seneca	Phase I Archaeological Survey for the Bloomville/Frankart Wireless Cellular Tower in the Village of Bloomville, Seneca County, Ohio (CTL# 15510108COLa)	Lawhon, Cassandra	2015	EMH&T, Inc.	Phase 1	0.2
19905	32091	Erie	Phase I Archaeological Survey for the Huron East/Enderle Wireless Cellular Tower in the City of Huron, Erie County, Ohio (CTL No. 15510110COLa)	Gullett, Catherine	2015	EMH&T, Inc.	Phase 1	0.2
19932	32477	Erie	Phase I Archaeological Survey for the STC300-OH Castalia North / SNDS-071 Wireless Cellular Tower in Margaretta Township, Erie County, (CTL# 15510327COLa)	Meyer, Elaine	2015	EMH&T, Inc.	Phase 1	0.2
19969	32133	Huron	Phase I Archaeological Survey for the Norwalk Speedway/SNDS-066/Speculative Properties LLC Wireless Cellular Tower in the City of Norwalk, Huron County, Ohio	Gullett, Catherine	2015	EMH&T, Inc.	Phase 1	0.2
20090	34041	Sandusky	Phase I Archaeological Survey for the STC302-OH Clyde West/SNDS-072 Wireless Cellular Tower in the City of Clyde, Sandusky County, Ohio (CTL No. 15510505COLa)	Gullett, Catherine	2016	EMH&T, Inc.	Phase 1	0.3

20141	35057	Erie	Phase I Archaeological Survey for the Bloomingville/SNDS-060/Puckrin Wireless Cellular Tower in Perkins Township, Erie County, Ohop (CTL No.15510486COLa)	Gullett, Catherine	2016	EMH&T, Inc.	Phase 1	0.2
20489	38535	Huron	Phase I Cultural Resources Management Investigations Conducted for the Approximately 102 ac. Furniture Parkway Site Located in the City of Norwalk, Huron County, Ohio	Meyer-Landis, Elaine	2017	EMH&T, Inc.	Phase 1	105.6
··	13341	Huron	Phase II (Survey) Investigation for the Proposed North Coast Aerospace Waterline Project (Sections B and C) in Norwalk Township, Huron County, Ohio: Addendum.	Bush, David R. and Mark A. Kollecker	1990	David R. Bush, Inc..	Phase 2	0.8
··	14066	Erie	Phase II Archaeological Testing of Sites 33 ER 446 and 33 ER 449, within the Proposed Eri-250-5.53 Project Area, Erie County, Ohio	Glenn, Jonathan, Mark A. Kollecker, Joan A. BYTHEWAY, and Beth A. Myers	1997	Center for Cultural Resource Research, Pittsburgh	Phase 2	0.3
··	14286	Erie	Additional Phase II Archaeological Testing of the Historic Component at 33 ER 449 for the Proposed ERI-250-5.53 (PID 8071) Project Area in Huron Township, Erie County, Ohio	Whitman, Linda G.	1999	ASC Group, Inc.	Phase 2	0.0
··	14434	Seneca	Phase II Cultural Resources Evaluation of Site 33 SE 590, near the Village of Republic, Scipio Township, Seneca County, Ohio	Haywood, Norman A.	2000	Haywood Archaeological Services	Phase 2	0.2
··	15595	Sandusky	Phase III Assessment Survey: 33 SA 197 and 33 SA 198, Two Multicomponent Sites in the Vicinity of Bellevue, Sandusky County, Ohio.	McDaniel, Gary	1988	ASC Group, Inc.	Phase 2	13.0
··	15599	Sandusky	An Archaeological Assessment of 33 SA 276: An Archaic Lithic Scatter Located Within the Proposed Leber Farm Industrial Development, York Township, Sandusky County, Ohio.	McDaniel, Gary	1990	ASC Group, Inc.	Phase 2	4.5
··	15601	Sandusky	An Archaeological Assessment of 33 SA 269: A Lithic Scatter Located Within the Proposed Leber Farm Industrial Development, York Township, Sandusky County, Ohio.	Sprague, Rae Norris	1990	ASC Group, Inc.	Phase 2	5.5
··	16226	Erie	Phase III Cultural Resources Management Investigations for Historic Property 33 ER 516 Located Within the Approximately 31.8ha (78.5 a) Crossings at Sandusky Development in Perkins Township, Erie County, Ohio.	Brown, Joel	2003	EMH&T, Inc.	Phase 3	2.0
··	17308	Huron	Memo-To-File/Photolog Report for the Proposed Improvements to the State Route 269 Crossing over the Norfolk and Southern Railroad in Bellevue, in Huron and Sandusky Counties, Ohio	Gibbs, Kevin	2000	ASC Group, Inc.	Phase 1	63.3
··	19428	Erie	The Heckelman Site (33ER14) Linear Ditches: A Perspective on the Middle and Late Woodland Time Periods in North Central Ohio (Milan Township, Erie County, Ohio)	Boatman, Glenwood & David Stothers	2014	Glenwood Boatman	Phase 3	2.3

Exhibit J
Aviation Correspondence

1. **Airport Notification Letters**
2. **Emerson FAA Filings**

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
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Attorneys for Firelands Wind, LLC

Exhibit J
Aviation Correspondence

1. Airport Notification Letters

Christine M.T. Pirik (0029759)
(Counsel of Record)
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wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Marion L. Dougherty
Dougherty Airport
6121 Route 20 East
Bellevue, OH 44811

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Dougherty Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

James F. Missler
Missler-Bellevue Airport
974 W Main
Bellevue, OH 44811

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Missler-Bellevue Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Bellevue Hospital (attn: Dianne E. Darr CHFM)
Bellevue Hospital Heliport
1400 W Main St
Bellevue, OH 44811

Dear Sir or Madam:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Bellevue Hospital Heliport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Louis H. Zorn
Zorn Acres Airport
604 Scheid Road
Sandusky, OH 44870

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Zorn Acres Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Ron Zoellner
Zoellner Airport
1618 Camp Road
Huron, OH 44839

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Zoellner Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Galloway & Sons
Galloway Airport
1810 Schenk Road
Sandusky, OH 44870

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Galloway Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. The Project Area is approximately 41,000 acres of land located in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

James P. Smith
Valley View Airport
2045 Washington Road
Norwalk, OH 44857

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Valley View Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Alden V. & Daniel J. Lake
Lake Air Ranch Airport
5715 Schenk Road
Sandusky, OH 44870

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Lake Air Ranch Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

City of Willard
Willard Airport
631 Myrtle Avenue
Willard, OH 44890

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Willard Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Don Mather
Matherfield Airport
2717 Old Railroad Rd
Sandusky, OH 44870

Dear Sir:

In accordance with the rules of the Ohio Power Siting Board, Ohio Administrative Code Rule 4906-4-07 (E)(1), Firelands Wind, LLC (Emerson Creek Wind Farm) is sending you this letter as a representative of Matherfield Airport, located within five miles of the proposed project. The wind project will consist of up to 71 wind turbine generators, along with access roads, electric collection cables, a substation, a laydown yard for construction staging, an operations and maintenance (O&M) facility, and up to three meteorological towers. It will be located on approximately 41,000 acres of private land in Lyme, Ridgefield, Norwich, Sherman, and Richmond Townships (Huron County); Groton and Oxford Townships (Erie County); and Reed and Venice Townships (Seneca County).

Your airport is located within a 5-mile radius of the project area and thus we are notifying you. We do not anticipate that the wind project will have any adverse effect on your airport. The project will comply with all Federal Aviation Administration rules and any applicable state rules.

If you would like additional information, please contact John Arehart, of Apex Clean Energy.

john.arehart@apexcleanenergy.com
434-220-6122

Very truly yours,

Nate Pedder

Exhibit J
Aviation Correspondence

2. Emerson FAA Filings

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
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Attorneys for Firelands Wind, LLC

Sara Stebbins

From: Nate Pedder <nate.pedder@apexcleanenergy.com>
Sent: Friday, January 4, 2019 4:22 PM
To: Sara Stebbins; Lindsay Donahoe
Subject: Emerson FAA Filings

Follow Up Flag: Follow up
Flag Status: Completed

See below for a list of filing numbers from our response email from FAA. We have filings: 2018-WTE-11906-OE through 2018-WTE-11992-OE. Filing 2018-WTE-11918-OE is for T20 and will be changed when the FAA re-opens, however until the government shutdown ends, we cannot re-file this moved location. Do you need anything else from me for the OPSB application in regards to the FAA filings? These were all filed 12/20/2018.

Your filing is assigned Aeronautical Study Number(s) (ASN): 2018-WTE-11962-OE, 2018-WTE-11963-OE, 2018-WTE-11964-OE, 2018-WTE-11965-OE, 2018-WTE-11966-OE, 2018-WTE-11967-OE, 2018-WTE-11968-OE, 2018-WTE-11969-OE, 2018-WTE-11970-OE, 2018-WTE-11971-OE, 2018-WTE-11972-OE, 2018-WTE-11973-OE, 2018-WTE-11974-OE, 2018-WTE-11975-OE, 2018-WTE-11976-OE, 2018-WTE-11977-OE, 2018-WTE-11978-OE, 2018-WTE-11979-OE, 2018-WTE-11980-OE, 2018-WTE-11981-OE, 2018-WTE-11982-OE, 2018-WTE-11983-OE, 2018-WTE-11984-OE, 2018-WTE-11985-OE, 2018-WTE-11986-OE, 2018-WTE-11987-OE, 2018-WTE-11988-OE, 2018-WTE-11989-OE, 2018-WTE-11990-OE, 2018-WTE-11991-OE, 2018-WTE-11992-OE.

Your filing is assigned Aeronautical Study Number(s) (ASN): 2018-WTE-11906-OE, 2018-WTE-11907-OE, 2018-WTE-11908-OE, 2018-WTE-11909-OE, 2018-WTE-11910-OE, 2018-WTE-11911-OE, 2018-WTE-11912-OE, 2018-WTE-11913-OE, 2018-WTE-11914-OE, 2018-WTE-11915-OE, 2018-WTE-11916-OE, 2018-WTE-11917-OE, 2018-WTE-11918-OE, 2018-WTE-11919-OE, 2018-WTE-11920-OE, 2018-WTE-11921-OE, 2018-WTE-11922-OE, 2018-WTE-11923-OE, 2018-WTE-11924-OE, 2018-WTE-11925-OE, 2018-WTE-11926-OE, 2018-WTE-11927-OE, 2018-WTE-11928-OE, 2018-WTE-11929-OE, 2018-WTE-11930-OE, 2018-WTE-11931-OE, 2018-WTE-11932-OE, 2018-WTE-11933-OE, 2018-WTE-11934-OE, 2018-WTE-11935-OE, 2018-WTE-11936-OE, 2018-WTE-11937-OE, 2018-WTE-11938-OE, 2018-WTE-11939-OE, 2018-WTE-11940-OE, 2018-WTE-11941-OE, 2018-WTE-11942-OE, 2018-WTE-11943-OE, 2018-WTE-11944-OE, 2018-WTE-11945-OE, 2018-WTE-11946-OE, 2018-WTE-11947-OE, 2018-WTE-11948-OE, 2018-WTE-11949-OE, 2018-WTE-11950-OE, 2018-WTE-11951-OE, 2018-WTE-11952-OE, 2018-WTE-11953-OE, 2018-WTE-11954-OE, 2018-WTE-11955-OE, 2018-WTE-11956-OE, 2018-WTE-11957-OE, 2018-WTE-11958-OE, 2018-WTE-11959-OE, 2018-WTE-11960-OE, 2018-WTE-11961-OE.

To review your electronic record, go to our website oeaaa.faa.gov and select the Search Archives link to locate your case using the assigned Aeronautical Study Number (ASN).

The FAA verified your filing and an aeronautical study has been initiated. Please allow a minimum 45 days for the FAA to complete the study. Please refer to the assigned ASN on all future inquiries regarding this filing.

For Wind Turbine proposals only, please ensure Wind Turbine Data as described on the project summary page in your registered e-filing account has been uploaded to your filing.

NATE PEDDER
Development Manager

Apex Clean Energy, Inc.

310 4th St. NE, Suite 200, Charlottesville, VA 22902
office: 434-326-5399 | cell: 248-417-8343 | fax: 434-220-3712
nate.pedder@apexcleanenergy.com | www.apexcleanenergy.com

Exhibit K
USFWS and ODNR Correspondence

1. **October 18, 2018 ODNR/USFWS Meeting Summary**
2. **June 26, 2018, et al., Bat Survey correspondence, Apex and USFWS**
3. **June 11, 2018, et al., Bat Survey correspondence, Apex and USFWS**
4. **December 19, 2017, et al., ODNR Survey Recommendations and correspondence between Apex and ODNR**
5. **November 9, 2017 ODNR/USFWS Meeting Summary**
6. **February 22, 2017 Survey Recommendation from ODNR**
7. **October 27, 2016 ODNR/USFWS Meeting Summary for Firelands Wind Project**
8. **October 27, 2016 ODNR/USFWS Meeting Summary for Emerson Creek Wind**
9. **August 29, 2016, et al., correspondence Apex and USFWS**
10. **May 22, 2014 ODNR/USFWS Meeting Summary**
11. **April 27, 2011 USFWS Project Review and correspondence**
12. **March 1, 2010 USFWS Project Review and correspondence**

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
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todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Exhibit K
USFWS and ODNR Correspondence

1. October 18, 2018 ODNR/USFWS Meeting Summary

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

EMERSON CREEK WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Erin Hazelton, ODNR
Jennie Geiger, Apex
John Arehart, Apex
Nate Pedder, Apex

Notes Prepared by: Apex

Date: November 7, 2018

On October 18, 2018, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to discuss the Emerson Creek (previously known as Firelands) Wind Project (project) in Seneca and Erie Counties, Ohio. The purpose of the meeting was to present a revision to the project boundary, discuss the results of recent additional studies, and determine if wildlife resource information is complete for the project to submit an Ohio Power Siting Board (OPSB) permit application. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint (PPT) presentation was provided and the following is a summary of the topics discussed.

There was general agreement that the material presented in the PPT presentation was accurate and that the studies were completed in accordance with the ODNR requirements and consistent with the UFWS 2012 Guidelines for Land-based Wind Energy Projects and 2013 Eagle Conservation Plan Guidance (ECPG). The survey recommendation letters provided by ODNR in December 2017 for both Emerson Creek South and Emerson Creek North (pka Firelands) were discussed, and it was agreed that an extensive number of surveys have been completed to date in and around the project area (see slide 8). ODNR requested shapefiles of the current boundary, as well as points surveyed to date, be provided for review and confirmation that the project has met ODNR Guidelines.

Federal and State Listed Species: It was agreed that there were no new federally-listed species since the last agency Project reviews in October 2016 (Emerson Creek South) and November 2017 (Emerson Creek North), and that the six state-listed species that have been added since the last Project reviews (loggerhead shrike [*Lanius ludovicianus*], upland sandpiper [*Bartramia longicauda*], greater redhorse [*Moxostoma valenciennesi*], blazing star moth [*Papaipema beeriana*], rayed bean [*Villosa fabalis*], and northern rifffleshell [*Epioblasma torulosa rangiana*]*)* are unlikely to occur in or be affected by the Project, and no further studies or management consideration are warranted.

Avian Studies

Apex presented results from avian studies completed to date. There was general agreement that avian studies are sufficient to adequately assess the current project area and respond to avian risk for purposes of OPSB permit submittal. ODNR confirmed that owl (2012-2013), raptor migration (2010-2017), and raptor nest surveys (2018) were sufficient to meet ODNR Guidelines for the

revised project area, and that passerine migration surveys (2010-2017) and breeding bird surveys (2011-2018) are likely sufficient.

Eagles: Results from ECPG-level surveys completed since 2016 were discussed. It was agreed that siting turbines a minimum of ½ inter-nest distance from existing eagle nests (currently 1.18 mi per USFWS input) is appropriate to minimize risk to the species during the breeding season. USFWS recommended that the USFWS Regional Eagle Coordinator be given the opportunity to review the eagle data.

Bats

Apex presented a review of existing bat information for the Project and results from the 2017-2018 mist-net bat surveys. There was agreement that bat studies completed to date are sufficient for purposes of OPSB permit submittal and to manage bat risk through siting and operational protocols. Avoidance and minimization measures for Indiana and northern long-eared bats were discussed and confirmed as follows to ensure regulatory compliance:

- Avoid tree removal to extent possible and within 150 feet of northern long-eared bat roosts from June 1 to August 1.
- Curtail all turbines at wind speeds up to 6.9 m/s during spring (Mar 15-May 15) and fall (Aug 1 – Oct 31) migration from 30 minutes before sunset to 30 minutes after sunrise. Curtail turbines at wind speeds up to 6.9 m/s within 2.5 miles of IBAT roost trees during summer (May 16 – Jul 31).
- Conduct post-construction monitoring in accordance with ODNR guidelines.

Other: USFWS confirmed that the Project is outside the range of the eastern massasauga (federally threatened) and that no additional species-specific surveys are warranted. ODNR additionally confirmed that no additional species-specific surveys are warranted for state-listed species.

Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS (attached).
- Apex to provide shapefiles of survey point locations to ODNR for review and confirmation that passerine migration and breeding bird surveys are sufficient for evaluation of the revised Project area (attached).
- Apex to provide shapefiles of eagle nests identified during 2018 nest surveys to USFWS (attached).
- Apex to provide eagle data to Chris Mensing, USFWS Eagle Coordinator, for review.

Attachment 1: Power Point Presentation

Exhibit K
USFWS and ODNR Correspondence

2. June 26, 2018, et al., Bat Survey correspondence, Apex and USFWS

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Jennie Geiger

From: Jennie Geiger
Sent: Tuesday, June 26, 2018 11:24 AM
To: 'Lott, Keith'
Subject: RE: FW: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Thanks for the clarification Keith. I believe we calculated the center point correctly, but if you could calculate and send to me that would be preferable to make sure we have the right location.

JENNIE GEIGER
office: 434-260-6982 | cell: 720-320-9450
jennie.geiger@apexcleanenergy.com

From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Saturday, June 16, 2018 10:38 PM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Subject: Re: FW: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Jennie,

What you've summarized is correct. I haven't been able to assess your point location, but according to the Section 7 & 10 Wind Energy Guidelines for sites where you have the approximate location for multiple roost trees you calculate a center point for those observations. If you'd like to do that yourself you'd just take the average of all the Latitude observations, and do the same for the Longitude. And then buffer that point by 2.5 miles. I should be able to do this later this week.

Keith

On Tue, Jun 12, 2018 at 4:28 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

> Thanks for the additional info Keith.
>
> And just to confirm I am understanding your email below, the buffer around the Emerson Creek South roost has been reduced to 2.5 miles and no additional surveys are required, and we can reduce the buffer around the Emerson Creek North roost to 2.5 miles if we confirm absence of Indiana bats within the outer tier during P/A surveys this summer (however, this option will not be available for wind farms in the future unless the buffer overlap is less than 123 acres). Is that accurate?
>
> Also, are you okay with the roost point we were using for the 2.5 mile buffer at Emerson Creek South?
>
> Thanks,
> Jennie

JENNIE GEIGER

office: 434-260-6982 | cell: 720-320-9450

jennie.geiger@apexcleanenergy.com

From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Monday, June 11, 2018 7:49 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Subject: Re: FW: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Jennie,

Last week there was an internal Fish & Wildlife Service call regarding the revised Indiana Bat Summer Survey Guidelines. Part of that call was a further explanation of the "outer-tier" guidance. On the call they explicitly mentioned that it was unlikely that it would be applicable to wind projects since it was intended specifically for small projects (<123 acres or <1% of the suitable habitat within the 5 mile buffer). Previously this was unclear whether the guidance would be applicable since wind projects in the midwest generally have limited habitat impacts.

For the Emerson South project the additional roost information from the Copperhead report will reduce the buffer size from 5 miles to 2.5 miles; which is consistent with the Indiana bat Section 7 and Section 10 Guidance for Wind Energy Projects (https://www.fws.gov/midwest/endangered/mammals/inba/WindEnergyGuidance.html).

For Emerson North project, since I gave you recommendations prior to this clarification, I stand by my previous recommendations, but this option will not be available for other wind projects (unless the project overlaps with < 123 acres of an Indiana bat buffer).

Let me know if you have any questions.

Keith

On Fri, Jun 1, 2018 at 1:07 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Hi Keith -

The 2017 report for Emerson Creek (South) can be accessed at the following link: https://apexcleanenergy.box.com/s/kzxuoql3ja37zjn9zorory4mnml1dbgt (it was too large to email). As for the July 1 roost location, there isn't one as they lost the bat given how far it flew. I wasn't sure how you wanted to deal with that since we are lacking a final location.

Thanks,
Jennie

JENNIE GEIGER
office: 434-260-6982 | cell: 720-320-9450
jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>
[cid:image001.png@01CE6DB9.0BF695D0]<http://www.apexcleanenergy.com/>

From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Friday, June 01, 2018 10:54 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>>
Subject: Re: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Jennie,

I have reports for Firelands and Emerson North, but I don't seem to have a report for Emerson South so if you could send that I'd appreciate it. From my emails I've got the 3 triangulated roost locations which include up to July 1st, so I have all of those. It's the location 8 miles to the south that I don't have. Could you send me that location and the dates that it occurred in that area?

Thanks.

Keith

On Fri, Jun 1, 2018 at 12:29 PM, Jennie Geiger
<jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>> wrote:
Hi Keith -

To clarify, my question below pertains to Emerson Creek (South) not Emerson Creek (North, pka Firelands). No IBATs or NLEBs were captured at Emerson Creek (North) in 2017, but one was captured at Emerson Creek (South) (EC33) and is included in the report for that project. Do you have that report or do you need for me to resend? I apologize that the names of these projects are so confusing - I would have used something simpler if it was up to me!

I have attached shps of the three potential roost trees that Copperhead triangulated. They should align with the ones you already have, but please let me know if that is not the case. Copperhead lost the bat on July 1 when it flew more than 8 miles south, therefore there was no roost tree location identified on that date.

Please let me know if there is any additional information I can provide.

Thanks,
Jennie

JENNIE GEIGER

office: 434-260-6982 | cell: 720-320-9450
jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>
[cid:image001.png@01CE6DB9.0BF695D0]<http://www.apexcleanenergy.com/>

From: Lott, Keith [mailto:keith_lott@fws.gov<mailto:keith_lott@fws.gov>]
Sent: Friday, June 01, 2018 9:42 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>>
Subject: Re: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Jennie,

When Copperhead submitted their data in 2017 they only included the one roost, they didn't include any of the roosts where the location was triangulated. There was also no mention of the Indiana bat capture or roosts in the report that Copperhead submitted. Site EC33 isn't mentioned in the Firelands report at all. I just went back in my emails and found locations for 3 of the triangulated roosts, ones where they did not have access to the property. Additionally, you'd mentioned that one roost was considerably further than some of the others. I do not have any record of receiving that location.

In order to ensure that we have all of the roost locations, please send me the lat/long and date the bat used this location for all of the roost locations. At that point I'll add them to the bat database and re-do the buffer distances.

Keith

On Fri, Jun 1, 2018 at 10:28 AM, Jennie Geiger <jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>> wrote:
Hi Keith -

Since we haven't received an official center point location for the 2017 Indiana bat capture at Emerson Creek, we went ahead and estimated it based on roost data and applied a 5-mile buffer around this point (see attached pdf). Based on the 2018 USFWS Rangewide Indiana Bat Survey Guidelines (Guidelines), we are seeking to reduce the Indiana bat buffer from 5 to 2.5 miles by confirming absence within the outer-tier buffer. Copperhead GIS analysis estimates there is 1,437 acres of forested habitat within the outer-tier buffer that falls within our project area. Copperhead surveyed 12 mist-net sites within the outer-tier during the 2017 presence/probable absence surveys, which is the appropriate number of mist-net sites per the Guidelines (1 site/123 ac).

Since the surveys were completed in 2017 and no Indiana bats were captured, we are requesting USFWS concurrence that Indiana bats are likely absent from the outer-tier buffer during the maternity season without having to complete additional surveys in 2018. Can you please confirm that the results of last year's surveys are sufficient to confirm probable absence of the species in the outer-tier buffer, therefore allowing us to focus minimization measures within the inner 2.5 miles around the center point?

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

Apex Clean Energy, Inc.
310 4th St NE, Suite 200, Charlottesville, VA 22902
office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712
jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com><mailto:jennie.geiger@apexcleane

nergy.com<mailto:jennie.geiger@apexcleanenergy.com>> |
www.apexcleanenergy.com<http://www.apexcleanenergy.com><http://www.apexcleanenergy.com/>

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Keith Lott
Wildlife Biologist
U.S. Fish and Wildlife Service
4625 Morse Road, Suite 104
Columbus, Ohio 43230

Phone: (614) 416-8993 ext. 31
Fax: (614) 416-8994

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--
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Exhibit K
USFWS and ODNR Correspondence

3. June 11, 2018, et al., Bat Survey correspondence, Apex and USFWS

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Jennie Geiger

From: Lott, Keith <keith_lott@fws.gov>
Sent: Monday, June 11, 2018 7:49 AM
To: Jennie Geiger
Subject: Re: FW: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question

Jennie,

Last week there was an internal Fish & Wildlife Service call regarding the revised Indiana Bat Summer Survey Guidelines. Part of that call was a further explanation of the "outer-tier" guidance. On the call they explicitly mentioned that it was unlikely that it would be applicable to wind projects since it was intended specifically for small projects (<123 acres or <1% of the suitable habitat within the 5 mile buffer). Previously this was unclear whether the guidance would be applicable since wind projects in the midwest generally have limited habitat impacts.

For the Emerson South project the additional roost information from the Copperhead report will reduce the buffer size from 5 miles to 2.5 miles; which is consistent with the Indiana bat Section 7 and Section 10 Guidance for Wind Energy Projects (https://www.fws.gov/midwest/endangered/mammals/inba/WindEnergyGuidance.html).

For Emerson North project, since I gave you recommendations prior to this clarification, I stand by my previous recommendations, but this option will not be available for other wind projects (unless the project overlaps with < 123 acres of an Indiana bat buffer).

Let me know if you have any questions.

Keith

On Fri, Jun 1, 2018 at 1:07 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

> Hi Keith -
>
> The 2017 report for Emerson Creek (South) can be accessed at the following link: https://apexcleanenergy.box.com/s/kzxuoql3ja37zjn9zorory4mnml1dbgt (it was too large to email). As for the July 1 roost location, there isn't one as they lost the bat given how far it flew. I wasn't sure how you wanted to deal with that since we are lacking a final location.
>
> Thanks,
> Jennie
>
> JENNIE GEIGER
> office: 434-260-6982 | cell: 720-320-9450
> jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>
> [cid:image001.png@01CE6DB9.0BF695D0]<http://www.apexcleanenergy.com/>
>
> From: Lott, Keith [mailto:keith_lott@fws.gov]
> Sent: Friday, June 01, 2018 10:54 AM
> To: Jennie Geiger <jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com>>
> Subject: Re: [EXTERNAL] BUSINESS CONFIDENTIAL: Emerson Creek Bat Survey Question
>
> Jennie,

Jennie Geiger

From: Jennie Geiger
Sent: Wednesday, May 16, 2018 2:02 PM
To: 'Lott, Keith'
Cc: Boyer, Angela; Dave Phillips
Subject: RE: [EXTERNAL] BUSINESS CONFIDENTIAL: Apex's Emerson Creek Wind Project

Hi Keith –

Thank you for the response. Based on the information provided below, we will have Copperhead add 2 survey sites within the Indiana bat buffer in an effort to determine presence or probable absence, recognizing that absence would eliminate the need for summer-time minimization or curtailment at our Emerson Creek ("North") Wind Project.

On a related note, could you please provide us with the inner and outer-tier buffers that USFWS is currently using for the Indiana bat captured at our Emerson Creek ("South") Wind Project during the presence/probable absence surveys completed by Copperhead in 2017? We will likely seek to complete additional surveys within the outer-tier buffer at this site as well in hopes of eliminating minimization/curtailment requirements for this Project.

Thanks,
Jennie

JENNIE GEIGER
office: 434-260-6982 | cell: 720-320-9450
jennie.geiger@apexcleanenergy.com

From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Wednesday, May 16, 2018 7:41 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Cc: Boyer, Angela <angela_boyer@fws.gov>; Dave Phillips <dave.phillips@apexcleanenergy.com>
Subject: Re: [EXTERNAL] BUSINESS CONFIDENTIAL: Apex's Emerson Creek Wind Project

Jennie,

Prior to the new Range-wide Indiana bat survey guidance, which came out in April 2018, when an Indiana bat was detected via netting or acoustically it was buffered by 5 miles (unless tracking indicated it traveled further). And the Service assumed presence throughout this buffer, thus we'd ask for avoidance and minimization measures for wind projects anywhere within this buffer. This new guidance, which can be found in Appendix G of the 2018 guidelines, allows us to look at this "outer tier" area of the buffer, which occurs between 2.5 - 5 miles from the original detection. Quoting from the guidance, "the additional survey data would 1) help refine the home range boundaries of the original colony, 2) confirm presence of additional colonies if present, 3) provide additional radio-tracking opportunities/roost tree locations, and 4) provide an option for project proponents to survey instead of always assuming presence."

The follow-up mist-net surveys that were conducted at Plum Brook, which did not actually capture Indiana bats, would not be sufficient to determine that Indiana bats may not be using sites within the Emerson North project boundary. Based upon the acoustic detection the Service still operates under the assumption that Indiana bats are present at Plum Brook, just in low numbers, which makes capture difficult.

Should surveys be conducted within in the northern portion of Emerson, and no Indiana bats were to be captured, the Service wouldn't ask for summer-time minimization or curtailment for turbines located within that area due to Indiana bat risk. The vast majority of the overlap between the Indiana bat detected at Plum Brook and the Emerson North project falls within this "outer-tier" (see attached map).

Northern long-eared bats have been found throughout the project area, but take associated with wind projects is currently exempt via the 4(d) rule.

Here's a link to the Indiana bat guidelines: https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2018RangewideIBatSurveyGuidelines.pdf

Let me know if you have any questions.

Keith

On Wed, May 9, 2018 at 4:03 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

> Hi Angie –
>
> Thank you for getting back to me so quickly. I wasn't sure who to reach out to on this since you were the one approving the study plan, but Keith makes sense since he is who I have been consulting with to date. Keith, I will give you a call when you are back in the office to discuss.
>
> Thanks,
>
> Jennie
>
> JENNIE GEIGER
>
> office: 434-260-6982 | cell: 720-320-9450
>
> jennie.geiger@apexcleanenergy.com
>
>
>
>
> **From:** Boyer, Angela [mailto:angela_boyer@fws.gov]
> **Sent:** Wednesday, May 09, 2018 11:18 AM
> **To:** Jennie Geiger <jennie.geiger@apexcleanenergy.com>
> **Cc:** Dave Phillips <dave.phillips@apexcleanenergy.com>; Keith Lott <keith_lott@fws.gov>
> **Subject:** Re: [EXTERNAL] BUSINESS CONFIDENTIAL: Apex's Emerson Creek Wind Project

Jennie,

It seems appropriate that l defer this conversation to Keith Lott, who is the office lead for the project. He will be returning to the office May 14. I can also discuss it with him when he returns.

Sincerely,

Angie

On Tue, May 8, 2018 at 4:08 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

> Hi Angela –
>
> Chris Leftwich of Copperhead Consulting called me regarding your suggestions for the bat survey plan at the north end of our Emerson Creek Project. I have attached notes from the 11/9/17 meeting we had with Keith Lott on this project, as well as a related email where he indicated that there have been an extensive number of mist-net surveys completed within this site and surrounding areas (e.g., Plum Brook), all of which indicate absence of Indiana bat within the project and vicinity during summer. As such, it was agreed that the project would present very low risk to this species during summer and that bat studies conducted to date are sufficient for purposes of OPSB permit submittal, and are sufficient to manage ESA-related bat risk through siting and operational protocols. Keith also provided Technical Assistance for avoidance measures as described in the attached that alleviate summer risk.
>
> I will give you a call shortly to discuss, as I would like to ensure we are all on the same page moving forward.
>
> Thanks,
> Jennie
>
> JENNIE GEIGER
>
> Environmental Permitting Manager
>
> Apex Clean Energy, Inc.

310 4th St NE, Suite 200, Charlottesville, VA 22902

office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712

jennie.geiger@apexcleanenergy.com | www.apexcleanenergy.com

--
Keith Lott
Wildlife Biologist
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Columbus, Ohio 43230

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Fax: (614) 416-8994

Exhibit K
USFWS and ODNR Correspondence

4. December 19, 2017 et al., ODNR Survey Recommendations and correspondence between Apex and ODNR

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Jennie Geiger

From: Erin.Hazelton@dnr.state.oh.us
Sent: Tuesday, December 19, 2017 7:26 AM
To: Jennie Geiger
Subject: RE: Emerson Creek North survey effort letter

Hi Jennie,
Since the acoustic surveys were approved by Jenny Norris, my predecessor, ODNR will accept them and won't require any additional bat acoustics for the current site boundary as long as an application is submitted to OPSB sometime next year. I'll likely request the data be refreshed if the application isn't submitted in the coming year or the site boundary changes significantly. Hopefully this makes sense--let me know if you have any questions.
Thanks,
Erin

Erin Hazelton
Wind Energy/Wildlife Administrator
ODNR Division of Wildlife
2045 Morse Road
Columbus, OH 43229
Phone: 614-265-6349
Email: Erin.Hazelton@dnr.state.oh.us

Good intentions can hurt, leave wildlife in the wild. Visit wildohio.gov/staywild to find out more.

From: Jennie Geiger [mailto:jennie.geiger@apexcleanenergy.com]
Sent: Friday, December 15, 2017 11:38 AM
To: Hazelton, Erin
Subject: RE: Emerson Creek North survey effort letter

Thanks Erin. Also, to confirm, ODNR is not requiring additional bat acoustic monitoring beyond what has already been completed for this site correct?

JENNIE GEIGER
office: 434-260-6982 | cell: 720-320-9450
jennie.geiger@apexcleanenergy.com

From: Erin.Hazelton@dnr.state.oh.us [mailto:Erin.Hazelton@dnr.state.oh.us]
Sent: Monday, December 11, 2017 11:09 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Cc: stuart.siegfried@puco.ohio.gov; grant.zeto@puco.ohio.gov; robert.holderbaum@puco.ohio.gov; Seymour, Megan <megan_seymour@fws.gov>; Kate.Parsons@dnr.state.oh.us
Subject: Emerson Creek North survey effort letter

Hello Jennie,
Please find the survey effort letter for the Emerson Creek North (Firelands) project attached to this email and let me know if you have any questions whatsoever.
Best,
Erin

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Michael R. Miller, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

December 8, 2017

To all interested parties:

Based upon the updated project boundary received November 2017 and further review of the project area, the Ohio Department of Natural Resources Division of Wildlife (DOW) has the following survey recommendations for Apex's proposed Emerson Creek North project (formerly known as "Firelands") located in Erie and Huron counties regarding wildlife species.

The project should follow the "moderate" survey effort protocol as described within the "On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio." If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

State-listed plant and animal species occur in Erie and Huron counties and the list can be found here: http://wildlife.ohiodnr.gov/species-and-habitats/state-listed-species/state-listed-species-by-county#plants. Additional surveys may be warranted to determine presence of state-listed species if construction will impact aquatic or wetland habitat. Once the turbine, road, pad and other infrastructure locations have been determined, please consult with DOW to determine if such surveys are needed.

The attached table summarizes the types and level of survey effort recommended by the DOW. Results from these studies will help assess the potential impact the turbines may pose and will influence our recommendations to the Ohio Power Siting Board (OPSB). Per recent review, bat acoustic data collected in the project area from 2011 will be accepted if an application is filed with the OPSB in 2018.

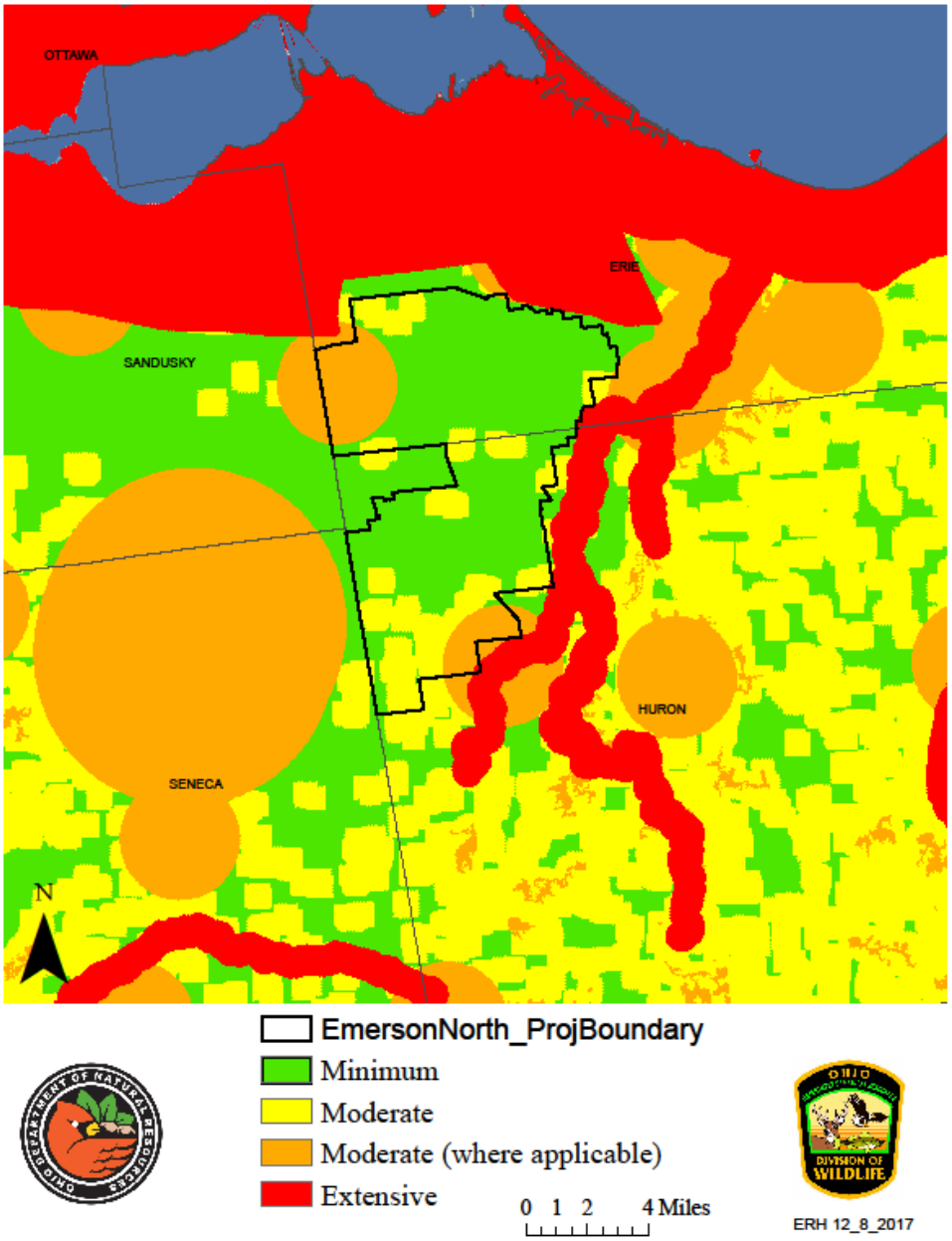
If you have any questions, please feel free to contact me at erin.hazelton@dnr.state.oh.us or 614.265.6349.

Erin Hazelton
Ohio Division of Wildlife
2045 Morse Road
Columbus, Ohio 43229

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Grant Zeto, Ohio Power Siting Board
Mr. Ashton Holderbaum, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Ms. Kate Haley Parsons, DOW

Emerson Creek North Wind Project (December 2017)	
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land, this requirement may be waived by DOW after reviewing the proposed turbine locations.
Raptor nest searches	Nest searches should occur on and within a 1-mile buffer of the proposed facility.
Raptor nest monitoring	Please consult with USFWS on bald eagle nests located within the search area. Nests should be monitored to assess daily bird activity. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within DOW's monitoring protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration survey points	9
Diurnal bird/raptor migration survey points	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl survey points	NS
Bat mist-netting survey points	18
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration survey points	NS
Radar monitoring locations	NS
Aquatic species surveys	This requirement may be waived by DOW after reviewing the proposed turbine/infrastructure locations.
Wetland species surveys	This requirement may be waived by DOW after reviewing the proposed turbine/infrastructure locations.

NS = Not required based on the lack of suitable habitat



Survey effort map with the revised boundary for Apex's proposed Emerson Creek North project (December 2017).

Ohio Department of Natural Resources
JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife
Raymond Petering, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

October 20, 2016

To all interested parties,

Based upon the revised project boundary map received on October 2016, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for Apex's proposed Emerson Creek project located in Erie and Huron counties.

Currently the project falls within regions of the state that DOW has identified as needing extensive monitoring efforts. The below survey recommendations are based on a GIS analysis of the site. Additionally, it is important to note that the federally and state endangered, Indiana bats (*Myotis sodalis*), as well as the state and federally threatened species, Northern Long-eared bat (*Myotis septentrionalis*), have been captured on or within 5 miles of the proposed project. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Nathan Reardon at Nathan.reardon@dnr.state.oh.us.

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	Please consult with USFWS Ohio FO on bald eagle nests located on or within the proposed project. Any nests should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	4
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl surveys	NS
Bat mist-netting (# of survey points)	8
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	1

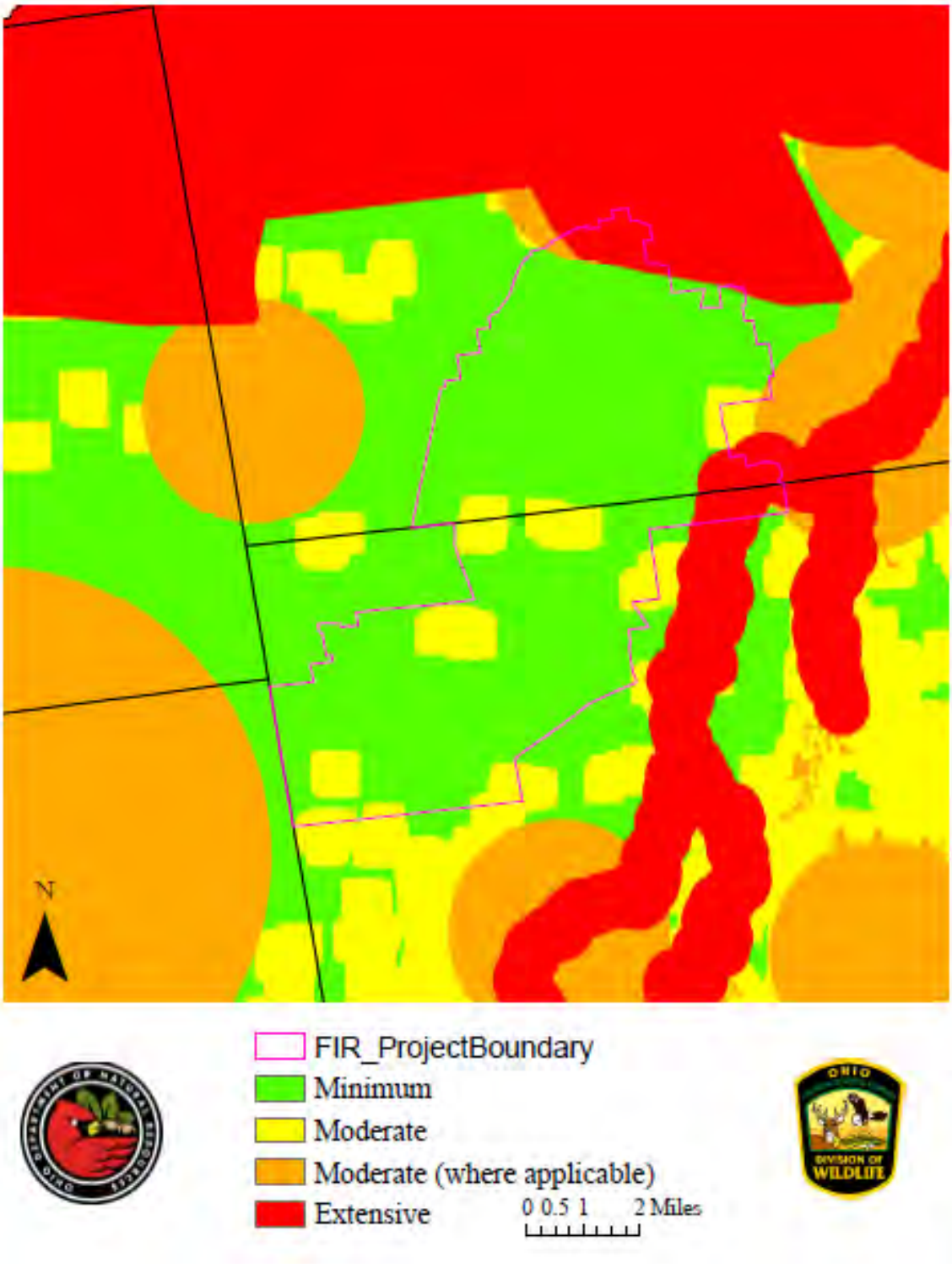
NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact Kate Parsons.

Ohio Division of Wildlife
2045 Morse Road
Columbus, Ohio 43229
Office: 614 265 6329

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Don Rosterfield, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Dave E. Kohler, DOW

Figure 1. Survey effort map with the revised boundary for Apex's proposed Firelands project.



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR DAVID MUSTINE, DIRECTOR

Ohio Division of Wildlife

David B. Lane, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

May 21, 2011

To all interested parties,

Based upon the revised project boundary map received on April 28, 2011 and conference call on April 20, 2011 the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for juwi Wind's proposed combined Firelands-Lyme project located in Erie, Huron, and Seneca counties.

Currently the project falls within regions of the state that DOW has identified as needing moderate monitoring efforts. Recommendations are based on a GIS analysis of the site and may be reevaluated after a site visit. Additionally, if the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below was created based upon a review of the project maps provided and summarizes the types and level of effort recommended by the DOW. Please note that monitoring and surveys should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio." Tetra Tech's proposed bald eagle nest monitoring methodology following the U.S. Fish and Wildlife Service's draft ECPG is approved for this site, however all other surveys should adhere to ODNR protocol.

Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board.

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Brian Mitch at (614) 265-6378 or brian.mitch@dnr.state.oh.us

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	There are 2 eagle nest located on or within the 2 miles of the proposed project. The pairs within the 2 mile radius should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	4 (waived)
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl surveys	NS
Bat mist-netting (# of survey points)	9
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	NS

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Jennifer Norris, Wind Energy Wildlife Biologist
Olentangy Wildlife Research Station
Ohio Division of Wildlife
8589 Horseshoe Road
Ashley, OH 43003
Office phone: 740-747-2525 x 26
Cell: 419-602-3141
Fax: 740-747-2278

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Brian Mitch, Ohio Department of Natural Resources

Figure 1. Survey effort map with the boundary for juwi Wind's proposed and revised Firelands-Lyme project.

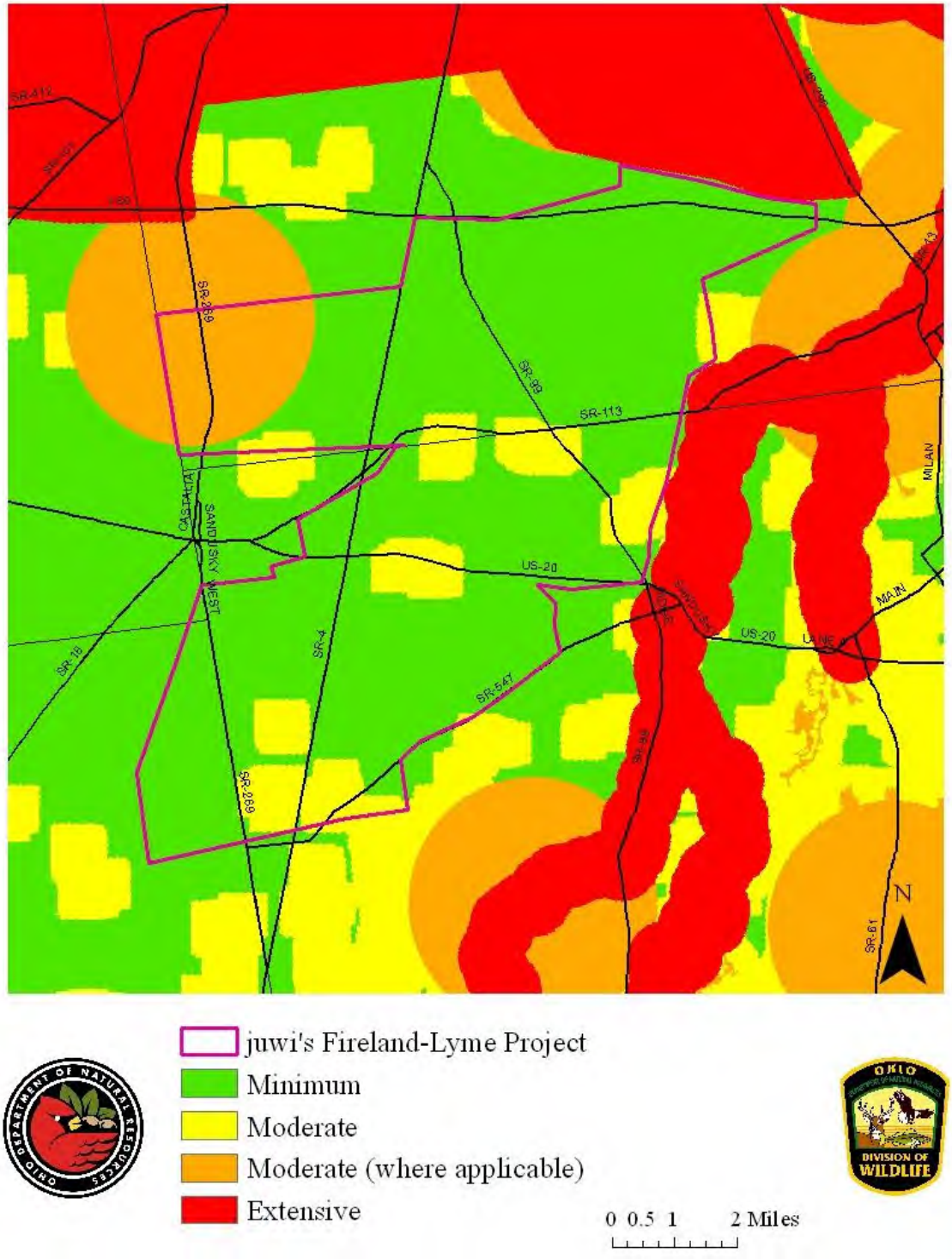
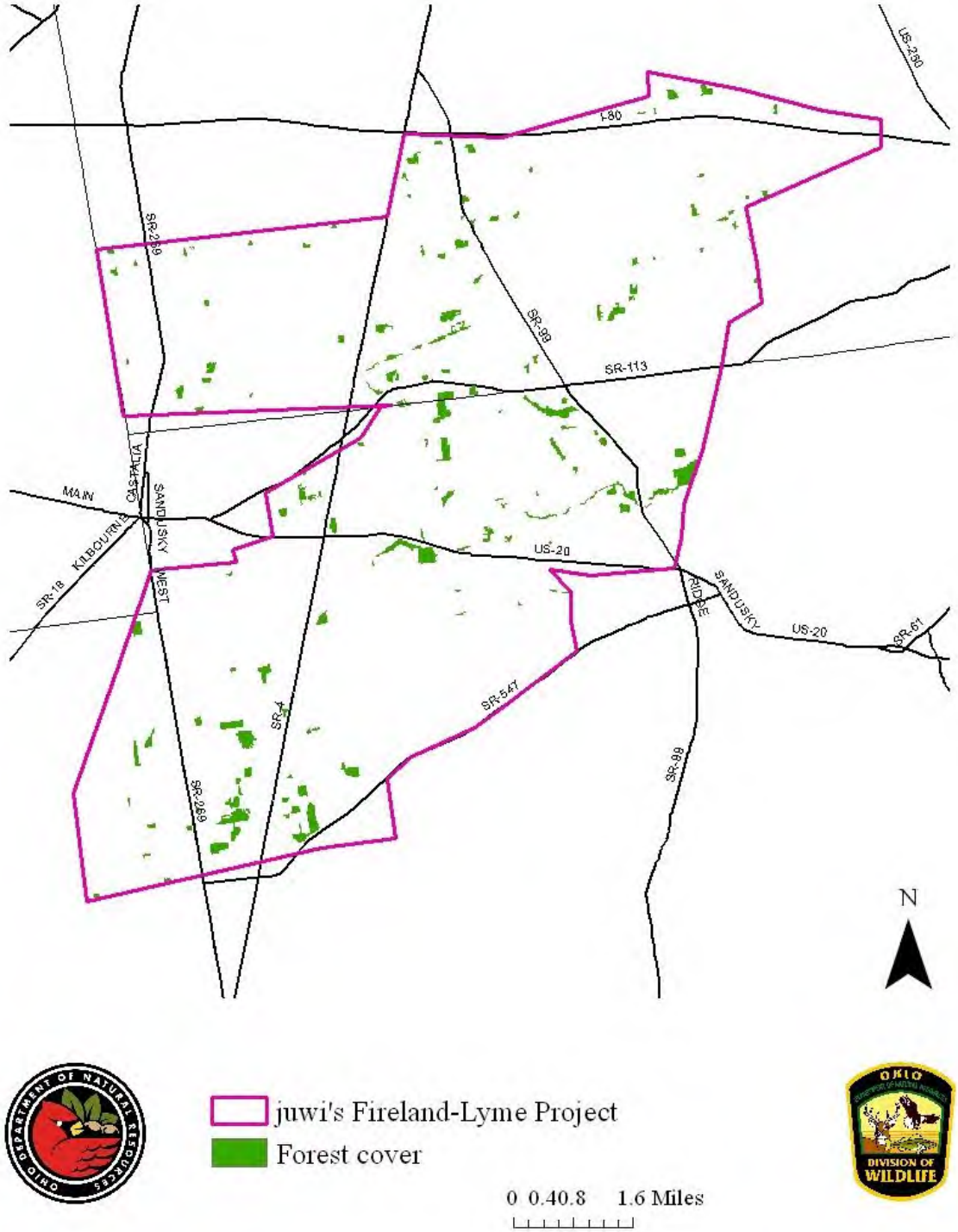


Figure 2. Forest cover with the boundary for juwi Wind's proposed and revised Firelands-Lyme project.



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR DAVID MUSTINE, DIRECTOR

Ohio Division of Wildlife

Vicki J. Mountz, Acting Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

April 16, 2011

To all interested parties,

Based upon the project boundary map received on April 7, 2011 the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for juwi Wind's proposed Lyme project located in Sandusky, Huron, and Seneca counties.

Currently the project falls within regions of the state that DOW has identified as needing moderate monitoring efforts. Recommendations are based on a GIS analysis of the site and may be reevaluated after a site visit. Additionally, if the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below was created based upon a review of the project maps provided and summarizes the types and level of effort recommended by the DOW. Please note that these survey recommendations are in addition to those recommended for juwi Wind's adjacent Fireland's project provided on September 30, 2010.

Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Brian Mitch at (614) 265-6378 or brian.mitch@dnr.state.oh.us

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. Because agricultural land is not considered to be suitable nesting habitat for most species of bird, turbines placed within these types of habitat are exempt of this recommendation.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	There is 1 eagle nest located on or within the 2 miles of the proposed project. The pair within the 2 mile radius should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	Waived
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl surveys	NS
Bat mist-netting (# of survey points)	6
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	NS

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Jennifer Norris, Wind Energy Wildlife Biologist
Olentangy Wildlife Research Station
Ohio Division of Wildlife
8589 Horseshoe Road
Ashley, OH 43003
Office phone: 740-747-2525 x 26
Cell: 419-602-3141
Fax: 740-747-2278

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Brian Mitch, Ohio Department of Natural Resources

Figure 1. Survey effort map with the boundary for juwi Wind's proposed Lyme project.

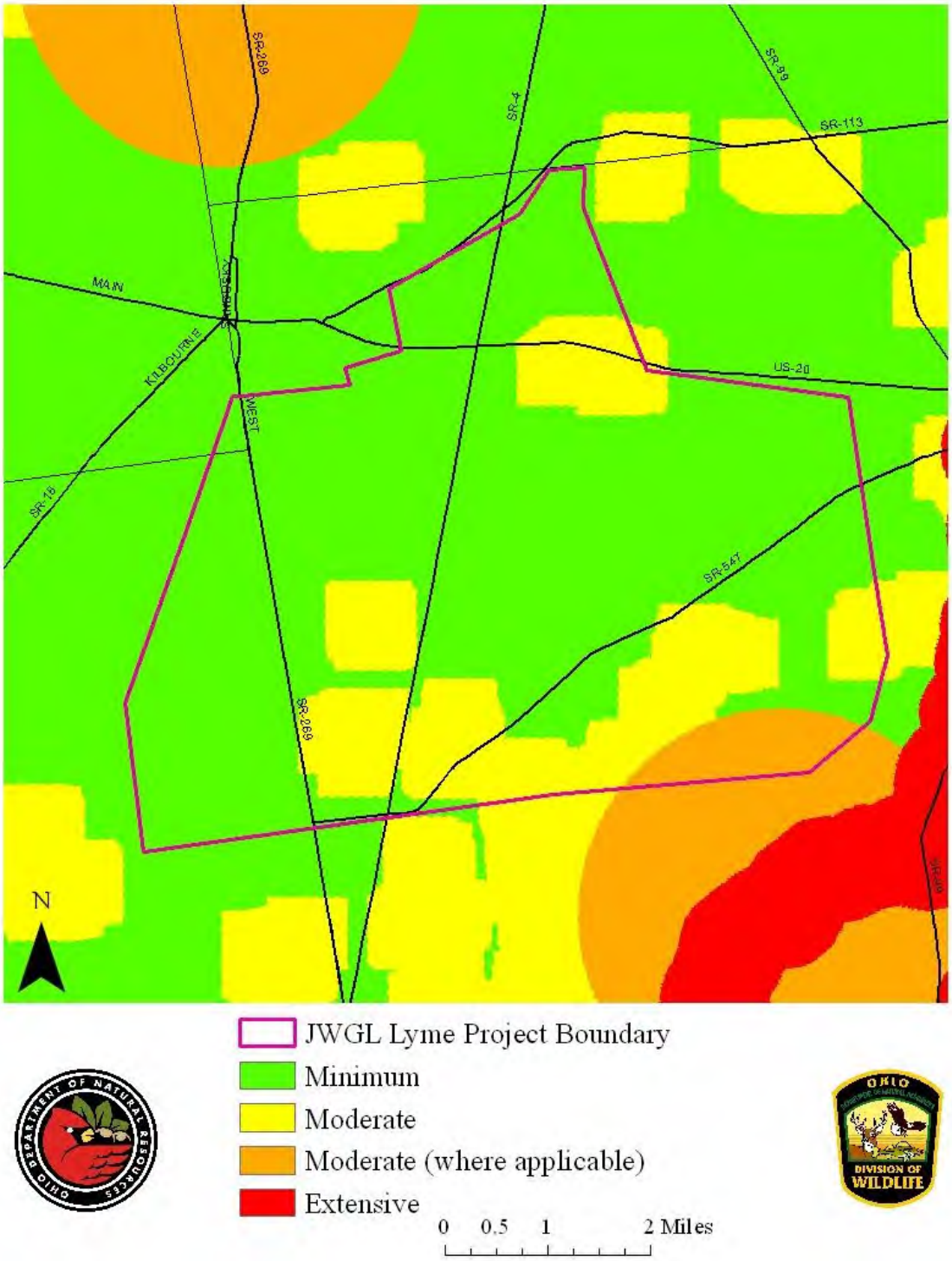
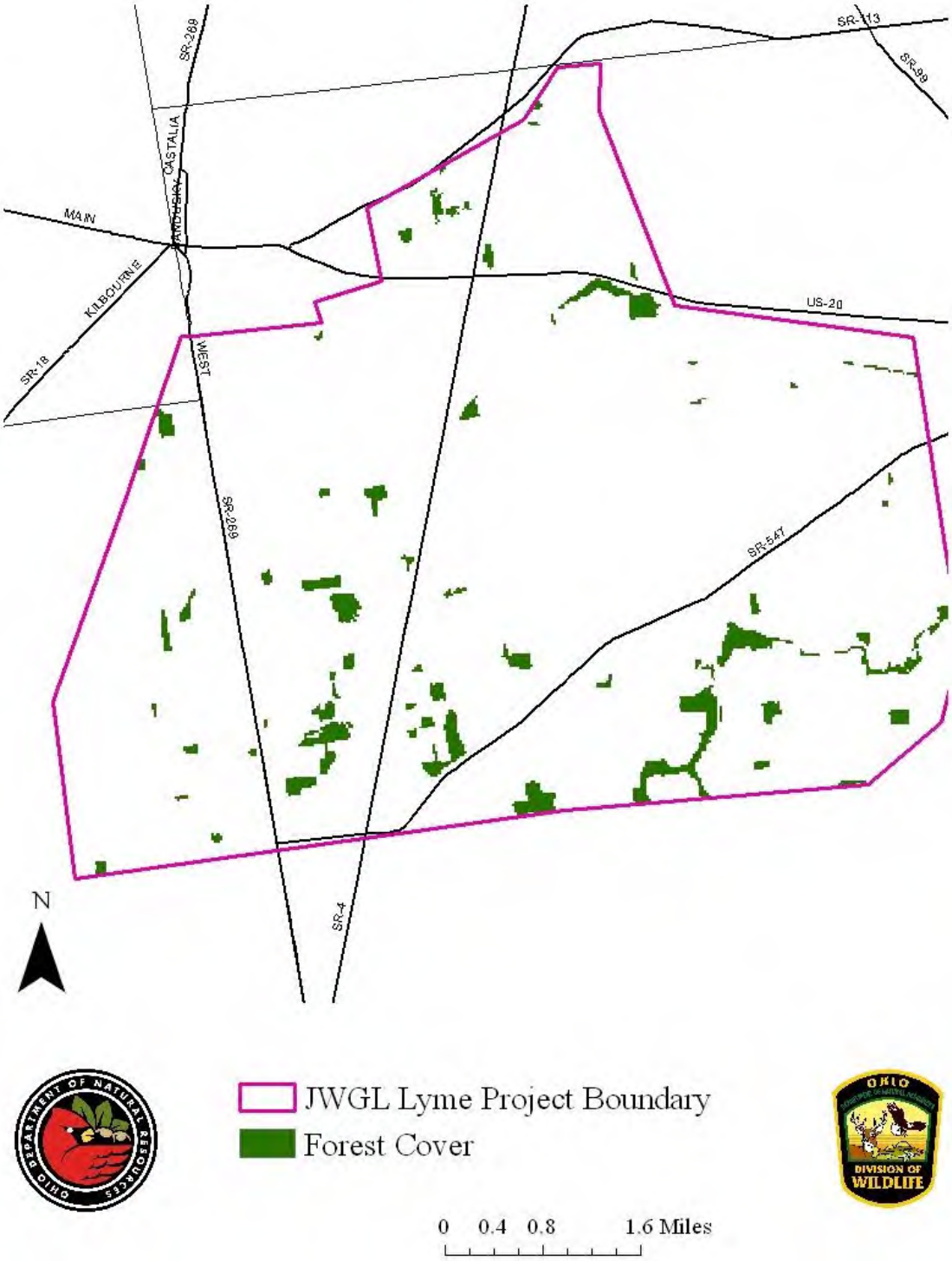


Figure 2. Forest cover with the boundary for juwi Wind's proposed Lyme project.



Ohio Department of Natural Resources
TED STRICKLAND, GOVERNOR SEAN D. LOGAN, DIRECTOR

Division of Wildlife
James A. Marshall, Acting Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

September 30, 2010

To all interested parties,

Based upon the revised project boundary map received on 29 September 2010 and site visit conducted on 7 November 2008, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for JW Great Lake's proposed wind energy project located in Huron and Erie Counties. The DOW has determined that this proposed facility would be classified as a "moderate" effort site under the current monitoring protocols based upon the location and land-use practices (Fig. 1).

The table below was created based upon the project maps provided and summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Brian Mitch at (614) 265-6378 or brian.mitch@dnr.state.oh.us

	Project
Survey type	JWGL Firelands
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. Because agricultural land is not considered to be suitable nesting habitat for most species of bird, turbines placed within these types of habitat are exempt of this recommendation.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.
Raptor nest monitoring	There is at least one nest for a protected species of raptor, a bald eagle nest, on or within 2-miles of the project area. This nest should be monitored in order to

	establish patterns of activity. This information will be used to recommend micro-siting of turbines in such a manner to reduce the likelihood of impacting this state and federally protected species. Any additional discovered during the raptor nest searches should also be monitored.
Bat acoustic monitoring	Monitoring should be conducted at all meteorological towers. As a signatory to the Cooperative Agreement, JWGL may opt not to conduct acoustic monitoring at this site. In exchange, JWGL agrees to not operate turbines when wind speeds are ≤4 m/s (as measured within the rotor swept area) from dusk to dawn, 1 July to 31 October for the life of the facility in order to minimize the likelihood of impacts to bats.
Passerine migration (# of survey points)	Waived
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	N/S
Owl playback survey points	N/S
Barn owl surveys	N/S
Bat mist-netting (# of survey points)	5
Nocturnal marsh bird survey points	N/S
Waterfowl survey points	N/S
Shorebird migration points	N/S
Radar monitoring locations	N/S

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Keith Lott, Wind Energy Wildlife Biologist

Old Woman Creek Nat'l Estuarine Research Reserve and State Nature Preserve
Ohio Division of Wildlife
2514 Cleveland Road East
Huron, OH 44839
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cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service

Figure 1.

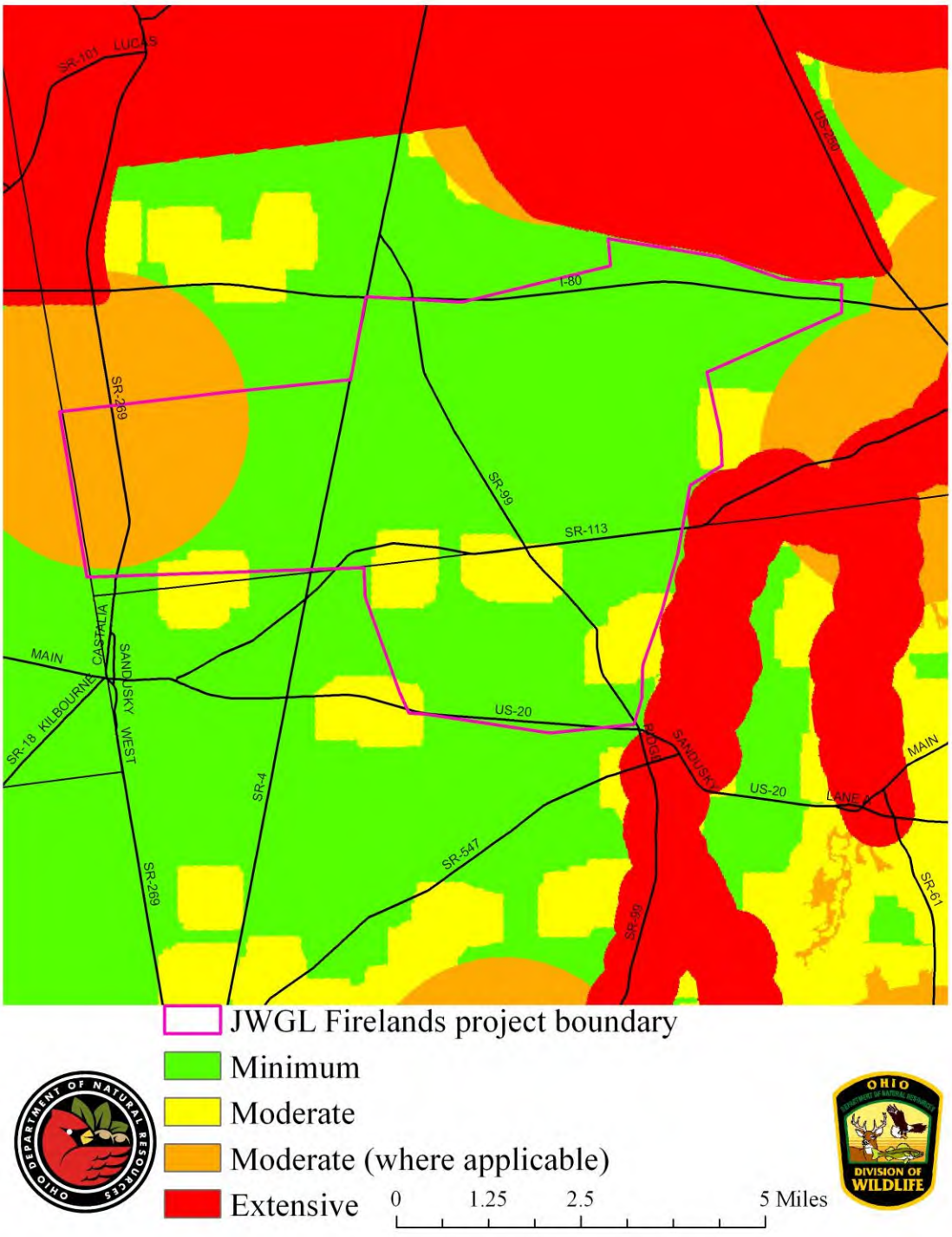
SR-101
LUCAS
US-250
I-80
SR-269
SR-99
SR-113
MAIN
CASTALIA
SANDUSKY
WEST
SR-18
KILBOURNE
US-20
SR-4
SR-269
SR-547
SR-99
SANDUSKY
MAIN
US-20
SR-61
JWGL Firelands project boundary
Minimum
Moderate
Moderate (where applicable)
Extensive
0
1.25
2.5
5 Miles
OHIO DEPARTMENT OF NATURAL RESOURCES
OHIO
DIVISION OF WILDLIFE

Figure 2.

SR-101
LUCAS
US-250
I-80
SR-269
SR-99
SR-113
CASTALIA
MAIN
SANDUSKY
WEST
SR-4
US-20
RIDGE
SANDUSKY
US-20
SR-269
SR-547
SR-99
JWGL Firelands project boundary
Forest cover
0
1
2
4 Miles
OHIO
DIVISION OF WILDLIFE

Exhibit K
USFWS and ODNR Correspondence

5. November 9, 2017 ODNR/USFWS Meeting Summary

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
150 East Gay Street, Suite 2400
Columbus, Ohio 43215
Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

From:	Jennie Geiger
To:	Lott, Keith (keith_lott@fws.gov); Erin Hazelton (Erin.Hazelton@dnr.state.oh.us)
Cc:	Dave Phillips (dave.phillips@apexcleanenergy.com); Sarah Moser (sarah.moser@apexcleanenergy.com); John Arehart III (john.arehart@apexcleanenergy.com)
Subject:	BUSINESS CONFIDENTIAL: Follow Up on Emerson Creek Meeting
Date:	Friday, December 01, 2017 12:46:23 PM
Attachments:	image001.png Emerson Creek_FWS_ODNR Meeting Summary with PPT_2017-11-09.pdf Emerson Creek (pka Firelands)_ProjBoundary.zip Emerson Creek _Active BAEA Nest.kmz

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Hi Keith/Erin –

Thank you for meeting with us last month to discuss the Emerson Creek Wind Project. I have attached meeting notes outlining the topics discussed, as well as the Powerpoint presentation (PPT) presented, for your review and consideration.

I have also attached shps of the revised Project boundary (which has been slightly reduced since the meeting), as well as the location of the recently identified eagle nest for your records and review. Keith, could you please provide us with an updated ½ inter-nest distance for the project based on the current project boundary and nest data?

If you could please confirm receipt due to the large file size I would appreciate it.

Thank you again for your time and helpful input.
Jennie

JENNIE GEIGER
Environmental Permitting Manager

Apex Clean Energy, Inc.
310 4th St NE, Suite 200, Charlottesville, VA 22902
office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712
jennie.geiger@apexcleanenergy.com | www.apexcleanenergy.com

EMERSON CREEK WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Erin Hazelton, ODNR
Jennie Geiger, Apex
Sarah Moser, Apex
Dave Phillips, Apex (via phone)

Notes Prepared by: Apex

Date: December 1, 2017

On November 9, 2017, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to discuss the Emerson Creek (previously known as Firelands) Wind Project (project) in Seneca and Erie Counties, Ohio. The purpose of the meeting was to present a revision to the project boundary, discuss the results of recent additional studies, and determine if wildlife resource information is complete for the project to submit an Ohio Power Siting Board (OPSB) permit application. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint presentation (PPT) was provided and the following is a summary of the topics discussed.

Avian Studies: There was general agreement that avian studies conducted to date are sufficient to adequately assess the current project area and respond to avian risk for purposes of OPSB permit submittal. ODNR confirmed that previous passerine migration, raptor migration, and raptor nest surveys (with supplemental data from 2018) were sufficient to meet ODNR Guidelines for the revised project area. ODNR recommended that additional breeding bird surveys be conducted, with the understanding that these would occur after submittal of the OPSB permit application (planned for Q2 2018). ODNR recommended that Apex enter into a cooperative agreement/memorandum of understanding with the agency.

It was agreed that siting turbines a minimum of ½ inter-nest distance from existing eagle nests is appropriate to minimize risk to the species. USFWS agreed to recalculate the ½ inter-nest distance setback recommendation based on the revised project boundary and current nest data. Apex also plans to review the project and eagle data with to the USFWS Regional Eagle Coordinator to further discuss eagle data and risk minimization measures. Apex committed to completing additional raptor/eagle nest surveys in spring 2018 to inform turbine siting and construction planning.

Bats: Apex presented a review of existing bat information for the project and results from the 2017 mist-net bat surveys. USFWS acknowledged that there have been an extensive number of mist-net surveys completed within this site and surrounding areas (e.g., Plum Brook), all of which indicate absence of Indiana bat within the project and vicinity during summer; thus, the project would present very low risk to this species during summer. There was general agreement that bat studies conducted to date are sufficient for purposes of OPSB permit submittal, and are sufficient to manage bat risk through siting and operational protocols. USFWS requested that Apex provide the acreage of potentially suitable Indiana bat habitat within the unassessed portion of the

project area as shown in PPT slide 13 for their review to determine if additional surveys are warranted in this area.

USFWS recommends the following avoidance and minimization measures to avoid take of Indiana bats and reduce risk to other bat species:

- Feather turbines at wind speeds below 6.9 m/s from 30 mins before sunset to 30 mins after sunrise during spring (Mar 15 – May 15) and fall (Aug 1 – Oct 31) migration.
- Site turbines a minimum of 1,000 feet from potentially suitable Indiana bat habitat within any unsurveyed portions of the project boundary (unless IBAT probable summer absence is confirmed in such habitat via future surveys, which would then remove the siting requirement).
- Unless otherwise approved by USFWS, avoid tree clearing as follows:
    - Within any unsurveyed portions of the project boundary from Oct 1 – May 31 (unless probable IBAT absence is confirmed).
    - Within all surveyed portions of the project boundary from Jun 1 – Jul 31.
- Conduct post-construction monitoring in accordance with ODNR guidelines.

Other: USFWS indicated that there may be potential for eastern massasauga (federally threatened) to occur within the NW corner of the current project area. Based on the minimal impacts planned in wetland habitat and adjacent uplands, USFWS agreed that risk is low. USFWS will inform Apex of known occurrences in the vicinity so that any known occupied potential habitat can be avoided.

Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS (attached).
- USFWS to recalculate ½ inter-nest distance based on boundary revisions and current eagle nest data.
- Apex to provide USFWS with the # of acres of potentially suitable Indiana bat habitat. within the unsurveyed portion of the project area for review and determination if additional surveys are recommended.
- USFWS to provide eastern massasauga data to inform siting.

Attachment 1: Power Point Presentation

Exhibit K
USFWS and ODNR Correspondence

6. February 22, 2017 Survey Recommendation from ODNR

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
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Phone: (614) 591-5461
Email: cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Firelands Wind, LLC

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Raymond Petering, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

February 22, 2017

To all interested parties,

Based upon the revised project boundary map received February 2017, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for Apex's proposed Emerson Creek project located in Huron county.

Currently the project falls within regions of the state that DOW has identified as needing moderate monitoring efforts. The below survey recommendations are based on a GIS analysis of the site. Additionally, it is important to note that the federally and state endangered, Indiana bats (*Myotis sodalis*), as well as the state and federally threatened species, Northern Long-eared bat (*Myotis septentrionalis*), have been captured on or within 5 miles of the proposed project. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Nathan Reardon at Nathan.reardon@dnr.state.oh.us.

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	Please consult with USFWS Ohio FO on bald eagle nests located on or within the proposed project. Any nests should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	20
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	2
Barn owl surveys	NS
Bat mist-netting (# of survey points)	40
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	NS

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact Kate Parsons.

Ohio Division of Wildlife
2045 Morse Road
Columbus, Ohio 43229
Office: 614 265 6329

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Don Rosterfield, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Dave E. Kohler, DOW

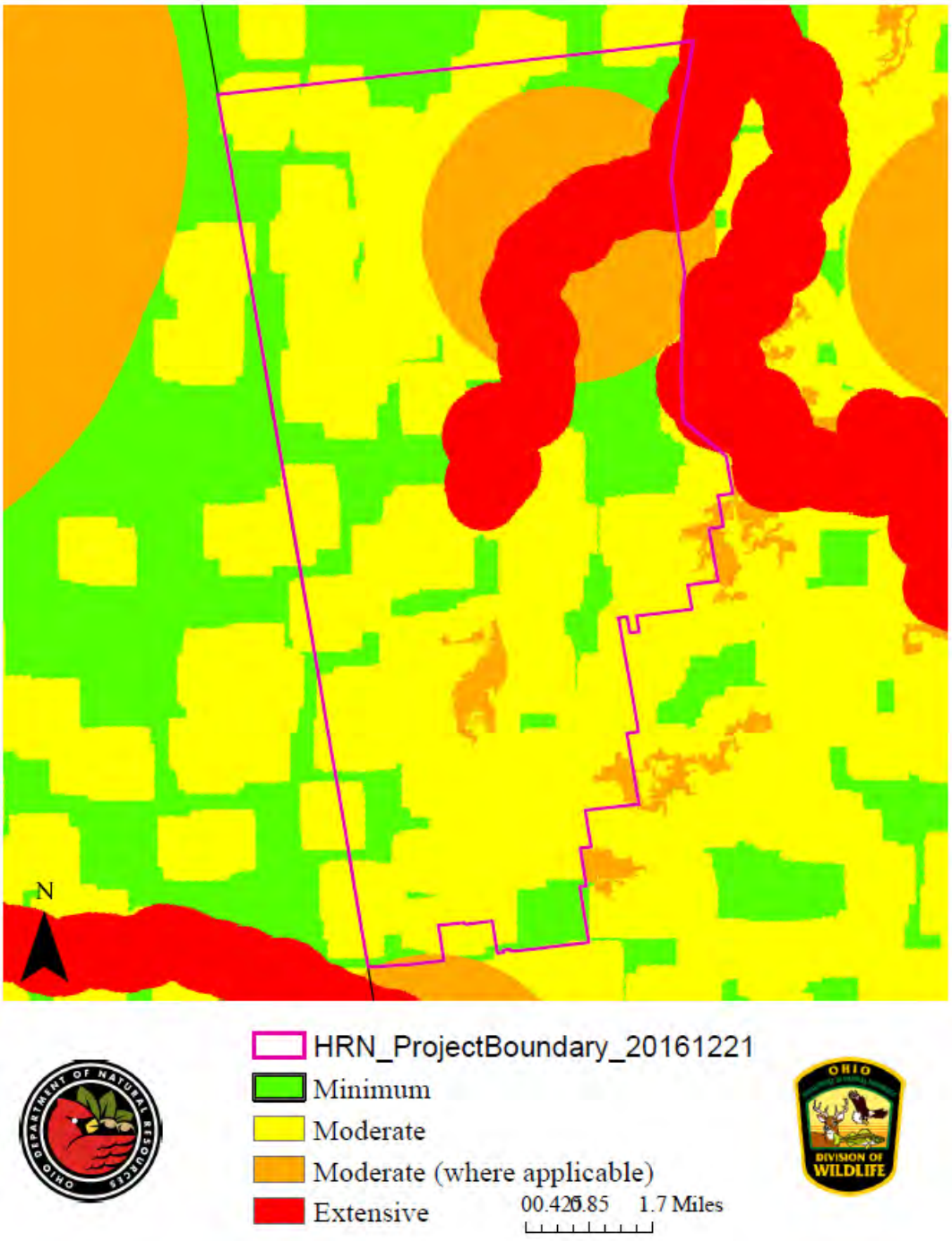

Figure 1. Survey effort map with the revised boundary for Apex's proposed Emerson Creek project.

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Raymond Petering, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

October 20, 2016

To all interested parties,

Based upon the revised project boundary map received on October 2016, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for Apex's proposed Emerson Creek project located in Huron county.

Currently the project falls within regions of the state that DOW has identified as needing extensive monitoring efforts. The below survey recommendations are based on a GIS analysis of the site. Additionally, it is important to note that the federally and state endangered, Indiana bats (*Myotis sodalis*), as well as the state and federally threatened species, Northern Long-eared bat (*Myotis septentrionalis*), have been captured on or within 5 miles of the proposed project. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Nathan Reardon at Nathan.reardon@dnr.state.oh.us.

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	Please consult with USFWS Ohio FO on bald eagle nests located on or within the proposed project. Any nests should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	18
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	2
Barn owl surveys	NS
Bat mist-netting (# of survey points)	36
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	1

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact Kate Parsons.

Ohio Division of Wildlife
2045 Morse Road
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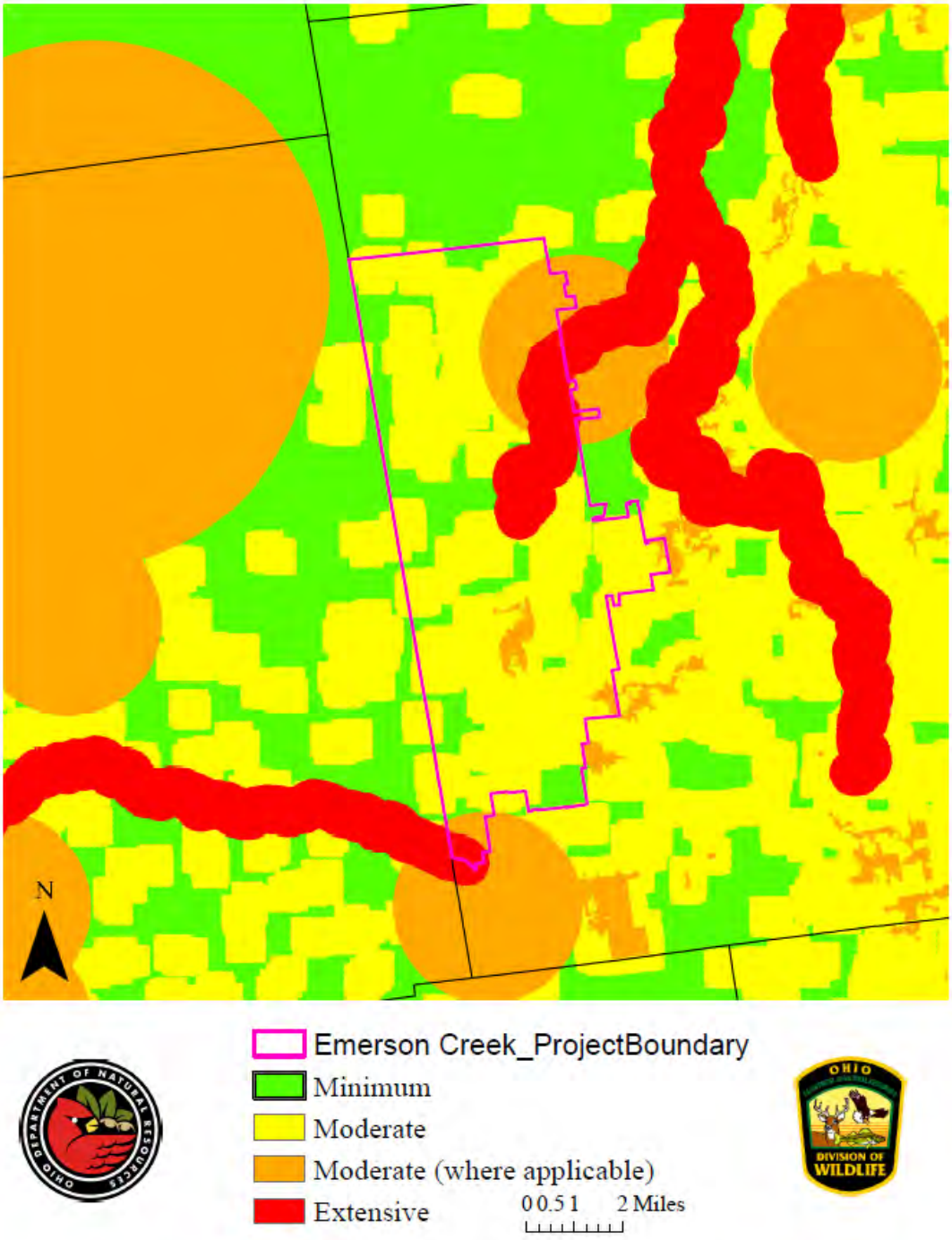
Office: 614 265 6329

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Don Rosterfield, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Dave E. Kohler, DOW

Figure 1. Survey effort map with the revised boundary for Apex's proposed Emerson Creek project.



Ohio Department of Natural Resources
JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife
Scott Zody, Chief
2045 Morse Rd., Bldg. G
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Phone: (614) 265-6300

June 19, 2012

To all interested parties,

Based upon the revised project boundary map received on April 19, 2012, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for Apex's proposed Emerson project located in Huron and Seneca counties.

Currently the revised project falls within regions of the state that DOW has identified as needing extensive monitoring efforts. The below survey recommendations are based on a GIS analysis of the site and a site visit conducted in 2010. Additionally, it is important to note that the federally and state endangered, Indiana bats (*Myotis sodalis*), were captured on or within 5 miles of the proposed project in 2011. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

The table below summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

For additional ODNR comments, including information on the potential presence of threatened and endangered species within or adjacent to your project area, please contact Brian Mitch at (614) 265-6378 or brian.mitch@dnr.state.oh.us

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land it, this requirement may be waived by DOW after a review of the proposed turbine locations is provided.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	There are 2 bald eagle nests located on or within the 2 miles of the proposed project. These pairs should be monitored to assess their daily movement patterns. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within the on-shore protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration (# of survey points)	25
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	2
Barn owl surveys	NS
Bat mist-netting (# of survey points)	50
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	Waived

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Jennifer Norris, Wind Energy Wildlife Biologist
Olentangy Wildlife Research Station
Ohio Division of Wildlife
8589 Horseshoe Road
Ashley, OH 43003
Office phone: 740-747-2525 x 26
Cell: 419-602-3141

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Don Rostofer, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Mr. Brian Mitch, Ohio Department of Natural Resources

Figure 1. Survey effort map with the revised boundary for Apex's proposed Emerson project.

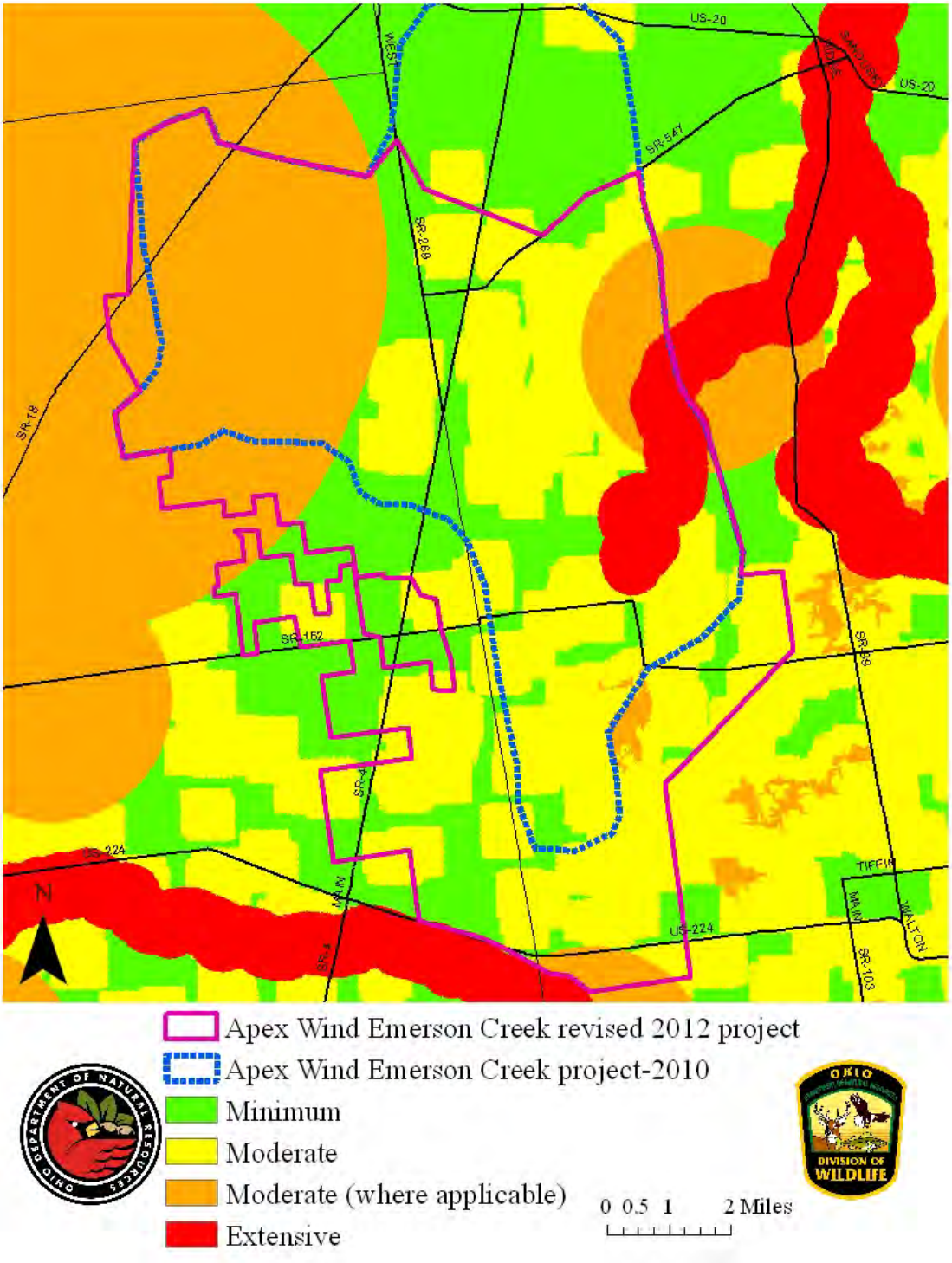
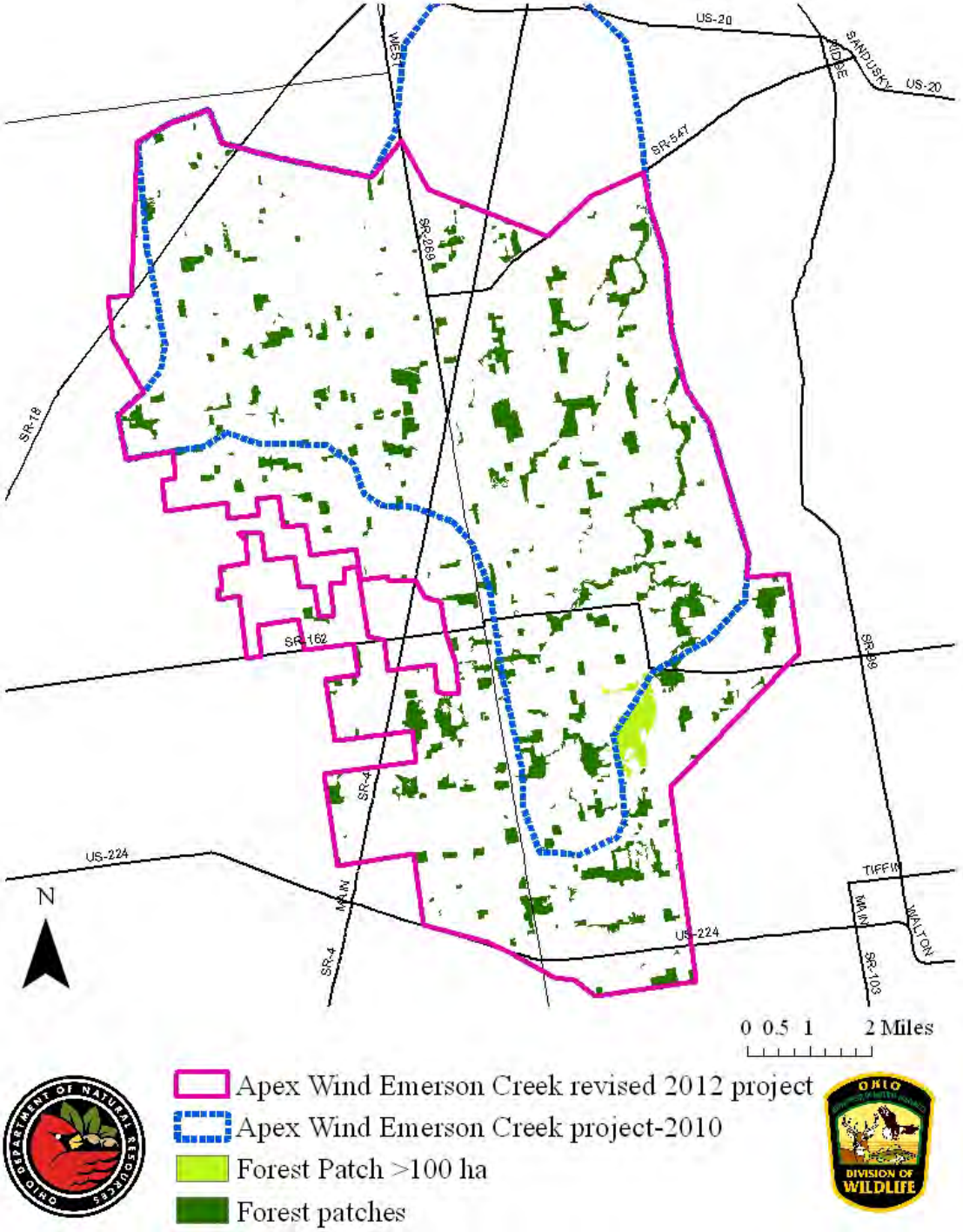


Figure 2. Forest cover within the revised boundary of Apex's proposed Emerson project.



Kevin Davis

From: Lott, Keith [Keith.Lott@dnr.state.oh.us]
Sent: Wednesday, June 09, 2010 3:02 PM
To: Rhett Good; Kevin Davis
Cc: Michelle Ritzert; Megan_Seymour@fws.gov; Siegfried, Stuart
Subject: RE: APEX Emerson Creek (formerly Huron County) Project
Attachments: Emerson Creek DOW survey effort letter 6-9-10.doc

Rhett and Kevin,

Attached are the Division of Wildlife survey recommendations for the Emerson project. Please review, if you have any questions please feel free to give me a call. As for Seneca Caverns, this is a commercial cave, there maybe a few bats that over winter within it. But similar to Ohio Caverns, it is not considered to be a hibernacula. Given that we know there are karst regions within the area, I would suggest contacting leased landowners to inquire about whether there are any caves within the region. If so, I would recommend surveying those to see if they are being used by bats.

Keith

Keith Lott, Wind Energy Wildlife Biologist

Old Woman Creek Nat'l Estuarine Research Reserve and State Nature Preserve
Ohio Division of Wildlife
2514 Cleveland Road East
Huron, OH 44839
Office phone: 419-433-4601
Cell: 419-602-3141
Fax: 419-433-2851

-----Original Message-----
From: Rhett Good [mailto:rgood@west-inc.com]
Sent: Wednesday, June 09, 2010 10:21 AM
To: Lott, Keith; Megan_Seymour@fws.gov
Cc: 'Kevin Davis'; 'Michelle Ritzert'
Subject: APEX Emerson Creek (formerly Huron County) Project

Hello Keith and Megan,

Kevin has asked me to follow-up with you regarding the APEX Emerson Creek project, formerly referred to as the APEX Huron County project. We completed a site visit of the area with you several weeks ago. Since that time, the project boundary has been revised, in part based on the site visit. Please see attached for shapefiles of the revised boundary, and a project map showing the previous and current boundary locations. Please review the current boundary, and provide us with your thoughts regarding wildlife considerations.

I was also curious if you had any records of bats utilizing Seneca Caverns as a hibernacula? Seneca Caverns is located in the NW portion of the current boundary, and is noted as a "quarry" on the attached USGS map.

Thanks in advance for your help.

Rhett E. Good
WEST, Inc.

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Ohio Department of Natural Resources
TED STRICKLAND, GOVERNOR SEAN D. LOGAN, DIRECTOR

Division of Wildlife
James A. Marshall, Acting Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

June 9, 2010

To all interested parties,

Based upon the project boundary map received on 9 June and site visit conducted on 17 February 2010, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared these survey recommendations for Apex Wind Energy's proposed project located in Seneca and Huron Counties.

Though this project area encompasses portions of Slate Run, which has previously been identified as a potential migratory corridor (Fig. 1), the habitat within the proposed project would not be what the DOW considers high quality stopover habitat. After reviewing the project area map provided and examining the potential habitat during the site visit, the DOW has determined that this proposed facility would be classified as a "moderate" site under the current monitoring protocols

The table below was created based upon the project maps provided and summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the "On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

	Project
Survey type	
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. Because agricultural land is not considered to be suitable nesting habitat for most species of bird, turbines placed within these types of habitat are exempt of this recommendation.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.

Raptor nest monitoring	There is 1 bald eagle nest known to be on or within 2 miles of this project area. Monitoring should be conducted to assess the movement patterns of this pair. Any additional nests discovered during the raptor nest searches should be monitored as well.
Bat acoustic monitoring	Acoustic monitoring should be conducted at all meteorological towers.
Passerine migration (# of survey points)	16
Diurnal bird/raptor migration (# of survey point)	1
Sandhill crane migration (same points as raptor migration)	N/S
Owl playback survey points	N/S
Barn owl surveys	N/S
Bat mist-netting (# of survey points)	32
Nocturnal marsh bird survey points	N/S
Waterfowl survey points	N/S
Shorebird migration points	N/S
Radar monitoring locations	N/S

NS = Not required based on the lack of suitable habitat.

If you have any questions, please feel free to contact me.

Keith Lott, Wind Energy Wildlife Biologist

Old Woman Creek Nat'l Estuarine Research Reserve and State Nature Preserve
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2514 Cleveland Road East

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cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service

Figure 1.

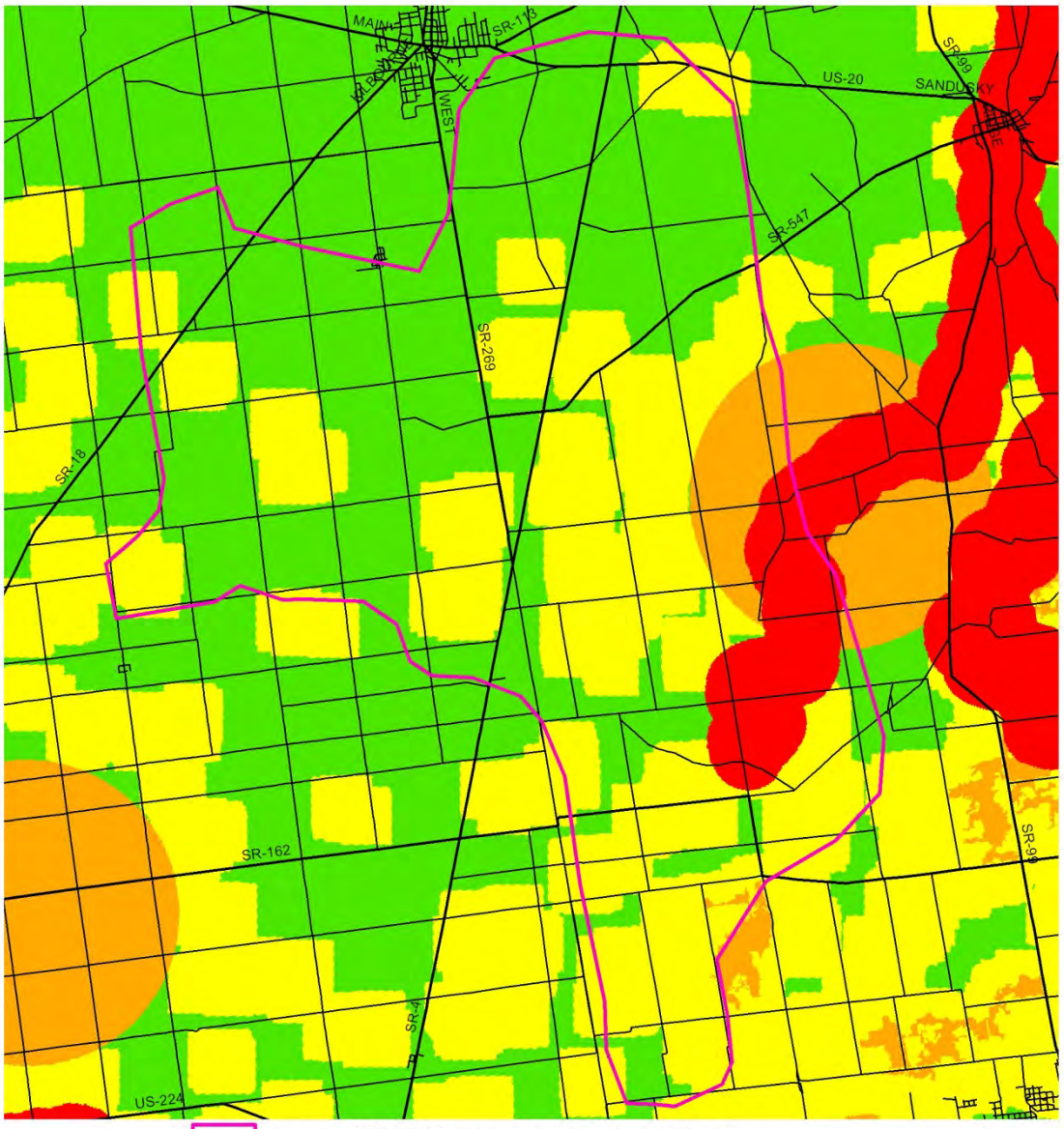
MAIN
SR-113
WEST
US-20
SANDUSKY
SR-99
SR-547
SR-269
SR-18
SR-162
SR-4
US-224
SR-99
Apex Wind Emerson Creek project
Minimum
Moderate
Moderate (where applicable)
Extensive
0
1.25
2.5
5 Miles
OHIO
DIVISION OF
WILDLIFE

Figure 2.

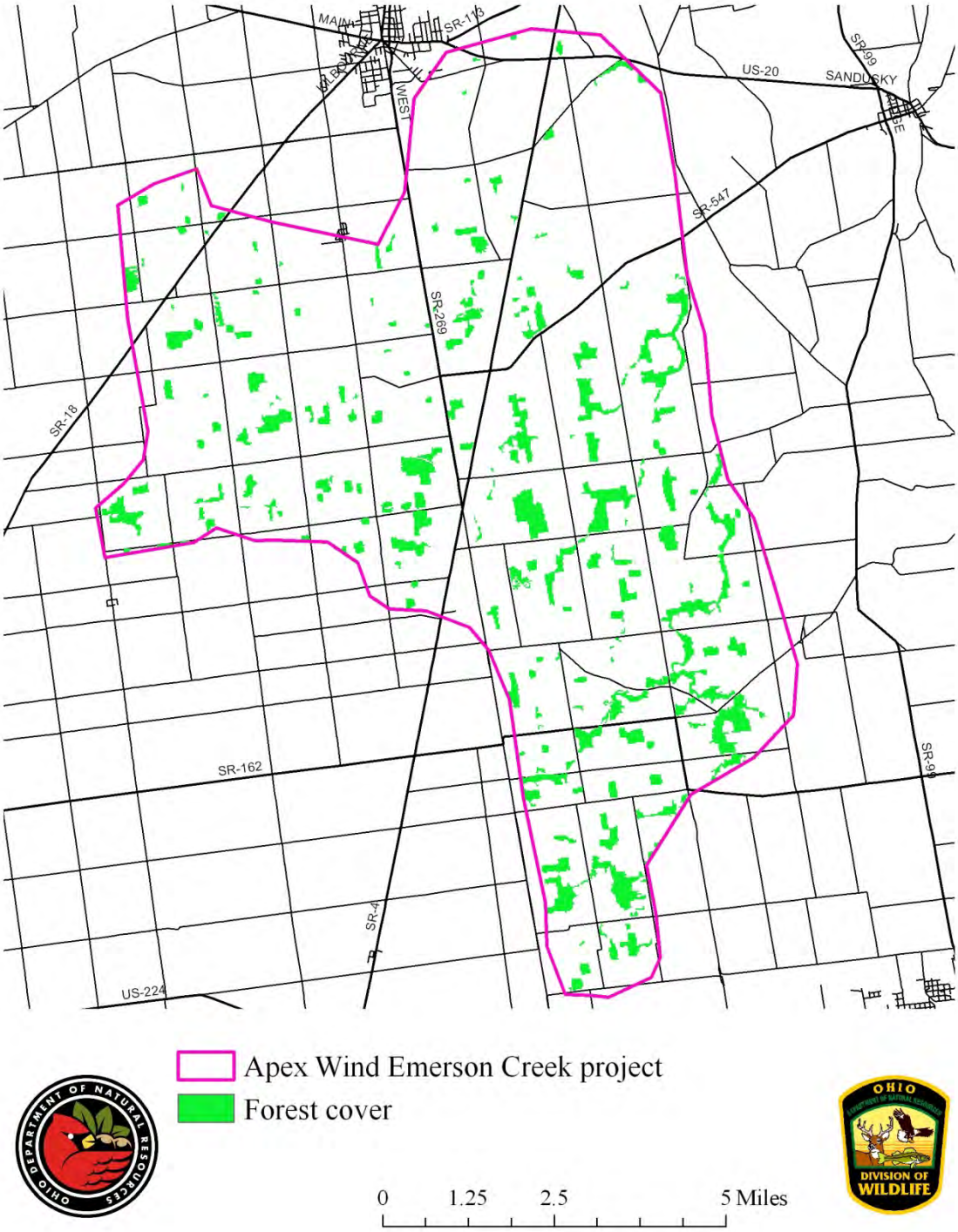
MAIN
SR-113
WEST
US-20
SANDUSKY
SR-99
SR-547
SR-269
SR-18
SR-162
SR-4
US-224
SR-99
Apex Wind Emerson Creek project
Forest cover
0
1.25
2.5
5 Miles
OHIO
DIVISION OF
WILDLIFE

Exhibit K
USFWS and ODNR Correspondence

7. October 27, 2016 ODNR/USFWS Meeting Summary for Firelands Wind Project

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
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Attorneys for Firelands Wind, LLC

Jennie Geiger

From: Kate.Parsons@dnr.state.oh.us
Sent: Monday, November 7, 2016 2:33 PM
To: Jennie Geiger
Subject: RE: BUSINESS CONFIDENTIAL: Firelands Meeting Follow-Up

Hi Jennie, Received. Thanks! Kate

From: Jennie Geiger [mailto:jennie.geiger@apexcleanenergy.com]
Sent: Friday, November 04, 2016 4:05 PM
To: Lott, Keith (keith_lott@fws.gov) <keith_lott@fws.gov>; Parsons, Kate <Kate.Parsons@dnr.state.oh.us>
Cc: Dave Phillips <dave.phillips@apexcleanenergy.com>; John Arehart III <john.arehart@apexcleanenergy.com>; Dalton Carr <dalton.carr@apexcleanenergy.com>
Subject: BUSINESS CONFIDENTIAL: Firelands Meeting Follow-Up

Hi Keith/Kate –

Attached is the summary of our October 27, 2016 meeting, including the Powerpoint presentation discussed. Also attached for your files are the shapefiles for the revised project boundary that we discussed during the meeting.

Please review and let me know if you have any comments. If none, it would be much appreciated if you could please confirm receipt.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

Apex Clean Energy, Inc.
310 4th St. NE, Suite 200, Charlottesville, VA 22902
office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712
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FIRELANDS WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Kate Parsons, ODNR
Jennie Geiger, Apex
Dalton Carr, Apex
Dave Phillips, Apex (by phone)

Notes Prepared by: Apex

Date: November 4, 2016

On October 27, 2016, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to discuss the Firelands Wind Project in Seneca County, Ohio. The purpose of the meeting was to review the current project boundary, discuss the results of wildlife studies completed to date, and agree on next steps necessary for the project to proceed to construction and operations. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint (PPT) presentation was provided and the following is a summary of the topics discussed.

There was general agreement that the material presented in the PPT presentation was accurate and that the studies were completed in accordance with the ODNR requirements and consistent with the UFWS 2012 Guidelines for Land-based Wind Energy Projects and 2013 Eagle Conservation Plan Guidance (ECPG). The survey recommendation letter provided by ODNR on Oct 20, 2016 was discussed, and ODNR concurred that "extensive monitoring effort" requirements would be waived at this site provided that Apex commit to siting turbines outside this area (i.e., the red areas shown on PPT slide 7), although it is likely that underground collection lines and an interconnecting substation will be within this area to connect the project to existing transmission lines.

Avian Studies: Apex presented results from avian studies conducted to date. ODNR stated that the historical raptor migration surveys (2011), breeding bird surveys (2011), and raptor nest surveys (2009-2014) conducted within this project area were sufficient for this site, and both agencies concurred that this site is relatively low risk to birds, including state listed species (e.g., northern harrier) and birds of conservation concern. It was agreed that an additional year of eagle/large bird use data in accordance with the ECPG is appropriate, and that additional surveys (including raptor nest surveys and eagle nest monitoring) are not necessary.

Bats: The group agreed that acoustic bat surveys conducted to date are sufficient meet ODNR and USFWS requirements, and that the data indicate low to average activity levels by bats in general. However, USFWS noted that results of mist-net surveys indicating negative presence/probable absence of Indiana bat (IBAT) are only valid for 2 years and additional surveys are recommended to confirm probable absence of IBAT. Avoidance and minimization measures for Indiana and northern long-eared bats to ensure regulatory compliance were discussed and confirmed as follows:

- Avoid tree removal to extent possible and within 150 feet of northern long-eared bat roosts from June 1 to August 1.
- Curtail all turbines at wind speeds up to 6.9 m/s during spring (Mar 15-May 15) and fall (Aug 1 – Oct 31) migration from 30 minutes before sunset to 30 minutes after sunrise.
- Curtail turbines at wind speeds up to 6.9 m/s within 5 miles of IBAT roost trees (currently no IBAT roosts are known within 5 miles of the project) during summer (May 16 – Jul 31).

Other Wildlife: Apex indicated that a desktop analysis for potentially suitable habitat for eastern massasauga (*Sistrurus catenatus*) is currently being conducted so that Apex can avoid impacts to this habitat if present; no ESA permit warranted.

USFWS and ODNR concurred that no additional species-specific surveys are warranted for state protected species or other wildlife.

Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS.

Attachment 1: Power Point Presentation

Exhibit K
USFWS and ODNR Correspondence

8. October 27, 2016 ODNR/USFWS Meeting Summary for Emerson Creek Wind

Christine M.T. Pirik (0029759)
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Attorneys for Firelands Wind, LLC

From:	Kate.Parsons@dnr.state.oh.us
To:	Jennie Geiger
Subject:	RE: BUSINESS CONFIDENTIAL: Emerson Creek Meeting Follow-Up
Date:	Monday, November 7, 2016 2:33:46 PM
Attachments:	image002.png

Hi Jennie, received. Thanks! Kate

From: Jennie Geiger [mailto:jennie.geiger@apexcleanenergy.com]
Sent: Friday, November 04, 2016 4:05 PM
To: Lott, Keith (keith_lott@fws.gov) <keith_lott@fws.gov>; Parsons, Kate <Kate.Parsons@dnr.state.oh.us>
Cc: Dave Phillips <dave.phillips@apexcleanenergy.com>; John Arehart III <john.arehart@apexcleanenergy.com>; Dalton Carr <dalton.carr@apexcleanenergy.com>
Subject: BUSINESS CONFIDENTIAL: Emerson Creek Meeting Follow-Up

Hi Keith/Kate –

Attached is the summary of our October 27, 2016 meeting, including the Powerpoint presentation discussed. Also attached for your files are the shapefiles for the revised project boundary that we discussed during the meeting.

Please review and let me know if you have any comments. If none, it would be much appreciated if you could please confirm receipt.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

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jennie.geiger@apexcleanenergy.com | www.apexcleanenergy.com

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EMERSON CREEK WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Kate Parsons, ODNR
Jennie Geiger, Apex
Dalton Carr, Apex
Dave Phillips, Apex (by phone)
John Arehart, Apex (by phone)

Notes Prepared by: Apex

Date: November 4, 2016

On October 27, 2016, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to discuss the Emerson Creek Wind Project in Seneca County, Ohio. The purpose of the meeting was to review the current project boundary, discuss the results of wildlife studies completed to date, and agree on next steps necessary for the project to proceed to construction and operations. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint (PPT) presentation was provided and the following is a summary of the topics discussed.

There was general agreement that the material presented in the PPT presentation was accurate and that the studies were completed in accordance with the ODNR requirements and consistent with the UFWS 2012 Guidelines for Land-based Wind Energy Projects and 2013 Eagle Conservation Plan Guidance (ECPG). The survey recommendation letter provided by ODNR on Oct 20, 2016 was discussed, and ODNR concurred that "extensive monitoring effort" requirements would be waived at this site provided that Apex adjust the project boundary to exclude the southern tip (i.e., the red area shown on PPT slide 7).

Avian Studies: Apex presented results from avian studies conducted to date. ODNR stated that the historical raptor migration surveys (2010-2011), owl surveys (2012-2013), breeding bird surveys (2012), and raptor nest surveys (2009-2014) conducted within this project area were sufficient for this site, and both agencies concurred that this site is relatively low risk to birds, including state listed species (e.g., northern harrier) and birds of conservation concern. It was agreed that an additional year of eagle/large bird use data in accordance with the ECPG is appropriate, and that additional surveys (including raptor nest surveys and eagle nest monitoring) are not necessary.

Bats: The group agreed that acoustic bat surveys conducted to date are sufficient meet ODNR and USFWS requirements, and that the data indicate low to average activity levels by bats in general. However, USFWS noted that results of mist-net surveys indicating negative presence/probable absence of Indiana bat (IBAT) are only valid for 2 years and additional surveys are recommended to confirm probable absence of IBAT. Avoidance and minimization measures for Indiana and northern long-eared bats were discussed and confirmed as follows to ensure regulatory compliance:

- Avoid tree removal to extent possible and within 150 feet of northern long-eared bat roosts from June 1 to August 1.
- Curtail all turbines at wind speeds up to 6.9 m/s during spring (Mar 15-May 15) and fall (Aug 1 – Oct 31) migration from 30 minutes before sunset to 30 minutes after sunrise. Curtail turbines at wind speeds up to 6.9 m/s within 5 miles of IBAT roost trees (currently no IBAT roosts are known within 5 miles of the project) during summer (May 16 – Jul 31).

Other Wildlife: Apex indicated that a desktop analysis for potentially suitable habitat for eastern massasauga (*Sistrurus catenatus*) is currently being conducted so that Apex can avoid impacts to this habitat if present; no ESA permit warranted.

USFWS and ODNR concurred that no additional species-specific surveys are warranted for state protected species or other wildlife.

Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS.

Attachment 1: Power Point Presentation

Exhibit K
USFWS and ODNR Correspondence

9. August 29, 2016, et al., correspondence Apex and USFWS

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Attorneys for Firelands Wind, LLC

From: Lott, Keith
To: Jennie Geiger
Subject: Re: BUSINESS CONFIDENTIAL: Emerson Creek Boundary
Date: Monday, August 29, 2016 7:29:24 AM
Attachments: Emerson_agle_nest_buffer_8_29_2016.pdf

Jennie et al,

The Service has previously provided comments on these projects individually. The information below provides answers to your specific questions. If you'd like a technical assistance letter that covers both projects let me know.

Bald eagle nests. The 1/2 inter-nest distance for this project is 1.18 miles. After buffering the project area by this distance there are 3 eagle nests that fall within that boundary (see attached map).

The nearest Indiana bat roost is the one at the Republic project (~ 5 miles to the west). There is also an acoustic detection at NASA's Plumbrook facility. Mist-netting has been conducted at this facility several times and no Indiana bats have been captured. Thus we believe that this is not likely a maternity colony, and indicates only occasional use. The nearest hibernacula is in Preble County, approximately 121 miles away. Indiana bats have been captured at a swarm site in Summit County (65 miles to the east), but the cave is not accessible to confirm that they hibernating within this cave.

There are numerous summertime captures of northern long-eared bats within the project boundary. The nearest confirmed roost trees are at the NASA Plumbrook facility. The site in Summit County would be the nearest known hibernacula for this species.

Eastern massasauga are known to occur in Richmond township in Huron County, thou not within the project area. If suitable habitat exists within the project area we'd request that a survey be conducted to determine whether or not massasauga are present in the project area.

If you have any questions let me know.

Keith

On Mon, Aug 22, 2016 at 3:16 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

> Hi Keith -
>
> Apex is developing the Emerson Creek Wind Project in Huron and Erie Counties Ohio (shapefiles of the proposed project area are attached and a snip is included below). Could you please provide me with any data or local knowledge on listed bat roosts and hibernacula, eagle nests, and any other federal listed species that are known to occur within the appropriate assessment area for each species based on this boundary, as well as provide the distance to the nearest hibernacula and maternal roost for bats?
>
> I would also like to get a meeting scheduled for September to discuss this project, the studies conducted to date, and next steps. Are there any weeks in September that would not work for you? I will send out a doodle poll to everyone to lock down a specific date once I have a general idea of when in the month will/will not work.

Thanks,
Jennie

[cid:image001.jpg@01D1FC79.FAD7E3F0]

JENNIE GEIGER
Environmental Permitting Manager

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[cid:image001.png@01CE6DB9.0BF695D0]<http://www.apexcleanenergy.com/>

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--
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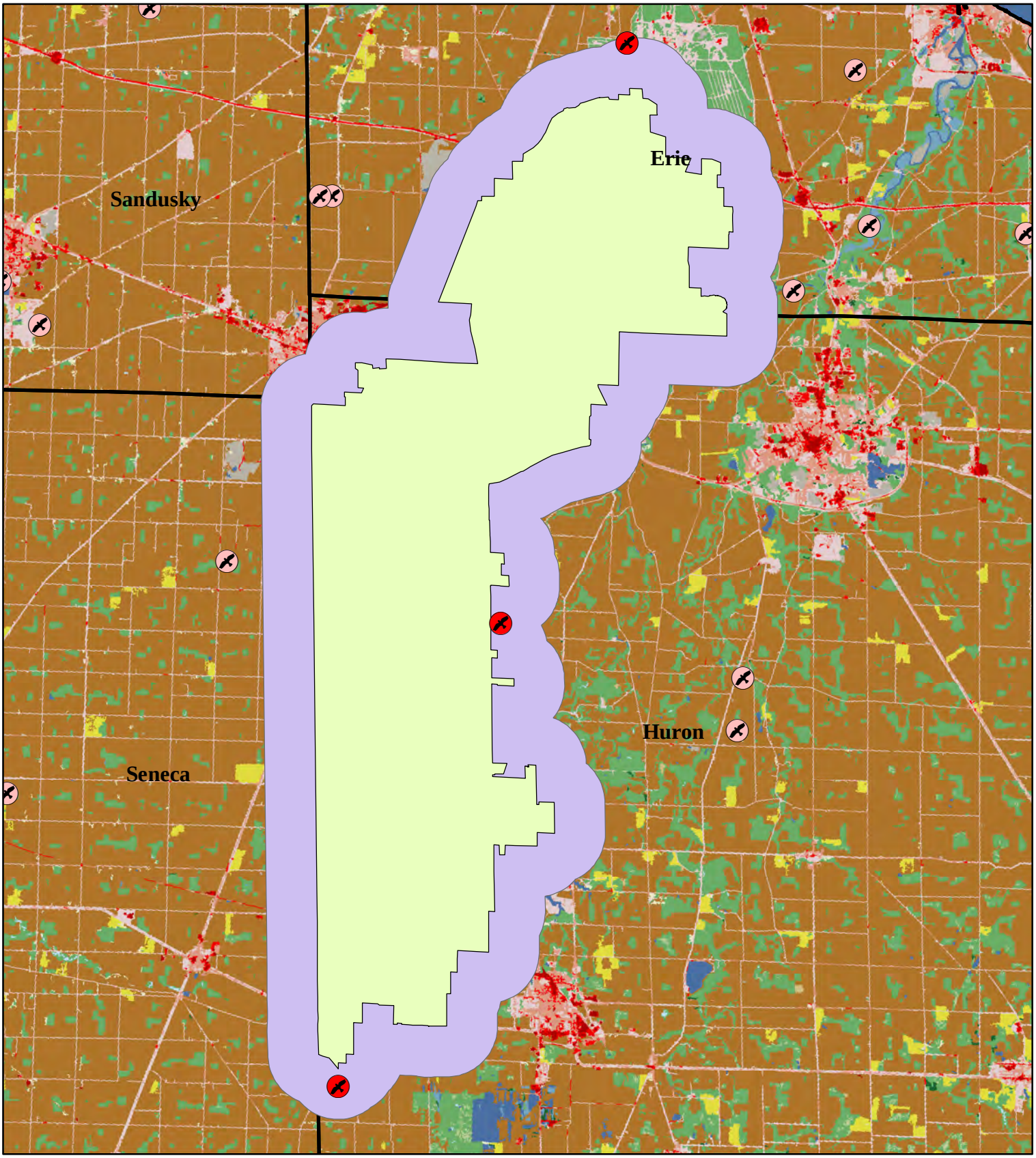

Eagle nests within buffer

Status

- Confirmed
- Unconfirmed

HRN_ProjectBoundary_20160810

1/2 eagle nest distance buffer

Bald eagle nest

Status

- Confirmed
- Unconfirmed

Exhibit K
USFWS and ODNR Correspondence

10. May 22, 2014 ODNR/USFWS Meeting Summary

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Attorneys for Firelands Wind, LLC

FIRELANDS WIND PROJECT - AGENCY MEETING SUMMARY

Meeting Attendees:	Keith Lott, USFWS Jenny Norris, ODNR Chris Mensing, USFWS (by Phone) Dave Phillips Apex John Arehart, Apex Laura Nagy, Tetra Tech
Notes Prepared by:	Apex
Date:	June 10, 2014

On May 22, 2014, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR) to discuss the Firelands Wind Project in Huron County and Erie County, Ohio. The goal of the meeting was to continue agency coordination on the project, discuss project schedule and data collected to date for bats and eagles, and review permitting recommendations for special status bats and bald eagles.

The meeting was held at the USFWS Ohio Ecological Services Field Office in Columbus, Ohio. Apex presented the attached Power Point presentation and received USFWS and ODNR technical input and recommendations. The following is a summary of the topics discussed:

- Project Status, Drivers, Issues
- Bat Studies and Risk
- Bald Eagle Studies and Risk
- Permitting and Schedule
- Next Steps

Bats

There was general agreement that the absence of Indiana bat (IBAT) and presence of northern long-eared bat was confirmed per the 2011 mist netting survey; however, USFWS noted that the negative presence/probable absence survey finding for IBAT was valid for a minimum of 2 years. Thus, these results may be considered expired by USFWS and need to be refreshed to confirm no risk of summer take of IBAT during operations. Also, given that NLEB is likely present, USFWS indicated that additional data would also be needed to understand roosting and foraging behavior on the site should the species be listed.

Should the project go forward with a voluntary Habitat Conservation Plan (HCP) and Incidental Take Permit (ITP) or required Endangered Species Act, Section 7 review under the National Environmental Policy Act (NEPA) analysis of the anticipated bald eagle take permit application, additional mist netting and telemetry data may be required to inform the process (e.g., population information, movement and roosting behavior). Given that NLEB is likely present, USFWS indicated that additional data would also be needed to understand roosting and foraging behavior on the site should the species be listed and an HCP/ITP or Section 7 process be necessary.

USFWS and ODNR noted that an acoustic IBAT detection was recently obtained in the Plum Brook NASA lands located approximately 3.5 miles north of the project. APEX will avoid turbine siting within 5-miles of this bat detection location, if necessary to maintain an absence determination for IBAT on the Firelands project.

Seasonal Risk - Seasonal risk and impact avoidance measures were discussed as follows:

- Fall: Currently fall IBAT and NLEB risk is assumed and impact avoidance would be considered complete if turbines were curtailed at windspeeds < 6.9m/s from Aug 1 to October 31.
- Spring - Currently IBAT and NLEB risk is assumed and impact avoidance would be considered complete if turbines were curtailed at windspeeds < 6.9m/s from Apr 1 to June 1.
- Summer - IBAT and NLEB risk is assumed; however, USFWS would not commit to acceptane of a 6.9 m/s curtailment threshold to consider risk discountable. This is inconsistent with other field offices in the Region and USFWS was not able to provide data to support this position; therefore, Apex looks forward to further discussion of this topic.

Other expectations for impact avoidance would be seasonal tree clearing (winter only) and minimizing the extent of tree clearing for project design and construction.

The possibility of USFWS providing a Technical Assistance Letter to avoid impacts to listed bats during construction and operations until take authorization was obtained through an HCP/ITP or Section 7 process was discussed and is considered a viable approach by USFWS and ODNR. It was agreed that the HCP/ITP would thus only need to address operational impacts.

With regard to ODNR's commenting on Ohio Power Siting Board (OPSB) permitting process, it was suggested that additional data may be necessary for ODNR to deem the application complete. Apex indicated that they intend to submit an application to the OPSB in late summer or fall.

ODNR is to provide recommended number and locations for mist netting surveys as soon as possible.

It was agreed that a monthly call is appropriate at this time to enable effective coordination on bats and regulatory compliance. The first follow-up call to discuss bat surveys and next steps is scheduled for Thursday, June 12, 1 pm ET.

Eagles

USFWS noted that the data collected to date is sufficient for development of a defensible Eagle Conservation Plan (ECP), take permit application and USFWS NEPA review.

USFWS indicated that past take model runs done by USFWS estimated 2.5 eagles/yr; however, it was understood that the project boundary, layout and take model have changed since then, and

that only a subset of the existing info would be used for the planned ECP. Therefore, a permit is recommended for the project.

FWS noted that a nest not present in Apex's survey data is known on the Plum Brook NASA lands, but that the project turbines will be over 3 miles from this nest, which is an acceptable distance to avoid risk of impacts.

Schedule

The following schedule was discussed as potentially viable for OPSB, HCP/ITP and ECP/Eagle Take Permitting to accommodate a Q2 2015 construction start.

Bat Studies	Jun - Jul 2014
HCP Development	Jul - Dec 2014
OPSB Application Submittal	Sep 2014
ECP Prep	Jun – Sep 2014
ECP Final and Eagle Permit Application Submittal	Oct 2014
Eagle NEPA	Oct 2014 – Oct 2015
HCP/ITP Application Submittal	Dec 2014
TAL Issued	Jan 2015
OPSB Complete	Sep 2015
Bat ITP Issued	Sep 2015
Eagle permit issued	Sept 2015

USFWS noted concerns about the ECP and eagle permitting schedule given the lack of staffing and funds for additional staffing to support the effort. However, USFWS noted that the complexity of this permit is expected to be low and therefore is willing to work to prioritize schedule as best as possible.

Action Items:

- Apex to send a meeting invite for follow-up call for bats – scheduled 1pm ET, Thurs, June 12, 2014
- Apex to send a meeting invite for follow-up call for eagles– scheduled 2pm ET, Tues, June 17, 2014
- Apex to send final bald eagle survey report to OPSB
- ODNR to provide Apex with bat survey expectations (# of sites) as soon as possible

Attachment 1: Power Point Presentation

Exhibit K
USFWS and ODNR Correspondence

11. April 27, 2011 USFWS Project Review and correspondence

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
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Attorneys for Firelands Wind, LLC

McIlvain, Douglas

From: Melanie_Cota@fws.gov
Sent: Tuesday, April 19, 2011 2:14 PM
To: McIlvain, Douglas; Krivos, Matthew C.; Myers, Paul
Cc: Norris, Jennifer; matthew_stuber@fws.gov
Subject: Re: Eagle Nest and Point Count Locations

Thanks Doug. I am in the process of finishing up a letter for the Firelands and Lyme project since it looks like FWS has not provided initial recommendations for either project. We calculated the inter nest distance for these projects and it looks like there are 29 bald eagle nests within 10 miles of the projects however, the inter nest distance came out to be 2 miles (which fits nicely with ODNR recommendations!). So only nests within 2 miles of the projects that would need nest monitoring according to the draft ECP guidelines would include the 1 nest within the Firelands project boundary (NW corner) and the 1 nest located approximately 1.3 miles south of the Lyme project on the eastern side of the project boundary. The nest is located just south of Pontiac Section Line Rd and west of SR 99. I will include a map in my letter for your reference. The other nests to the east of the Firelands project are now located outside the 2 mile radius (inter nest distance). We still recommend following Appendix C of the Draft ECP guidelines to include fixed point counts within the project areas and an assessment of eagle concentration areas but we can discuss more on the call tomorrow.

Thanks! ~MC

Melanie Cota
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Working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

"McIlvain, Douglas" <Douglas.McIlvain@tetratech.com>

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04/19/2011 01:27 PM

To"Norris, Jennifer" <Jennifer.Norris@dnr.state.oh.us>, "Melanie_Cota@fws.gov" <Melanie_Cota@fws.gov>

cc

SubjectEagle Nest and Point Count Locations

Jennifer & Melanie,

It is my understanding that the State of Ohio will not provide the exact coordinates for the known eagle nests. So in preparation for our call tomorrow, I will be forwarding you our map showing the eagle nests we have identified and are currently monitoring along with our eagle point count locations. We are in the process of confirming that we have updated all the locations, and will get you the figure probably tomorrow morning. We were able to identify and confirm the two nests along the Huron River that we had previously not been able to access. Hopefully, you can review our map with your information to let us know if we have missed any nests.

Thank you,

Douglas J. McIlvain, CHMM
Senior Project Manager

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

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April 27, 2011

COPY FOR YOUR INFORMATION

Matt Krivos
JUWI Wind, LLC
629 Euclid Ave, Suite 635
Cleveland, OH 44114

TAILS : 31420-2011-TA- 0625

Re: Firelands and Phase 2 Lyme Wind Power Projects in Erie, Sandusky, Huron and Seneca Counties

Dear Mr. Krivos:

This letter is in response to the revised Firelands and newly proposed Phase 2 Lyme wind power project in Erie, Sandusky, Huron and Seneca Counties, Ohio. The project areas appear to be a mix of agricultural land with scattered forested areas throughout. The project areas are within ½ mile- 1 mile west of the Huron River. The Firelands project northeast boundary abuts the Lake Erie Western Important Bird Area (IBA). The Firelands project is located approximately 1.5 miles west of the Milan State Wildlife Area. We understand the Firelands and Phase 2 Lyme project is proposed for approximately 100 MW each, including between 100-120 turbines. According to a letter from the Ohio Department of Natural Resources (ODNR) dated September 30, 2010, the Division of Wildlife (DOW) has determined that the Firelands project would be classified as a "moderate" site under the current monitoring protocols based upon the location and land-use practices. In addition, a letter from the ODNR dated April 16, 2011; the DOW has determined the Lyme project would also be classified as "moderate" site.

The following comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws. The Service has been working closely with ODNR DOW to develop recommended survey protocols and site evaluations that will satisfy both state and federal wildlife statutes, and this letter describes these measures, in part. The protocols, "On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio" are available on ODNR's website at:
http://www.dnr.state.oh.us/Home/wild_resourcessubhomepage/ResearchandSurveys/WildlifeWind/tabid/21467/Default.aspx
We encourage and appreciate your early coordination with both ourselves and ODNR, and recommend continued collaboration on this project to ensure wildlife issues are fully and appropriately addressed.

The Service supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotor-swept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power

generation as a wildlife-friendly, renewable source of power, development sites with comparatively low bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife.

WATER RESOURCE COMMENTS:

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to the aquatic resource. If water resources will be impacted, the Buffalo District of the U.S. Army Corps of Engineers should be contacted for possible need of a Section 404 permit.

ENDANGERED SPECIES COMMENTS:

Because of the potential for wind power projects to impact endangered bird, bat, or other listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be authorized through the initiation of formal consultation if a Federal agency is involved; or if a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During the winter Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

Indiana Bat Maternity Habitat

There are no positive records for Indiana bat captures within Erie, Sandusky, Huron and Seneca Counties and in addition, there are no records within 10 miles of the proposed project boundaries. This may reflect more a function of low survey effort rather than the relative abundance of the species. The project areas appear to be a mix of agricultural land with scattered forested areas throughout, with a number of forested

areas exceeding 50-100 acres. It appears that suitable summer foraging and roosting habitat for the Indiana bat likely exists within the project area.

Mist Net Surveys: Based on ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, a total of 5 mist net surveys have been requested for the Firelands project and 6 mist net surveys for the Lyme project. The Service agrees that this is an appropriate level of effort for the proposed project boundaries. The surveys must be conducted by a permitted surveyor (see attached list) and be designed and conducted in coordination with the Endangered Species Coordinator for this office. Survey effort should follow ODNR's protocols, which exceed the Service's standard protocol. The highest quality Indiana bat habitat areas within the project area should be selected for mist netting. We recommend that any Indiana bats captured, especially reproductively active females, be monitored through radio-tracking to determine roost locations and foraging patterns. If an Indiana bat is captured, this office shall be notified within 24 hours, or by the next business day.

Radio Transmitters: Up to four Indiana bats should be fitted with radio transmitters and tracked to roost site(s) and foraging areas until daily activity patterns are fairly well established, or as long as the transmitter remains attached and activated. Preference shall be given to tracking female bats, though one male Indiana bat may be tracked if captured prior to capturing four female Indiana bats. Please see the ODNR's protocols for additional information on radio tracking non-Indiana bats.

Acoustic Surveys: Bat acoustic monitoring is to be conducted at all meteorological towers within the project areas, with 1 unit positioned at 5 meters off the ground and 1 unit within the rotor swept area. Met towers should be erected within both phases of the project to ensure adequate coverage of the project areas. We recommend regular inspection of the AnaBat detectors throughout the survey period to ensure proper functioning.

The results of all bat surveys should be coordinated with this office prior to initiation of any work. Based on the results of the mist net survey, we will evaluate potential impacts to the Indiana bat from the proposed project. If sufficient information is not provided to document that take is unlikely, authorization of incidental take either through Section 7 or Section 10 of the Endangered Species Act of 1973, as amended, will be necessary.

Hibernacula Habitat

The project area lies within an area primarily underlain with Silurian and Devonian carbonate bedrock, indicating that the presence of caves is possible, and several identified karst areas are found within the project area. Please see the Ohio Department of Natural Resources, Division of Geological Survey Ohio Karst Areas Map (www.dnr.state.oh.us/portals/10/pdf/karstmap.pdf,), for additional information. If caves or sinkholes are present within the project area, we recommend further coordination with this office to determine if surveys of these areas are recommended.

Indiana Bat Migratory Habitat

Wind energy facilities in various habitat types across the U.S. and Canada have been documented to cause "widespread and often extensive fatalities of bats" (Arnett *et al.* 2008), primarily during the fall *migratory* season. Further, Indiana bat mortality has been detected at a wind power facility in Indiana, confirming suspicions that fall migrating Indiana bats are also susceptible to mortality from wind turbines. At this time, research into the mechanisms that cause mortality of bats at wind power sites is still ongoing, and few operational tools exist to avoid and minimize take — feathering of turbines during times when bats are most at risk has been shown to reduce mortality in some situations. Based on this, we are advising all operating wind farms and wind farms in planning stages within the range of the listed bats that lethal take is a possibility without curtailment of operations at night during the migratory period regardless of

whether summer habitat is present or if Indiana bats are detected during summer mist netting. Due to the potential of take during spring and fall migration, we recommend developers evaluate their exposure to the prohibitions of ESA. This is a risk management decision the developer must make. The Service advises you to consider the following two options to ensure violations of the Endangered Species Act (ESA) Section 9 take prohibition do not occur:

1) Feather turbines during low wind speed conditions at night during the fall and spring migratory seasons as a way to proactively and definitively avoid take of Indiana bats (and other species of bats as well). Based on the Indiana bat Draft Recovery Plan First Revision (Service, 2007), fall migration generally occurs between August 1 and October 15, and spring migration generally occurs between April 1 and May 15.

2) Wind facility developers can work with the Service to apply for an Incidental Take Permit by submitting a Habitat Conservation Plan (HCP), as required under Section 10 of the Endangered Species Act. A HCP can be used to address Indiana bat presence during both summer foraging and migration periods. A HCP does typically require some time and survey effort to complete. Alternatively, you may consider joining in the regional effort to develop a wind power HCP to address Indiana bats and other listed species.

If you plan to implement either of these two options, please contact us for further information.

The proposed project lies within the range of the federally listed endangered **piping plover** (*Charadrius melodus*), as well as the federally threatened **eastern prairie fringed orchid** (*Platanthera leucophaea*), **Lakeside daisy** (*Hymenoxys herbacea*), and **Lake Erie Watersnake** (*Nerodia sipedon insularum*). Due to the location of the proposed project areas, impacts are not anticipated for these species.

The proposed project lies within the range of the **Kirtland's warbler** (*Dendroica kirtlandii*), a federally listed endangered species. The Kirtland's warbler is a small blue-gray songbird with a bright yellow breast. This species migrates through Ohio in the spring and fall, traveling between its breeding grounds in Michigan, Wisconsin, and Ontario and its wintering grounds in the Bahamas. During migration, individual birds usually forage in low vegetation and stay in one area for a few days. This species prefers shrub habitat and the Service recommends a habitat assessment for these project areas to see if surveys are warranted. If habitat is present with the project boundary, pre-construction survey methods should be coordinated with the Service and ODNR and surveys should be conducted in the spring season from April 15- June 1 and fall season from August 1- October 15. Any sightings should be reported to the Service within 24 hours, or the next business day. Survey results will be evaluated to document the extent to which the proposed project may affect the Kirtland's warbler.

The project lies within the range of the **eastern massasauga** (*Sistrurus catenatus catenatus*), a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. Your proactive efforts to conserve this species now may help avoid the need to list the species under the Endangered Species Act in the future. Due to their reclusive nature, we encourage early project coordination to avoid potential impacts to massasaugas and their habitat. At a minimum, project evaluations should contain delineations of whether or not massasauga habitat occurs within project boundaries.

The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. For additional information on the eastern massasauga, including project

management ideas, please visit the following website:
http://www.fws.gov/midwest/Endangered/lists/candidat.html or contact this office directly. There is known population north of the project boundary in Margaretta Township, Erie County. This population is less than 1 mile from the project Firelands boundary however, the current status of this population is unknown. The Service suggests conducting a habitat assessment within the project area to determine if appropriate habitat is present. If habitat is present within the project area, surveys may be warranted and will need to be coordinated with this office.

The proposed project lies within the range of the **rayed bean** (*Villosa fabalis*), a freshwater mussel that is currently proposed for listing as federally endangered. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). Should the proposed project directly or indirectly impact any of the habitat types described above, we recommend that a survey be conducted to determine the presence or probable absence of rayed bean mussels in the vicinity of the proposed site. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the FWS recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented. The U.S. Fish and Wildlife Service's (FWS) Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seeks to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

At this time, we continue to encourage existing and proposed wind developments to follow current Service recommendations on wind power siting and construction (*Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003).* The Service also encourages developers to coordinate with Service biologists regarding their projects. Proper coordination will help developers make informed decisions in siting, constructing, and operating their facilities. Additionally, the Service hopes to work cooperatively with wind developers to advance the state of the art of wind power siting, construction, and operation. Advancements in these areas will represent great strides towards the environmentally safe development of this otherwise renewable and clean source of energy.

The Service and ODNR have worked together to develop a recommended bird survey protocol for wind turbine projects. The details of the protocol are provided in ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. ODNR has documented that the project area qualifies for "moderate" survey effort due to the proximity to possible migratory bird high use areas. We recommend implementation of the ODNR bird survey protocol to document baseline bird use of the project area. Bird survey results will be interpreted to determine if

potential risk to birds is relatively high or low in various portions of the project area. Based on survey results we may make recommendations as to turbine placement and operation, or pre- or post-construction monitoring.

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). On February 8, 2011, the U.S. Fish and Wildlife Service released the Draft Voluntary, Land-Based Wind Energy Guidelines that have now been published in the Federal Register and are now open for public comment until May 19, 2011. The Guidelines can be found at: http://www.fws.gov/windenergy. Until those guidelines are final, the Service recommends following the 2003 Interim Guidelines. We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;

2) Rank potential sites by risk to wildlife;

3) Avoid placing turbines in documented locations of federally-listed species;

4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations. (i.e., rookeries, leks, State or Federal refuges, staging areas, wetlands, riparian corridors, etc.) Avoid known daily movement flyways and areas with a high incidence of fog, mist or low visibility;

5) Avoid placing turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;

6) Configure turbine arrays to avoid potential avian mortality where feasible. (i.e., group turbines and orient rows of turbines parallel to known bird movements) Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;

7) Avoid fragmenting large, contiguous tracts of wildlife habitat. Wherever practical, place turbines on lands already disturbed and away from intact healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas;

8) Minimize roads, fences, and other infrastructure. Wherever possible, align collection lines and access roads to minimize disturbance;

9) Develop a habitat restoration plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. (i.e., avoid attracting prey animals used by raptors;

10) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities. Avoid placing external ladders and platforms on tubular towers to minimize perching/nesting. Avoid use of guy wires for turbine or meteorological tower supports. All existing guy wires should be marked with bird deterrents. (Avian Power Line Interaction Committee 1996);

11) If taller turbines (top of rotor-swept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable;

12) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

13) Wherever feasible, place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds. Use recommendations of the Avian Power Line Interaction Committee (1996) for any required above-ground lines, transformers, or conductors;

The full text of the guidelines is available at http://www.fws.gov/habitatconservation/wind.pdf. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

BALD AND GOLDEN EAGLE COMMENTS:

Bald and golden eagles are included under the Migratory Bird Treaty Act, but are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). The Service recently issued a final rule that authorizes issuance of eagle take permits, where the take to be authorized is associated with otherwise lawful activities. If take of bald eagles is likely, based on the best information available, a bald eagle take permit for this project will be necessary. There is a known bald eagle nest located within the northwest corner of the Firelands project boundary. We understand that some monitoring of this nest was conducted in 2010. In addition, the proposed Lyme Phase 2 project boundary has a bald eagle nest located approximately 1.3 miles south of the project boundary on the eastern side of the project. There are also 3 other bald eagle nests located north (2.2 miles) and east (2.4 and 2.5 miles) of the Firelands project boundary. Raptor nest searches and nest monitoring should be conducted in accordance with ODNR's survey protocol to identify any raptors, including bald eagles that may nest or migrate within or near the project area. The results of this survey should be coordinated with this office.

On February 8, 2011, the U.S. Fish and Wildlife Service released the Draft Eagle Conservation Plan Guidance that have now been published in the Federal Register and are available for public comment until May 19, 2011. The Guidelines can be found at: http://www.fws.gov/windenergy. The Draft Eagle Conservation Plan Guidance was developed to provide interpretive guidance to wind developers, Service biologists who evaluate potential impacts on eagles from proposed wind energy projects, and others in applying the regulatory permit standards as specified by the Bald and Golden Eagle Protection Act and other federal laws. Appendix C of the Draft Eagle Conservation Plan Guidance suggests a monitoring protocol for wind projects that is more extensive that ODNR's current protocol. This guidance suggests a way to estimate relative abundance and eagle exposure rates, characterization of the project area nesting population, and eagle migration and concentration areas. While this guidance is still draft, we believe that it deserves careful attention, as it lays out a proposed process for evaluating risk to eagles from wind power projects and developing an eagle conservation plan, in support of applying for a permit to authorize take. Monitoring data should be interpreted to document potential risk to eagles. If take of eagles is likely, a bald eagle take permit will be necessary.

COORDINATION OF SURVEY RESULTS:

Please submit survey results to this office for review. Survey results will be interpreted to determine areas with relatively low bat and bird activity/diversity as opposed to areas with relatively high bat and

bird activity/diversity. Based on the survey results, we may make recommendations as to turbine placement and operation, additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, additional permits under the Bald and Golden Eagle Protection Act, or pre- or post-construction monitoring.

POST CONSTRUCTION MONITORING:

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. We recommend that the post-construction monitoring protocol be developed based on the results of pre-construction monitoring, and look forward to working with the project proponent to develop this document.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Melanie Cota at extension 15 in this office if I can be of further assistance.

Sincerely,

for Mary Knapp, Ph.D.
Supervisor

Cc: Ms. Jennifer Norris, ODNR, Olentangy Wildlife Research Station, Ashley, OH
Mr. Brian Mitch, ODNR, REALM, Columbus, OH
Mr. Doug McIlvain, Tetra Tech, 250 W Court St. 200W, Cincinnati, OH 45202

Attachment: USFWS Permitted Indiana bat Surveyors in Ohio

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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March 22, 2011

USFWS permittees for Indiana bat surveys in Ohio*

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Apogee Environmental Consultants, Inc. Joel Beverly P.O. Box 338 Ermine, KY 41815 (606) 633-7677 / FAX (606) 632-2626 apogee_env@bellsouth.net	**Appalachian Technical Services** P.O. Box 3537 6741 Indian Creek Road Wise, VA 24293 (276) 328-4200 / FAX (276) 328-4900 wise@atsone.com
BHE Environmental 11733 Chesterdale Road Cincinnati, OH 45246 (513) 326-1500 / FAX (513) 326-1550 ktyrell@bheenvironmental.com	**Eric Britzke** 112 Cherokee Trail Clinton, MS 39056 (870) 261-3666 Eric.R.Britzke@usace.army.mil
Timothy Carter Ball State University Department of Biology, CL 121 Muncie, IN 47306-0440 (765) 285-8842 / FAX (765) 285-8804 tccarter@bsu.edu	**Civil & Environmental Consultants** Katie Dunlap 8740 Orion Place, Suite 100 Columbus, OH 43240 (614) 710-0175 / (888) 598-6808 FAX (614) 540-6638 kdunlap@cecinc.com 3600 Park 42 Drive, Suite 130B Cincinnati, OH 45241-2072 (513) 985-0226 / (800) 759-5614 333 Baldwin Road Pittsburgh, PA 15205-9702 (412) 429-2324 / (800) 365-2324 FAX (412) 429-2114
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Marlo Perdicas 9186 Baer Road Marshallville, OH 44645	**Pittsburgh Wildlife & Environmental, Inc.** Neil Bossart 853 Beagle Club Road McDonald, PA 15057 (724) 796-5137 nbossart@windstream.net
Redwing Ecological Services, Inc. Benjamin Deetsch 129 South Sixth Street Louisville, KY 40202 (502) 625-3009 FAX (502) 625-3077 kfuchs@rewing.win.net	**Stantec Consulting Services, Inc.** Jeff Brown 11687 Lebanon Road Cincinnati, OH 45241 (513) 842-8205 / FAX (513) 842-8250 jeff.brown@stantec.com Bob Madej 1500 Lakeshore Drive, Suite 100 Columbus, OH 43204 (614) 486-4383 / FAX (614) 486-4387 robert.madej@stantec.com James Kiser 1901 Nelson Miller Parkway Louisville, KY 40223 (502) 212-5000 / FAX (502) 212-5055 james.kiser@stantec.com
Lynn Robbins Southwest Missouri State University Department of Biology 901 South National Avenue Springfield, MO 65804-0095 (417) 836-5366 FAX (417) 836-4204 lwr704f@smsu.edu	
Merrill Tawse 791 Woodland Road Mansfield, OH 44906 (419) 756-1203 / cell (419) 989-2335 mtawsebats@yahoo.com	**Third Rock Consultants, LLC** Rain Storm 2514 Regency Rd., Suite 104 Lexington, KY 40503 (859) 977-2000 / FAX (859) 977-2001 mforee@thirdrockconsultants.com
John Timpone 427 Terrington Drive Ballwin, MO 63021 (417) 894-5554 wanderingwolverine13@yahoo.com	**Tragus Environmental Consulting** Mike Johnson Endangered Species Consultants 37 North Highland Avenue Akron, OH 44303 (330) 472-7013 mike@tragusinc.com

Brianne Lorraine Walters Dept. of Ecology and Organisimal Biology Indiana State University Terre Haute, IN 47809 (812) 237-8294 / FAX (812) 237-2526 bwalters2@isugw.indstate.edu	**Western Ecosystems Technology, Inc.** Stephen Brandebura 2003 Central Avenue Cheyenne, WY 82001 (307) 634-1756 / FAX (307) 637-6981 sbrandebura@west-inc.com
John O. Whitaker, Jr. Department of Life Sciences Indiana State University Terre Haute, IN 47809 (812) 237-2383 / FAX (812) 237-2526 jwhitaker3@isugw.indstate.edu	

*This list reflects permit data available as of March 22, 2011, and is subject to periodic revision to reflect permit changes

Exhibit K
USFWS and ODNR Correspondence

12. March 1, 2010 USFWS Project Review and correspondence

Christine M.T. Pirik (0029759)
(Counsel of Record)
Terrence O'Donnell (0074213)
William V. Vorys (0093479)
Dickinson Wright PLLC
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Attorneys for Firelands Wind, LLC

Kevin Davis

From: Megan_Seymour@fws.gov
Sent: Tuesday, June 15, 2010 10:00 AM
To: Rhett Good
Cc: 'Lott, Keith'; Kevin Davis; 'Michelle Ritzert'
Subject: Re: APEX Emerson Creek (formerly Huron County) Project
Attachments: pic13169.gif

Rhett and Kevin,
Our letter dated March 1, 2010 is still relevant. Keith's recent email specified the number of mist net surveys for Indiana bats based on the revised project boundary. There is an eagle nest within 2 miles of the site and therefore eagle use of the project area should be monitored to document if take is likely. We have come up with some more specific eagle monitoring suggestions--these are pasted below for your consideration. Let me know if you have any questions.
Megan

Megan Seymour
Wildlife Biologist
U.S. Fish & Wildlife Service
4625 Morse Rd.
Suite 104
Columbus, OH 43230
(614) 416-8993 ext. 16
(614) 416-8994 fax

Pre-construction eagle monitoring recommendation

Note: The US Fish and Wildlife Service (Service) does not currently have any "final" eagle monitoring recommendations for the proper sting and operation of wind developments. At this time, the Service continues to recommend siting and operating wind turbines within the guidelines outlined in our published *Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003.* Some of the monitoring recommendations provided below have been take from the internal *Draft Implementation Guidance for Eagle Take Permits Under 50 DFR 22.26 and 50 CFR 22.27,* dated March 2010. As better information and data become available on this topic, the Service hopes to further enhance these guidelines to be in the best interests of our nation's wildlife and the environmentally safe development of this otherwise renewable and clean source of energy.

The following should be done for a minimum of one year prior to development for the nest near the site:

Document the location of the bald eagle nest(s), and their important foraging and roosting areas.

1) Document the productivity of the eagle nest.

2) In addition to habitat that is documented to be used by eagles, identify any potentially important local eagle habitat (nest trees, roost sites, undeveloped shoreline, bodies of water with abundant foraging opportunities, etc).

3) Record daily movements and habitat use patterns of breeding and wintering eagles (adults and juveniles) in relation to the proposed turbine location and to differing weather conditions.

4) Identify any eagle migration events that may occur within or near the project area.

5) If any other eagles are observed within the project area, they should also be monitored as described above and below.

<u>Objectives</u> of monitoring:

1) Knowledge of eagle nest, foraging area, and roosting area locations, will allow the developer to site any wind turbine away from these areas. Specifically, developers should avoid siting turbines anywhere **near** or **between** any nest, foraging site, and/or roosting site, as eagles likely travel and hunt around, within, and between these locations with a high frequency.

2) Additionally, knowledge of the daily movements of eagles will allow the developer to avoid siting turbines **within** or **near** common flight paths (aka flight corridors).

3) Knowledge of habitat use and movements in differing weather conditions is important because, as weather conditions change, eagle habits and movements may also change. This information will be important for the developer to know both in siting and operation of turbines.

4) Knowledge of potentially important habitat (suitable nest trees, roost site, good foraging habitat, etc.) will not only allow the developer to site wind turbines away from these resources, but also to ensure they are conserved during the physical construction of the development *(see recommendations in the Bald Eagle Management Guidelines)*.

<u>Tips</u> to appropriately gather the above information:

1) Spend no less than 20 days during each breeding season and 20 days during each winter collecting this information (more if necessary to gather sufficient data and in all weather conditions). This will give you the best chance at documenting all important areas and habitat usage.

2) Breeding season movement and habitat use information should be gathered throughout the breeding season (early March to late August)to document any habitat use changes between different stages of breeding – incubation, hatching/rearing, and fledging.

3) Winter movement and habitat use information should be gathered between the end of the breeding season and mid-February, when breeding season begins again.

These recommendations are intended to be a “starting point” for a developer in their pre-construction monitoring for bald and golden eagles. Ultimately, it is the responsibility of the developer to conduct their own **sufficient** monitoring for eagles and to site any wind turbines at the most appropriate location to avoid take of eagles. Additionally, if a turbine(s) is constructed, it is the responsibility of the developer to operate it in a manner that is safe for eagles and all wildlife, and, thus, consistent with the laws and guidelines that protect these wildlife species. If, based on the monitoring conducted, it is determined that take of eagles is likely from construction or operation of the turbines, we may request an additional year of monitoring, and further coordination with the U.S. Fish and Wildlife Service will be necessary.

"Rhett Good" <rgood@west-inc.com>

"Rhett Good" <rgood@west-inc.com>	To"'Lott, Keith'" <Keith.Lott@dnr.state.oh.us>, <Megan_Seymour@fws.gov>
06/09/2010 10:20 AM	cc"'Kevin Davis'" <kevin@apexwind.com>, "'Michelle Ritzert'" <mritzert@west-inc.com>
	SubjectAPEX Emerson Creek (formerly Huron County) Project

Hello Keith and Megan,

Kevin has asked me to follow-up with you regarding the APEX Emerson Creek project, formerly referred to as the APEX Huron County project. We completed a site visit of the area with you several weeks ago. Since that time, the project boundary has been revised, in part based on the site visit. Please see attached for shapefiles of the revised boundary, and a project map showing the previous and current boundary locations. Please review the current boundary, and provide us with your thoughts regarding wildlife considerations.

I was also curious if you had any records of bats utilizing Seneca Caverns as a hibernacula? Seneca Caverns is located in the NW portion of the current boundary, and is noted as a "quarry" on the attached USGS map.

Thanks in advance for your help.

Rhett E. Good
WEST, Inc.

CONFIDENTIALITY NOTICE: This message and any accompanying communications are covered by the Electronic Communications Privacy Act, 18 U.S.C. §§ 2510-2521, and contain information that is privileged, confidential or otherwise protected from disclosure. If you are not the intended recipient or an agent responsible for delivering the communication to the intended recipient, you are hereby notified that you have received this communication in error. Dissemination, distribution or copying of this e-mail or the information herein by anyone other than the intended recipient, or an employee or agent responsible for delivering the message to the intended recipient, is prohibited. If you have received this communication in error, please notify us immediately by e-mail and delete the original message. Thank you.[attachment "PrjMapwPreviousPBoundary_ODNR.pdf" deleted by Megan Seymour/R3/FWS/DOI] [attachment "PrjBoundary_ECreek.zip" deleted by Megan Seymour/R3/FWS/DOI]

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

March 1, 2010

Mr. Kevin Davis
Apex Wind Energy, Inc.
Queen Charlotte Bldg.
212 East High St.
Charlottesville, VA 22902

TAILS# 31420-2010-TA-0422

Dear Mr. Davis:

This is in response to your February 18, 2010 site visit to the proposed Apex Wind Energy's Huron project, located in portions of Thompson, Reed, and Venice Townships, Seneca County, and Lyme, Sherman, Norwich, and Richmond Townships, Huron County, Ohio. We understand you may consider expanding the project area to the east further than indicated in the information you initially provided. The proposed project involves the installation of an unspecified number of wind turbines, and associated collection lines, access roads, substations, and other infrastructure. The project area is predominantly rural and agricultural with some woodlots and forested riparian corridors scattered throughout. Woodlots are significantly more concentrated in the south and eastern portions of the project area.

The following comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws. The U.S. Fish and Wildlife Service (Service) has been working closely with the Ohio Department of Natural Resources (ODNR) Division of Wildlife to develop recommended survey protocols and site evaluations that will satisfy both state and federal wildlife statutes, and this letter describes these measures, in part. We appreciate your early coordination with both ourselves and ODNR, and recommend continued collaboration on this project to ensure wildlife issues are fully and appropriately addressed. As you are aware, ODNR has developed an On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio (ODNR's protocols). Based on the habitat within the project area, this project qualifies as a "moderate" survey effort under ODNR's protocols. The Service agrees that this level of effort is sufficient to document wildlife use of the project area. However, prior to finalizing the specific number of survey points required under ODNR's protocols, a final project area boundary should be provided to ODNR and the Service.

The Service supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotoswept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly, renewable source of power, development sites with comparatively low

bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife.

WATER RESOURCE COMMENTS:

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to the aquatic resource. If water resources will be impacted, the Buffalo District of the Corps of Engineers should be contacted for possible need of a Section 404 permit.

ENDANGERED SPECIES COMMENTS:

Because of the potential for wind power projects to impact endangered bird, bat, or other listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be authorized through the initiation of formal consultation, if a Federal agency, is involved; or if a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During the winter Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

The Service currently has no records for Indiana bats within Seneca and Huron Counties, however suitable summer habitat for the Indiana bat exists within the project area. Additionally, wind power developments within Pennsylvania, West Virginia, and other states are known to cause take of relatively large numbers of bats, therefore further assessment of the bat community within the project area is warranted to determine if take of bats is likely to occur.

Mist Net Surveys: Based on the revised project boundaries to be provided, ODNR's protocols will recommend a specific number of mist net surveys for the project area that is consistent with the Service's Indiana bat mist net survey protocol. We recommend that the highest quality Indiana bat habitat areas within the project area be selected for mist netting. Mature woodlots greater than 100 acres in size with permanent water sources should be the primary focus of mist net surveys. Service biologists would be happy to aid in identification and selection of suitable mist net sites, if necessary. Please note that Indiana bat surveys may only be conducted by individuals with a Federal permit (**please see attached list**). If an Indiana bat is captured, this office shall be notified within 24 hours, or by the next business day.

Radio Transmitters: Up to four Indiana bats should be fitted with radio transmitters and tracked to roost site(s) and foraging areas until daily activity patterns are fairly well established, or as long as the transmitter remains attached and activated. Preference shall be given to tracking female bats, though one male Indiana bat may be tracked if captured prior to capturing four female Indiana bats. Please see ODNR's protocols for additional information on radio tracking non-Indiana bats.

Acoustic Surveys: Acoustic monitoring should be conducted at all meteorological towers within the project area and follow ODNR's protocols.

Regardless of the results of the mist net surveys, it is important to note that Indiana bat mortality was recently detected at a wind power facility in Indiana. The mortality occurred during the fall migration period, and the project area where the mortality occurred was composed of agricultural fields and did not support suitable Indiana bat summer habitat (forests). This indicates that take of Indiana bats from wind turbines during the fall and possibly during the spring migration seasons could occur at any wind power facility within the range of the Indiana bat. At this time the Service is developing range-wide recommendations for wind power facilities for which take of Indiana bats is only likely to occur during the migration periods. The Service will provide all wind power developers in Ohio these recommendations when they become available. In the meantime, developers may want to consider the following two options to ensure violations of the Endangered Species Act (ESA) Section 9 take prohibition do not occur:

1) Feather turbines during low wind speed conditions at night during the fall and spring migratory seasons as a way to proactively and definitively avoid take of Indiana bats (and other species of bats as well). Based on the Indiana bat Draft Recovery Plan First Revision (Service, 2007), fall migration generally occurs between August 1 and October 15, and spring migration generally occurs between April 1 and May 15.

2) Alternatively, work with the Service to develop a valid research program for your facility during the migration seasons. Then apply for an ESA Section 10(a)(1)(A) Enhancement of Survival permit that would allow for legal possession of Indiana bat fatalities during the research program. The details of such a research program may vary according to sites, but in general would include operating the turbines under various regimes and conducting fatality searches for each participating turbine to gain better knowledge of when Indiana bats are most susceptible to fatalities during the migration periods. Data from this research will be used by the Service to determine the level of take that occurs during migration periods, potentially to suggest more appropriate avoidance and minimization measures, and timing of such measures relative to migration periods. Either of these two options would allow wind facilities to operate without risk of violating the Endangered Species Act.

A third alternative is for a wind facility to work with the Service to apply for an Incidental Take Permit by submitting a Habitat Conservation Plan (HCP), as required under Section 10 of the Endangered Species Act. An HCP can be used to address Indiana bat presence during both summer foraging and migration periods. An HCP does typically require some time and survey effort to complete.

The project lies within the range of the **eastern massasauga** *(Sistrurus catenatus catenatus)*, a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. Eastern massasaugas are known to occur approximately 2.5 miles outside of the project boundaries. We did not observe any suitable massasauga habitat during our site visit, and an examination of aerial photos did not document any large wetland complexes within the project boundaries. Therefore, no additional actions relative to the eastern massasauga are warranted at this time.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the FWS recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented. The U.S. Fish and Wildlife Service's (FWS) Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seeks to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

The Service and ODNR Division of Wildlife have worked together to develop a recommended bird survey protocol for wind turbine projects. As noted above, ODNR's protocols indicate that this site is a "moderate" effort site. Upon completion of the moderate effort surveys, results will be interpreted to determine if potential risk to birds is relatively high or low in various portions of the project area. Based on survey results we may make recommendations as to turbine placement and operation, or pre- or post-construction monitoring.

The project lies within the range of the **bald eagle** (*Haliaeetus leucocephalus*), a species included under the Migratory Bird Treaty Act, but also afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). One bald eagle nests exists approximately 2.5 miles east of the project boundary provided prior to the site visit. Additional eagles' nests occur approximately 3 miles south, 4.5 miles north, and 4 miles southwest of the project boundary. If the project area is modified to include any area within 2 miles of a bald eagle nest, that nest should be monitored in accordance with ODNR's protocols. The results of these surveys should be coordinated with this office to determine if take of bald eagles is likely to occur.

The Service recently issued a final rule that authorizes issuance of eagle take permits, where the take to be authorized is associated with otherwise lawful activities. If take of bald eagles is likely, based on the results of any eagle surveys and the best information available, a bald eagle take permit for this project may be recommended.

Recent amendments to the BGEPA outlined the limited issuance of permits that authorize the take of eagles when such take is associated with otherwise lawful activities, cannot practicably be avoided, and is compatible with the goal of stable or increasing eagle breeding populations. Additional criteria for permit issuance are outlined in the BGEPA (*50 CFR 22.26 and 22.27*). If take of bald eagles is likely to occur, wind developers should carefully consider several of the take permit criteria, as these will likely be the most difficult for wind projects to achieve.

1) The proposed take must be consistent with the preservation of the species. In general, the ongoing and, so far, unpredictable take that wind developments may cause makes it difficult for the Service to determine that a wind development will not violate this criteria.

2) In the case of programmatic take under the BGEPA (the type of take wind developments are likely to cause), permit applicants must minimize potential disturbance and mortality to eagles as much as possible so that any resulting take is "unavoidable." The Service eventually hopes to have better guidelines in place for siting and constructing wind developments. Currently, however, project siting measures and minimization technology is, in most cases, insufficient to satisfy this criteria.

At this time, we continue to encourage existing and proposed wind developments to follow current Service recommendations on wind power siting and construction (*Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003).* The Service also encourages developers to coordinate with Service biologists regarding their projects. Proper coordination will help developers make informed decisions in siting, constructing, and operating their facilities as well as ensure awareness of the potential liability associated with unpermitted take of eagles and their habitat. Additionally, the Service hopes to work cooperatively with wind developers to advance the state of the art of wind power siting, construction, and operation. Advancements in these areas will represent great strides towards the environmentally safe development of this otherwise renewable and clean source of energy. We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the Service's guidelines in an effort to minimize impacts to all migratory birds and bats.

1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;

2) Rank potential sites by risk to wildlife;

3) Avoid placing turbines in documented locations of federally-listed species;

4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations. (i.e., rookeries, leks, State or Federal refuges, staging areas, wetlands, riparian corridors, etc.) Avoid known daily movement flyways and areas with a high incidence of fog, mist or low visibility;

5) Avoid placing turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;

6) Configure turbine arrays to avoid potential avian mortality where feasible. (i.e., group turbines and orient rows of turbines parallel to known bird movements) Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;

7) Avoid fragmenting large, contiguous tracts of wildlife habitat. Wherever practical, place turbines on lands already disturbed and away from intact healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas;

8) Minimize roads, fences, and other infrastructure. Wherever possible, align collection lines and access roads to minimize disturbance;

9) Develop a habitat restoration plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. (i.e., avoid attracting prey animals used by raptors;

10) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities. Avoid placing external ladders and platforms on tubular towers to minimize perching/nesting. Avoid use of guy wires for turbine or meteorological tower supports. All existing guy wires should be marked with bird deterrents. (Avian Power Line Interaction Committee 1996);

11) If taller turbines (top of rotor-swept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable;

12) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

13) Wherever feasible, place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds. Use recommendations of the Avian Power Line Interaction Committee (1996) for any required above-ground lines, transformers, or conductors;

The full text of the guidelines is available at http://www.fws.gov/habitatconservation/wind.pdf. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

COORDINATION OF SURVEY RESULTS:

Please submit survey results to this office for review. Survey results will be interpreted to determine areas with relatively low bat and bird activity/diversity as opposed to areas with relatively high bat and bird activity/diversity. Based on the survey results, we may make recommendations as to turbine placement and operation, additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, additional permits under the Bald and Golden Eagle Protection Act, or pre- or post-construction monitoring.

POST CONSTRUCTION MONITORING:

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. We recommend that the post-construction monitoring protocol be developed based on ODNR's Protocols, and look forward to working with the project proponent to develop this document.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Megan Seymour at extension 16 in this office if we can be of further assistance.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

Cc: Mr. Keith Lott, ODNR, Old Woman Creek, 2514 Cleveland Road East, Huron, OH 44839
Mr. Brian Mitch, ODNR, REALM, Columbus, OH
Mr. Rhett Good, WEST, Inc. 804 North College, Suite 103, Bloomington, IN 47403

Attachments:
USFWS Permittees for Indiana bat surveys in Ohio.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

1/31/2019 2:34:06 PM

in

Case No(s). 18-1607-EL-BGN

Summary: Application - Part 6 of 17 electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC