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Shasta County Department of Resource Management
Planning Division

FOUNTAIN WIND PROJECT

FINAL ENVIRONMENTAL IMPACT REPORT – APPENDIX

April 2021



Use Permit No. UP 16-007
State Clearinghouse No. 2019012029

Prepared for:
Department of Resource Management
Planning Division

Prepared by:
Environmental Science Associates





Shasta County Department of Resource Management
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Appendix A

Supplemental Information and Technical Studies

- A1. Stantec: Project Description Refinements
- A2. Stantec: Biological Resources – Extended Survey Areas
- A3. Environmental Design & Research: Shadow Flicker Analysis
- A4. Stantec: Visual Resources Technical Report
- A5. West: eDNA Foothill Yellow-legged Frog Report
- A6. Capitol Airspace Group: The Moose Camp Helipad

A1. Stantec: Project Description Refinements

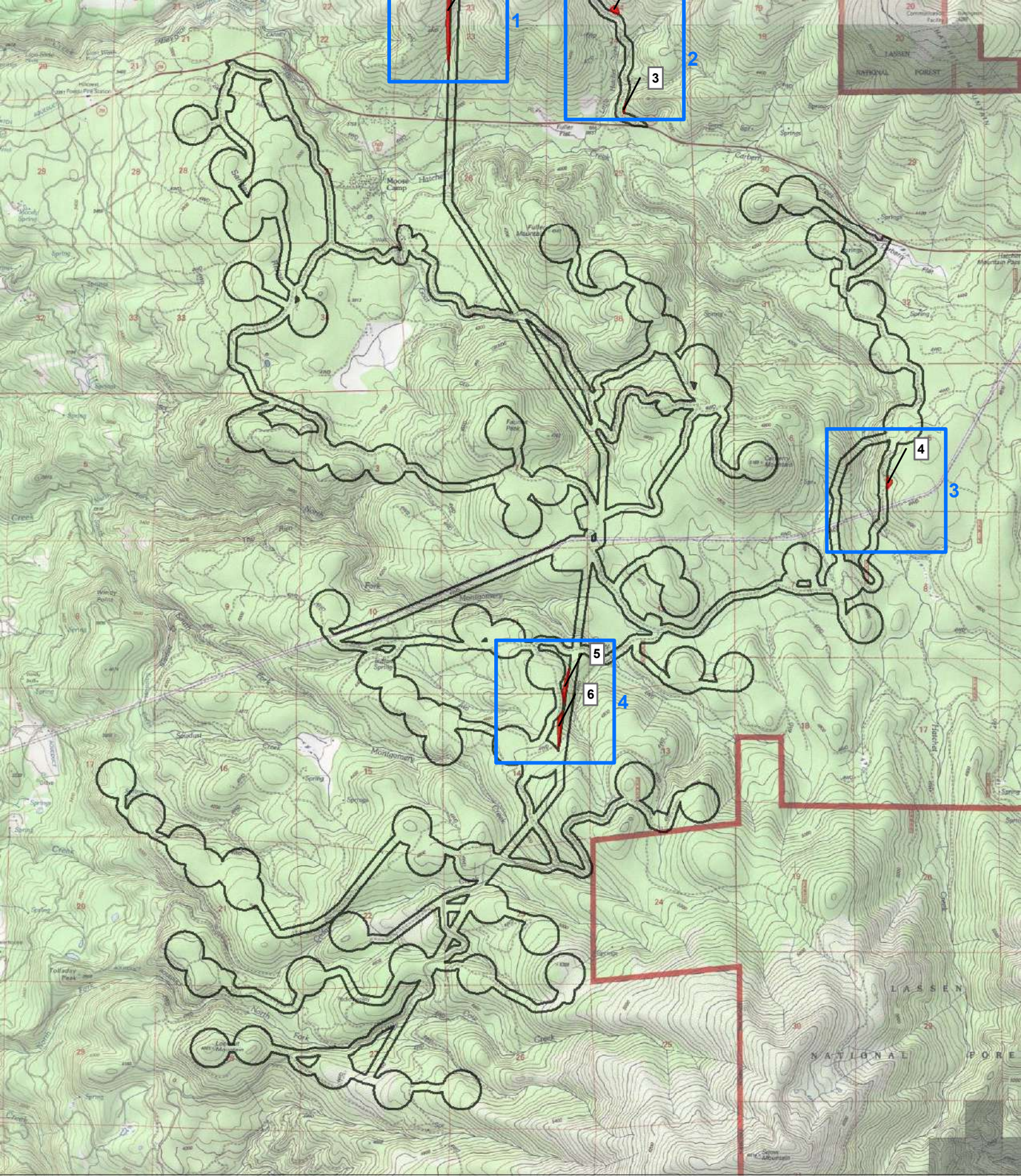
To:	Lio Salazar	From:	Caitlin Barns
	Shasta County Planning		Portland, Oregon
File:	Fountain Wind Project	Date:	February 12, 2021

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

1.1 REFINEMENTS TO THE PROJECT DESCRIPTION SINCE CIRCULATION OF THE DEIR

Since issuance of the Draft EIR, the project applicant has continued to coordinate with Shasta County staff and the regulatory agencies to further refine the project layout based on the presence of sensitive resources and the availability of updated turbine models that were not on the market when the application was submitted, as well as other factors. Supplemental technical studies conducted in support of the project were used to further refine the project footprint. The project applicant also reviewed public comments submitted in response to the DEIR to assess whether project refinements that respond to concerns stated by commenters could be incorporated. As a result, the project applicant has made a number of refinements to the proposed project since circulation of the DEIR. These refinements include the following:

- **Layout refinements to avoid sensitive environmental resources and improve engineering design.** Since the circulation of the DEIR, the applicant has refined the project footprint by eliminating one wind turbine generator location, and realigning access roads and electric collection lines. This has resulted in the avoidance or minimization of impacts on sensitive environmental resources, including a reduction in direct impacts on aquatic resources, riparian habitats, and a previously identified cultural site (FW 11). The majority of these changes occur within the Project Site defined in the DEIR, but several adjustments occur slightly (<500 ft) outside the Project Site boundaries, resulting in the need for additional surveys. A comparison of the modified project footprint in relation to the Project Site examined in the DEIR is depicted in Figure 1.
 - Refinement 1 (Survey Area 1): moved overhead collection line and associated access road up to approximately 250 ft west to avoid existing drainage and associated aquatic features including a perennial stream, intermittent stream, and riparian wetland segments.
 - Refinement 2 (Survey Area 2): moved access road up to approximately 130 ft northeast in order to utilize existing crossing of a nearby perennial stream and associated adjacent wetlands.
 - Refinements 3 (Survey Area 3): moved access road up to approximately 125 ft east in order to straighten access road.
 - Refinement 4 (Survey Area 4): moved access road up to approximately 275 ft east in order to utilize existing access road.
 - Refinement 5 and 6 (Survey Area 5 and 6): moved overhead collection line up to approximately 250 ft west in order to avoid building collection line on sloping terrain and align with an existing access road corridor.
 - Refinement 7 (FW 11): moved underground collection line approximately 100 ft west to avoid cultural resource site.



Legend

-  Map Index
-  Survey Areas
-  Proposed Project Site

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Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

- **Elimination of turbine location M03.** The applicant has chosen to eliminate turbine location M03 from further consideration as a potential turbine siting location in response to CDFW concerns about the potential for higher collision risk for raptors at this location. The two years of avian used data did not reflect observations of high raptor visitation at Turbine M04, therefore that turbine is being retained as part of the proposed project.
- **Clarification regarding fiber optic cable installation.** Chapter 2, Description of Project and Alternatives, in the Draft EIR states that the Project would include installation of a communication system within the same footprint as the electrical collection system. “The communication system consists of fiber optic communication cabling for the Supervisory Control and Data Acquisition (SCADA) system, which provides communication capabilities between turbine locations, substation, and operations and maintenance facilities. Most of the collector system would be located underground and adjacent to onsite access roads” (DEIR Section 2.4.2). To clarify this description, fiber optic cabling would be installed within the footprint of the electrical collection system as well as within approximately 4.5 miles of existing access roads in the northeastern portion of the Project Site. The approximately 4.5 miles of fiber optic cabling co-located with the existing roads would connect the proposed electrical system to the operations and maintenance facility, and to the existing fiber optic system located off of SR 299. See Figure 2.
- **Clarification of PG&E facilities.** Chapter 2, Description of Project and Alternatives, in the Draft EIR describes the PG&E upgrades needed as a result of constructing the new substation and switching station:

“Upgrades to PG&E facilities are anticipated to include construction or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, the new poles would be located adjacent to the proposed substation and switching station...The Applicant would construct the switching station; PG&E would construct the electrical connections to its facility. PG&E ultimately would own and operate the switching station and interconnection components” (DEIR Section 2.4.2).

Several clarifications are suggested for this description. First, in addition to the four to six new transmission poles, up to four replacement poles could be associated with replacement or reconfiguration of the existing utility line structures within the existing right of way. Second, a stormwater retention basin is planned for the proposed switching station facility and would be constructed within the switching station permanent footprint. See Figure 3 below which provides an updated design of the proposed switching station. Third, the switching station would be electrically connected to the substation. And lastly, the Applicant will build and own the Project substation while PG&E will own and operate the switching station and interconnection lines.

- **Additional project design features and Applicant Proposed Measures.** The applicant has identified several additional Applicant Proposed Measures (APMs) as set forth below. Although the Draft EIR is legally adequate without these additional measures, the applicant is voluntarily offering them and agrees that the County can impose these APMs as Conditions of Approval. These include:

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

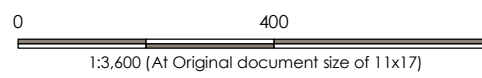
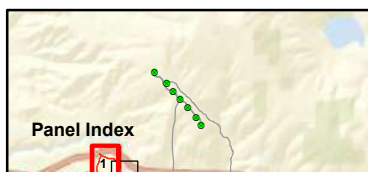
- Preparation of a worker environmental awareness training program to be implemented during construction;
 - Continued application of relevant provisions from US Fish and Wildlife Service's (USFWS) Land-Based Wind Energy Guidelines (WEGs) during construction and operation of the Project;
 - Preparation and implementation of a Bird and Bat Conservation Plan (BBCS), which will detail measures to be taken during project operations to reduce impacts to birds and bats. Measures include post-construction mortality monitoring, prey reduction techniques, and adaptive management strategies;
 - Development of a Nesting Bird Management Plan (NBMP) in coordination with California Department of Fish and Wildlife to avoid or minimize adverse impacts to nesting birds during construction. The NBMP will establish nesting seasons, species-specific avoidance buffers, and measures to reduce disturbance to nests;
 - Application of measures described in the Avian Power Line Interaction Committee (APLIC) guidelines to reduce avian collisions and electrocution with project infrastructure, including installation of bird flight diverters and electrical design recommendations;
 - Adoption of a Federal Aviation Administration-approved lighting plan for meteorological towers, and downward-facing and shielded lighting on other project components in consideration of the USFWS Communication Tower Guidance, to reduce the potential for nocturnal bird collisions;
 - Implementation of an Invasive Species Management Plan prior to construction, to include invasive weed control measures and best practices to reduce introduction or limit the spread of noxious weed species; and
 - Avoidance of sensitive habitats and waterways during application of dust palliatives.
- **Option to use more advanced wind turbine model.** A higher capacity, more efficient wind turbine model has recently become commercially available. Recent advancements in turbine technology have trended toward increasing the generating capacity and efficiency of individual turbines, resulting in the potential to install fewer turbines with higher rated nameplate generating capacities. The DEIR indicated that the applicant would be selecting turbines that could range between 3.0 MW to 5.7 MW. The applicant is now proposing that it be permitting to select a model of up to 6.2MW in capacity.

The applicant has revised the project description to include the ability to select among a range of turbine nameplate capacities, ranging from 3.0 MW to 6.2 MW. This modification also allows further flexibility to account for generating capacity rating changes to existing turbine models. For instance, advanced software applications may allow a 5.7 MW turbine to operate at a 6.0 MW capacity without physical changes to the turbine. The proposed, expanded capacity range also captures any capacity upgrades that manufacturers could release for the originally proposed turbine models prior to construction. Since it is not possible at this time to ensure that any particular model of turbine will be available when the project is constructed, the FEIR assumes that any model between the lowest and highest capacity range could be selected. Table 1 compares the specifications of the turbine model options.



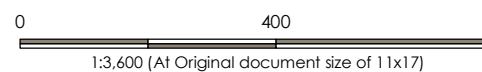
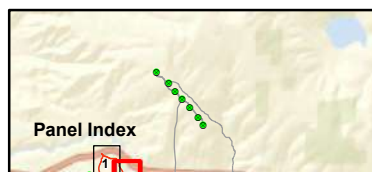
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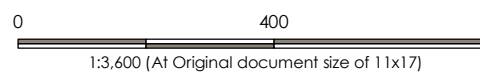
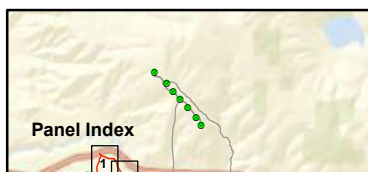
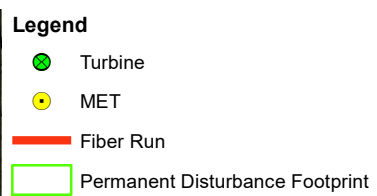
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- Fiber Run
- Permanent Disturbance Footprint





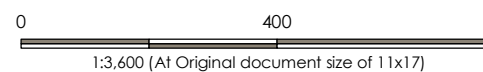
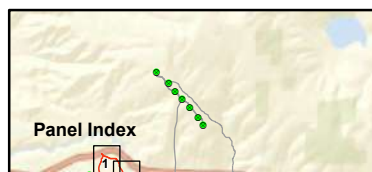
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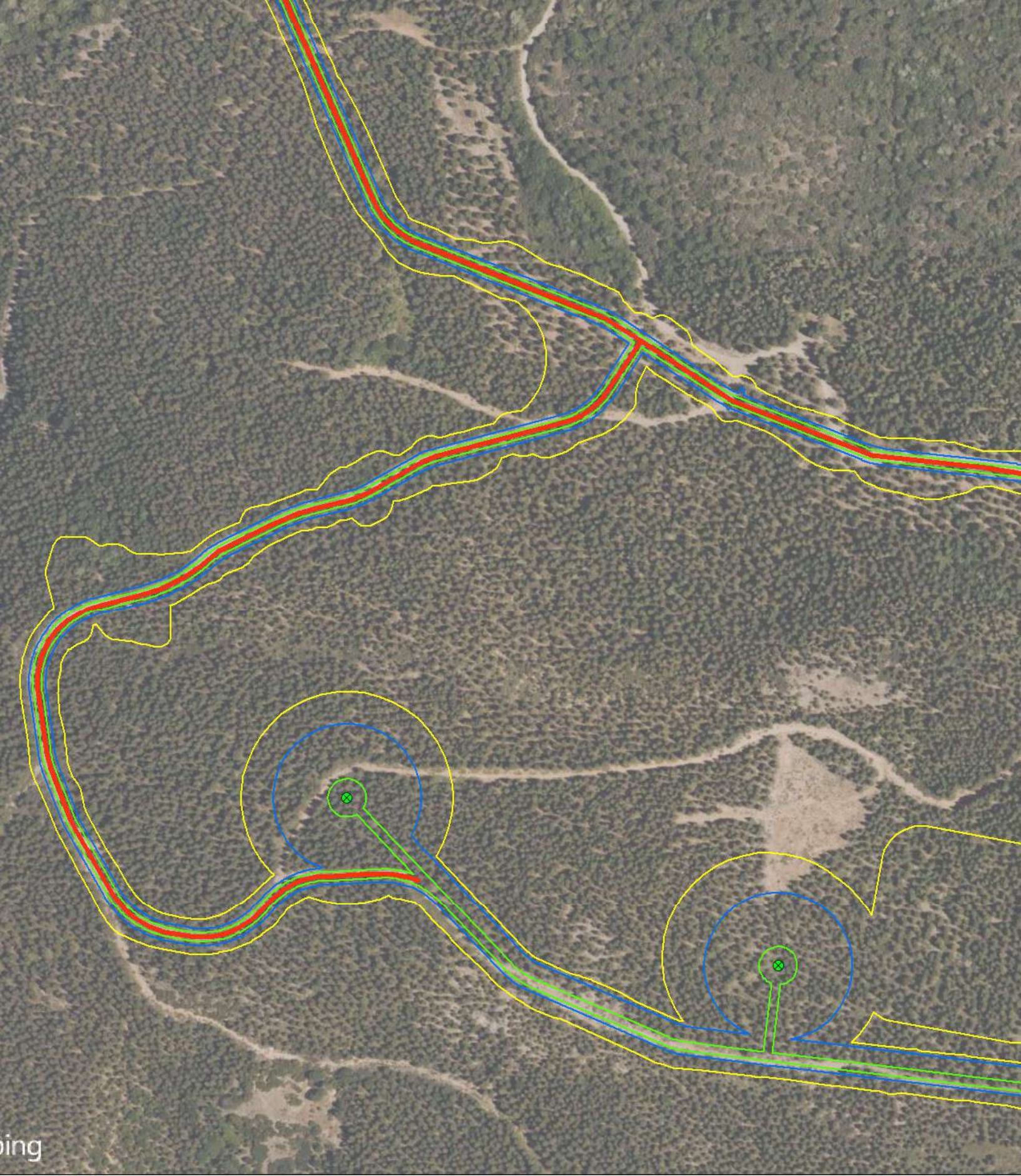






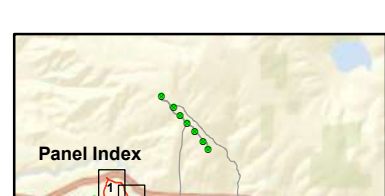
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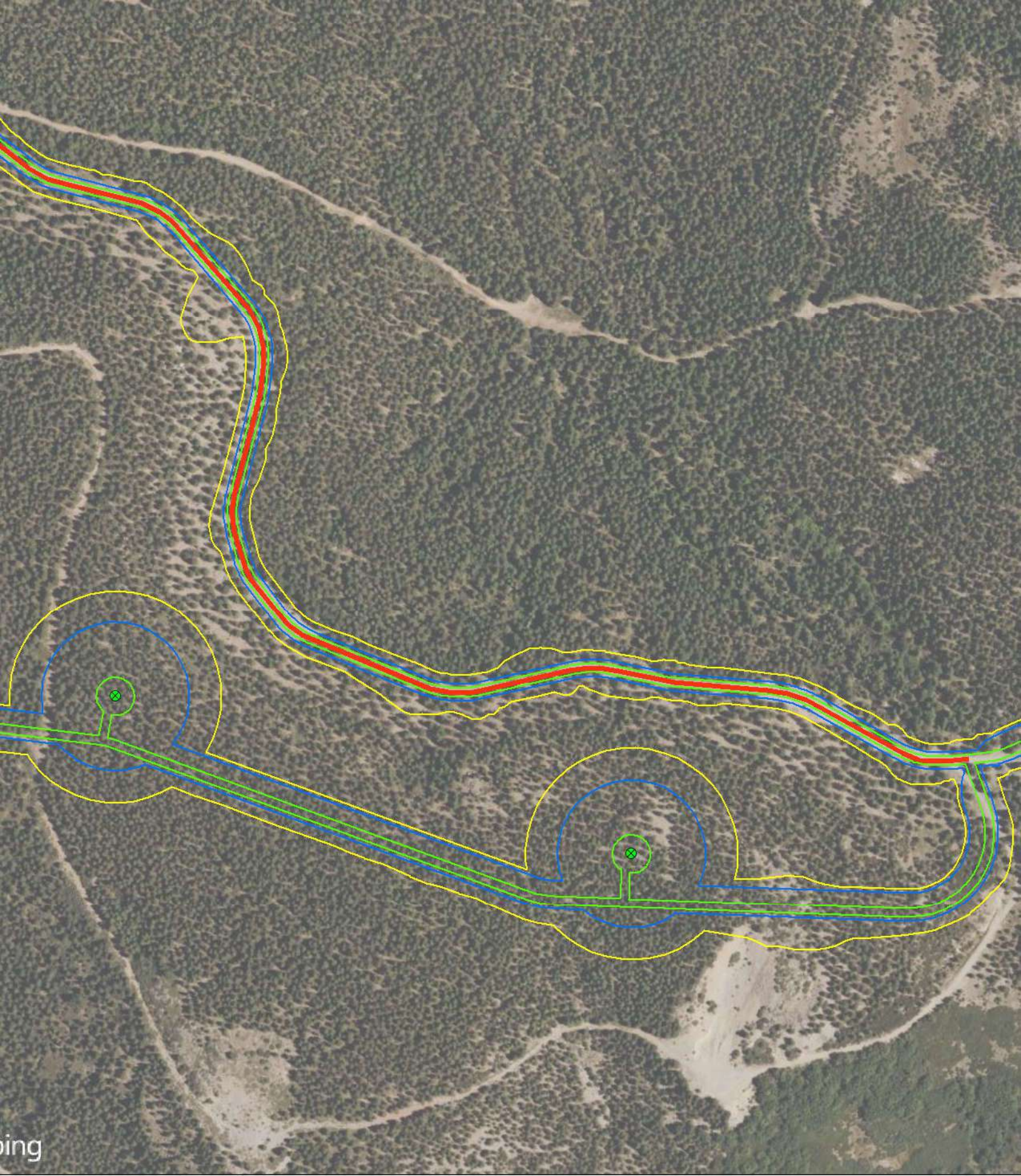


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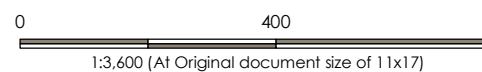
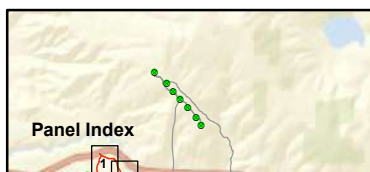


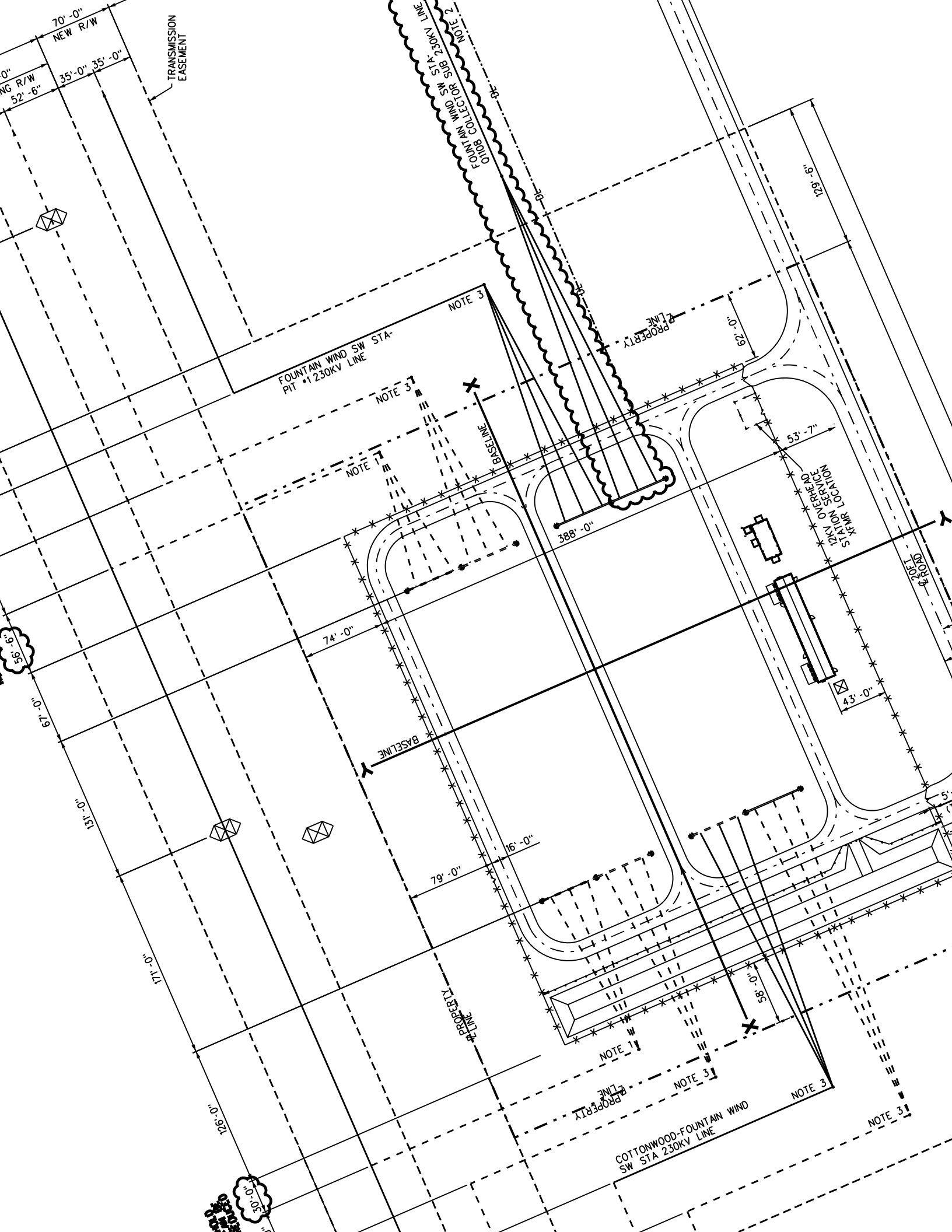
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-  Turbine
-  MET
-  Fiber Run
-  Permanent Disturbance Footprint





Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

Table 1. Comparison of Turbine Options

Turbine Specifications	Turbine Models Proposed in DEIR		Optional Turbine Model	Percent Change from Maximum Assumed in DEIR
	3.0 MW	5.7 MW	6.2 MW	
Number of Towers ¹	72	37	34	--
Rotor Diameter	417 ft (127 m)	531 ft (162 m)	558 ft (170 m)	+5%
Blade Length	186 ft (62 m)	237 ft (79 m)	250 ft (83 m)	+5%
Hub Height	292 ft (89 m)	410 ft (125 m)	377 ft (115 m)	-8%
Total Turbine Height	500 ft (152.5 m)	676 ft (206 m)	656 ft (200 m)	-3%
Rotor-swept Area per Turbine	136,572 sq ft	221,452 sq ft	244,545 sq ft	+10%
Total Rotor-swept Area	9,833,184 sq ft	8,193,724 sq ft	8,314,530 sq ft	-15%

1.2 SCOPE OF ANALYSES CONDUCTED FOR REFINEMENTS TO THE PROJECT DESCRIPTION SINCE CIRCULATION OF THE DEIR

This memorandum contains results of analyses undertaken to support the conclusion that the project refinements would not result in any new or substantially more severe environmental impacts beyond those that were disclosed in the DEIR. Accordingly, the applicant reviewed the potential for proposed project refinements to affect resource topics considered in the DEIR. The project changes analyzed in this document would, under CEQA, have no impact to the following topic areas, and thus no further analyses are included herein:

- Agriculture and Forestry Resources
- Air Quality and Greenhouse Gas Emissions
- Communications
- Energy
- Geology and Soils, or Paleontological or Mineral Resources
- Land Use and Planning
- Population and Housing
- Public Services
- Recreation
- Transportation
- Utilities and Service Systems
- Wildfire

For several topics considered in the DEIR, including biological resources, cultural resources, visual resources, noise, hazards and hazardous materials, and hydrology and water quality Stantec has conducted supplemental analyses and technical studies to substantiate and confirm the impact analyses presented in the DEIR as applied to the project revisions. The results of these analyses are presented in the following sections. Topic areas for which an additional technical report was produced include:

¹ The EIR assumes the Project could include up to 72 turbines. The total number of wind turbines would depend on the turbine model selected and final design. Calculations are estimations based on this range.

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

- Biological resources: results of botanical, wetland, and wildlife pedestrian survey of unsurveyed areas resulting from refinements to the project footprint (Appendix A).
- Cultural resources: results of cultural pedestrian survey of unsurveyed areas resulting from refinements to the project footprint (Appendix B).
- Shadow flicker: results of analyses of potential impacts shadow flicker from use of 6.2 MW turbines (Appendix C).

1.3 RESULTS OF SUPPLEMENTAL ENVIRONMENTAL ANALYSIS OF PROJECT REVISIONS

The proposed revisions to the project description result in no change to the impact conclusions presented in the DEIR, as many project refinements result in no new impacts or a reduction in potential impacts to sensitive resources. This conclusion is supported by supplemental technical studies where necessary. These are not considered “significant new information” requiring recirculation under section 15088.5 of the CEQA Guidelines because they show either no changes in the potential for environmental impacts or reduced potential for environmental impacts. Analyses supporting this conclusion are presented in the following sections and in the attached appendices.

1.3.1 BIOLOGICAL RESOURCES

Sensitive Natural Communities and Special Status Plants

Vegetation communities present in Survey Areas 1-6 were consistent with communities reported in the initial technical studies; no unique soil types, new vegetation assemblages, or rock outcrops were present. No special status plants or new sensitive natural communities were observed during surveys. The new areas surveyed were consistent biologically with the previously surveyed adjacent areas.

Wetlands and Aquatic Features

A perennial stream and riparian wetlands occur in Survey Area 1 (Figure 1A). The perennial stream and associated riparian corridor are continuations of features mapped during the project’s aquatic resources survey (Stantec 2019a). Based on a review of datasheets collected for perennial streams and riparian wetlands in the survey area, the features’ vegetation, hydrology, and soils were very similar to previously observed characteristics. Accordingly, there would be no change to the impact conclusion presented in the DEIR.

The project footprint described in the DEIR would have located an overhead collection line within the drainage feature located adjacent to Survey Area 1 for approximately 3,800 feet. The drainage feature is made up of segments categorized as intermittent stream, perennial stream, and riparian wetland. The overhead collection line was moved up to 250 ft west to avoid direct impacts to the feature and its riparian corridor, and in response to a comment letter from CDFW requesting impacts to riparian habitat be minimized further. As a result of the reroute in this location, direct impacts to this drainage and its riparian corridor would be substantially reduced.

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

Special Status Wildlife

Soils, plant species and communities, and habitats present in the expanded survey areas are consistent with the description of habitats present in the previous project surveys. Accordingly, there would be no differences in use by or potential to be impacted for any species of common or special status wildlife as compared with reports composed for the project as originally designed, as well as the implementation of mitigation measures proposed in the DEIR.

Birds and Bats

Option to Use Up to 6.2 MW Turbine Model. The higher-capacity turbines have a larger rotor-swept area than the range of originally proposed 3.0 MW turbines (79% larger per turbine) and 5.7 MW turbines (10% larger per turbine). In general, a larger rotor-swept area per turbine could result in greater strike risk to birds and bats. However, because the higher-capacity turbines are more efficient, the applicant requires fewer of them to reach the project's maximum nameplate capacity of 216 MW. Therefore, with the use of the the additional turbine option, there would be a reduction in total rotor-swept area of up to 1.2 million sq ft, or 15%, in comparison with the rotor-swept area that would result from the use of the 3.0 MW turbines, or nearly 145,000 sq ft or 1% resulting from the use of the 5.7 MW turbines. As a result, there would be an up to 15% reduction in the strike risk to birds and bats if the 6.2 MW turbine option is selected.

Elimination of Turbine Location M03. Results of avian point count surveys undertaken during preparation of the DEIR suggest that the proposed location of Turbine M03, located on the edge of the proposed Project Site, was visited at a higher frequency by raptor species than other turbine locations. Although Year 2 point count surveys did not show any higher frequency of use, the applicant chose to eliminate this turbine location from the project, thereby eliminating its potential to directly impact birds or bats. Because Point Count survey data did not reflect observation of high raptor use at Turbine M04, that turbine remained part of the project.

Design Features and Updates to APMs. Implementation of the applicant's additional voluntary protection measures would not increase any previously identified environmental impact or result in any new environmental impacts. The applicant will continue to develop, construct, and operate the project in consideration of the USFWS's Wind Energy Guidelines to reduce potential interaction with biological resources. Although not a requirement, the applicant will prepare a BBCS and NBMP, which will include commitments to perform post-construction mortality monitoring, prey reduction measures, adaptive management strategies, and nest avoidance strategies, that when implemented would avoid or reduce potential impacts to avian and bat species.

Impacts to birds and bats resulting from project operation will be further reduced through the implementation of several additional applicant commitments, including application of the Avian Power Line Interaction Committee's (APLIC) guidelines to reduce collisions (APLIC 2012) and electrocution (APLIC 2006). By following guidance in the 2012 manual, the applicant will reduce potential bird collisions with overhead collector lines by employing line marking devices. And by following the guidance in the 2006 manual, the applicant will reduce potential bird electrocutions by separating grounded and energized portions of aboveground collector lines.

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

In addition, the applicant has committed to preparing a Federal Aviation Administration-approved lighting plan for meteorological towers, and also follow USFWS Communication Tower Guidance such as using downward-facing and shielded lighting on other project components, to reduce the potential for nocturnal bird collisions. Shielded or downward-facing lighting reduces the potential for accidental attraction, collisions, or disorientation.

1.3.2 CULTURAL RESOURCES

This memorandum concludes that the revisions to the project would not result in any new or substantially more severe environmental impacts on cultural resources. Environmental conditions in Survey Areas 1-6 closely match those described during previous surveys (Stantec 2019b). Ground disturbances associated with logging activities, including tracks, pits, and ruts consistent with the use of trucks and large tracked equipment, were observed in all locations. Understory management in Survey Areas 4, 5, and 6 appeared to have occurred recently. No cultural resources were observed, and Survey Areas 1-6 do not possess heightened potential for the presence of buried cultural resources relative to the adjacent, previously surveyed areas.

In addition, the Project Site analyzed in the DEIR identifies an underground collection line within a cultural resource site (FW 11). FW 11 is comprised of prehistoric and historic cultural resources, including prehistoric basalt and black obsidian flakes and flake tools, and historic logging artifacts. The applicant has realigned the footprint of the collection line within the Project Site to avoid intersecting FW 11, thereby avoiding impacts to that site (See Figure B1 in Appendix B).

1.3.3 HYDROLOGY AND WATER QUALITY

A perennial stream occurs in Survey Area 1 (Figure A1). The perennial stream is a continuation of a feature mapped during the project's aquatic resources survey (Stantec 2019a). Based on a review of datasheets collected for perennial streams in the survey area, the feature's vegetation, hydrology, and soils were very similar to previously observed characteristics. Accordingly, there would be no change to the impact conclusion presented in the DEIR.

The project footprint described in the DEIR would have located an overhead collection line within the drainage feature located adjacent to Survey Area 1 for approximately 3,800 feet. These components were moved up to approximately 250 ft west to avoid direct impacts to the drainage, and in response to a comment letter from CDFW requesting impacts to riparian habitat associated with drainages be minimized further. As a result of the reroute in this location, direct and indirect potential impacts to this drainage resulting from project construction, including erosion and sedimentation, reduced water quality, runoff, and disturbances to bed and bank, would be substantially reduced.

1.3.4 NOISE

Additional analysis was performed to determine whether use of a 6.2 MW turbine would change any of the conclusions regarding noise impacts in the the DEIR. If selected, the higher capacity turbines would operate at a noise level within the range of the worst-case, loudest turbine analyzed in the DEIR (between 99 and 105.5dB(A).) The newer models also have the ability to reduce noise levels by adjusting the turbine controller settings, i.e., an optimization of rpm and pitch. The noise settings are not static and can be applied to optimize

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

the operational output of the turbine. Noise settings can be tailored to time of day as well as wind direction to offer the most suitable solution for a specific location. As a result, the use of the newly available turbine models would not change the impact determination for noise impacts assessed in the DEIR.

1.3.5 HAZARDS AND HAZARDOUS MATERIALS (SHADOW FLICKER)

An updated shadow flicker analysis for a project layout was performed based on a hypothetical layout of 72 6.2 MW turbines. This analysis is exceedingly conservative since, if the 6.2 MW turbines are selected, fewer than 72 would be installed. The detailed report is included as Appendix C. In comparison to the layout using the 5.7 MW turbines, three new receptors would be added to the “0-1 hours/year” category for shadow flicker, and five existing receptors could experience up to 20 additional hours of shadow flicker per year. No new receptors would experience more than 30 hours of shadow flicker per year, the threshold for which mitigation is recommended. As a result, the use of the higher capacity turbine would not change the impact determination for impacts caused by shadow flicker assessed in the DEIR.

1.3.6 VISUAL RESOURCES

The DEIR evaluated the potential visual effects of project turbines with a maximum height of 206 m, or 676 ft. Visual simulations produced to support the DEIR showed these turbines with a hub height of 125 m (410 ft), an 81-m (266-ft) rotor blade length, and a total rotor diameter of 162 m (532 ft). The higher capacity turbine models are slightly shorter than those evaluated in the DEIR with a maximum height of 200 m (656 ft), with a hub height of 115 m (377 ft), an 83-m (250-ft) rotor blade length, but with a slightly larger rotor diameter of 170 m (558 ft).

Use of the higher capacity turbines would not result in any change to conclusions regarding the project’s visual impacts as assessed in the DEIR. The hub heights would be 10 m (33 ft) shorter with the optional turbine models, but the total area within which the rotor blades would spin (the “rotor-swept area”) would be 8 m (26 ft) wider, due to the additional 4-m (13-ft) length of the blades. The net reduction in turbine height would be 6 m (20 ft). Views of the higher capacity turbines would be virtually indistinguishable from the 5.7 MW turbines shown in visual simulations from Key Observation Points (KOPs) located within the mountain communities area. These are the views from KOPs along the State Route 299 corridor between Round Mountain to the west and Burney to the east and are the closest views evaluated in the DEIR. Visual impacts of the project would remain significant and unavoidable.

Visual quality would be reduced in views from KOPs 1, 2, and 3 to the same degree that they would be with the turbines evaluated in the DEIR. Shorter hub heights could mean that the nacelles of some of the more distant turbines would not be visible above certain ridgelines. While this could reduce the potential number of new sources of night lighting compared with what was evaluated in the EIR, rotor blades would remain a source of contrast along the ridgeline in terms of form, color, and, when spinning, motion.

In views from KOP 4 and KOP 5, shorter hub heights and slightly larger rotor diameters would not alter effects as described in the DEIR. Proposed turbines would remain visible in views alongside existing turbines, though, as in other views, lower hub heights could reduce the degree to which some of the nacelles would be visible above ridgelines. The difference between the two turbine models in the two distant views evaluated,

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from State Route 299 to the east (KOP 6) and Redding to the west (KOP 7), in which a large number of proposed turbines would be visible but difficult to discern individually, would be negligible.

1.4 CONCLUSION

The analyses in this memorandum and the supplemental technical studies confirm that the proposed refinements to the project description since circulation of the DEIR would not result in any new or substantially more significant environmental impacts beyond those already disclosed in the DEIR; would not change impact conclusions described in the DEIR; would reduce potential environmental impacts resulting from Project construction and operation; and are not considered significant new information requiring recirculation under section 15088.5 of the CEQA Guidelines.

Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

2.0 REFERENCES

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APPENDIX A: ASSESSMENT OF POTENTIAL EFFECTS ON BIOLOGICAL RESOURCES IN FOUNTAIN WIND PROJECT EXPANDED SURVEY AREAS

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Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

**APPENDIX B: FOUNTAIN WIND ENERGY PROJECT CULTURAL RESOURCES PHASE
1 INVENTORY OF 4,463 ACRES, SHASTA COUNTY CALIFORNIA, ADDENDUM 3:
SUPPLEMENTAL ARCHAEOLOGICAL SURVEY, OCTOBER 2020**

February 12, 2021

Lio Salazar

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Reference: Analyses of Refinements to the Project Description Since Circulation of the Draft Environmental Impact Report

APPENDIX C: FOUNTAIN WIND SUPPLEMENTAL PROJECT SHADOW FLICKER ANALYSIS

A2. Stantec: Biological Resources – Extended Survey Areas

To:	John Kuba	From:	David Plumpton and Sarah Tona
	ConnectGen		Redding, California
File:	Fountain Wind Project	Date:	November 3, 2020

**Reference: Assessment of Potential Effects on Biological Resources in Fountain Wind Project
Extended Survey Areas**

INTRODUCTION

Stantec undertook surveys to assess the potential for new environmental impacts due to minor realignment of certain elements of the project on November 2, 2020. Surveys were undertaken in six areas outside but contiguous with previously surveyed areas. The expanded survey areas range from 0.18 acre to 6.27 acres and total 12.86 acres. Figure 1 identifies these expanded survey areas as Survey Areas 1-6.

METHODS

Desktop Analysis. Stantec biologists Sarah Tona and David Plumpton conducted an analysis of biological resources (i.e., botanical, wildlife, and wetland/aquatic) in Survey Areas 1-6. Ms. Tona, a botanist, conducted an onsite survey to characterize the potential presence of special status plant species, sensitive vegetation communities, or wetlands. Dr. Plumpton, a Certified Wildlife Biologist®, reviewed previous, project-specific wildlife studies, and the California Natural Diversity Database (CNDDDB; California Department of Fish and Wildlife 2020), and results of the onsite survey to characterize the potential for special status wildlife or their habitat to occur in Survey Areas 1-6.

Prior to conducting field work, Ms. Tona reviewed the biological resources reports prepared for the project, including the *Aquatic Resources Survey Report* (Stantec 2019a) and *Rare Plant Surveys and Natural Vegetation Community Mapping* (WEST 2018a, 2019a) and publicly available biological resources data from the survey area, including Waters of the U.S. and vegetation communities. Ms. Tona and Dr. Plumpton also reviewed the lists of special status plant species with potential to occur in the survey area (WEST 2018a, 2019a) and previous studies on special status wildlife, including the *Foothill Yellow-Legged Frog and Cascades Frog Habitat Assessments and Surveys, Fountain Wind Project, California* (WEST 2018b) and the *Request for Clarification on 2017 and 2018 Raptor Nest Survey Reports for the Fountain Wind Project* (WEST 2019b). Ms. Tona also queried the California Native Plant Society Inventory of Rare and Endangered Plants (California Native Plant Society 2020a) and CNDDDB to determine whether any plant species in addition to those already analyzed in the DEIR should be considered during the onsite survey.

Field Survey. On November 2, 2020 Ms. Tona characterized habitats in Survey Areas 1-6 and assessed the potential for presence of sensitive biological resources different from those described in the DEIR. During the survey, Ms. Tona mapped vegetation communities following protocols in *A Manual of California Vegetation Online* (California Native Plant Society 2020b) and potential wetlands. Ms. Tona compared vegetation communities observed during this survey to special status plant species habitat to determine if special status plant species could have the potential to occur in Survey Areas 1-6.

Reference: Assessment of Potential Effects on Biological Resources in Fountain Wind Project Extended Survey Areas

RESULTS AND DISCUSSION

Sensitive Natural Communities and Special Status Plants

Vegetation communities present in Survey Areas 1-6 were consistent with communities reported in the initial technical studies; no unique soil types, new vegetation assemblages, or rock outcrops were present. Surveyors identified *Pinus ponderosa* Forest Alliance and *Abies concolor* – *Pseudotsuga menziesii* Forest Alliances during her survey. These alliances are dominated by conifer trees, including ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), and Douglas fir (*Pseudotsuga menziesii*), with scattered black oak (*Quercus kelloggii*). The understory ranged from sparse to dense, the latter dominated by *Ceanothus* species, greenleaf manzanita (*Arctostaphylos patula*), and snowberry (*Symphoricarpos* sp.). Much of Survey Areas 1-6 possessed a thick layer of duff and woody debris on the forest floor. A perennial stream and narrow riparian corridor bisected a portion of the extended survey area, characterized as *Populus trichocarpa* Forest and Woodland Alliance. The riparian vegetation was dominated by black cottonwood (*Populus trichocarpa*) trees and saplings with dense willow (*Salix* spp.) shrubs and mountain dogwood (*Cornus nuttallii*).

Vegetation communities present in Survey Areas 1-6 were consistent with communities reported in the initial technical studies; no unique soil types, new vegetation assemblages, or rock outcrops were present. No special status plants or new sensitive natural communities were observed during surveys. The new areas surveys were consistent biologically with the previously surveyed adjacent areas.

Wetlands and Aquatic Features

A perennial stream and riparian wetlands occur in Survey Area 1 (Figure 1A). The perennial stream and associated riparian corridor are continuations of features mapped during the project's aquatic resources survey (Stantec 2019a). Based on a review of datasheets collected for perennial streams and riparian wetlands in the survey area, the features' vegetation, hydrology, and soils were very similar to previously observed characteristics. Accordingly, there would be no change to the impact conclusion presented in the DEIR.

The project footprint described in the DEIR would have located an access road and overhead collection line within the drainage feature located adjacent to Survey Area 1 for approximately 3,800 feet. These features were moved up to 250 ft west to avoid direct impacts to the feature and its riparian corridor, and in response to a comment letter from CDFW requesting impacts to riparian habitat be minimized further. As a result of the access road reroute in this location, direct impacts to this drainage and its riparian corridor would be substantially reduced.

Special Status Wildlife

Soils, plant species and communities, and habitats present in the expanded survey areas are consistent with the description of habitats present in the previous project surveys. Accordingly, there would be no differences in use by or potential to be impacted for any species of common or special status wildlife as compared with reports composed for the project as originally designed, as well as the implementation of mitigation measures proposed in the DEIR.

Reference: Assessment of Potential Effects on Biological Resources in Fountain Wind Project Extended Survey Areas

Birds and Bats

Optional Turbine Option. The higher-capacity turbines have a larger rotor-swept area than the originally proposed 3.0 MW turbines (79% larger per turbine) and 5.7 MW turbines (10% larger per turbine). In general, a larger rotor-swept area per turbine could result in greater strike risk to birds and bats. However, because the higher-capacity, optional turbines are more efficient, the applicant requires fewer of them to reach the project's maximum nameplate capacity of 216 MW. Therefore, with the use of the the additional turbine option, there would be a reduction in total rotor-swept area of up to 1.2 million sq ft, or 12%, in comparison with the rotor-swept area that would result from the use of the 3.0 MW turbines, or nearly 145,000 sq ft or 1% resulting from the use of the 5.7 MW turbines. As a result, there would be an up to 12% reduction in the strike risk to birds and bats if the 6.2 MW turbine option is selected.

Removal of Turbine M03. Results of avian point count surveys undertaken during preparation of the DEIR suggest that the proposed location of Turbine M03, located on the edge of the proposed Project Site, was visited at a higher frequency by raptor species than other turbine locations. Although Year 2 point count surveys did not show any higher frequency of use, the applicant chose to eliminate this turbine location from the project, thereby eliminating its potential to directly impact birds or bats.

Design Features and Updates to APMs. Implementation of the applicant's additional voluntary protection measures would not increase any previously identified environmental impact or result in any new environmental impacts. The applicant will continue to develop, construct, and operate the project in consideration of the USFWS's Wind Energy Guidelines to reduce potential interaction with biological resources. Although not a requirement, the applicant will prepare a BBCS and NBMP, which will include commitments to perform post-construction mortality monitoring, prey reduction measures, adaptive management strategies, and nest avoidance strategies, that when implemented would avoid or reduce potential impacts to avian and bat species.

Impacts to birds and bats resulting from project operation will be further reduced through the implementation of several additional applicant commitments, including application of the Avian Power Line Interaction Committee's (APLIC) guidelines to reduce collisions (APLIC 2012) and electrocution (APLIC 2006). By following guidance in the 2012 manual, the applicant will reduce potential bird collisions with overhead collector lines by employing line marking devices. And by following the guidance in the 2006 manual, the applicant will reduce potential bird electrocutions by separating grounded and energized portions of aboveground collector lines.

In addition, the applicant has committed to preparing a Federal Aviation Administration-approved lighting plan for meteorological towers, and also follow USFWS Communication Tower Guidance such as using downward-facing and shielded lighting on other project components, to reduce the potential for nocturnal bird collisions. Shielded or downward-facing lighting reduces the potential for accidental attraction, collisions, or disorientation.

Reference: Assessment of Potential Effects on Biological Resources in Fountain Wind Project Extended Survey Areas

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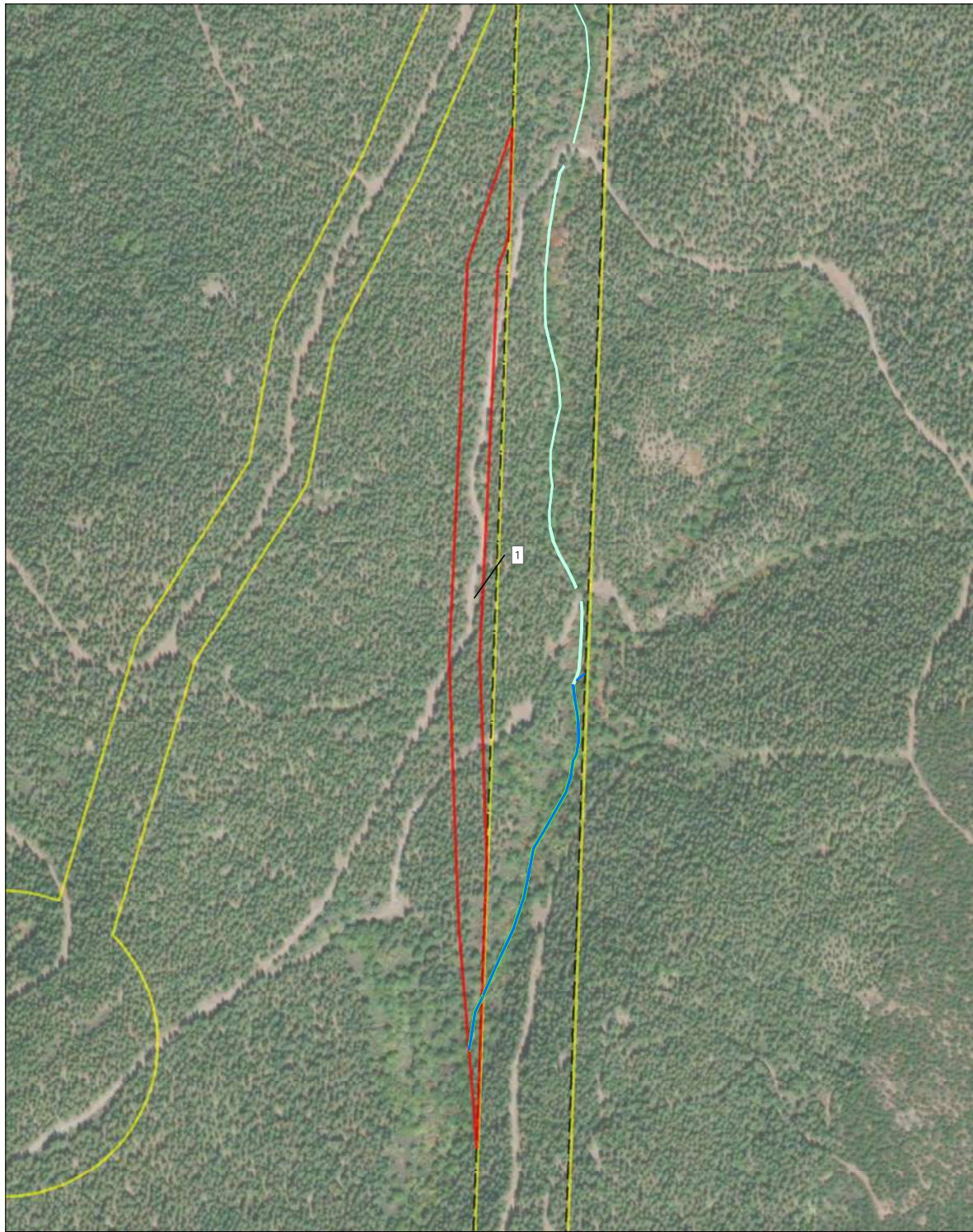
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Western EcoSystems Technology, Inc. 2019a. Rare Plant Surveys and Natural Vegetation Community Mapping. Fountain Wind Project. Shasta County, California.

Western EcoSystems Technology, Inc. 2019b. Request for Clarification on 2017 and 2018 Raptor Nest Survey Reports for the Fountain Wind Project.



- Legend**
- Waters of the U.S. in the Extended Survey Area (2020)
- Perennial Stream (0.024 (acres), 175 (ft))
 - Riparian Wetland (0.016 (acres))
- Waters of the United States (2017-2019)
- Intermittent Stream
 - Perennial Stream
 - Riparian Wetland
- Extended Survey Area
 - Proposed project site
 - Previous Surveyed Areas

Notes

1. Coordinate System: NAD 1983 2011 StatePlane California FIPS 0401 F1 US
2. Base features USGS 2020; btl 2020

0 275 550 Feet
1:4,000 (At Original document size of 11x17)



Project Location 185804576
Shasta County CA Prepared by J/C on 2020-11-06
Technical Review by SI on 2020-11-06
Client/Project Independent Review by CB on 2020-11-06

ConnectGen Generating LLC
Fountain Wind Project

Figure No.

A1

Title

Biological Resources

A3. Environmental Design & Research: Shadow Flicker Analysis



Environmental Design & Research,
Landscape Architecture, Engineering & Environmental Services, D.P.C.

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memorandum

To: Henry Woltag
ConnectGen LLC

EDR Project No: 19255

From: Jacob Runner

Date: September 3, 2020

Reference: Fountain Wind Farm
Shadow Flicker Analysis

Comments:

Introduction

This memorandum report presents the findings of a shadow flicker analysis for the proposed Fountain Wind Farm (the Project) proposed by ConnectGen LLC (Client) in Shasta County, California (Figure 1). The layout evaluated in this analysis includes 72 Siemens Gamesa wind turbines on a 115-meter tower. The shadow flicker impact was evaluated at 72 receptors within 10 rotor diameters (1,700 meters) of the proposed wind turbines.

Shadow flicker refers to the shadows that a wind turbine casts over structures and observers at times of the day when the sun is directly behind the turbine rotor from an observer's position. During intervals of sunshine, operating wind turbine generators will cast a shadow on surrounding areas as the rotor blades pass in front of the sun, causing a flickering effect while the rotor is in motion. 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). 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 intensity 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 residences and wind turbines can significantly reduce or eliminate shadow flicker effects. At distances beyond roughly 10 rotor diameters (approximately 1,700 meters based on the largest turbine model proposed for the Project [SG170]) shadow flicker effects are generally considered negligible (BERR, 2009; DECC, 2011; DOER, 2011). For this reason, the shadow flicker analysis was run with a study area of 10 rotor diameters (1,700 meters).

The location and duration of shadow flicker can be predicted quite accurately using computer modeling programs and input data regarding turbine locations, turbine dimensions, receptor locations, local topography, and sunshine frequency. A conservative assumption that the turbines are in continuous operation is also applied. Shadow flicker effects predicted by the modeling exercise are expressed in terms of frequency (hours per year) at each receptor location.

Methods

This shadow flicker analysis evaluated the potential impact of 72 Siemens Gamesa SG170 turbines, each with a rotor diameter of 170 meters and a hub height of 115 meters (Figure 2).

WindPRO 3.3 software and the associated Shadow module was used to conduct the shadow flicker analysis. This software 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 72 proposed wind turbine sites (provided by the Applicant).
- The latitude and longitude coordinates for 72 potential receptors located within the 10-rotor diameter Study Area.
- USGS 1:24,000 topographic mapping and USGS digital elevation model (DEM) data.
- The rotor diameter (170 meters) and hub height (115 meters) for the SG 170 turbine.
- Annual wind rose data (provided by the Applicant) to determine the approximate directional frequency of rotor orientation throughout the year (Table A1 of Attachment A).
- 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 Sacramento, California was used (Table A2 of Attachment A). Data were obtained from NOAA's "Comparative Climatic Data for the United States through 2015" (<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 (DECC, 2011).
- In the preliminary analysis, the possible screening effect of trees and buildings adjacent to the receptors was not taken into consideration. In addition, the number and/or orientation of windows in residential receptors were not considered in the analysis.

Based on these variables and assumptions, *WindPRO* was used to calculate the theoretical number of hours per year that shadow flicker would occur at any given location in the vicinity of the Project. These predicted values represent a worst-case scenario. To more accurately calculate the amount of shadow flicker modeled to occur at non-participating receptors predicted to receive over 30-hours in the preliminary analysis, a desktop analysis was conducted to identify obstacles that could fully or partially block shadows at receptor sites. These data were then incorporated into the *WindPro* model and the analysis of predicted shadow flicker impacts at this receptor was evaluated. The following steps were undertaken as part of this desktop analysis:

1. Orthographic images were imported into the *WindPro* model (all images are geo-referenced).
2. Using digitizing tools in *WindPro*, geometric objects were drawn to represent different types of obstacles. Each object was assigned a width, length, and height to reflect the dimensions of the obstacle, as documented through client correspondence and orthographic images.
3. Porosity is then assigned to each obstacle. Low porosity factors (0, 0.2, etc.) were assigned to dense obstacles (such as buildings or stands of conifers) while higher porosity factors (0.5, 0.6, etc.) were assigned to obstacles with less density (such as widely spaced deciduous trees), see Table 1.

Table 1. Summary of Identified Obstacles at Non-Participating Receptors Predicted to Exceed 30 Hours¹

Receptor ID	Obstacle Types	Obstacle Location Relative to Receptor	Approximate Obstacle Dimensions (meters)	Assigned Porosity Factor
46	Stand of Mixed Trees	NW	12 x 19 x 7	0.3
51	Large Stand of Mixed Trees	W	12 x 44 x 50	0.3
12	Large Stand of Mixed Trees	W	12 x 67 x 45	0.3
15	Large Stand of Mixed Trees	W	12 x 43 x 71	0.3
16	Large Stand of Mixed Trees	W	12 x 13 x 30	0.3
11	Large Stand of Mixed Trees	NNW	12 x 67 x 45	0.3
	Large Stand of Mixed Trees	WSW	12 x 35 x 22	0.3
47	Large Stand of Mixed Trees	W	12 x 36 x 51	0.3
48	Large Stand of Mixed Trees	WNW	12 x 21 x 21	0.3
52	Large Stand of Mixed Trees	W	12 x 67 x 45	0.3
3	Large Stand of Mixed Trees	W	12 x 30 x 41	0.3
	Large Stand of Mixed Trees	WSW	12 x 20 x 74	0.3
50	Large Stand of Mixed Trees	W	12 x 30 x 41	0.3
	Large Stand of Mixed Trees	WSW	12 x 20 x 74	0.3
5	Large Stand of Mixed Trees	NNE	12 x 35 x 22	0.3
	Large Stand of Mixed Trees	W	12 x 20 x 14	0.3
	Stand of Evergreen Trees	WNW	12 x 36 x 71	0.2
1	Large Stand of Mixed Trees	NW	12 x 60 x 146	0.3
	Large Stand of Mixed Trees	NNE	12 x 128 x 247	0.3
49	Large Stand of Mixed Trees	NW	12 x 19 x 7	0.3
7	Stand of Evergreen Trees	W	12 x 36 x 71	0.2
	Large Stand of Mixed Trees	SE	12 x 20 x 14	0.3
6	Large Stand of Mixed Trees	NW	12 x 36 x 71	0.2
	Large Stand of Mixed Trees	W	12 x 41 x 18	0.3
2	Deciduous Tree	W	12 x 8 x 7	0.4
	Open Hedge	N	8 x 30 x 5	0.7
57	Large Stand of Mixed Trees	NW	12 x 24 x 11	0.3

No consistent national, state, county, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines at the proposed Project site. The National Association of Regulatory Utility Commissioners (NARUC)

¹ The non-participating receptors identified in this table were identified based on the results of the conservative worst-case analysis modeling. See the Results section of this document for an identification of receptors predicted to receive over 30 hours of shadow flicker per year after the effects of screening were taken into consideration.

recommends a threshold of 30 hours of shadow flicker per year at occupied buildings (NARUC, 2012). Accordingly, a threshold of 30 hours of shadow flicker per year was applied to this Project.

Although shadow flicker has been alleged to cause or contribute to health effects, including seizures, modern wind turbines typically operate at a frequency lower than the typical threshold for photosensitive epilepsy sensitivity, and there is no evidence that wind turbines can trigger seizures (British Epilepsy Association, 2007; Ellenbogen et al., 2012; NHMRC, 2010; DECC, 2011).

Other health effects alleged to be caused by wind turbines are the symptoms associated with Wind Turbine Syndrome including insomnia, headaches, tinnitus, dizziness, nausea, panic attacks, and palpitations. Based on a detailed review of scientific literature and other reports, an expert panel found that, "there is limited scientific evidence of an association from prolonged shadow flicker (exceeding 30 minutes per day) and potential transitory cognitive and physical health effects" (Ellenbogen et al., 2012). Ellenbogen et al. (2012) also concluded, "there is no evidence for a set of health effects, from exposure to wind turbines that could be characterized as a 'Wind Turbine Syndrome.'" The primary concern with shadow flicker is the annoyance it can cause for adjacent homeowners.

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

Results

Output from the model includes the following information:

- Calculated shadow flicker time (specific days, maximum hours per day, and total hours per year when shadow flicker is expected) at each of the receptors located in the Study Area.
- Tabulated and plotted time of day that receptors are predicted to receive shadow flicker (Attachment B).
- Shadow isolines, which are used to create maps showing turbine locations, receptors, and projected shadow flicker duration (hours per year; Figure 3).

A summary of the projected shadow flicker at each of the 72 receptors in the Study Area is presented below:

- 16 (22%) of the receptors may be affected 0-1 hour/year,
- 14 (19%) of the receptors may be affected 1-10 hours/year,
- 19 (26%) of the receptors may be affected 10-20 hours/year,
- 21 (29%) of the receptors may be affected 20-30 hours/year,
- 2 (3%) of the receptors may be affected for more than 30 hours/year.

As these results indicate, 97% of the receptors are predicted to receive less than 30 hours of shadow flicker per year, with 47% 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 and will generally last less than 1 hour per day. The maximum daily duration of shadow flicker is 1 hour and 12 minutes (at receptor 2, see Attachment B).

Table 2 provides the results of the predicted shadow flicker at the two receptors calculated to experience more than 30 hours of shadow flicker per year. Figure 4 shows the results of the predicted shadow flicker with obstacles in place at non-participating receptors originally predicted over 30-hours of shadow flicker per year. The times of day and

duration of shadow flicker experienced by each receptor 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 detailed calendars that illustrate the specific times of year and day that shadow flicker may occur at all receptors.

Table 2. Summary of Shadow Flicker Results at Receptors Predicted to Exceed 30 Hours

Receptor ID	Project Status	Predicted Annual Shadow Flicker (hh:mm)	Predicted Max Daily Shadow Flicker (hh:mm)	Predicted Shadow Flicker (days/year)
2	Non-Participating	63:06	1:12	176
58	Participating	55:14	0:55	250

Details regarding shadow flicker effects predicted at the two receptors predicted to receive over 30 hours of shadow flicker are presented in Table 3 below and in Attachment B.

Table 3. Daily Effect to Receptors Predicted to Exceed 30 Hours of Shadow Flicker

Receptor ID	Project Status	Predicted Annual Shadow Flicker (hh:mm)	Turbines Contributing to Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker ¹
2	Non-Participating	63:06	E01, D04, D05	3:30 PM – 4:45 PM 6:45 PM – 8:15 PM
58	Participating	55:14	N02, N02A, N05, M08, M10	6:45 AM – 7:30 AM 8:00 AM – 8:45 AM 4:15 PM – 6:15 PM 7:15 PM – 8:30 PM

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

Conclusion

In summary, as a result of modeling the proposed Siemens Games SG 170 turbine model, *WindPRO* predicted that two receptors will receive more than 30 hours of shadow flicker per year. The primary concern with shadow flicker is the annoyance that it can cause for adjacent homeowners. A common finding is that annoyance is lower among residents who benefited economically from the wind turbines (i.e., project participants; Michaud et al., 2016). One of the receptors predicted to receive over 30 hours of shadow flicker per year is a Project participant.

Depending on the final turbine layout and model selected, there may be no non-participating receptors that are predicted to receive more than 30 hours/year of shadow flicker, the proposed threshold for which mitigation will be performed as discussed below. Therefore, following final turbine model selection the Applicant will prepare an updated receptor-specific shadow flicker analysis for non-participating residences. This analysis will take into account any screening by existing yard trees, buildings, or proximity to stands of trees and the number and/or orientation of windows in residential receptors. Additionally, this analysis will also use project specific met data to account for wind being below or above generation speeds.

Many of the modeled shadow flicker hours are expected to be of low intensity, as they will occur during the early morning or late afternoon hours when the sun is low in the sky. When the sun sinks low on 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. Following the final shadow flicker analysis for non-participating residences, if shadow flicker is modeled to exceed 30 hours per year at a non-participating residence, the following mitigation options are available: work with the landowner to become a Project participant or planting of trees or installation of window blinds to block the shadow flicker. These mitigation options can be easily implemented even after the Facility has been constructed.

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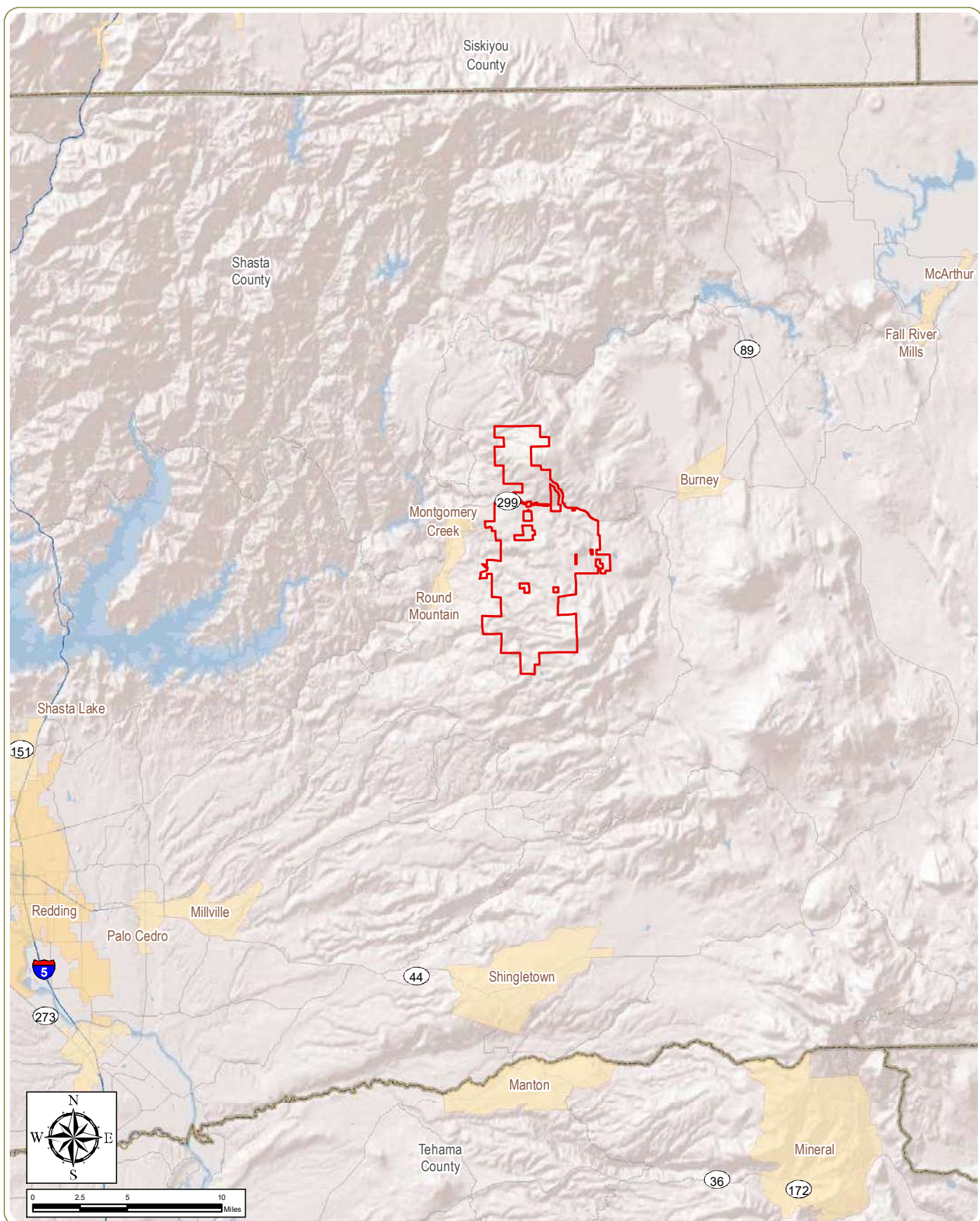
Michaud et. al. 2016. Estimating Annoyance to Calculated Wind Turbine Shadow Flicker is Improved when Variables Associated with Wind Turbine Noise Exposure are considered. *Journal of the Acoustical Society of America* 139, 1480.

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Figures



Fountain Wind Farm

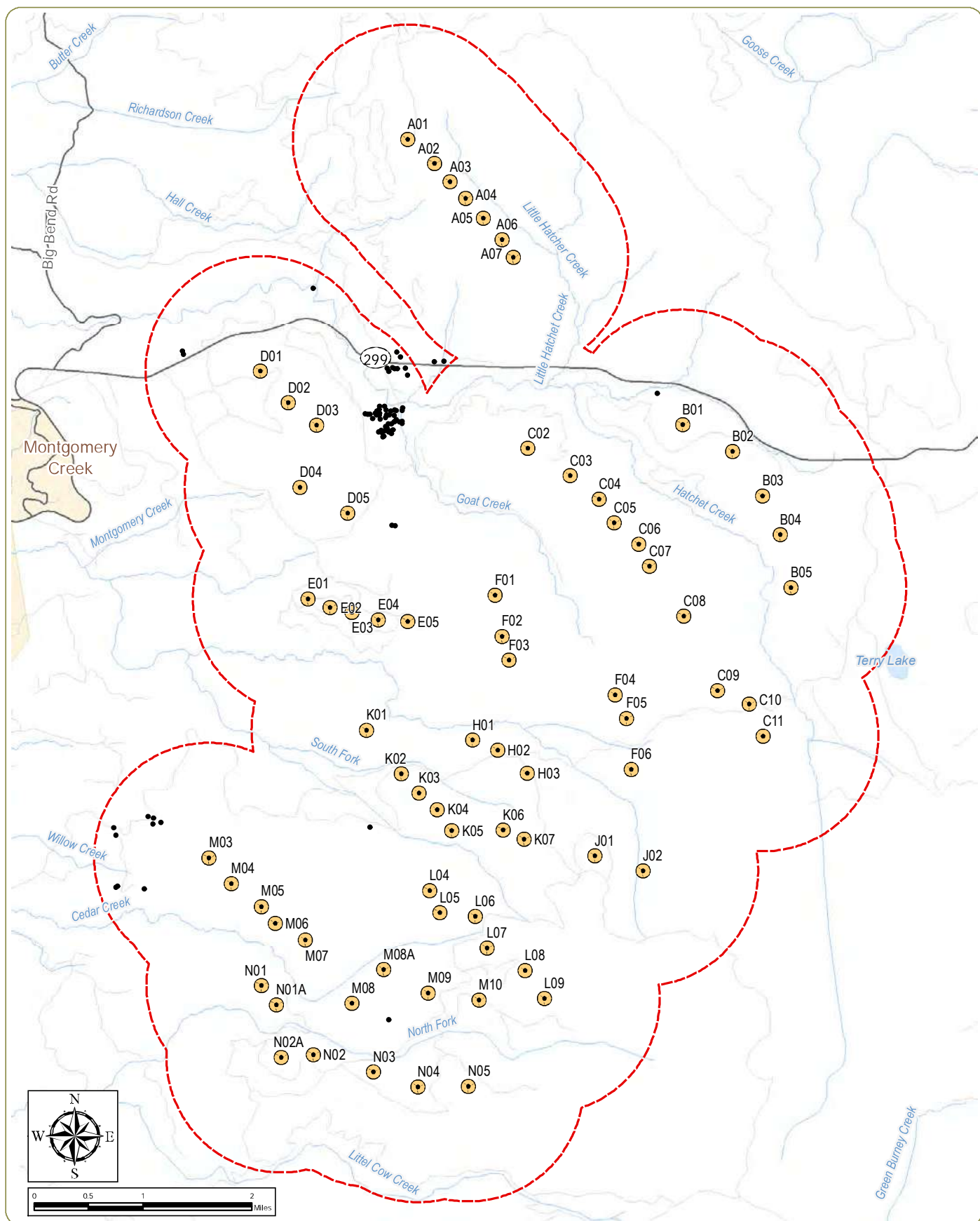
Shasta County, California

Figure 1. Regional Project Location

Project Area

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 September 3, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.





Fountain Wind Farm

Shasta County, California

Figure 2. Proposed Turbine Layout

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on September 3, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Receptor
- Wind Turbine
- ▭ 1,700-meter Study Area



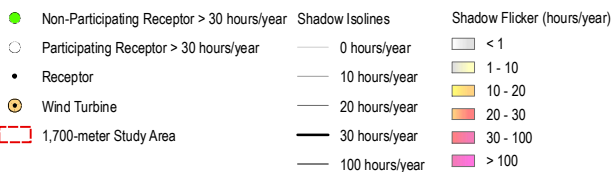
www.edrdpc.com



Fountain Wind Farm

Shasta County, California

Figure 3. Projected Shadow Flicker



Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on September 3, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



www.edrdpc.com

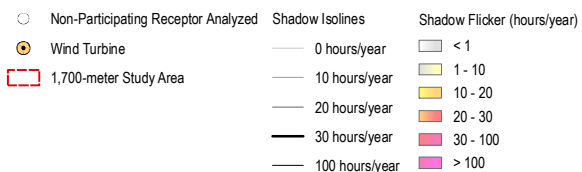


Fountain Wind Farm

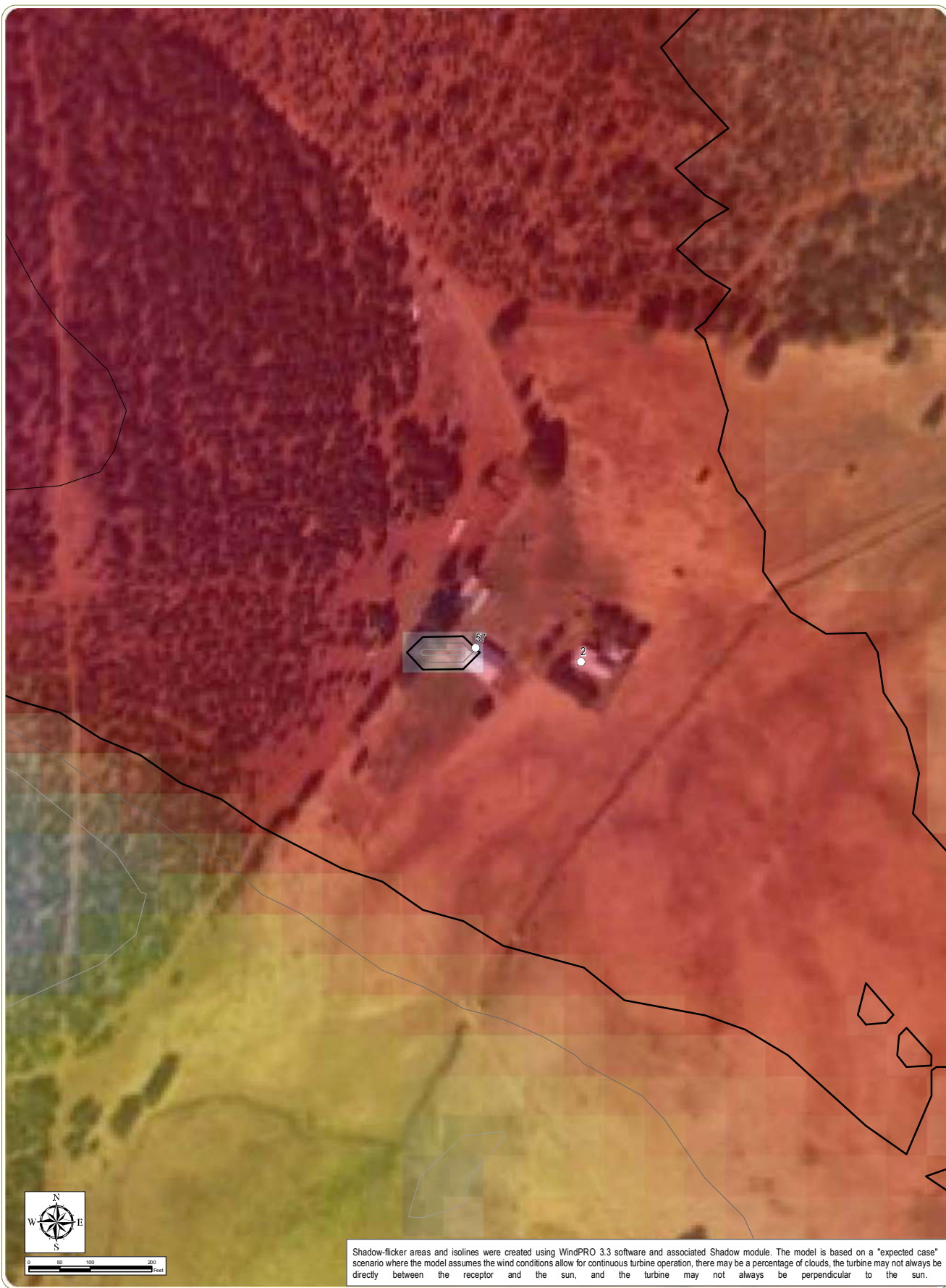
Shasta County, California

Figure 4. Projected Shadow Flicker with Obstacles
Sheet 1 of 2

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on September 3, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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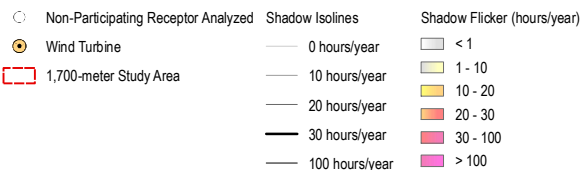


Fountain Wind Farm

Shasta County, California

Figure 4. Projected Shadow Flicker with Obstacles
Sheet 2 of 2

Notes: 1. Basemap: ESRI StreetMap North America, 2008. 2. This map was generated in ArcMap on September 3, 2020. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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Attachment A

Wind Rose and Sunshine Data

Table A1. Wind Rose Data

SECTOR	N	NNE	NE	ENE	E	ESE	SE	SSE
Frequency	0.26	0.74	3.65	22.10	20.89	1.36	0.06	0.27
Hours of Operation	23	65	319	1,935	1,830	119	5	24

SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW
Frequency	3.88	16.34	20.16	8.68	1.13	0.22	0.12	0.15
Hours of Operation	340	1,432	1,766	761	99	19	10	13

Source: Wind rose data provided by ConnectGen LLC.

Table A2. Sunshine Probability Data¹

Month	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Sunshine Probability ²	0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

¹Source: NOAA Comparative Climatic Data for the United States through 2015 – Sacramento, California Weather Station.

²Defined 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 Results and Calendar

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Main Result

Assumptions for shadow calculations

Maximum distance for influence 1,700 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
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761

W	WNW	NW	NNW	Sum
99	19	10	13	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: 5m_contour.wpo (2)

Obstacles used in calculation

Eye height for map: 1.5 m

Grid resolution: 1.0 m

All coordinates are in

UTM (north)-NAD83 (US+CA) Zone: 10

WTGs

	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	RPM
					Valid	Manufact.					
			[m]								[RPM]
A01	597,318	4,527,808	1,492.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A02	597,712	4,527,454	1,504.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A03	597,941	4,527,184	1,490.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A04	598,171	4,526,937	1,500.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A05	598,437	4,526,648	1,484.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A06	598,714	4,526,329	1,457.7	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
A07	598,875	4,526,063	1,438.8	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
B01	601,381	4,523,596	1,279.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
B02	602,116	4,523,200	1,331.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
B03	602,564	4,522,544	1,353.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
B04	602,827	4,521,967	1,380.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
B05	602,987	4,521,187	1,420.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C02	599,095	4,523,244	1,363.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C03	599,718	4,522,840	1,375.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C04	600,146	4,522,492	1,399.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C05	600,369	4,522,141	1,388.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C06	600,735	4,521,827	1,440.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C07	600,890	4,521,500	1,448.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C08	601,395	4,520,764	1,527.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C09	601,895	4,519,661	1,405.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C10	602,363	4,519,468	1,403.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
C11	602,575	4,518,991	1,389.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
D01	595,140	4,524,387	1,139.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
D02	595,549	4,523,917	1,186.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
D03	595,971	4,523,583	1,191.8	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
D04	595,721	4,522,668	1,191.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
D05	596,430	4,522,287	1,204.4	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
E01	595,841	4,521,015	1,265.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
E02	596,170	4,520,891	1,248.2	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
E03	596,491	4,520,821	1,285.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
E04	596,885	4,520,706	1,258.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
E05	597,317	4,520,684	1,244.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
F01	598,610	4,521,072	1,433.8	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
F02	598,715	4,520,467	1,415.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	
F03	598,817	4,520,112	1,404.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8	

To be continued on next page...

SHADOW - Main Result

...continued from previous page

	Easting	Northing	Z	Row data/Description	WTG type		Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	RPM [RPM]
					Valid	Manufact.					
			[m]								
F04	600,387	4,519,601	1,437.8	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
F05	600,551	4,519,255	1,413.7	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
F06	600,625	4,518,503	1,415.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
H01	598,278	4,518,936	1,379.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
H02	598,647	4,518,781	1,411.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
H03	599,088	4,518,444	1,441.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
J01	600,083	4,517,222	1,548.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
J02	600,797	4,517,003	1,573.2	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K01	596,707	4,519,080	1,307.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K02	597,221	4,518,435	1,358.8	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K03	597,481	4,518,149	1,380.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K04	597,756	4,517,907	1,383.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K05	597,970	4,517,594	1,374.2	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K06	598,727	4,517,605	1,468.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
K07	599,039	4,517,466	1,508.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L04	597,642	4,516,708	1,461.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L05	597,794	4,516,383	1,448.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L06	598,318	4,516,326	1,446.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L07	598,491	4,515,859	1,498.7	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L08	599,056	4,515,524	1,579.7	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
L09	599,342	4,515,113	1,621.2	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M03	594,381	4,517,194	1,211.5	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M04	594,709	4,516,810	1,268.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M05	595,156	4,516,473	1,310.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M06	595,360	4,516,223	1,316.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M07	595,801	4,515,977	1,343.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M08	596,496	4,515,042	1,365.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M08A	596,959	4,515,539	1,388.3	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M09	597,622	4,515,191	1,421.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
M10	598,374	4,515,088	1,510.2	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N01	595,155	4,515,306	1,343.6	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N01A	595,379	4,515,016	1,291.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N02	595,918	4,514,280	1,372.9	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N02A	595,449	4,514,243	1,403.7	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N03	596,809	4,514,026	1,393.1	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N04	597,468	4,513,805	1,445.4	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8
N05	598,214	4,513,815	1,526.0	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 1... Yes	Yes	Siemens Gamesa	SG 6.0-170-6,200	6,200	170.0	115.0	8.8

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
						a.g.l.	window		(ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
1	596,761	4,517,643	1,313.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
2	597,139	4,522,095	1,193.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
3	596,965	4,523,417	1,160.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
4	597,077	4,523,458	1,160.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
5	596,936	4,523,472	1,156.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
6	596,892	4,523,480	1,154.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
7	596,927	4,523,510	1,153.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
8	597,040	4,523,485	1,158.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
9	597,075	4,523,502	1,157.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
10	597,102	4,523,517	1,154.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
11	596,977	4,523,500	1,155.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
12	596,994	4,523,518	1,154.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
13	597,018	4,523,541	1,152.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
14	597,077	4,523,604	1,143.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
15	596,914	4,523,677	1,141.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
16	596,992	4,523,699	1,137.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
17	597,199	4,523,634	1,137.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
18	597,049	4,523,741	1,133.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
19	596,900	4,523,731	1,140.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
20	596,860	4,523,737	1,143.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
21	596,907	4,523,763	1,139.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0

To be continued on next page...

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Main Result

...continued from previous page

No.	Easting	Northing	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
			[m]	[m]	[m]	a.g.l.	window		(ZVI) a.g.l.
						[m]	[°]		[m]
22	596,842	4,523,763	1,143.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
23	596,865	4,523,793	1,141.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
24	596,900	4,523,815	1,139.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
25	597,003	4,523,811	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
26	597,072	4,523,791	1,132.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
28	597,152	4,523,804	1,130.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
29	597,130	4,523,806	1,129.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
30	596,902	4,523,866	1,139.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
31	596,973	4,523,866	1,136.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
32	597,246	4,523,843	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
33	597,237	4,523,800	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
34	597,016	4,524,431	1,138.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
35	597,096	4,524,432	1,139.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
36	597,128	4,524,422	1,140.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
37	597,169	4,524,418	1,140.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
38	597,284	4,524,428	1,142.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
39	597,044	4,524,382	1,137.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
40	597,320	4,524,323	1,135.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
41	597,161	4,524,663	1,147.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
42	597,211	4,524,594	1,146.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
43	601,007	4,524,052	1,253.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
44	594,004	4,524,632	1,054.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
45	593,985	4,524,684	1,054.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
46	596,765	4,523,743	1,146.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
47	596,801	4,523,680	1,147.6	1.0	1.0	1.0	90.0	"Green house mode"	2.0
48	596,728	4,523,747	1,148.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
49	596,687	4,523,749	1,149.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
50	596,950	4,523,415	1,160.2	1.0	1.0	1.0	90.0	"Green house mode"	2.0
51	597,031	4,523,606	1,146.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
52	596,991	4,523,563	1,150.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0
53	597,117	4,523,632	1,135.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
54	597,136	4,523,639	1,134.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
57	597,086	4,522,102	1,193.5	1.0	1.0	1.0	90.0	"Green house mode"	2.0
58	597,040	4,514,798	1,418.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
59	593,426	4,516,733	1,005.4	1.0	1.0	1.0	90.0	"Green house mode"	2.0
60	593,029	4,516,772	950.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
61	593,007	4,516,752	950.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
62	593,479	4,517,798	991.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
63	593,554	4,517,692	994.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
64	593,668	4,517,712	1,007.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
65	593,563	4,517,780	997.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
66	592,979	4,517,635	948.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
67	593,003	4,517,524	948.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
68	597,234	4,523,612	1,145.9	1.0	1.0	1.0	90.0	"Green house mode"	2.0
69	597,150	4,523,668	1,132.7	1.0	1.0	1.0	90.0	"Green house mode"	2.0
70	597,235	4,523,642	1,147.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
71	597,122	4,523,729	1,130.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
72	597,005	4,523,739	1,135.0	1.0	1.0	1.0	90.0	"Green house mode"	2.0
73	597,859	4,524,531	1,150.3	1.0	1.0	1.0	90.0	"Green house mode"	2.0
74	597,712	4,524,519	1,148.8	1.0	1.0	1.0	90.0	"Green house mode"	2.0
75	595,923	4,525,608	1,080.1	1.0	1.0	1.0	90.0	"Green house mode"	2.0

Calculation Results

Shadow receptor

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]	
1	21:24	50	0:31	3:46	
2	126:21	176	1:12	63:06	
3	49:49	102	0:42	24:49	
4	51:03	137	0:36	26:56	
5	23:42	73	0:29	10:44	
6	0:00	0	0:00	0:00	

To be continued on next page...

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Main Result

...continued from previous page

No.	Shadow, worst case		Max shadow hours per day [h/day]	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	
7	0:00	0	0:00	0:00	
8	55:02	144	0:37	29:09	
9	51:00	140	0:36	27:10	
10	48:42	138	0:35	26:02	
11	0:00	0	0:00	0:00	
12	0:00	0	0:00	0:00	
13	0:00	0	0:00	0:00	
14	0:00	0	0:00	0:00	
15	0:00	0	0:00	0:00	
16	34:12	94	0:28	16:48	
17	27:26	76	0:32	15:12	
18	33:32	82	0:36	19:28	
19	43:36	93	0:41	25:22	
20	50:38	119	0:43	29:13	
21	47:27	116	0:41	27:24	
22	47:57	99	0:43	28:19	
23	45:28	94	0:42	27:11	
24	41:59	90	0:40	25:13	
25	35:21	84	0:37	21:04	
26	31:38	78	0:35	18:40	
28	28:02	75	0:32	16:34	
29	28:51	76	0:33	17:04	
30	41:16	90	0:40	24:58	
31	36:29	86	0:38	22:00	
32	23:54	68	0:30	14:10	
33	24:19	69	0:30	14:19	
34	43:04	103	0:32	20:39	
35	42:31	109	0:30	20:18	
36	41:41	112	0:30	19:56	
37	38:35	114	0:29	18:36	
38	19:07	58	0:27	8:54	
39	46:14	113	0:31	22:13	
40	14:55	44	0:27	7:41	
41	6:12	27	0:17	2:35	
42	19:49	53	0:27	8:20	
43	0:00	0	0:00	0:00	
44	18:24	43	0:33	8:03	
45	17:41	41	0:33	7:23	
46	0:00	0	0:00	0:00	
47	6:38	28	0:18	2:46	
48	0:00	0	0:00	0:00	
49	0:00	0	0:00	0:00	
50	52:13	104	0:44	25:55	
51	0:00	0	0:00	0:00	
52	0:00	0	0:00	0:00	
53	31:13	80	0:34	17:16	
54	30:23	80	0:34	16:52	
57	14:44	44	0:24	6:07	
58	125:12	250	0:55	55:14	
59	16:56	45	0:30	10:33	
60	40:50	107	0:29	29:27	
61	30:18	73	0:28	23:05	
62	35:53	85	0:35	8:54	
63	40:36	89	0:39	11:11	
64	49:22	101	0:42	12:19	
65	40:59	92	0:38	10:00	
66	10:58	33	0:26	4:29	
67	11:33	34	0:27	5:06	
68	16:12	40	0:31	9:20	
69	29:13	77	0:33	16:26	
70	16:01	40	0:31	9:19	
71	29:47	77	0:34	17:11	
72	36:02	85	0:37	20:56	
73	0:00	0	0:00	0:00	

To be continued on next page...

SHADOW - Main Result

...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]	
74	0:00	0	0:00	0:00	
75	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]
A01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (68)	0:00	0:00
A02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (69)	0:00	0:00
A03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (70)	0:00	0:00
A04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (71)	0:00	0:00
A05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (72)	0:00	0:00
A06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (73)	0:00	0:00
A07	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (74)	0:00	0:00
B01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (109)	0:00	0:00
B02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (111)	0:00	0:00
B03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (112)	0:00	0:00
B04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (116)	0:00	0:00
B05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (118)	0:00	0:00
C02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (79)	0:00	0:00
C03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (80)	0:00	0:00
C04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (110)	0:00	0:00
C05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (113)	0:00	0:00
C06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (114)	0:00	0:00
C07	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (115)	0:00	0:00
C08	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (117)	0:00	0:00
C09	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (121)	0:00	0:00
C10	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (122)	0:00	0:00
C11	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (123)	0:00	0:00
D01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (75)	24:12	10:21
D02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (76)	79:59	41:31
D03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (77)	190:44	101:00
D04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (78)	72:18	32:25
D05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (82)	91:30	45:10
E01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (81)	21:07	8:52
E02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (83)	0:00	0:00
E03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (84)	0:00	0:00
E04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (85)	0:00	0:00
E05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (139)	0:00	0:00
F01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (86)	0:00	0:00
F02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (87)	0:00	0:00
F03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (88)	0:00	0:00
F04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (119)	0:00	0:00
F05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (120)	0:00	0:00
F06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (124)	0:00	0:00
H01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (90)	0:00	0:00
H02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (95)	0:00	0:00
H03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (96)	0:00	0:00
J01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (125)	0:00	0:00
J02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (126)	0:00	0:00
K01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (89)	0:00	0:00
K02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (91)	0:00	0:00
K03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (92)	0:00	0:00
K04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (93)	0:00	0:00
K05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (94)	0:00	0:00
K06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (97)	0:00	0:00
K07	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (104)	0:00	0:00
L04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (102)	21:24	3:46
L05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (103)	0:00	0:00
L06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (106)	0:00	0:00
L07	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (107)	0:00	0:00
L08	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (108)	0:00	0:00
L09	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (131)	0:00	0:00
M03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (138)	103:58	48:08

To be continued on next page...

SHADOW - Main Result

...continued from previous page

No.	Name	Worst case [h/year]	Expected [h/year]
M04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (137)	52:40	19:40
M05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (98)	0:00	0:00
M06	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (99)	0:00	0:00
M07	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (100)	0:00	0:00
M08	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (128)	68:29	30:09
M08A	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (136)	0:00	0:00
M09	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (105)	0:00	0:00
M10	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (130)	17:34	12:13
N01	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (101)	0:00	0:00
N01A	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (134)	0:00	0:00
N02	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (127)	10:50	6:01
N02A	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (135)	5:36	3:19
N03	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (129)	0:00	0:00
N04	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (132)	0:00	0:00
N05	Siemens Gamesa SG 6.0-170 6200 170.0 !O! hub: 115.0 m (TOT: 200.0 m) (133)	23:31	4:18

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 1 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (76)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January		February		March	April	May	June	July	August	September	October	November	December	
1	07:32		08:48 (L04)	07:19	06:43	06:53	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12	08:38 (L04)
	16:50	29	09:17 (L04)	17:24	17:57	19:31	20:03	20:32	20:43	20:25	19:43	18:53	18:06	16:41	20 08:58 (L04)
2	07:32		08:49 (L04)	07:18	06:41	06:51	06:06	05:39	05:40	06:05	06:35	07:05	06:39	07:13	08:38 (L04)
	16:51	29	09:18 (L04)	17:25	17:59	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05	16:41	22 09:00 (L04)
3	07:33		08:50 (L04)	07:17	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40	07:14	08:37 (L04)
	16:51	28	09:18 (L04)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41	24 09:01 (L04)
4	07:33		08:50 (L04)	07:16	06:38	06:48	06:03	05:38	05:41	06:07	06:37	07:07	06:41	07:15	08:37 (L04)
	16:52	28	09:18 (L04)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:41	25 09:02 (L04)
5	07:33		08:51 (L04)	07:15	06:37	06:46	06:02	05:37	05:42	06:08	06:38	07:08	06:42	07:16	08:37 (L04)
	16:53	27	09:18 (L04)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40	25 09:02 (L04)
6	07:33		08:51 (L04)	07:14	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09	06:44	07:17	08:37 (L04)
	16:54	26	09:17 (L04)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40	26 09:03 (L04)
7	07:32		08:52 (L04)	07:13	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10	06:45	07:18	08:37 (L04)
	16:55	25	09:17 (L04)	17:31	18:04	19:37	20:09	20:36	20:42	20:19	19:33	18:43	16:59	16:40	27 09:04 (L04)
8	07:32		08:53 (L04)	07:11	07:32	06:41	05:59	05:37	05:44	06:10	06:41	07:11	06:46	07:19	08:37 (L04)
	16:56	25	09:18 (L04)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40	28 09:05 (L04)
9	07:32		08:54 (L04)	07:10	07:30	06:40	05:58	05:36	05:44	06:11	06:42	07:12	06:47	07:20	08:38 (L04)
	16:57	24	09:18 (L04)	17:33	19:06	19:40	20:11	20:37	20:42	20:16	19:30	18:40	16:57	16:40	28 09:06 (L04)
10	07:32		08:56 (L04)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21	08:38 (L04)
	16:58	22	09:18 (L04)	17:35	19:08	19:41	20:12	20:38	20:41	20:15	19:28	18:38	16:56	16:40	29 09:07 (L04)
11	07:32		08:56 (L04)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22	08:38 (L04)
	16:59	20	09:16 (L04)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40	29 09:07 (L04)
12	07:31		08:58 (L04)	07:07	07:26	06:35	05:54	05:36	05:47	06:14	06:45	07:15	06:51	07:22	08:39 (L04)
	17:00	18	09:16 (L04)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40	29 09:08 (L04)
13	07:31		08:59 (L04)	07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23	08:38 (L04)
	17:01	17	09:16 (L04)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40	30 09:08 (L04)
14	07:31		09:01 (L04)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24	08:39 (L04)
	17:02	13	09:14 (L04)	17:40	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:41	30 09:09 (L04)
15	07:30		09:03 (L04)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25	08:40 (L04)
	17:03	10	09:13 (L04)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41	30 09:10 (L04)
16	07:30			07:02	07:19	06:29	05:50	05:36	05:50	06:18	06:49	07:20	06:55	07:25	08:40 (L04)
	17:04			17:42	19:14	19:47	20:18	20:41	20:38	20:07	19:18	18:29	16:50	16:41	31 09:11 (L04)
17	07:30			07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26	08:40 (L04)
	17:06			17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41	31 09:11 (L04)
18	07:29			06:59	07:16	06:26	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27	08:41 (L04)
	17:07			17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49	16:42	30 09:11 (L04)
19	07:29			06:58	07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23	06:59	07:27	08:41 (L04)
	17:08			17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42	30 09:11 (L04)
20	07:28			06:56	07:12	06:23	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28	08:42 (L04)
	17:09			17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:23	16:47	16:42	30 09:12 (L04)
21	07:27			06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:28	08:43 (L04)
	17:10			17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43	30 09:13 (L04)
22	07:27			06:53	07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26	07:02	07:29	08:43 (L04)
	17:11			17:49	19:21	19:53	20:24	20:43	20:34	19:58	19:08	18:20	16:46	16:43	30 09:13 (L04)
23	07:26			06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:29	08:43 (L04)
	17:13			17:50	19:22	19:54	20:24	20:43	20:34	19:57	19:06	18:18	16:45	16:44	30 09:13 (L04)
24	07:25			06:50	07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29	07:05	07:30	08:44 (L04)
	17:14			17:52	19:23	19:55	20:25	20:43	20:33	19:55	19:04	18:17	16:45	16:44	30 09:14 (L04)
25	07:25			06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:30	08:44 (L04)
	17:15			17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45	30 09:14 (L04)
26	07:24			06:47	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31	08:45 (L04)
	17:16			17:54	19:25	19:57	20:27	20:43	20:31	19:52	19:01	18:14	16:43	16:45	31 09:16 (L04)
27	07:23			06:46	07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32	07:08	08:42 (L04)	07:31 08:45 (L04)
	17:17			17:55	19:26	19:58	20:28	20:43	20:30	19:51	18:59	18:13	16:43	10 08:52 (L04)	16:46 31 09:16 (L04)
28	07:22			06:44	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	08:41 (L04)	07:31 08:46 (L04)
	17:19			17:56	19:27	19:59	20:29	20:44	20:29	19:49	18:58	18:11	16:43	13 08:54 (L04)	16:47 30 09:16 (L04)
29	07:22				06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	08:39 (L04)	07:32 08:46 (L04)
	17:20				19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	17 08:56 (L04)	16:47 30 09:16 (L04)
30	07:21				06:56	06:09	05:40	05:39	06:02	06:32	07:03	07:35	07:11	08:39 (L04)	07:32 08:46 (L04)
	17:21				19:29	20:02	20:30	20:43	20:27	19:46	18:54	18:09	16:42	18 08:57 (L04)	16:48 30 09:16 (L04)
31	07:20				06:54		05:39		06:03	06:33		07:37		07:32	08:48 (L04)
	17:22				19:30		20:31		20:26	19:44		18:07		16:49	29 09:17 (L04)
Potential sun hours	298			297	369	398	448	451	458	428	375	346	299	288	
Total, worst case	341												58		885
Sun reduction	0.45												0.61		0.47
Oper. time red.	1.00												1.00		1.00
Wind dir. red.	0.37												0.37		0.37
Total reduction	0.17												0.23		0.18
Total, real	57												13		156

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 2 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32		15:48 (E01)	07:19	06:43	06:52			06:07			18:52 (D05)	05:39		18:54 (D05)		
	16:50	24	16:12 (E01)	17:23	17:57	19:31			20:03	48	19:40 (D05)	20:32	64	20:02 (D04)			
2	07:33		15:48 (E01)	07:18	06:41	06:51			06:06			18:52 (D05)	05:38		18:55 (D05)		
	16:50	25	16:13 (E01)	17:25	17:58	19:32			20:04	49	19:41 (D05)	20:33	62	20:02 (D04)			
3	07:33		15:49 (E01)	07:17	06:40	06:49			06:05			18:50 (D05)	05:38		18:56 (D05)		
	16:51	24	16:13 (E01)	17:26	18:00	19:33			20:05	51	19:41 (D05)	20:34	60	20:02 (D04)			
4	07:33		15:50 (E01)	07:16	06:38	06:48			06:03			18:50 (D05)	05:38		18:56 (D05)		
	16:52	23	16:13 (E01)	17:27	18:01	19:34			20:06	51	19:41 (D05)	20:34	58	20:01 (D04)			
5	07:33		15:50 (E01)	07:15	06:37	06:46			06:02			18:49 (D05)	05:37		18:57 (D05)		
	16:53	24	16:14 (E01)	17:28	18:02	19:35			20:07	53	19:42 (D05)	20:35	57	20:01 (D04)			
6	07:33		15:51 (E01)	07:14	06:35	06:44			06:01			18:49 (D05)	05:37		18:58 (D05)		
	16:54	23	16:14 (E01)	17:30	18:03	19:36			20:08	53	19:42 (D05)	20:36	53	20:00 (D04)			
7	07:33		15:51 (E01)	07:13	06:34	06:43			06:00			18:49 (D05)	05:37		18:58 (D05)		
	16:55	22	16:13 (E01)	17:31	18:04	19:37			20:09	54	19:43 (D05)	20:36	51	19:59 (D04)			
8	07:32		15:52 (E01)	07:11	07:32	06:41			05:59			18:49 (D05)	05:36		18:59 (D05)		
	16:56	21	16:13 (E01)	17:32	19:05	19:38			20:10	57	19:48 (D04)	20:37	48	19:58 (D04)			
9	07:32		15:53 (E01)	07:10	07:30	06:39			05:57			18:49 (D05)	05:36		18:59 (D05)		
	16:57	21	16:14 (E01)	17:33	19:06	19:40			20:11	60	19:49 (D04)	20:38	45	19:57 (D04)			
10	07:32		15:54 (E01)	07:09	07:29	06:38			05:56			18:47 (D05)	05:36		19:00 (D05)		
	16:58	20	16:14 (E01)	17:35	19:07	19:41			20:12	62	19:49 (D04)	20:38	39	19:55 (D04)			
11	07:32		15:54 (E01)	07:08	07:27	06:36			05:55			18:47 (D05)	05:36		19:01 (D05)		
	16:59	19	16:13 (E01)	17:36	19:09	19:42			20:13	63	19:50 (D04)	20:39	37	19:38 (D05)			
12	07:32		15:56 (E01)	07:07	07:26	06:35			05:54			18:47 (D05)	05:36		19:01 (D05)		
	17:00	17	16:13 (E01)	17:37	19:10	19:43			20:14	64	19:51 (D04)	20:39	37	19:38 (D05)			
13	07:31		15:57 (E01)	07:05	07:24	06:33			05:53			18:47 (D05)	05:36		19:02 (D05)		
	17:01	16	16:13 (E01)	17:38	19:11	19:44			20:15	64	19:51 (D04)	20:40	36	19:38 (D05)			
14	07:31		15:58 (E01)	07:04	07:22	06:32			05:52			18:48 (D05)	05:36		19:02 (D05)		
	17:02	14	16:12 (E01)	17:40	19:12	19:45			20:16	65	19:53 (D04)	20:40	35	19:37 (D05)			
15	07:31		16:00 (E01)	07:03	07:21	06:30			05:51			18:48 (D05)	05:36		19:03 (D05)		
	17:03	11	16:11 (E01)	17:41	19:13	19:46			20:17	66	19:54 (D04)	20:41	34	19:37 (D05)			
16	07:30		16:02 (E01)	07:02	07:19	06:28			05:50			18:48 (D05)	05:36		19:03 (D05)		
	17:04	7	16:09 (E01)	17:42	19:14	19:47			20:18	67	19:55 (D04)	20:41	34	19:37 (D05)			
17	07:30			07:00	07:17	06:27			05:49			18:48 (D05)	05:36		19:03 (D05)		
	17:05			17:43	19:15	19:48			20:19	68	19:56 (D04)	20:41	34	19:37 (D05)			
18	07:29			06:59	07:16	06:25			05:48			18:49 (D05)	05:36		19:04 (D05)		
	17:07			17:44	19:16	19:49			20:20	68	19:57 (D04)	20:42	33	19:37 (D05)			
19	07:29			06:58	07:14	06:24			05:47			18:49 (D05)	05:36		19:04 (D05)		
	17:08			17:46	19:17	19:50			20:21	68	19:57 (D04)	20:42	33	19:37 (D05)			
20	07:28			06:56	07:12	06:22			05:47			18:49 (D05)	05:36		19:04 (D05)		
	17:09			17:47	19:18	19:51			20:22	69	19:58 (D04)	20:42	33	19:37 (D05)			
21	07:28			06:55	07:11	06:21			05:46			18:50 (D05)	05:36		19:04 (D05)		
	17:10			17:48	19:19	19:52	13		19:11 (D05)	05:46		18:50 (D05)	05:36		19:04 (D05)		
22	07:27			06:53	07:09	06:20			19:24 (D05)	05:45		18:50 (D05)	05:36		19:05 (D05)		
	17:11			17:49	19:21	19:53	22		19:07 (D05)	05:45		18:50 (D05)	05:36		19:05 (D05)		
23	07:26			06:52	07:07	06:18			19:29 (D05)	05:44		20:00 (D04)	20:43	33	19:38 (D05)		
	17:12			17:50	19:22	19:54	28		19:03 (D05)	05:44		18:50 (D05)	05:37		19:05 (D05)		
24	07:26			06:50	07:06	06:17			19:31 (D05)	05:43		20:01 (D04)	20:43	33	19:38 (D05)		
	17:14			17:51	19:23	19:55	32		19:01 (D05)	05:43		18:51 (D05)	05:37		19:05 (D05)		
25	07:25			06:49	07:04	06:15			19:33 (D05)	05:43		20:02 (D04)	20:43	33	19:38 (D05)		
	17:15			17:53	19:24	19:56	35		19:00 (D05)	05:43		18:51 (D05)	05:37		19:05 (D05)		
26	07:24			06:48	07:02	06:14			19:35 (D05)	05:42		20:03 (D04)	20:43	34	19:39 (D05)		
	17:16			17:54	19:25	19:57	38		18:57 (D05)	05:42		18:51 (D05)	05:38		19:05 (D05)		
27	07:23			06:46	07:01	06:12			19:35 (D05)	05:41		20:03 (D04)	20:44	34	19:39 (D05)		
	17:17			17:55	19:26	19:58	41		18:56 (D05)	05:41		18:52 (D05)	05:38		19:05 (D05)		
28	07:22			06:44	06:59	06:11			19:37 (D05)	05:41		20:04 (D04)	20:44	34	19:39 (D05)		
	17:18			17:56	19:27	20:00	43		18:55 (D05)	05:41		18:52 (D05)	05:38		19:05 (D05)		
29	07:22				06:57	06:10			19:38 (D05)	05:40		20:04 (D04)	20:44	35	19:40 (D05)		
	17:20				19:28	20:01	45		18:53 (D05)	05:40		18:53 (D05)	05:39		19:05 (D05)		
30	07:21				06:56	06:08			19:38 (D05)	05:40		20:04 (D04)	20:44	35	19:40 (D05)		
	17:21				19:29	20:02	46		18:53 (D05)	05:40		18:53 (D05)	05:39		19:05 (D05)		
31	07:20				06:54				19:39 (D05)	05:40		20:03 (D04)	20:44	37	19:42 (D05)		
	17:22				19:30				05:39			18:54 (D05)					
									20:31			20:03 (D04)					
Potential sun hours	298			297	369	398			448			451					
Total, worst case		311				343			1974			1224					
Sun reduction		0.45				0.82			0.92			0.94					
Oper. time red.		1.00				1.00			1.00			1.00					
Wind dir. red.		0.89				0.53			0.52			0.52					
Total reduction		0.42				0.45			0.50			0.51					
Total, real		130				155			982			628					

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 2 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July			August			September			October			November			December		
1	05:40		19:05 (D05)	06:04		18:58 (D05)	06:34		07:04	06:38		07:12	15:36 (E01)				
	20:44	37	19:42 (D05)	20:25	63	20:01 (D04)	19:43		18:53	18:06		16:41	19	15:55 (E01)			
2	05:40		19:04 (D05)	06:05		18:58 (D05)	06:35		07:05	06:39		07:13	15:37 (E01)				
	20:43	38	19:42 (D05)	20:24	62	20:00 (D04)	19:41		18:51	17:05		16:41	20	15:57 (E01)			
3	05:41		19:05 (D05)	06:06		18:58 (D05)	06:36		07:06	06:40		07:14	15:37 (E01)				
	20:43	43	20:02 (D04)	20:23	61	19:59 (D04)	19:40		18:49	17:04		16:41	21	15:58 (E01)			
4	05:41		19:05 (D05)	06:06		18:58 (D05)	06:37		07:07	06:41		07:15	15:37 (E01)				
	20:43	47	20:04 (D04)	20:22	59	19:58 (D04)	19:38		18:48	17:02		16:41	21	15:58 (E01)			
5	05:42		19:04 (D05)	06:07		18:58 (D05)	06:38		07:08	06:43		07:16	15:37 (E01)				
	20:43	50	20:05 (D04)	20:21	57	19:57 (D04)	19:36		18:46	17:01		16:40	22	15:59 (E01)			
6	05:42		19:04 (D05)	06:08		18:59 (D05)	06:39		07:09	06:44		07:17	15:37 (E01)				
	20:43	53	20:06 (D04)	20:20	53	19:52 (D05)	19:35		18:44	17:00		16:40	23	16:00 (E01)			
7	05:43		19:04 (D05)	06:09		18:59 (D05)	06:40		07:10	06:45		07:18	15:37 (E01)				
	20:42	54	20:06 (D04)	20:19	53	19:52 (D05)	19:33		18:43	16:59		16:40	24	16:01 (E01)			
8	05:44		19:04 (D05)	06:10		18:59 (D05)	06:41		07:11	06:46		07:19	15:37 (E01)				
	20:42	57	20:08 (D04)	20:17	52	19:51 (D05)	19:31		18:41	16:58		16:40	23	16:00 (E01)			
9	05:44		19:04 (D05)	06:11		19:00 (D05)	06:42		07:12	06:47		07:20	15:37 (E01)				
	20:42	58	20:09 (D04)	20:16	51	19:51 (D05)	19:30		18:39	16:57		16:40	24	16:01 (E01)			
10	05:45		19:03 (D05)	06:12		19:00 (D05)	06:43		07:13	06:48		07:21	15:38 (E01)				
	20:41	61	20:09 (D04)	20:15	50	19:50 (D05)	19:28		18:38	16:56		16:40	24	16:02 (E01)			
11	05:46		19:03 (D05)	06:13		19:00 (D05)	06:44		07:14	06:50		07:22	15:38 (E01)				
	20:41	63	20:10 (D04)	20:14	50	19:50 (D05)	19:26		18:36	16:55		16:40	24	16:02 (E01)			
12	05:46		19:03 (D05)	06:14		19:01 (D05)	06:45		07:15	06:51		07:23	15:39 (E01)				
	20:41	65	20:11 (D04)	20:12	48	19:49 (D05)	19:25		18:35	16:54		16:40	24	16:03 (E01)			
13	05:47		19:02 (D05)	06:15		19:01 (D05)	06:46		07:16	06:52		07:23	15:39 (E01)				
	20:40	67	20:11 (D04)	20:11	46	19:47 (D05)	19:23		18:33	16:53		16:40	25	16:04 (E01)			
14	05:48		19:02 (D05)	06:16		19:01 (D05)	06:47		07:17	06:53		07:24	15:39 (E01)				
	20:40	69	20:12 (D04)	20:10	45	19:46 (D05)	19:21		18:32	16:52		16:40	25	16:04 (E01)			
15	05:49		19:02 (D05)	06:17		19:02 (D05)	06:48		07:19	06:54		07:25	15:39 (E01)				
	20:39	70	20:13 (D04)	20:08	42	19:44 (D05)	19:20		18:30	16:51		16:41	25	16:04 (E01)			
16	05:49		19:02 (D05)	06:18		19:03 (D05)	06:49		07:20	06:56		07:26	15:40 (E01)				
	20:39	72	20:14 (D04)	20:07	40	19:43 (D05)	19:18		18:28	16:50		16:41	25	16:05 (E01)			
17	05:50		19:01 (D05)	06:19		19:04 (D05)	06:50		07:21	06:57		07:26	15:40 (E01)				
	20:38	72	20:13 (D04)	20:06	38	19:42 (D05)	19:16		18:27	16:49		16:41	25	16:05 (E01)			
18	05:51		19:01 (D05)	06:20		19:06 (D05)	06:51		07:22	06:58		07:27	15:41 (E01)				
	20:37	71	20:12 (D04)	20:04	34	19:40 (D05)	19:15		18:25	16:49		16:41	25	16:06 (E01)			
19	05:52		19:01 (D05)	06:21		19:08 (D05)	06:52		07:23	06:59		07:27	15:42 (E01)				
	20:37	71	20:12 (D04)	20:03	30	19:38 (D05)	19:13		18:24	16:48		16:42	25	16:07 (E01)			
20	05:53		19:01 (D05)	06:22		19:10 (D05)	06:53		07:24	07:00		07:28	15:42 (E01)				
	20:36	70	20:11 (D04)	20:01	26	19:36 (D05)	19:11		18:22	16:47		16:42	25	16:07 (E01)			
21	05:54		19:00 (D05)	06:23		19:12 (D05)	06:54		07:25	07:01		07:29	15:43 (E01)				
	20:35	71	20:11 (D04)	20:00	21	19:33 (D05)	19:10		18:21	16:46		16:43	25	16:08 (E01)			
22	05:54		18:59 (D05)	06:24		19:17 (D05)	06:55		07:26	07:03		07:29	15:43 (E01)				
	20:35	70	20:09 (D04)	19:58	11	19:28 (D05)	19:08		18:20	16:46		16:43	25	16:08 (E01)			
23	05:55		18:59 (D05)	06:25			06:56		07:27	07:04		07:30	15:44 (E01)				
	20:34	70	20:09 (D04)	19:57			19:06		18:18	16:45		16:43	25	16:09 (E01)			
24	05:56		18:59 (D05)	06:26			06:57		07:29	07:05		07:30	15:44 (E01)				
	20:33	69	20:08 (D04)	19:55			19:04		18:17	16:44		16:44	25	16:09 (E01)			
25	05:57		18:59 (D05)	06:27			06:58		07:30	07:06		07:30	15:44 (E01)				
	20:32	68	20:07 (D04)	19:54			19:03		18:15	16:44		16:45	25	16:09 (E01)			
26	05:58		18:59 (D05)	06:28			06:59		07:31	07:07		07:31	15:45 (E01)				
	20:31	68	20:07 (D04)	19:52			19:01		18:14	16:43		16:45	25	16:10 (E01)			
27	05:59		18:59 (D05)	06:29			07:00		07:32	07:08		07:31	15:45 (E01)				
	20:30	67	20:06 (D04)	19:51			18:59		18:13	16:43		16:46	25	16:10 (E01)			
28	06:00		18:59 (D05)	06:30			07:01		07:33	07:09		07:31	15:45 (E01)				
	20:29	66	20:05 (D04)	19:49			18:58		18:11	16:42		16:46	25	16:10 (E01)			
29	06:01		18:59 (D05)	06:31			07:02		07:34	07:10		07:32	15:46 (E01)				
	20:28	65	20:04 (D04)	19:48			18:56		18:10	16:42		16:47	24	16:10 (E01)			
30	06:02		18:58 (D05)	06:32			07:03		07:35	07:11		07:32	15:47 (E01)				
	20:27	65	20:03 (D04)	19:46			18:54		18:09	16:42		16:48	25	16:12 (E01)			
31	06:03		18:58 (D05)	06:33					07:37			07:32	15:47 (E01)				
	20:26	64	20:02 (D04)	19:44					18:07			16:49	25	16:12 (E01)			
Potential sun hours	458			428		375	346		298			288					
Total, worst case	1931			992					63			743					
Sun reduction	0.97			0.96					0.61			0.47					
Oper. time red.	1.00			1.00					1.00			1.00					
Wind dir. red.	0.51			0.52					0.89			0.89					
Total reduction	0.52			0.53					0.57			0.44					
Total, real	1008			523					36			326					

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 3 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (78)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	18:48 (D03) 20:32	05:39 20:44	05:40 20:44	06:04 20:25	19:37 (D02) 24 20:01 (D02)	06:34 19:43	19:06 (D03) 6 19:12 (D03)	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	18:49 (D03) 20:33	05:38 20:44	05:40 20:44	06:05 20:24	19:12 (D03) 29 20:00 (D02)	06:35 19:41		07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	18:49 (D03) 19:42 (D02)	05:38 20:34	05:41 20:43	06:05 20:23	19:08 (D03) 36 19:59 (D02)	06:36 19:40		07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:38 19:34	06:03 20:06	18:50 (D03) 19:43 (D02)	05:38 20:34	05:41 20:43	06:06 20:22	19:06 (D03) 38 19:58 (D02)	06:37 19:38		07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	18:51 (D03) 19:44 (D02)	05:37 20:35	05:42 20:43	06:07 20:21	19:04 (D03) 41 19:57 (D02)	06:38 19:36		07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	18:52 (D03) 19:46 (D02)	05:37 20:36	05:42 20:43	06:08 20:20	19:03 (D03) 41 19:56 (D02)	06:39 19:35		07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	18:54 (D03) 19:47 (D02)	05:37 20:36	05:43 20:43	06:09 20:19	19:01 (D03) 42 19:55 (D02)	06:40 19:33		07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 18:05	06:41 19:38	05:59 20:10	18:55 (D03) 19:48 (D02)	05:36 20:37	05:44 20:42	06:10 20:17	19:00 (D03) 42 19:54 (D02)	06:41 19:31		07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 18:06	06:39 19:40	05:57 20:11	18:57 (D03) 19:49 (D02)	05:36 20:38	05:44 20:45	06:11 20:16	18:59 (D03) 41 19:53 (D02)	06:42 19:30		07:12 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 18:07	06:38 19:41	05:56 20:12	18:59 (D03) 19:49 (D02)	05:36 20:38	05:45 20:42	06:12 20:15	19:03 (D03) 39 19:51 (D02)	06:43 19:28		07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 18:09	06:36 19:42	05:55 20:13	19:06 (D03) 19:50 (D02)	05:35 20:39	05:46 20:41	06:13 20:14	18:58 (D03) 34 19:52 (D03)	06:44 19:26		07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 18:10	06:35 19:43	05:54 20:14	19:02 (D03) 19:51 (D02)	05:34 20:39	05:46 20:41	06:14 20:12	18:57 (D03) 36 19:53 (D03)	06:45 19:25		07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 18:11	06:33 19:44	05:53 20:15	18:58 (D03) 19:52 (D02)	05:33 20:40	05:47 20:40	06:15 20:11	19:47 (D02) 6 19:53 (D02)	06:46 19:23		07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 18:12	06:32 19:45	05:52 20:16	18:57 (D03) 19:53 (D02)	05:36 20:40	05:48 20:40	06:16 20:11	18:55 (D03) 11 19:56 (D02)	06:47 19:21		07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 18:13	06:30 19:46	05:51 20:17	18:54 (D03) 19:54 (D02)	05:36 20:41	05:49 20:39	06:17 20:13	19:44 (D02) 13 19:57 (D02)	06:48 19:20		07:18 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 18:14	06:28 19:47	05:50 20:18	18:53 (D03) 19:55 (D02)	05:35 20:41	05:49 20:39	06:18 20:16	18:54 (D03) 16 19:59 (D02)	06:49 19:18		07:19 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 18:15	06:27 19:48	05:49 20:19	18:52 (D03) 19:56 (D02)	05:36 20:41	05:50 20:38	06:19 20:17	19:42 (D02) 17 19:59 (D02)	06:50 19:16		07:20 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 18:16	06:25 19:49	05:48 20:20	18:51 (D03) 19:54 (D02)	05:36 20:42	05:51 20:37	06:20 20:19	19:41 (D02) 20 20:00 (D02)	06:51 19:15		07:21 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 18:17	06:24 19:50	05:47 20:21	18:50 (D03) 19:54 (D02)	05:36 20:42	05:52 20:37	06:21 20:10	19:41 (D02) 19 20:01 (D02)	06:52 19:13		07:22 18:24	06:59 16:49	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 18:18	06:22 19:51	05:47 20:22	18:49 (D03) 19:53 (D02)	05:36 20:42	05:53 20:36	06:22 20:11	19:40 (D02) 22 20:02 (D02)	06:53 19:11		07:23 18:22	06:59 16:47	07:29 16:42
21	07:28 17:10	06:55 17:48	06:11 18:19	06:21 19:52	05:46 20:23	18:48 (D03) 19:53 (D02)	05:36 20:43	05:54 20:35	06:23 20:10	19:40 (D02) 23 20:03 (D02)	06:54 19:10		07:24 18:21	07:01 16:46	07:30 16:43
22	07:27 17:11	06:53 17:49	06:09 18:21	06:19 19:53	05:45 20:24	18:48 (D03) 19:52 (D02)	05:36 20:43	05:54 20:35	06:24 20:11	19:39 (D02) 24 20:03 (D02)	06:55 19:08		07:25 18:20	07:03 16:46	07:31 16:43
23	07:26 17:12	06:52 17:50	06:07 18:22	06:18 19:54	05:44 20:25	18:47 (D03) 19:52 (D02)	05:37 20:43	05:55 20:34	06:25 20:12	19:38 (D02) 24 20:03 (D02)	06:56 19:06		07:26 18:18	07:04 16:45	07:32 16:43
24	07:26 17:14	06:50 17:51	06:06 18:23	06:17 19:55	05:43 20:26	18:47 (D03) 19:52 (D02)	05:37 20:43	05:56 20:33	06:26 20:14	19:38 (D02) 26 20:04 (D02)	06:57 19:55		07:27 18:17	07:05 16:44	07:33 16:44
25	07:25 17:15	06:49 17:53	06:04 18:24	06:15 19:56	05:43 20:26	18:47 (D03) 19:51 (D02)	05:37 20:43	05:57 20:32	06:27 20:14	19:38 (D02) 26 20:04 (D02)	06:58 19:54		07:28 18:15	07:06 16:44	07:34 16:45
26	07:24 17:16	06:48 17:54	06:02 18:25	06:14 19:57	05:42 20:27	18:47 (D03) 19:52 (D02)	05:38 20:44	05:58 20:31	06:28 20:17	19:38 (D02) 27 20:05 (D02)	06:59 19:01		07:29 18:14	07:07 16:43	07:35 16:45
27	07:23 17:17	06:46 17:55	06:01 18:26	06:12 19:59	05:41 20:28	18:47 (D03) 19:50 (D02)	05:38 20:44	05:59 20:30	06:29 20:18	19:38 (D02) 27 20:05 (D02)	07:00 19:51		07:30 18:13	07:08 16:43	07:36 16:46
28	07:22 17:18	06:45 17:56	06:59 18:00	06:11 20:01	05:41 20:29	18:47 (D03) 19:52 (D02)	05:38 20:44	06:00 20:29	06:30 20:16	19:38 (D02) 27 20:05 (D02)	07:01 19:49		07:31 18:11	07:09 16:42	07:37 16:46
29	07:22 17:20	06:57 18:28	06:10 19:20	06:20 20:30	05:40 20:30	18:50 (D03) 19:48 (D02)	05:37 20:44	06:01 20:28	06:31 20:17	19:36 (D02) 26 20:03 (D02)	07:02 19:48		07:32 18:10	07:10 16:42	07:38 16:47
30	07:21 17:21	06:56 18:29	06:08 19:22	06:20 20:32	05:40 20:31	18:48 (D03) 19:24 (D03)	05:40 20:31	06:02 20:27	06:32 20:16	19:37 (D02) 26 20:03 (D02)	07:03 19:46		07:33 18:09	07:11 16:42	07:39 16:48
31	07:20 17:22	06:54 18:30	06:04 19:24	06:17 20:34	05:39 20:31	18:47 (D03) 19:41 (D02)	05:39 20:41	06:03 20:26	06:33 20:15	19:37 (D02) 25 20:02 (D02)	07:04 19:45		07:34 18:07	07:12 16:43	07:40 16:49
Potential sun hours	298	297	369	398	448		452	458	428		375		346	298	288
Total, worst case				660	824			405	1094		6				
Sun reduction				0.82	0.92			0.97	0.96		0.93				
Oper. time red.				1.00	1.00			1.00	1.00		1.00				
Wind dir. red.				0.50	0.52			0.50	0.56		0.57				
Total reduction				0.47	0.48			0.48	0.54		0.53				
Total, real				308	395			196	587		3				

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 4 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32		07:19	16:31 (D04)	06:43	06:52			06:07			19:24 (D02)	05:39				
	16:50		17:23	24 16:55 (D04)	17:57	19:31			20:03		17	19:41 (D02)	20:32				
2	07:33		07:18	16:31 (D04)	06:41	06:51			06:06			19:23 (D02)	05:38				
	16:50		17:25	24 16:55 (D04)	17:58	19:32			20:04		19	19:42 (D02)	20:33				
3	07:33		07:17	16:32 (D04)	06:40	06:49			06:05			19:22 (D02)	05:38				
	16:51		17:26	23 16:55 (D04)	18:00	19:33			20:05		20	19:42 (D02)	20:34				
4	07:33		07:16	16:33 (D04)	06:38	06:48			06:03			19:22 (D02)	05:38				
	16:52		17:27	21 16:54 (D04)	18:01	19:34			20:06		21	19:43 (D02)	20:34				
5	07:33		07:15	16:35 (D04)	06:37	06:46			19:02 (D03)	06:02		19:22 (D02)	05:37				
	16:53		17:28	18 16:53 (D04)	18:02	19:35	9	19:11 (D03)	20:07	22	19:44 (D02)	20:35					
6	07:33		07:14	16:36 (D04)	06:35	06:44			18:57 (D03)	06:01		19:22 (D02)	05:37				
	16:54		17:30	16 16:52 (D04)	18:03	19:36	17	19:14 (D03)	20:08	24	19:46 (D02)	20:36					
7	07:33		07:13	16:39 (D04)	06:34	06:43			18:55 (D03)	06:00		19:22 (D02)	05:37				
	16:55		17:31	11 16:50 (D04)	18:04	19:37	22	19:17 (D03)	20:09	25	19:47 (D02)	20:36					
8	07:32		07:12	16:43 (D04)	07:32	06:41			18:53 (D03)	05:59		19:22 (D02)	05:36				
	16:56		17:32	3 16:46 (D04)	19:05	19:38	25	19:18 (D03)	20:10	25	19:47 (D02)	20:37					
9	07:32		07:10		07:30	06:39			18:51 (D03)	05:57		19:23 (D02)	05:36				
	16:57		17:33		19:06	19:40	27	19:18 (D03)	20:11	24	19:47 (D02)	20:38					
10	07:32		07:09		07:29	06:38			18:50 (D03)	05:56		19:22 (D02)	05:36				
	16:58		17:35		19:07	19:41	30	19:20 (D03)	20:12	24	19:46 (D02)	20:38					
11	07:32		07:08		07:27	06:36			18:48 (D03)	05:55		19:23 (D02)	05:36				
	16:59		17:36		19:09	19:42	32	19:20 (D03)	20:13	22	19:45 (D02)	20:39					
12	07:32		07:07		07:26	06:35			18:48 (D03)	05:54		19:23 (D02)	05:36				
	17:00		17:37		19:10	19:43	33	19:21 (D03)	20:14	21	19:44 (D02)	20:39					
13	07:31		07:05		07:24	06:33			18:47 (D03)	05:53		19:24 (D02)	05:36				
	17:01		17:38		19:11	19:44	34	19:21 (D03)	20:15	20	19:44 (D02)	20:40					
14	07:31		07:04		07:22	06:32			18:47 (D03)	05:52		19:25 (D02)	05:36				
	17:02		17:39		19:12	19:45	34	19:21 (D03)	20:16	18	19:43 (D02)	20:40					
15	07:31		16:36 (D04)	07:03	07:21	06:30			18:46 (D03)	05:51		19:27 (D02)	05:36				
	17:03	3	16:39 (D04)	17:41	19:13	19:46	35	19:21 (D03)	20:17	15	19:42 (D02)	20:41					
16	07:30		16:33 (D04)	07:02	07:19	06:28			18:46 (D03)	05:50		19:28 (D02)	05:36				
	17:04	6	16:39 (D04)	17:42	19:14	19:47	35	19:21 (D03)	20:18	13	19:41 (D02)	20:41					
17	07:30		16:33 (D04)	07:00	07:17	06:27			18:45 (D03)	05:49		19:30 (D02)	05:36				
	17:05	8	16:41 (D04)	17:43	19:15	19:48	36	19:21 (D03)	20:19	9	19:39 (D02)	20:41					
18	07:29		16:31 (D04)	06:59	07:16	06:25			18:46 (D03)	05:48			05:36				
	17:07	11	16:42 (D04)	17:44	19:16	19:49	35	19:21 (D03)	20:20			20:42					
19	07:29		16:31 (D04)	06:58	07:14	06:24			18:45 (D03)	05:47			05:36				
	17:08	13	16:44 (D04)	17:46	19:17	19:50	35	19:20 (D03)	20:21			20:42					
20	07:28		16:30 (D04)	06:56	07:12	06:22			18:46 (D03)	05:47			05:36				
	17:09	15	16:45 (D04)	17:47	19:18	19:51	34	19:20 (D03)	20:22			20:42					
21	07:28		16:30 (D04)	06:55	07:11	06:21			18:45 (D03)	05:46			05:36				
	17:10	16	16:46 (D04)	17:48	19:19	19:52	33	19:18 (D03)	20:23			20:43					
22	07:27		16:30 (D04)	06:53	07:09	06:19			18:46 (D03)	05:45			05:36				
	17:11	17	16:47 (D04)	17:49	19:21	19:53	32	19:18 (D03)	20:24			20:43					
23	07:26		16:29 (D04)	06:52	07:07	06:18			18:46 (D03)	05:44			05:37				
	17:12	19	16:48 (D04)	17:50	19:22	19:54	30	19:16 (D03)	20:25			20:43					
24	07:26		16:29 (D04)	06:50	07:06	06:17			18:47 (D03)	05:43			05:37				
	17:14	20	16:49 (D04)	17:51	19:23	19:55	29	19:16 (D03)	20:26			20:43					
25	07:25		16:30 (D04)	06:49	07:04	06:15			18:49 (D03)	05:43			05:37				
	17:15	22	16:52 (D04)	17:53	19:24	19:56	26	19:15 (D03)	20:26			20:43					
26	07:24		16:29 (D04)	06:48	07:02	06:14			18:49 (D03)	05:42			05:38				
	17:16	24	16:53 (D04)	17:54	19:25	19:57	27	19:35 (D02)	20:27			20:44					
27	07:23		16:29 (D04)	06:46	07:01	06:12			18:51 (D03)	05:41			05:38				
	17:17	25	16:54 (D04)	17:55	19:26	19:58	28	19:37 (D02)	20:28			20:44					
28	07:22		16:29 (D04)	06:45	06:59	06:11			18:53 (D03)	05:41			05:38				
	17:18	26	16:55 (D04)	17:56	19:27	20:00	26	19:38 (D02)	20:29			20:44					
29	07:22		16:30 (D04)		06:57	06:10			18:55 (D03)	05:40			05:39				
	17:20	26	16:56 (D04)		19:28	20:01	24	19:38 (D02)	20:30			20:44					
30	07:21		16:30 (D04)		06:56	06:08			19:25 (D02)	05:40			05:39				
	17:21	26	16:56 (D04)		19:29	20:02	14	19:39 (D02)	20:31			20:44					
31	07:20		16:30 (D04)		06:54				05:39								
	17:22	26	16:56 (D04)		19:30				20:31								
Potential sun hours	298		297		369	398			448			452					
Total, worst case	303		140			742			339								
Sun reduction	0.45		0.62			0.82			0.92								
Oper. time red.	1.00		1.00			1.00			1.00								
Wind dir. red.	0.87		0.87			0.60			0.52								
Total reduction	0.41		0.56			0.51			0.50								
Total, real	124		79			378			168								

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 4 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04	19:34 (D02)	06:34	18:47 (D03)	07:04	06:38			07:12	
	20:44	20:25	21 19:55 (D02)	19:43	32 19:19 (D03)	18:53	18:06			16:41	
2	05:40	06:05	19:33 (D02)	06:35	18:48 (D03)	07:05	06:39			07:13	
	20:44	20:24	23 19:56 (D02)	19:41	30 19:18 (D03)	18:51	17:05			16:41	
3	05:41	06:05	19:33 (D02)	06:36	18:49 (D03)	07:06	06:40		16:11 (D04)	07:14	
	20:43	20:23	23 19:56 (D02)	19:40	27 19:16 (D03)	18:49	17:04	5	16:16 (D04)	16:41	
4	05:41	06:06	19:32 (D02)	06:37	18:50 (D03)	07:07	06:41		16:08 (D04)	07:15	
	20:43	20:22	25 19:57 (D02)	19:38	25 19:15 (D03)	18:48	17:02	12	16:20 (D04)	16:40	
5	05:42	06:07	19:32 (D02)	06:38	18:51 (D03)	07:08	06:43		16:06 (D04)	07:16	
	20:43	20:21	25 19:57 (D02)	19:36	22 19:13 (D03)	18:46	17:01	16	16:22 (D04)	16:40	
6	05:42	06:08	19:32 (D02)	06:39	18:53 (D03)	07:09	06:44		16:04 (D04)	07:17	
	20:43	20:20	24 19:56 (D02)	19:35	17 19:10 (D03)	18:44	17:00	19	16:23 (D04)	16:40	
7	05:43	06:09	19:32 (D02)	06:40	18:57 (D03)	07:10	06:45		16:03 (D04)	07:18	
	20:43	20:19	23 19:55 (D02)	19:33	9 19:06 (D03)	18:43	16:59	21	16:24 (D04)	16:40	
8	05:44	06:10	19:32 (D02)	06:41		07:11	06:46		16:03 (D04)	07:19	
	20:42	20:17	22 19:54 (D02)	19:31		18:41	16:58	23	16:26 (D04)	16:40	
9	05:44	06:11	19:32 (D02)	06:42		07:12	06:47		16:02 (D04)	07:20	
	20:42	20:16	21 19:53 (D02)	19:30		18:39	16:57	24	16:26 (D04)	16:40	
10	05:45	06:12	19:32 (D02)	06:43		07:13	06:48		16:02 (D04)	07:21	
	20:42	20:15	19 19:51 (D02)	19:28		18:38	16:56	24	16:26 (D04)	16:40	
11	05:46	06:13	19:32 (D02)	06:44		07:14	06:50		16:02 (D04)	07:22	
	20:41	20:14	18 19:50 (D02)	19:26		18:36	16:55	26	16:28 (D04)	16:40	
12	05:46	06:14	19:33 (D02)	06:45		07:15	06:51		16:02 (D04)	07:23	
	20:41	20:12	16 19:49 (D02)	19:25		18:35	16:54	26	16:28 (D04)	16:40	
13	05:47	06:15	19:32 (D02)	06:46		07:16	06:52		16:01 (D04)	07:23	
	20:40	20:11	15 19:47 (D02)	19:23		18:33	16:53	27	16:28 (D04)	16:40	
14	05:48	06:16	19:02 (D03)	06:47		07:17	06:53		16:01 (D04)	07:24	
	20:40	20:10	25 19:46 (D02)	19:21		18:32	16:52	26	16:27 (D04)	16:40	
15	05:49	06:17	18:59 (D03)	06:48		07:19	06:54		16:02 (D04)	07:25	
	20:39	20:08	27 19:44 (D02)	19:20		18:30	16:51	25	16:27 (D04)	16:41	
16	05:49	06:18	18:57 (D03)	06:49		07:20	06:56		16:02 (D04)	07:26	
	20:39	20:07	28 19:43 (D02)	19:18		18:28	16:50	24	16:26 (D04)	16:41	
17	05:50	06:19	18:55 (D03)	06:50		07:21	06:57		16:03 (D04)	07:26	
	20:38	20:06	27 19:42 (D02)	19:16		18:27	16:49	22	16:25 (D04)	16:41	
18	05:51	06:20	18:54 (D03)	06:51		07:22	06:58		16:03 (D04)	07:27	
	20:37	20:04	27 19:21 (D03)	19:15		18:25	16:48	20	16:23 (D04)	16:41	
19	05:52	06:21	18:53 (D03)	06:52		07:23	06:59		16:04 (D04)	07:28	
	20:37	20:03	29 19:22 (D03)	19:13		18:24	16:48	19	16:23 (D04)	16:42	
20	05:53	06:22	18:52 (D03)	06:53		07:24	07:00		16:05 (D04)	07:28	
	20:36	20:01	30 19:22 (D03)	19:11		18:22	16:47	17	16:22 (D04)	16:42	
21	05:54	06:23	18:51 (D03)	06:54		07:25	07:01		16:05 (D04)	07:29	
	20:35	20:00	32 19:23 (D03)	19:10		18:21	16:46	16	16:21 (D04)	16:43	
22	05:54	06:24	18:50 (D03)	06:55		07:26	07:03		16:06 (D04)	07:29	
	20:35	19:58	33 19:23 (D03)	19:08		18:20	16:46	15	16:21 (D04)	16:43	
23	05:55	06:25	18:49 (D03)	06:56		07:27	07:04		16:07 (D04)	07:30	
	20:34	19:57	34 19:23 (D03)	19:06		18:18	16:45	13	16:20 (D04)	16:43	
24	05:56	06:26	18:49 (D03)	06:57		07:29	07:05		16:09 (D04)	07:30	
	20:33	19:55	35 19:24 (D03)	19:04		18:17	16:44	11	16:20 (D04)	16:44	
25	05:57	06:27	18:48 (D03)	06:58		07:30	07:06		16:11 (D04)	07:30	
	20:32	19:54	36 19:24 (D03)	19:03		18:15	16:44	8	16:19 (D04)	16:45	
26	05:58	19:43 (D02)	06:28	18:48 (D03)	06:59	07:31	07:07		16:12 (D04)	07:31	
	20:31	4 19:47 (D02)	19:52	19:23 (D03)	19:01	18:14	16:43	6	16:18 (D04)	16:45	
27	05:59	19:40 (D02)	06:29	18:48 (D03)	07:00	07:32	07:08		16:15 (D04)	07:31	
	20:30	10 19:50 (D02)	19:51	19:23 (D03)	18:59	18:13	16:43	3	16:18 (D04)	16:46	
28	06:00	19:38 (D02)	06:30	18:48 (D03)	07:01	07:33	07:09			07:32	
	20:29	14 19:52 (D02)	19:49	19:23 (D03)	18:58	18:11	16:42			16:46	
29	06:01	19:36 (D02)	06:31	18:48 (D03)	07:02	07:34	07:10			07:32	
	20:28	17 19:53 (D02)	19:48	19:22 (D03)	18:56	18:10	16:42			16:47	
30	06:02	19:35 (D02)	06:32	18:48 (D03)	07:03	07:35	07:11			07:32	
	20:27	19 19:54 (D02)	19:46	19:22 (D03)	18:54	18:09	16:42			16:48	
31	06:03	19:34 (D02)	06:33	18:48 (D03)		07:37				07:32	
	20:26	21 19:55 (D02)	19:44	19:21 (D03)		18:07				16:49	
Potential sun hours	458		428		375		346		298		288
Total, worst case	85		844		162			448			
Sun reduction	0.97		0.96		0.93			0.61			
Oper. time red.	1.00		1.00		1.00			1.00			
Wind dir. red.	0.52		0.57		0.60			0.87			
Total reduction	0.52		0.57		0.58			0.55			
Total, real	44		482		94			248			

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 5 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (80)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	16:16 (D04) 16:24 (D04)	07:19 17:23	16:24 (D04) 17:57	06:43 19:31	06:52 20:03	06:07 20:32	05:39 20:44	05:40 20:25	06:04 19:43	06:34 18:53	06:38 18:06
2	07:33 16:50	16:15 (D04) 16:25 (D04)	07:18 17:25	16:27 (D04) 17:58	06:41 19:32	06:51 20:04	06:06 20:33	05:38 20:44	05:40 20:24	06:05 19:41	06:35 18:51	06:39 17:05
3	07:33 16:51	16:15 (D04) 16:26 (D04)	07:17 17:26	16:37 (D04) 18:00	06:40 19:33	06:50 20:05	06:05 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04
4	07:33 16:52	16:15 (D04) 16:27 (D04)	07:16 17:27	16:38 (D04) 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02
5	07:33 16:53	16:15 (D04) 16:28 (D04)	07:15 17:28	16:37 (D04) 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01
6	07:33 16:54	16:15 (D04) 16:29 (D04)	07:14 17:30	16:38 (D04) 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00
7	07:33 16:55	16:15 (D04) 16:30 (D04)	07:13 17:31	16:34 (D04) 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59
8	07:32 16:56	16:14 (D04) 16:31 (D04)	07:12 17:32	16:32 (D04) 19:05	06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58
9	07:32 16:57	16:14 (D04) 16:32 (D04)	07:10 17:33	16:30 (D04) 19:06	06:40 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57
10	07:32 16:58	16:14 (D04) 16:33 (D04)	07:09 17:35	16:29 (D04) 19:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56
11	07:32 16:59	16:14 (D04) 16:35 (D04)	07:08 17:36	16:27 (D04) 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55
12	07:32 17:00	16:14 (D04) 16:36 (D04)	07:07 17:37	16:26 (D04) 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54
13	07:31 17:01	16:14 (D04) 16:37 (D04)	07:06 17:38	16:24 (D04) 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53
14	07:31 17:02	16:13 (D04) 16:38 (D04)	07:04 17:39	16:22 (D04) 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:10	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52
15	07:31 17:03	16:14 (D04) 16:39 (D04)	07:03 17:41	16:21 (D04) 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:18 18:30	06:54 16:51
16	07:30 17:04	16:13 (D04) 16:40 (D04)	07:02 17:42	16:19 (D04) 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50
17	07:30 17:05	16:14 (D04) 16:41 (D04)	07:00 17:43	16:17 (D04) 19:15	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49
18	07:29 17:07	16:14 (D04) 16:42 (D04)	06:59 17:44	16:16 (D04) 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48
19	07:29 17:08	16:15 (D04) 16:43 (D04)	06:58 17:46	16:17 (D04) 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48
20	07:28 17:09	16:14 (D04) 16:44 (D04)	06:56 17:47	16:16 (D04) 19:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47
21	07:28 17:10	16:15 (D04) 16:44 (D04)	06:55 17:48	16:17 (D04) 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46
22	07:27 17:11	16:15 (D04) 16:44 (D04)	06:53 17:49	16:18 (D04) 19:21	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46
23	07:26 17:12	16:16 (D04) 16:44 (D04)	06:52 17:50	16:19 (D04) 19:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45
24	07:26 17:14	16:16 (D04) 16:43 (D04)	06:50 17:51	16:20 (D04) 19:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44
25	07:25 17:15	16:17 (D04) 16:44 (D04)	06:49 17:53	16:21 (D04) 19:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44
26	07:24 17:16	16:18 (D04) 16:44 (D04)	06:48 17:54	16:22 (D04) 19:25	06:14 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43
27	07:23 17:17	16:18 (D04) 16:44 (D04)	06:46 17:55	16:23 (D04) 19:26	06:12 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43
28	07:22 17:18	16:19 (D04) 16:43 (D04)	06:45 17:56	16:24 (D04) 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42
29	07:22 17:20	16:20 (D04) 16:42 (D04)		16:25 (D04) 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42
30	07:21 17:21	16:21 (D04) 16:42 (D04)		16:26 (D04) 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42
31	07:20 17:22	16:22 (D04) 16:40 (D04)		16:27 (D04) 19:30	06:04 20:03	05:39 20:31	06:03 20:26	06:33 19:45	07:37 18:07	07:37 18:07	07:37 18:07	07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case	665	25									533	199
Sun reduction	0.45	0.62									0.61	0.47
Oper. time red.	1.00	1.00									1.00	1.00
Wind dir. red.	0.88	0.88									0.88	0.88
Total reduction	0.40	0.54									0.54	0.41
Total, real	263	14									286	82

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 6 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (81)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 7 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (82)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 8 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32		07:19	16:28 (D04)	06:43	06:52			06:07			19:21 (D02)	05:39				
	16:50		17:23	20 16:48 (D04)	17:57	19:31			20:03		20	19:41 (D02)	20:32				
2	07:33		07:18	16:29 (D04)	06:41	06:51			06:06			19:21 (D02)	05:38				
	16:50		17:25	18 16:47 (D04)	17:58	19:32			20:04		21	19:42 (D02)	20:33				
3	07:33		07:17	16:31 (D04)	06:40	06:49			18:57 (D03)	06:05		19:19 (D02)	05:38				
	16:51		17:26	15 16:46 (D04)	18:00	19:33	11	19:08 (D03)	20:05	23	19:42 (D02)	20:34					
4	07:33		07:16	16:33 (D04)	06:38	06:48			18:54 (D03)	06:03		19:19 (D02)	05:38				
	16:52		17:27	11 16:44 (D04)	18:01	19:34	18	19:12 (D03)	20:06	24	19:43 (D02)	20:34					
5	07:33		07:15		06:37	06:46			18:51 (D03)	06:02		19:19 (D02)	05:37				
	16:53		17:28		18:02	19:35	22	19:13 (D03)	20:07	25	19:44 (D02)	20:35					
6	07:33		07:14		06:35	06:44			18:48 (D03)	06:01		19:20 (D02)	05:37				
	16:54		17:30		18:03	19:36	26	19:14 (D03)	20:08	26	19:46 (D02)	20:36					
7	07:33		07:13		06:34	06:43			18:47 (D03)	06:00		19:20 (D02)	05:37				
	16:55		17:31		18:04	19:37	29	19:16 (D03)	20:09	25	19:45 (D02)	20:36					
8	07:32		07:12		06:41	06:41			18:46 (D03)	05:59		19:20 (D02)	05:36				
	16:56		17:32		19:05	19:38	30	19:16 (D03)	20:10	25	19:45 (D02)	20:37					
9	07:32		07:10		06:39	06:39			18:44 (D03)	05:57		19:21 (D02)	05:36				
	16:57	4	16:32 (D04)		19:06	19:40	33	19:17 (D03)	20:11	24	19:45 (D02)	20:38					
10	07:32		07:09		06:38	06:38			18:44 (D03)	05:56		19:20 (D02)	05:36				
	16:58	6	16:33 (D04)		19:07	19:41	34	19:18 (D03)	20:12	23	19:43 (D02)	20:38					
11	07:32		07:08		06:36	06:36			18:42 (D03)	05:55		19:21 (D02)	05:36				
	16:59	9	16:35 (D04)		19:09	19:42	35	19:17 (D03)	20:13	22	19:43 (D02)	20:39					
12	07:32		07:07		06:35	06:35			18:42 (D03)	05:54		19:22 (D02)	05:36				
	17:00	10	16:35 (D04)		19:10	19:43	36	19:18 (D03)	20:14	20	19:42 (D02)	20:39					
13	07:31		07:05		06:33	06:33			18:41 (D03)	05:53		19:22 (D02)	05:36				
	17:01	12	16:36 (D04)		19:11	19:44	37	19:18 (D03)	20:15	19	19:41 (D02)	20:40					
14	07:31		07:04		06:32	06:32			18:42 (D03)	05:52		19:24 (D02)	05:36				
	17:02	14	16:37 (D04)		19:12	19:45	36	19:18 (D03)	20:16	16	19:40 (D02)	20:40					
15	07:31		07:03		06:30	06:30			18:41 (D03)	05:51		19:26 (D02)	05:36				
	17:03	15	16:39 (D04)		19:13	19:46	36	19:17 (D03)	20:17	13	19:39 (D02)	20:41					
16	07:30		07:02		06:28	06:28			18:41 (D03)	05:50		19:28 (D02)	05:36				
	17:04	16	16:39 (D04)		19:14	19:47	37	19:18 (D03)	20:18	9	19:37 (D02)	20:41					
17	07:30		07:00		06:27	06:27			18:41 (D03)	05:49			05:36				
	17:05	18	16:41 (D04)		19:15	19:48	36	19:17 (D03)	20:19			20:41					
18	07:29		06:59		06:25	06:25			18:41 (D03)	05:48			05:36				
	17:07	20	16:42 (D04)		19:16	19:49	36	19:17 (D03)	20:20			20:42					
19	07:29		06:58		06:24	06:24			18:41 (D03)	05:47			05:36				
	17:08	21	16:44 (D04)		19:17	19:50	34	19:15 (D03)	20:21			20:42					
20	07:28		06:56		06:22	06:22			18:42 (D03)	05:47			05:36				
	17:09	22	16:45 (D04)		19:18	19:51	33	19:15 (D03)	20:22			20:42					
21	07:28		06:55		06:21	06:21			18:42 (D03)	05:46			05:36				
	17:10	23	16:46 (D04)		19:19	19:52	31	19:13 (D03)	20:23			20:43					
22	07:27		06:53		06:19	06:19			18:43 (D03)	05:45			05:36				
	17:11	24	16:47 (D04)		19:21	19:53	30	19:13 (D03)	20:24			20:43					
23	07:26		06:52		06:18	06:18			18:43 (D03)	05:44			05:37				
	17:12	25	16:48 (D04)		19:22	19:54	28	19:11 (D03)	20:25			20:43					
24	07:26		06:50		06:17	06:17			18:45 (D03)	05:43			05:37				
	17:14	26	16:49 (D04)		19:23	19:55	25	19:10 (D03)	20:26			20:43					
25	07:25		06:49		06:15	06:15			18:46 (D03)	05:43			05:37				
	17:15	26	16:50 (D04)		19:24	19:56	28	19:35 (D02)	20:26			20:43					
26	07:24		06:48		06:14	06:14			18:48 (D03)	05:42			05:38				
	17:16	26	16:50 (D04)		19:25	19:57	27	19:35 (D02)	20:27			20:44					
27	07:23		06:46		06:12	06:12			18:51 (D03)	05:41			05:38				
	17:17	26	16:50 (D04)		19:26	19:58	24	19:37 (D02)	20:28			20:44					
28	07:22		06:45		06:11	06:11			19:24 (D02)	05:41			05:38				
	17:18	25	16:50 (D04)		19:27	20:00	14	19:38 (D02)	20:29			20:44					
29	07:22		06:44		06:10	06:10			19:22 (D02)	05:40			05:39				
	17:20	25	16:50 (D04)		19:28	20:01	16	19:38 (D02)	20:30			20:44					
30	07:21		06:44		06:08	06:08			19:21 (D02)	05:40			05:39				
	17:21	24	16:50 (D04)		19:29	20:02	18	19:39 (D02)	20:31			20:44					
31	07:20		06:44		06:04	06:04			05:39								
	17:22	22	16:49 (D04)		19:30	20:03			20:31								
Potential sun hours	298		297		369	398			448			452					
Total, worst case	439		64			800			335								
Sun reduction	0.45		0.62			0.82			0.92								
Oper. time red.	1.00		1.00			1.00			1.00								
Wind dir. red.	0.87		0.87			0.60			0.52								
Total reduction	0.41		0.57			0.52			0.50								
Total, real	181		36			415			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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 8 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04	19:32 (D02)	06:34	18:41 (D03)	07:04	06:38		07:12	16:08 (D04)	
	20:44	20:25	21 19:53 (D02)	19:43	35 19:16 (D03)	18:53	18:06		16:41	9 16:17 (D04)	
2	05:40	06:05	19:31 (D02)	06:35	18:42 (D03)	07:05	06:39		07:13	16:10 (D04)	
	20:44	20:24	23 19:54 (D02)	19:41	34 19:16 (D03)	18:51	17:05		16:41	6 16:16 (D04)	
3	05:41	06:05	19:31 (D02)	06:36	18:42 (D03)	07:06	06:40		07:14	16:12 (D04)	
	20:43	20:23	23 19:54 (D02)	19:40	33 19:15 (D03)	18:49	17:04		16:41	4 16:16 (D04)	
4	05:41	06:06	19:30 (D02)	06:37	18:43 (D03)	07:07	06:41		07:15		
	20:43	20:22	25 19:55 (D02)	19:38	31 19:14 (D03)	18:48	17:02		16:40		
5	05:42	06:07	19:30 (D02)	06:38	18:43 (D03)	07:08	06:43		07:16		
	20:43	20:21	25 19:55 (D02)	19:36	29 19:12 (D03)	18:46	17:01		16:40		
6	05:42	06:08	19:29 (D02)	06:39	18:44 (D03)	07:09	06:44	16:07 (D04)	07:17		
	20:43	20:20	26 19:55 (D02)	19:35	27 19:11 (D03)	18:44	17:00	4 16:11 (D04)	16:40		
7	05:43	06:09	19:29 (D02)	06:40	18:46 (D03)	07:10	06:45	16:03 (D04)	07:18		
	20:43	20:19	26 19:55 (D02)	19:33	23 19:09 (D03)	18:43	16:59	11 16:14 (D04)	16:40		
8	05:44	06:10	19:29 (D02)	06:41	18:48 (D03)	07:11	06:46	16:01 (D04)	07:19		
	20:42	20:17	25 19:54 (D02)	19:31	18 19:06 (D03)	18:41	16:58	16 16:17 (D04)	16:40		
9	05:44	06:11	19:29 (D02)	06:42	18:51 (D03)	07:12	06:47	16:00 (D04)	07:20		
	20:42	20:16	24 19:53 (D02)	19:30	12 19:03 (D03)	18:39	16:57	18 16:18 (D04)	16:40		
10	05:45	06:12	19:29 (D02)	06:43		07:13	06:48	15:59 (D04)	07:21		
	20:42	20:15	22 19:51 (D02)	19:28		18:38	16:56	20 16:19 (D04)	16:40		
11	05:46	06:13	19:29 (D02)	06:44		07:14	06:50	15:59 (D04)	07:22		
	20:41	20:14	21 19:50 (D02)	19:26		18:36	16:55	22 16:21 (D04)	16:40		
12	05:46	06:14	19:30 (D02)	06:45		07:15	06:51	15:58 (D04)	07:23		
	20:41	20:12	19 19:49 (D02)	19:25		18:35	16:54	23 16:21 (D04)	16:40		
13	05:47	06:15	19:29 (D02)	06:46		07:16	06:52	15:57 (D04)	07:23		
	20:40	20:11	18 19:47 (D02)	19:23		18:33	16:53	25 16:22 (D04)	16:40		
14	05:48	06:16	19:30 (D02)	06:47		07:17	06:53	15:57 (D04)	07:24		
	20:40	20:10	16 19:46 (D02)	19:21		18:32	16:52	25 16:22 (D04)	16:40		
15	05:49	06:17	19:01 (D03)	06:48		07:19	06:54	15:57 (D04)	07:25		
	20:39	20:08	19 19:44 (D02)	19:20		18:30	16:51	26 16:23 (D04)	16:41		
16	05:49	06:18	18:57 (D03)	06:49		07:20	06:56	15:57 (D04)	07:26		
	20:39	20:07	25 19:43 (D02)	19:18		18:28	16:50	26 16:23 (D04)	16:41		
17	05:50	06:19	18:54 (D03)	06:50		07:21	06:57	15:57 (D04)	07:26		
	20:38	20:06	27 19:42 (D02)	19:16		18:27	16:49	26 16:23 (D04)	16:41		
18	05:51	06:20	18:52 (D03)	06:51		07:22	06:58	15:57 (D04)	07:27		
	20:37	20:04	26 19:40 (D02)	19:15		18:25	16:48	26 16:23 (D04)	16:41		
19	05:52	06:21	18:50 (D03)	06:52		07:23	06:59	15:58 (D04)	07:28		
	20:37	20:03	26 19:16 (D03)	19:13		18:24	16:48	25 16:23 (D04)	16:42		
20	05:53	06:22	18:49 (D03)	06:53		07:24	07:00	15:58 (D04)	07:28		
	20:36	20:01	28 19:17 (D03)	19:11		18:22	16:47	24 16:22 (D04)	16:42		
21	05:54	06:23	18:48 (D03)	06:54		07:25	07:01	15:58 (D04)	07:29		
	20:35	20:00	30 19:18 (D03)	19:10		18:21	16:46	23 16:21 (D04)	16:43		
22	05:54	06:24	18:47 (D03)	06:55		07:26	07:03	15:59 (D04)	07:29		
	20:35	19:58	31 19:18 (D03)	19:08		18:20	16:46	22 16:21 (D04)	16:43		
23	05:55	06:25	18:46 (D03)	06:56		07:27	07:04	15:59 (D04)	07:30		
	20:34	19:57	33 19:19 (D03)	19:06		18:18	16:45	21 16:20 (D04)	16:43		
24	05:56	06:26	18:45 (D03)	06:57		07:29	07:05	16:00 (D04)	07:30		
	20:33	19:55	34 19:19 (D03)	19:04		18:17	16:44	20 16:20 (D04)	16:44		
25	05:57	06:27	18:44 (D03)	06:58		07:30	07:06	16:01 (D04)	07:31		
	20:32	19:54	35 19:19 (D03)	19:03		18:15	16:44	18 16:19 (D04)	16:45		
26	05:58	06:28	18:44 (D03)	06:59		07:31	07:07	16:02 (D04)	07:31		
	20:31	19:52	36 19:20 (D03)	19:01		18:14	16:43	16 16:18 (D04)	16:45		
27	05:59	19:40 (D02)	06:29	18:43 (D03)	07:00	07:32	07:08	16:03 (D04)	07:31		
	20:30	6 19:46 (D02)	19:51	36 19:19 (D03)	18:59	18:13	16:43	15 16:18 (D04)	16:46		
28	06:00	19:37 (D02)	06:30	18:43 (D03)	07:01	07:33	07:09	16:03 (D04)	07:32		
	20:29	12 19:49 (D02)	19:49	36 19:19 (D03)	18:58	18:11	16:42	14 16:17 (D04)	16:46		
29	06:01	19:35 (D02)	06:31	18:42 (D03)	07:02	07:34	07:10	16:04 (D04)	07:32		
	20:28	14 19:49 (D02)	19:48	37 19:19 (D03)	18:56	18:10	16:42	13 16:17 (D04)	16:47		
30	06:02	19:34 (D02)	06:32	18:42 (D03)	07:03	07:35	07:11	16:06 (D04)	07:32		
	20:27	17 19:51 (D02)	19:46	37 19:19 (D03)	18:54	18:09	16:42	10 16:16 (D04)	16:48		
31	06:03	19:33 (D02)	06:33	18:42 (D03)		07:37			07:32		
	20:26	19 19:52 (D02)	19:44	36 19:18 (D03)		18:07			16:49		
Potential sun hours	458		428	375		346	298		288		
Total, worst case	68		846	242			489		19		
Sun reduction	0.97		0.96	0.93			0.61		0.47		
Oper. time red.	1.00		1.00	1.00			1.00		1.00		
Wind dir. red.	0.52		0.57	0.61			0.87		0.87		
Total reduction	0.53		0.58	0.60			0.56		0.43		
Total, real	36		488	144			273		8		

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 9 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32		07:19	16:29 (D04)	06:43	06:52	18:56 (D03)	06:07		19:18 (D02)	05:39						
	16:50		17:23	20 16:49 (D04)	17:57	19:31	11 19:07 (D03)	20:03	23	19:41 (D02)	20:32						
2	07:33		07:18	16:30 (D04)	06:41	06:51	18:52 (D03)	06:06		19:18 (D02)	05:38						
	16:50		17:25	18 16:48 (D04)	17:58	19:32	18 19:10 (D03)	20:04	24	19:42 (D02)	20:33						
3	07:33		07:17	16:32 (D04)	06:40	06:49	18:49 (D03)	06:05		19:17 (D02)	05:38						
	16:51		17:26	14 16:46 (D04)	18:00	19:33	22 19:11 (D03)	20:05	25	19:42 (D02)	20:34						
4	07:33		07:16	16:34 (D04)	06:38	06:48	18:48 (D03)	06:03		19:17 (D02)	05:38						
	16:52		17:27	10 16:44 (D04)	18:01	19:34	25 19:13 (D03)	20:06	26	19:43 (D02)	20:34						
5	07:33		07:15		06:37	06:46	18:46 (D03)	06:02		19:18 (D02)	05:37						
	16:53		17:28		18:02	19:35	28 19:14 (D03)	20:07	24	19:42 (D02)	20:35						
6	07:33		07:14		06:35	06:44	18:44 (D03)	06:01		19:18 (D02)	05:37						
	16:54		17:30		18:03	19:36	30 19:14 (D03)	20:08	24	19:42 (D02)	20:36						
7	07:33		07:13		06:34	06:43	18:43 (D03)	06:00		19:19 (D02)	05:37						
	16:55		17:31		18:04	19:37	32 19:15 (D03)	20:09	23	19:42 (D02)	20:36						
8	07:32		07:12		06:41	06:41	18:42 (D03)	05:59		19:19 (D02)	05:36						
	16:56		17:32		19:05	19:38	33 19:15 (D03)	20:10	22	19:41 (D02)	20:37						
9	07:32	16:31 (D04)	07:10		06:39	06:39	18:41 (D03)	05:57		19:20 (D02)	05:36						
	16:57	1 16:32 (D04)	17:33		19:06	19:40	34 19:15 (D03)	20:11	20	19:40 (D02)	20:38						
10	07:32	16:29 (D04)	07:09		06:38	06:38	18:41 (D03)	05:56		19:20 (D02)	05:36						
	16:58	4 16:33 (D04)	17:35		19:07	19:41	35 19:16 (D03)	20:12	18	19:38 (D02)	20:38						
11	07:32	16:28 (D04)	07:08		06:36	06:36	18:40 (D03)	05:55		19:22 (D02)	05:36						
	16:59	7 16:35 (D04)	17:36		19:09	19:42	35 19:15 (D03)	20:13	15	19:37 (D02)	20:39						
12	07:32	16:26 (D04)	07:07		06:35	06:35	18:40 (D03)	05:54		19:23 (D02)	05:36						
	17:00	9 16:35 (D04)	17:37		19:10	19:43	36 19:16 (D03)	20:14	12	19:35 (D02)	20:39						
13	07:31	16:26 (D04)	07:05		06:33	06:33	18:40 (D03)	05:53		19:26 (D02)	05:36						
	17:01	10 16:36 (D04)	17:38		19:11	19:44	35 19:15 (D03)	20:15	7	19:33 (D02)	20:40						
14	07:31	16:25 (D04)	07:04		06:32	06:32	18:40 (D03)	05:52			05:36						
	17:02	12 16:37 (D04)	17:39		19:12	19:45	35 19:15 (D03)	20:16			20:40						
15	07:31	16:25 (D04)	07:03		06:30	06:30	18:40 (D03)	05:51			05:36						
	17:03	14 16:39 (D04)	17:41		19:13	19:46	34 19:14 (D03)	20:17			20:41						
16	07:30	16:24 (D04)	07:02		06:28	06:28	18:40 (D03)	05:50			05:36						
	17:04	15 16:39 (D04)	17:42		19:14	19:47	34 19:14 (D03)	20:18			20:41						
17	07:30	16:24 (D04)	07:00		06:27	06:27	18:40 (D03)	05:49			05:36						
	17:05	17 16:41 (D04)	17:43		19:15	19:48	33 19:13 (D03)	20:19			20:41						
18	07:29	16:24 (D04)	06:59		06:25	06:25	18:41 (D03)	05:48			05:36						
	17:07	18 16:42 (D04)	17:44		19:16	19:49	31 19:12 (D03)	20:20			20:42						
19	07:29	16:24 (D04)	06:58		06:24	06:24	18:41 (D03)	05:47			05:36						
	17:08	20 16:44 (D04)	17:46		19:17	19:50	30 19:11 (D03)	20:21			20:42						
20	07:28	16:24 (D04)	06:56		06:22	06:22	18:43 (D03)	05:47			05:36						
	17:09	21 16:45 (D04)	17:47		19:18	19:51	27 19:10 (D03)	20:22			20:42						
21	07:28	16:24 (D04)	06:55		06:21	06:21	18:43 (D03)	05:46			05:36						
	17:10	22 16:46 (D04)	17:48		19:19	19:52	25 19:08 (D03)	20:23			20:43						
22	07:27	16:24 (D04)	06:53		06:19	06:19	18:45 (D03)	05:45			05:36						
	17:11	23 16:47 (D04)	17:49		19:21	19:53	21 19:06 (D03)	20:24			20:43						
23	07:26	16:24 (D04)	06:52		06:18	06:18	18:46 (D03)	05:44			05:37						
	17:12	24 16:48 (D04)	17:50		19:22	19:54	22 19:32 (D02)	20:25			20:43						
24	07:26	16:24 (D04)	06:50		06:17	06:17	18:49 (D03)	05:43			05:37						
	17:14	25 16:49 (D04)	17:51		19:23	19:55	22 19:34 (D02)	20:26			20:43						
25	07:25	16:25 (D04)	06:49		06:15	06:15	19:23 (D02)	05:43			05:37						
	17:15	26 16:51 (D04)	17:53		19:24	19:56	12 19:35 (D02)	20:26			20:43						
26	07:24	16:25 (D04)	06:48		06:14	06:14	19:21 (D02)	05:42			05:38						
	17:16	26 16:51 (D04)	17:54		19:25	19:57	14 19:35 (D02)	20:27			20:44						
27	07:23	16:25 (D04)	06:46		06:12	06:12	19:20 (D02)	05:41			05:38						
	17:17	26 16:51 (D04)	17:55		19:26	19:58	17 19:37 (D02)	20:28			20:44						
28	07:22	16:26 (D04)	06:45		06:11	06:11	19:20 (D02)	05:41			05:38						
	17:18	24 16:50 (D04)	17:56		19:27	20:00	18 19:38 (D02)	20:29			20:44						
29	07:22	16:26 (D04)			06:10	06:10	19:18 (D02)	05:40			05:39						
	17:20	24 16:50 (D04)			19:28	20:01	20 19:38 (D02)	20:30			20:44						
30	07:21	16:27 (D04)			06:08	06:08	19:18 (D02)	05:40			05:39						
	17:21	23 16:50 (D04)			19:29	20:02	21 19:39 (D02)	20:31			20:44						
31	07:20	16:28 (D04)			06:54			05:39									
	17:22	21 16:49 (D04)			19:30			20:31									
Potential sun hours	298		297		369		398		448		452						
Total, worst case	412		62				790		263								
Sun reduction	0.45		0.62				0.82		0.92								
Oper. time red.	1.00		1.00				1.00		1.00								
Wind dir. red.	0.87		0.87				0.61		0.53								
Total reduction	0.41		0.57				0.52		0.51								
Total, real	169		35				412		133								

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 9 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04	19:33 (D02)	06:34	18:39 (D03)	07:04	06:38			07:12	16:10 (D04)
	20:44	20:25	14 19:47 (D02)	19:43	19:14 (D03)	18:53	18:06			16:41	7 16:17 (D04)
2	05:40	06:05	19:32 (D02)	06:35	18:39 (D03)	07:05	06:39			07:13	16:11 (D04)
	20:44	20:24	16 19:48 (D02)	19:41	19:14 (D03)	18:51	17:05			16:41	5 16:16 (D04)
3	05:41	06:05	19:31 (D02)	06:36	18:39 (D03)	07:06	06:40			07:14	16:15 (D04)
	20:43	20:23	18 19:49 (D02)	19:40	19:13 (D03)	18:49	17:04			16:41	1 16:16 (D04)
4	05:41	06:06	19:30 (D02)	06:37	18:39 (D03)	07:07	06:41			07:15	
	20:43	20:22	20 19:50 (D02)	19:38	19:12 (D03)	18:48	17:02			16:40	
5	05:42	06:07	19:29 (D02)	06:38	18:39 (D03)	07:08	06:43			07:16	
	20:43	20:21	22 19:51 (D02)	19:36	19:11 (D03)	18:46	17:01			16:40	
6	05:42	06:08	19:28 (D02)	06:39	18:40 (D03)	07:09	06:44			07:17	
	20:43	20:20	23 19:51 (D02)	19:35	19:10 (D03)	18:44	17:00			16:40	
7	05:43	06:09	19:28 (D02)	06:40	18:41 (D03)	07:10	06:45		16:04 (D04)	07:18	
	20:43	20:19	24 19:52 (D02)	19:33	19:09 (D03)	18:43	16:59	11	16:15 (D04)	16:40	
8	05:44	06:10	19:27 (D02)	06:41	18:42 (D03)	07:11	06:46		16:02 (D04)	07:19	
	20:42	20:17	25 19:52 (D02)	19:31	19:07 (D03)	18:41	16:58	15	16:17 (D04)	16:40	
9	05:44	06:11	19:27 (D02)	06:42	18:43 (D03)	07:12	06:47		16:01 (D04)	07:20	
	20:42	20:16	25 19:52 (D02)	19:30	19:06 (D03)	18:39	16:57	18	16:19 (D04)	16:40	
10	05:45	06:12	19:27 (D02)	06:43	18:45 (D03)	07:13	06:48		15:59 (D04)	07:21	
	20:42	20:15	24 19:51 (D02)	19:28	19:03 (D03)	18:38	16:56	21	16:20 (D04)	16:40	
11	05:46	06:13	19:27 (D02)	06:44	18:48 (D03)	07:14	06:50		15:59 (D04)	07:22	
	20:41	20:14	23 19:50 (D02)	19:26	19:00 (D03)	18:36	16:55	22	16:21 (D04)	16:40	
12	05:46	06:14	19:27 (D02)	06:45		07:15	06:51		15:59 (D04)	07:23	
	20:41	20:12	22 19:49 (D02)	19:25		18:35	16:54	23	16:22 (D04)	16:40	
13	05:47	06:15	19:26 (D02)	06:46		07:16	06:52		15:58 (D04)	07:23	
	20:40	20:11	21 19:47 (D02)	19:23		18:33	16:53	24	16:22 (D04)	16:40	
14	05:48	06:16	19:26 (D02)	06:47		07:17	06:53		15:58 (D04)	07:24	
	20:40	20:10	20 19:46 (D02)	19:21		18:32	16:52	24	16:22 (D04)	16:40	
15	05:49	06:17	19:26 (D02)	06:48		07:19	06:54		15:58 (D04)	07:25	
	20:39	20:08	18 19:44 (D02)	19:20		18:30	16:51	26	16:24 (D04)	16:41	
16	05:49	06:18	19:27 (D02)	06:49		07:20	06:56		15:58 (D04)	07:26	
	20:39	20:07	16 19:43 (D02)	19:18		18:28	16:50	26	16:24 (D04)	16:41	
17	05:50	06:19	19:28 (D02)	06:50		07:21	06:57		15:58 (D04)	07:26	
	20:38	20:06	14 19:42 (D02)	19:16		18:27	16:49	26	16:24 (D04)	16:41	
18	05:51	06:20	19:29 (D02)	06:51		07:22	06:58		15:58 (D04)	07:27	
	20:37	20:04	11 19:40 (D02)	19:15		18:25	16:48	25	16:23 (D04)	16:41	
19	05:52	06:21	18:55 (D03)	06:52		07:23	06:59		15:59 (D04)	07:28	
	20:37	20:03	20 19:39 (D02)	19:13		18:24	16:48	24	16:23 (D04)	16:42	
20	05:53	06:22	18:52 (D03)	06:53		07:24	07:00		15:59 (D04)	07:28	
	20:36	20:01	23 19:38 (D02)	19:11		18:22	16:47	23	16:22 (D04)	16:42	
21	05:54	06:23	18:50 (D03)	06:54		07:25	07:01		15:59 (D04)	07:29	
	20:35	20:00	21 19:11 (D03)	19:10		18:21	16:46	22	16:21 (D04)	16:43	
22	05:54	06:24	18:48 (D03)	06:55		07:26	07:03		16:00 (D04)	07:29	
	20:35	19:58	25 19:13 (D03)	19:08		18:20	16:46	21	16:21 (D04)	16:43	
23	05:55	06:25	18:46 (D03)	06:56		07:27	07:04		16:00 (D04)	07:30	
	20:34	19:57	28 19:14 (D03)	19:06		18:18	16:45	20	16:20 (D04)	16:43	
24	05:56	06:26	18:45 (D03)	06:57		07:29	07:05		16:02 (D04)	07:30	
	20:33	19:55	29 19:14 (D03)	19:04		18:17	16:44	18	16:20 (D04)	16:44	
25	05:57	06:27	18:44 (D03)	06:58		07:30	07:06		16:02 (D04)	07:31	
	20:32	19:54	31 19:15 (D03)	19:03		18:15	16:44	17	16:19 (D04)	16:45	
26	05:58	06:28	18:43 (D03)	06:59		07:31	07:07		16:03 (D04)	07:31	
	20:31	19:52	32 19:15 (D03)	19:01		18:14	16:43	15	16:18 (D04)	16:45	
27	05:59	06:29	18:42 (D03)	07:00		07:32	07:08		16:04 (D04)	07:31	
	20:30	19:51	34 19:16 (D03)	18:59		18:13	16:43	14	16:18 (D04)	16:46	
28	06:00	06:30	18:42 (D03)	07:01		07:33	07:09		16:05 (D04)	07:32	
	20:29	19:49	34 19:16 (D03)	18:58		18:11	16:42	12	16:17 (D04)	16:46	
29	06:01	06:31	18:41 (D03)	07:02		07:34	07:10		16:06 (D04)	07:32	
	20:28	19:48	35 19:16 (D03)	18:56		18:10	16:42	11	16:17 (D04)	16:47	
30	06:02	06:32	18:41 (D03)	07:03		07:35	07:11		16:07 (D04)	07:32	
	20:27	19:46	35 19:16 (D03)	18:54		18:09	16:42	9	16:16 (D04)	16:48	
31	06:03	19:35 (D02)	06:33	18:40 (D03)		07:37				07:32	
	20:26	9 19:44 (D02)	19:44	36 19:16 (D03)		18:07				16:49	
Potential sun hours	458		428	375		346	298			288	
Total, worst case	9		739	305			467			13	
Sun reduction	0.97		0.96	0.93			0.61			0.47	
Oper. time red.	1.00		1.00	1.00			1.00			1.00	
Wind dir. red.	0.53		0.57	0.62			0.87			0.87	
Total reduction	0.53		0.58	0.61			0.56			0.43	
Total, real	5		426	185			260			6	

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)

SHADOW - Calendar

Shadow receptor: 10 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32		07:19	16:29 (D04)	06:43				06:52	18:50 (D03)	06:07		19:16 (D02)	05:39			
	16:50		17:23	20 16:49 (D04)	17:57				19:31	19:09 (D03)	20:03	25	19:41 (D02)	20:32			
2	07:33		07:18	16:30 (D04)	06:41				06:51	18:47 (D03)	06:06		19:16 (D02)	05:38			
	16:50		17:25	18 16:48 (D04)	17:58				19:32	19:11 (D03)	20:04	25	19:41 (D02)	20:33			
3	07:33		07:17	16:32 (D04)	06:40				06:49	18:45 (D03)	06:05		19:16 (D02)	05:38			
	16:51		17:26	14 16:46 (D04)	18:00				19:33	19:11 (D03)	20:05	24	19:40 (D02)	20:34			
4	07:33		07:16	16:35 (D04)	06:38				06:48	18:44 (D03)	06:03		19:16 (D02)	05:38			
	16:52		17:27	9 16:44 (D04)	18:01				19:34	19:13 (D03)	20:06	24	19:40 (D02)	20:34			
5	07:33		07:15		06:37				06:46	18:42 (D03)	06:02		19:17 (D02)	05:37			
	16:53		17:28		18:02				19:35	19:13 (D03)	20:07	22	19:39 (D02)	20:35			
6	07:33		07:14		06:35				06:44	18:41 (D03)	06:01		19:18 (D02)	05:37			
	16:54		17:30		18:03				19:36	19:13 (D03)	20:08	20	19:38 (D02)	20:36			
7	07:33		07:13		06:34				06:43	18:41 (D03)	06:00		19:19 (D02)	05:37			
	16:55		17:31		18:04				19:37	19:14 (D03)	20:09	19	19:38 (D02)	20:36			
8	07:32		07:12		07:32				06:41	18:40 (D03)	05:59		19:20 (D02)	05:36			
	16:56		17:32		19:05				19:38	19:14 (D03)	20:10	17	19:37 (D02)	20:37			
9	07:32		07:10		07:30				06:39	18:39 (D03)	05:57		19:21 (D02)	05:36			
	16:57		17:33		19:06				19:40	19:13 (D03)	20:11	14	19:35 (D02)	20:38			
10	07:32		07:09		07:29				06:38	18:39 (D03)	05:56		19:22 (D02)	05:36			
	16:58	3	16:33 (D04)	17:35	19:07				19:41	19:14 (D03)	20:12	10	19:32 (D02)	20:38			
11	07:32		07:08		07:27				06:36	18:38 (D03)	05:55		19:26 (D02)	05:36			
	16:59	6	16:35 (D04)	17:36	19:09				19:42	19:13 (D03)	20:13	2	19:28 (D02)	20:39			
12	07:32		07:07		07:26				06:35	18:39 (D03)	05:54			05:36			
	17:00	8	16:35 (D04)	17:37	19:10				19:43	19:13 (D03)	20:14			20:39			
13	07:31		07:05		07:24				06:33	18:39 (D03)	05:53			05:36			
	17:01	9	16:36 (D04)	17:38	19:11				19:44	19:12 (D03)	20:15			20:40			
14	07:31		07:04		07:22				06:32	18:39 (D03)	05:52			05:36			
	17:02	12	16:37 (D04)	17:39	19:12				19:45	19:12 (D03)	20:16			20:40			
15	07:31		07:03		07:21				06:30	18:39 (D03)	05:51			05:36			
	17:03	14	16:39 (D04)	17:41	19:13				19:46	19:11 (D03)	20:17			20:41			
16	07:30		07:02		07:19				06:28	18:40 (D03)	05:50			05:36			
	17:04	14	16:39 (D04)	17:42	19:14				19:47	19:10 (D03)	20:18			20:41			
17	07:30		07:00		07:17				06:27	18:40 (D03)	05:49			05:36			
	17:05	16	16:41 (D04)	17:43	19:15				19:48	19:09 (D03)	20:19			20:41			
18	07:29		06:59		07:16				06:25	18:42 (D03)	05:48			05:36			
	17:07	18	16:42 (D04)	17:44	19:16				19:49	19:08 (D03)	20:20			20:42			
19	07:29		06:58		07:14				06:24	18:42 (D03)	05:47			05:36			
	17:08	19	16:44 (D04)	17:46	19:17				19:50	19:06 (D03)	20:21			20:42			
20	07:28		06:56		07:12				06:22	18:44 (D03)	05:47			05:36			
	17:09	21	16:45 (D04)	17:47	19:18				19:51	19:04 (D03)	20:22			20:42			
21	07:28		06:55		07:11				06:21	18:46 (D03)	05:46			05:36			
	17:10	21	16:46 (D04)	17:48	19:19				19:52	19:30 (D02)	20:23			20:43			
22	07:27		06:53		07:09				06:19	18:50 (D03)	05:45			05:36			
	17:11	22	16:47 (D04)	17:49	19:21				19:53	19:32 (D02)	20:24			20:43			
23	07:26		06:52		07:07				06:18	19:21 (D02)	05:44			05:37			
	17:12	24	16:48 (D04)	17:50	19:22				19:54	19:32 (D02)	20:25			20:43			
24	07:26		06:50		07:06				06:17	19:20 (D02)	05:43			05:37			
	17:14	25	16:49 (D04)	17:51	19:23				19:55	19:34 (D02)	20:26			20:43			
25	07:25		06:49		07:04				06:15	19:19 (D02)	05:43			05:37			
	17:15	26	16:51 (D04)	17:53	19:24				19:56	19:35 (D02)	20:26			20:43			
26	07:24		06:48		07:02				06:14	19:18 (D02)	05:42			05:38			
	17:16	26	16:51 (D04)	17:54	19:25				19:57	19:35 (D02)	20:27			20:44			
27	07:23		06:46		07:01				06:12	19:17 (D02)	05:41			05:38			
	17:17	25	16:51 (D04)	17:55	19:26				19:58	19:37 (D02)	20:28			20:44			
28	07:22		06:45		06:59				06:11	19:17 (D02)	05:41			05:38			
	17:18	25	16:51 (D04)	17:56	19:27				20:00	19:38 (D02)	20:29			20:44			
29	07:22				06:57				06:10	19:16 (D02)	05:40			05:39			
	17:20	23	16:50 (D04)		19:28				20:01	19:38 (D02)	20:30			20:44			
30	07:21		06:56		18:58 (D03)	06:08			20:02	19:16 (D02)	05:40			05:39			
	17:21	23	16:50 (D04)		19:29	3			20:02	19:39 (D02)	20:31			20:44			
31	07:20		06:54		18:52 (D03)						05:39						
	17:22	21	16:49 (D04)		19:30	14					20:31						
Potential sun hours	298		297		369				398		448			452			
Total, worst case	401		61		17				771		202						
Sun reduction	0.45		0.62		0.73				0.82		0.92						
Oper. time red.	1.00		1.00		1.00				1.00		1.00						
Wind dir. red.	0.87		0.87		0.63				0.61		0.53						
Total reduction	0.41		0.56		0.48				0.52		0.51						
Total, real	164		34		8				403		103						

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 10 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04		06:34	18:37 (D03)	07:04	06:38			07:12	16:11 (D04)
	20:44	20:25		19:43	35 19:12 (D03)	18:53	18:06			16:41	6 16:17 (D04)
2	05:40	06:05	19:34 (D02)	06:35	18:37 (D03)	07:05	06:39			07:13	16:13 (D04)
	20:44	20:24	7 19:41 (D02)	19:41	35 19:12 (D03)	18:51	17:05			16:41	3 16:16 (D04)
3	05:41	06:05	19:32 (D02)	06:36	18:37 (D03)	07:06	06:40			07:14	
	20:43	20:23	12 19:44 (D02)	19:40	34 19:11 (D03)	18:49	17:04			16:41	
4	05:41	06:06	19:30 (D02)	06:37	18:37 (D03)	07:07	06:41			07:15	
	20:43	20:22	15 19:45 (D02)	19:38	34 19:11 (D03)	18:48	17:02			16:40	
5	05:42	06:07	19:29 (D02)	06:38	18:37 (D03)	07:08	06:43			07:16	
	20:43	20:21	18 19:47 (D02)	19:36	33 19:10 (D03)	18:46	17:01			16:40	
6	05:42	06:08	19:28 (D02)	06:39	18:37 (D03)	07:09	06:44			07:17	
	20:43	20:20	20 19:48 (D02)	19:35	32 19:09 (D03)	18:44	17:00			16:40	
7	05:43	06:09	19:27 (D02)	06:40	18:37 (D03)	07:10	06:45			07:18	
	20:43	20:19	21 19:48 (D02)	19:33	31 19:08 (D03)	18:43	16:59	11 16:15 (D04)		16:40	
8	05:44	06:10	19:26 (D02)	06:41	18:38 (D03)	07:11	06:46			07:19	
	20:42	20:17	23 19:49 (D02)	19:31	29 19:07 (D03)	18:41	16:58	14 16:17 (D04)		16:40	
9	05:44	06:11	19:26 (D02)	06:42	18:39 (D03)	07:12	06:47			07:20	
	20:42	20:16	23 19:49 (D02)	19:30	27 19:06 (D03)	18:39	16:57	18 16:19 (D04)		16:40	
10	05:45	06:12	19:25 (D02)	06:43	18:40 (D03)	07:13	06:48			07:21	
	20:42	20:15	25 19:50 (D02)	19:28	24 19:04 (D03)	18:38	16:56	20 16:20 (D04)		16:40	
11	05:46	06:13	19:25 (D02)	06:44	18:41 (D03)	07:14	06:50			07:22	
	20:41	20:14	25 19:50 (D02)	19:26	21 19:02 (D03)	18:36	16:55	21 16:21 (D04)		16:40	
12	05:46	06:14	19:25 (D02)	06:45	18:44 (D03)	07:15	06:51			07:23	
	20:41	20:12	24 19:49 (D02)	19:25	15 18:59 (D03)	18:35	16:54	23 16:22 (D04)		16:40	
13	05:47	06:15	19:24 (D02)	06:46	18:48 (D03)	07:16	06:52			07:23	
	20:40	20:11	23 19:47 (D02)	19:23	6 18:54 (D03)	18:33	16:53	23 16:22 (D04)		16:40	
14	05:48	06:16	19:24 (D02)	06:47		07:17	06:53			07:24	
	20:40	20:10	22 19:46 (D02)	19:21		18:32	16:52	24 16:22 (D04)		16:40	
15	05:49	06:17	19:24 (D02)	06:48		07:19	06:54			07:25	
	20:39	20:08	20 19:44 (D02)	19:20		18:30	16:51	25 16:24 (D04)		16:41	
16	05:49	06:18	19:24 (D02)	06:49		07:20	06:56			07:26	
	20:39	20:07	19 19:43 (D02)	19:18		18:28	16:50	26 16:24 (D04)		16:41	
17	05:50	06:19	19:24 (D02)	06:50		07:21	06:57			07:26	
	20:38	20:06	18 19:42 (D02)	19:16		18:27	16:49	26 16:24 (D04)		16:41	
18	05:51	06:20	19:25 (D02)	06:51		07:22	06:58			07:27	
	20:37	20:04	15 19:40 (D02)	19:15		18:25	16:48	25 16:23 (D04)		16:41	
19	05:52	06:21	19:26 (D02)	06:52		07:23	06:59			07:28	
	20:37	20:03	13 19:39 (D02)	19:13		18:24	16:48	24 16:23 (D04)		16:42	
20	05:53	06:22	19:27 (D02)	06:53		07:24	07:00			07:28	
	20:36	20:01	11 19:38 (D02)	19:11		18:22	16:47	22 16:22 (D04)		16:42	
21	05:54	06:23	18:54 (D03)	06:54		07:25	07:01			07:29	
	20:35	20:00	16 19:36 (D02)	19:10		18:21	16:46	21 16:21 (D04)		16:43	
22	05:54	06:24	18:50 (D03)	06:55		07:26	07:03			07:29	
	20:35	19:58	17 19:35 (D02)	19:08		18:20	16:46	21 16:21 (D04)		16:43	
23	05:55	06:25	18:48 (D03)	06:56		07:27	07:04			07:30	
	20:34	19:57	20 19:08 (D03)	19:06		18:18	16:45	19 16:20 (D04)		16:43	
24	05:56	06:26	18:46 (D03)	06:57		07:29	07:05			07:30	
	20:33	19:55	24 19:10 (D03)	19:04		18:17	16:44	18 16:20 (D04)		16:44	
25	05:57	06:27	18:44 (D03)	06:58		07:30	07:06			07:30	
	20:32	19:54	27 19:11 (D03)	19:03		18:15	16:44	16 16:19 (D04)		16:45	
26	05:58	06:28	18:43 (D03)	06:59		07:31	07:07			07:31	
	20:31	19:52	29 19:12 (D03)	19:01		18:14	16:43	14 16:18 (D04)		16:45	
27	05:59	06:29	18:42 (D03)	07:00		07:32	07:08			07:31	
	20:30	19:51	30 19:12 (D03)	18:59		18:13	16:43	14 16:18 (D04)		16:46	
28	06:00	06:30	18:41 (D03)	07:01		07:33	07:09			07:32	
	20:29	19:49	32 19:13 (D03)	18:58		18:11	16:42	12 16:17 (D04)		16:46	
29	06:01	06:31	18:40 (D03)	07:02		07:34	07:10			07:32	
	20:28	19:48	33 19:13 (D03)	18:56		18:10	16:42	10 16:17 (D04)		16:47	
30	06:02	06:32	18:39 (D03)	07:03		07:35	07:11			07:32	
	20:27	19:46	34 19:13 (D03)	18:54		18:09	16:42	8 16:16 (D04)		16:48	
31	06:03	06:33	18:39 (D03)			07:37				07:32	
	20:26	19:44	34 19:13 (D03)			18:07				16:49	
Potential sun hours	458	428		375		346	298			288	
Total, worst case		650		356			455			9	
Sun reduction		0.96		0.93			0.61			0.47	
Oper. time red.		1.00		1.00			1.00			1.00	
Wind dir. red.		0.58		0.63			0.87			0.87	
Total reduction		0.58		0.61			0.56			0.43	
Total, real		375		218			253			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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 11 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (86)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:38	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:43
22	07:27 17:11	06:53 17:49	06:09 19:21	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:00 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20		06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:03 20:26	06:33 19:45		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 12 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (87)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
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	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 13 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (88)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
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	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
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	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
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17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
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	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
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22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
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	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 14 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (89)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:44		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 15 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (90)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 16 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March	April	May	June
1	07:32	15:51 (D04)	07:19	06:43	06:52		06:07	05:39
	16:50	25 16:16 (D04)	17:23	17:57	19:31		20:03	20:32
2	07:33	15:51 (D04)	07:18	06:41	06:51		06:06	05:38
	16:50	26 16:17 (D04)	17:25	17:58	19:32		20:04	20:33
3	07:33	15:52 (D04)	07:17	06:40	06:49		06:05	05:38
	16:51	25 16:17 (D04)	17:26	18:00	19:33		20:05	20:34
4	07:33	15:53 (D04)	07:16	06:38	06:48		06:03	05:38
	16:52	24 16:17 (D04)	17:27	18:01	19:34		20:06	20:34
5	07:33	15:53 (D04)	07:15	06:37	06:46		06:02	05:37
	16:53	25 16:18 (D04)	17:28	18:02	19:35		20:07	20:35
6	07:33	15:54 (D04)	07:14	06:35	06:44		06:01	05:37
	16:54	24 16:18 (D04)	17:30	18:03	19:36		20:08	20:36
7	07:33	15:55 (D04)	07:13	06:34	06:43		06:00	05:37
	16:55	23 16:18 (D04)	17:31	18:04	19:37		20:09	20:36
8	07:32	15:55 (D04)	07:12	07:32	06:41		05:59	05:36
	16:56	23 16:18 (D04)	17:32	19:05	19:38		20:10	20:37
9	07:32	15:56 (D04)	07:10	07:30	06:39		05:57	05:36
	16:57	22 16:18 (D04)	17:33	19:06	19:40		20:11	20:38
10	07:32	15:57 (D04)	07:09	07:29	06:38	19:11 (D02)	05:56	05:36
	16:58	21 16:18 (D04)	17:35	19:07	19:41	6 19:17 (D02)	20:12	20:38
11	07:32	15:58 (D04)	07:08	07:27	06:36	19:06 (D02)	05:55	05:36
	16:59	21 16:19 (D04)	17:36	19:09	19:42	14 19:20 (D02)	20:13	20:39
12	07:32	15:58 (D04)	07:07	07:26	06:35	19:04 (D02)	05:54	05:36
	17:00	20 16:18 (D04)	17:37	19:10	19:43	18 19:22 (D02)	20:14	20:39
13	07:31	16:00 (D04)	07:06	07:24	06:33	19:02 (D02)	05:53	05:36
	17:01	18 16:18 (D04)	17:38	19:11	19:44	20 19:22 (D02)	20:15	20:40
14	07:31	16:00 (D04)	07:04	07:22	06:32	19:01 (D02)	05:52	05:36
	17:02	17 16:17 (D04)	17:39	19:12	19:45	23 19:24 (D02)	20:16	20:40
15	07:31	16:02 (D04)	07:03	07:21	06:30	19:00 (D02)	05:51	05:36
	17:03	15 16:17 (D04)	17:41	19:13	19:46	24 19:24 (D02)	20:17	20:41
16	07:30	16:03 (D04)	07:02	07:19	06:28	19:00 (D02)	05:50	05:36
	17:04	12 16:15 (D04)	17:42	19:14	19:47	25 19:25 (D02)	20:18	20:41
17	07:30	16:06 (D04)	07:00	07:17	06:27	18:58 (D02)	05:49	05:36
	17:05	8 16:14 (D04)	17:43	19:15	19:48	27 19:25 (D02)	20:19	20:41
18	07:29		06:59	07:16	06:25	18:58 (D02)	05:48	05:36
	17:07		17:44	19:16	19:49	27 19:25 (D02)	20:20	20:42
19	07:29		06:58	07:14	06:24	18:58 (D02)	05:47	05:36
	17:08		17:46	19:17	19:50	27 19:25 (D02)	20:21	20:42
20	07:28		06:56	07:12	06:22	18:58 (D02)	05:47	05:36
	17:09		17:47	19:18	19:51	27 19:25 (D02)	20:22	20:42
21	07:28		06:55	07:11	06:21	18:57 (D02)	05:46	05:36
	17:10		17:48	19:19	19:52	27 19:24 (D02)	20:23	20:43
22	07:27		06:53	07:09	06:19	18:58 (D02)	05:45	05:36
	17:11		17:49	19:21	19:53	26 19:24 (D02)	20:24	20:43
23	07:26		06:52	07:07	06:18	18:58 (D02)	05:44	05:37
	17:12		17:50	19:22	19:54	25 19:23 (D02)	20:25	20:43
24	07:26		06:50	07:06	06:17	18:59 (D02)	05:43	05:37
	17:14		17:51	19:23	19:55	23 19:22 (D02)	20:26	20:43
25	07:25		06:49	07:04	06:15	19:00 (D02)	05:43	05:37
	17:15		17:53	19:24	19:56	21 19:21 (D02)	20:26	20:43
26	07:24		06:48	07:02	06:14	19:00 (D02)	05:42	05:38
	17:16		17:54	19:25	19:57	19 19:19 (D02)	20:27	20:44
27	07:23		06:46	07:01	06:12	19:02 (D02)	05:41	05:38
	17:17		17:55	19:26	19:59	16 19:18 (D02)	20:28	20:44
28	07:22		06:45	06:59	06:11	19:04 (D02)	05:41	05:38
	17:18		17:56	19:27	20:00	12 19:16 (D02)	20:29	20:44
29	07:22			06:57	06:10	19:06 (D02)	05:40	05:39
	17:20			19:28	20:01	6 19:12 (D02)	20:30	20:44
30	07:21			06:56	06:08		05:40	05:39
	17:21			19:29	20:02		20:31	20:44
31	07:20			06:54			05:39	
	17:22			19:30			20:31	
Potential sun hours	298		297	369	398		448	452
Total, worst case		349			413			
Sun reduction		0.45			0.82			
Oper. time red.		1.00			1.00			
Wind dir. red.		0.89			0.58			
Total reduction		0.43			0.51			
Total, real		149			209			

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:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 16 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	19:05 (D02) 18:53	07:04 18:06	07:12 16:41
2	05:40 20:44	06:05 20:24	06:35 19:41	19:09 (D02) 19:15 (D02)	07:05 18:51	16:41 16:01 (D04)
3	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	16:41 16:02 (D04)
4	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	16:41 16:03 (D04)
5	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	16:41 16:03 (D04)
6	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	16:41 16:04 (D04)
7	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	16:41 16:05 (D04)
8	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	16:41 16:04 (D04)
9	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57	16:41 16:05 (D04)
10	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	16:41 16:06 (D04)
11	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	16:41 16:06 (D04)
12	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	16:41 16:07 (D04)
13	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	16:41 16:08 (D04)
14	05:48 20:40	06:16 20:10	19:13 (D02) 19:21 (D02)	06:47 19:21	07:17 18:32	16:41 16:08 (D04)
15	05:49 20:39	06:17 20:08	19:10 (D02) 19:24 (D02)	06:48 19:20	07:19 18:30	16:41 16:08 (D04)
16	05:49 20:39	06:18 20:07	19:08 (D02) 19:25 (D02)	06:49 19:18	07:20 18:28	16:41 16:09 (D04)
17	05:50 20:38	06:19 20:06	19:06 (D02) 19:26 (D02)	06:50 19:16	07:21 18:27	16:41 16:09 (D04)
18	05:51 20:37	06:20 20:04	19:05 (D02) 19:27 (D02)	06:51 19:15	07:22 18:25	16:41 16:10 (D04)
19	05:52 20:37	06:21 20:03	19:04 (D02) 19:28 (D02)	06:52 19:13	07:23 18:24	16:41 16:11 (D04)
20	05:53 20:36	06:22 20:01	19:03 (D02) 19:28 (D02)	06:53 19:11	07:24 18:22	16:41 16:11 (D04)
21	05:54 20:35	06:23 20:00	19:03 (D02) 19:29 (D02)	06:54 19:10	07:25 18:21	16:41 16:12 (D04)
22	05:54 20:35	06:24 19:58	19:02 (D02) 19:29 (D02)	06:55 19:08	07:26 18:20	16:41 16:12 (D04)
23	05:55 20:34	06:25 19:57	19:02 (D02) 19:29 (D02)	06:56 19:06	07:27 18:18	16:41 16:13 (D04)
24	05:56 20:33	06:26 19:55	19:01 (D02) 19:29 (D02)	06:57 19:04	07:29 18:17	16:41 16:13 (D04)
25	05:57 20:32	06:27 19:54	19:01 (D02) 19:28 (D02)	06:58 19:03	07:30 18:15	15:44 (D04) 16:45
26	05:58 20:31	06:28 19:52	19:01 (D02) 19:28 (D02)	06:59 19:01	07:31 18:14	15:44 (D04) 16:45
27	05:59 20:30	06:29 19:51	19:01 (D02) 19:27 (D02)	07:00 18:59	07:32 18:13	15:41 (D04) 16:46
28	06:00 20:29	06:30 19:49	19:02 (D02) 19:26 (D02)	07:01 18:58	07:33 18:11	15:40 (D04) 16:46
29	06:01 20:28	06:31 19:48	19:02 (D02) 19:25 (D02)	07:02 18:56	07:34 18:10	15:40 (D04) 16:47
30	06:02 20:27	06:32 19:46	19:03 (D02) 19:23 (D02)	07:03 18:54	07:35 18:09	15:39 (D04) 16:48
31	06:03 20:26	06:33 19:45	19:04 (D02) 19:22 (D02)	07:04 18:57	07:37 18:07	15:50 (D04) 16:49
Potential sun hours	458	428	375	346	298	288
Total, worst case		403	20		90	777
Sun reduction		0.96	0.93		0.61	0.47
Oper. time red.		1.00	1.00		1.00	1.00
Wind dir. red.		0.58	0.58		0.89	0.89
Total reduction		0.59	0.57		0.58	0.45
Total, real		239	11		52	347

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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Project:

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Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 17 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (92)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	18:28 (D03) 18:59 (D03)	06:07 20:32	05:39 20:44	06:04 20:25	06:34 19:43		07:04 18:53	06:38 18:06
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	18:28 (D03) 18:59 (D03)	06:06 20:04	05:38 20:33	06:05 20:44	06:35 19:41		07:05 18:51	06:39 17:05
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	18:28 (D03) 18:57 (D03)	06:05 20:05	05:38 20:34	06:05 20:23	06:36 19:40	18:34 (D03) 18:44 (D03)	07:06 18:49	06:40 17:04
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	18:29 (D03) 18:57 (D03)	06:03 20:06	05:38 20:34	06:06 20:22	06:37 19:38	18:30 (D03) 18:47 (D03)	07:07 18:48	06:41 17:02
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	18:30 (D03) 18:55 (D03)	06:02 20:07	05:37 20:35	06:07 20:21	06:38 19:36	18:28 (D03) 18:48 (D03)	07:08 18:46	06:43 17:01
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	18:30 (D03) 18:54 (D03)	06:01 20:08	05:37 20:36	06:08 20:20	06:39 19:35	18:26 (D03) 18:50 (D03)	07:09 18:44	06:44 17:00
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	18:32 (D03) 18:52 (D03)	06:00 20:09	05:37 20:36	06:09 20:19	06:40 19:33	18:25 (D03) 18:50 (D03)	07:10 18:43	06:45 16:59
8	07:32 16:56	07:12 17:32	07:32 19:05	06:41 19:38	18:33 (D03) 18:50 (D03)	05:59 20:10	05:36 20:37	06:10 20:17	06:41 19:31	18:23 (D03) 18:51 (D03)	07:11 18:41	06:46 16:58
9	07:32 16:57	07:10 17:33	07:30 19:06	06:39 19:40	18:36 (D03) 18:46 (D03)	05:57 20:11	05:36 20:38	06:11 20:16	06:42 19:30	18:22 (D03) 18:52 (D03)	07:12 18:39	06:47 16:57
10	07:32 16:58	07:09 17:35	07:29 19:07	06:38 19:41		05:56 20:12	05:36 20:38	06:12 20:15	06:43 19:28	18:22 (D03) 18:52 (D03)	07:13 18:38	06:48 16:56
11	07:32 16:59	07:08 17:36	07:27 19:09	06:36 19:42		05:55 20:13	05:36 20:39	06:13 20:14	06:44 19:26	18:21 (D03) 18:52 (D03)	07:14 18:36	06:50 16:55
12	07:32 17:00	07:07 17:37	07:26 19:10	06:35 19:43	19:16 (D02) 19:22 (D02)	05:54 20:14	05:36 20:39	06:14 20:12	06:45 19:25	18:20 (D03) 18:50 (D03)	07:15 18:35	06:51 16:54
13	07:31 17:01	07:05 17:38	07:24 19:11	06:33 19:44	19:12 (D02) 19:22 (D02)	05:53 20:15	05:36 20:40	06:15 20:11	06:46 19:23	18:20 (D03) 18:51 (D03)	07:16 18:33	06:52 16:53
14	07:31 17:02	07:04 17:39	07:22 19:12	06:32 19:45	19:10 (D02) 19:24 (D02)	05:52 20:16	05:36 20:40	06:16 20:10	19:20 (D02) 19:25 (D02)	18:20 (D03) 18:51 (D03)	07:17 18:32	06:53 16:52
15	07:31 17:03	07:03 17:41	07:21 19:13	06:30 19:46	19:08 (D02) 19:25 (D02)	05:51 20:17	05:36 20:41	06:17 20:08	19:16 (D02) 19:28 (D02)	18:19 (D03) 18:50 (D03)	07:19 18:30	06:54 16:51
16	07:30 17:04	07:02 17:42	07:19 19:14	06:28 19:47	19:08 (D02) 19:26 (D02)	05:50 20:18	05:36 20:41	06:18 20:07	19:14 (D02) 19:30 (D02)	18:19 (D03) 18:50 (D03)	07:20 18:28	06:56 16:50
17	07:30 17:05	07:00 17:43	07:17 19:15	06:27 19:48	19:06 (D02) 19:27 (D02)	05:49 20:19	05:36 20:41	06:19 20:06	19:13 (D02) 19:31 (D02)	18:20 (D03) 18:49 (D03)	07:21 18:27	06:57 16:49
18	07:29 17:07	06:59 17:44	07:16 19:16	06:25 19:49	19:06 (D02) 19:28 (D02)	05:48 20:20	05:36 20:42	06:20 20:37	19:12 (D02) 19:32 (D02)	18:20 (D03) 18:48 (D03)	07:22 18:25	06:58 16:48
19	07:29 17:08	06:58 17:46	07:14 19:17	06:24 19:50	19:05 (D02) 19:28 (D02)	05:47 20:21	05:36 20:42	06:21 20:37	19:11 (D02) 19:32 (D02)	18:20 (D03) 18:45 (D03)	07:23 18:24	06:59 16:48
20	07:28 17:09	06:56 17:47	07:12 19:18	06:22 19:51	19:05 (D02) 19:29 (D02)	05:47 20:22	05:36 20:42	06:22 20:36	19:10 (D02) 19:33 (D02)	18:20 (D03) 18:44 (D03)	07:24 18:22	07:00 16:47
21	07:28 17:10	06:55 17:48	07:11 19:19	06:21 19:52	19:04 (D02) 19:28 (D02)	05:46 20:23	05:36 20:43	06:23 20:35	19:10 (D02) 19:33 (D02)	18:22 (D03) 18:42 (D03)	07:25 18:21	07:01 16:46
22	07:27 17:11	06:53 17:49	07:09 19:21	06:19 19:53	19:05 (D02) 19:28 (D02)	05:45 20:24	05:36 20:43	06:24 20:35	19:09 (D02) 19:33 (D02)	18:24 (D03) 18:39 (D03)	07:26 18:19	07:03 16:46
23	07:26 17:12	06:52 17:50	07:07 19:22	06:18 19:54	19:04 (D02) 19:27 (D02)	05:44 20:25	05:37 20:43	06:25 20:34	19:09 (D02) 19:33 (D02)	18:28 (D03) 18:34 (D03)	07:27 18:18	07:04 16:45
24	07:26 17:14	06:50 17:51	07:06 19:23	06:17 19:55	19:05 (D02) 19:26 (D02)	05:43 20:26	05:37 20:43	06:26 20:33	19:09 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:27 18:17	07:05 16:44
25	07:25 17:15	06:49 17:53	07:04 19:24	06:15 19:56	19:06 (D02) 19:26 (D02)	05:43 20:26	05:37 20:43	06:27 20:32	19:09 (D02) 19:31 (D02)	18:28 (D03) 18:34 (D03)	07:28 18:15	07:06 16:44
26	07:24 17:16	06:48 17:54	07:02 19:25	06:14 19:57	19:07 (D02) 19:24 (D02)	05:42 20:27	05:38 20:44	06:28 20:31	19:09 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:29 18:14	07:07 16:43
27	07:23 17:17	06:46 17:55	07:01 19:26	06:12 19:58	19:08 (D02) 19:23 (D02)	05:41 20:28	05:38 20:44	06:29 20:30	19:09 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:30 18:12	07:08 16:43
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 20:00	19:10 (D02) 19:21 (D02)	05:41 20:29	05:38 20:44	06:30 20:29	19:10 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:31 18:11	07:09 16:42
29	07:22 17:20	06:45 17:56	06:59 19:27	06:10 20:01	19:10 (D02) 19:21 (D02)	05:41 20:30	05:38 20:44	06:30 20:28	19:10 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:32 18:10	07:10 16:42
30	07:21 17:21	06:45 17:56	06:59 19:27	06:10 20:01	19:10 (D02) 19:21 (D02)	05:41 20:30	05:38 20:44	06:30 20:28	19:10 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:33 18:10	07:11 16:42
31	07:20 17:22	06:44 17:56	06:58 19:26	06:09 20:00	19:10 (D02) 19:21 (D02)	05:40 20:30	05:37 20:44	06:31 20:27	19:10 (D02) 19:32 (D02)	18:28 (D03) 18:34 (D03)	07:34 18:09	07:12 16:42
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			290	524				315	517			
Sun reduction			0.73	0.82				0.96	0.93			
Oper. time red.			1.00	1.00				1.00	1.00			
Wind dir. red.			0.69	0.62				0.57	0.69			
Total reduction			0.50	0.51				0.54	0.64			
Total, real			146	265				171	331			

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 18 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (93)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	18:22 (D03) 18:29 (D03)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	18:56 (D02) 19:19 (D02)	07:04 18:53
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	18:29 (D03) 19:04 (D02)	06:06 20:09	05:38 20:36	05:40 20:43	06:05 20:24	06:35 19:41	18:56 (D02) 19:18 (D02)	07:05 18:51
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	19:04 (D02) 19:16 (D02)	06:05 20:09	05:38 20:36	05:41 20:43	06:05 20:19	06:36 19:40	18:57 (D02) 19:16 (D02)	07:06 18:49
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	19:16 (D02) 19:28 (D02)	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	18:58 (D02) 19:14 (D02)	07:07 18:48
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	19:28 (D02) 19:40 (D02)	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	19:00 (D02) 19:12 (D02)	07:08 18:46
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	19:40 (D02) 19:52 (D02)	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	19:00 (D02) 19:12 (D02)	07:09 18:44
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	19:52 (D02) 20:04 (D02)	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	19:00 (D02) 19:12 (D02)	07:10 18:43
8	07:32 16:56	07:12 17:32	07:32 19:05	06:41 19:38	20:04 (D02) 20:16 (D02)	05:59 20:09	05:36 20:36	05:44 20:43	06:10 20:17	06:41 19:31	19:00 (D02) 19:12 (D02)	07:11 18:41
9	07:32 16:57	07:10 17:33	07:30 19:06	06:39 19:40	20:16 (D02) 20:28 (D02)	05:57 20:09	05:36 20:36	05:44 20:43	06:11 20:16	06:42 19:30	19:00 (D02) 19:12 (D02)	07:12 18:39
10	07:32 16:58	07:09 17:35	07:29 19:07	06:38 19:41	20:28 (D02) 20:40 (D02)	05:56 20:12	05:36 20:36	05:45 20:43	06:12 20:15	06:43 19:28	19:00 (D02) 19:12 (D02)	07:13 18:38
11	07:32 16:59	07:08 17:36	07:27 19:09	06:36 19:42	20:40 (D02) 20:52 (D02)	05:55 20:13	05:36 20:36	05:46 20:43	06:13 20:14	06:44 19:26	19:00 (D02) 19:12 (D02)	07:14 18:36
12	07:32 17:00	07:07 17:37	07:26 19:10	06:35 19:43	20:52 (D02) 21:04 (D02)	05:54 20:14	05:36 20:36	05:46 20:43	06:14 20:12	06:45 19:25	19:00 (D02) 19:12 (D02)	07:15 18:35
13	07:31 17:01	07:06 17:38	07:24 19:11	06:33 19:44	21:04 (D02) 21:16 (D02)	05:53 20:15	05:36 20:36	05:47 20:43	06:15 20:11	06:46 19:23	19:00 (D02) 19:12 (D02)	07:16 18:33
14	07:31 17:02	07:04 17:39	07:22 19:12	06:32 19:45	21:16 (D02) 21:28 (D02)	05:52 20:16	05:36 20:36	05:48 20:43	06:16 20:10	06:47 19:21	19:00 (D02) 19:12 (D02)	07:17 18:32
15	07:31 17:03	07:03 17:41	07:21 19:13	06:30 19:46	21:28 (D02) 21:40 (D02)	05:51 20:17	05:36 20:36	05:49 20:43	06:17 20:08	06:48 19:20	19:00 (D02) 19:12 (D02)	07:19 18:30
16	07:30 17:04	07:02 17:42	07:19 19:14	06:28 19:47	21:40 (D02) 21:52 (D02)	05:50 20:18	05:36 20:36	05:49 20:43	06:18 20:07	06:49 19:18	19:00 (D02) 19:12 (D02)	07:20 18:28
17	07:30 17:05	07:00 17:43	07:17 19:15	06:27 19:48	21:52 (D02) 22:04 (D02)	05:49 20:19	05:36 20:36	05:50 20:43	06:19 20:06	06:50 19:16	19:00 (D02) 19:12 (D02)	07:21 18:27
18	07:29 17:07	06:59 17:44	07:16 19:16	06:25 19:49	22:04 (D02) 22:16 (D02)	05:48 20:20	05:36 20:36	05:51 20:43	06:20 20:04	06:51 19:15	19:00 (D02) 19:12 (D02)	07:22 18:25
19	07:29 17:08	06:58 17:46	07:14 19:17	06:24 19:50	22:16 (D02) 22:28 (D02)	05:47 20:21	05:36 20:36	05:52 20:43	06:21 20:03	06:52 19:15	19:00 (D02) 19:12 (D02)	07:23 18:24
20	07:28 17:09	06:56 17:47	07:12 19:18	06:22 19:51	22:28 (D02) 22:40 (D02)	05:47 20:22	05:36 20:36	05:53 20:43	06:22 20:01	06:53 19:14	19:00 (D02) 19:12 (D02)	07:24 18:22
21	07:28 17:10	06:55 17:48	07:11 19:19	06:21 19:52	22:40 (D02) 22:52 (D02)	05:46 20:23	05:36 20:36	05:54 20:43	06:23 20:00	06:54 19:16	19:00 (D02) 19:12 (D02)	07:25 18:21
22	07:27 17:11	06:53 17:49	07:09 19:21	06:19 19:53	22:52 (D02) 23:04 (D02)	05:45 20:24	05:36 20:36	05:54 20:43	06:24 19:58	06:55 19:17	19:00 (D02) 19:12 (D02)	07:26 18:20
23	07:26 17:12	06:52 17:50	07:07 19:22	06:18 19:54	23:04 (D02) 23:16 (D02)	05:44 20:25	05:37 20:36	05:55 20:43	06:25 19:57	06:56 19:18	19:00 (D02) 19:12 (D02)	07:27 18:18
24	07:26 17:14	06:50 17:51	07:06 19:23	06:17 19:55	23:16 (D02) 23:28 (D02)	05:43 20:26	05:37 20:36	05:56 20:43	06:26 19:55	06:57 19:19	19:00 (D02) 19:12 (D02)	07:29 18:17
25	07:25 17:15	06:49 17:53	07:04 19:24	06:15 19:56	23:28 (D02) 23:40 (D02)	05:43 20:26	05:37 20:36	05:57 20:43	06:27 19:54	06:58 19:20	19:00 (D02) 19:12 (D02)	07:30 18:15
26	07:24 17:16	06:48 17:54	07:02 19:25	06:14 19:57	23:40 (D02) 23:52 (D02)	05:42 20:27	05:38 20:36	05:58 20:43	06:28 19:52	06:59 19:21	19:00 (D02) 19:12 (D02)	07:31 18:14
27	07:23 17:17	06:46 17:55	07:01 19:26	06:12 19:59	23:52 (D02) 24:04 (D02)	05:41 20:28	05:38 20:36	05:59 20:43	06:29 19:51	07:00 19:22	19:00 (D02) 19:12 (D02)	07:32 18:13
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 20:00	24:04 (D02) 24:16 (D02)	05:41 20:29	05:38 20:36	06:00 20:43	06:30 19:49	07:01 19:22	19:00 (D02) 19:12 (D02)	07:33 18:11
29	07:22 17:20	06:45 17:56	06:59 19:27	06:11 20:00	24:16 (D02) 24:28 (D02)	05:41 20:29	05:38 20:36	06:01 20:43	06:31 19:48	07:02 19:23	19:00 (D02) 19:12 (D02)	07:34 18:10
30	07:21 17:21	06:44 17:57	06:58 19:28	06:10 20:01	24:28 (D02) 24:40 (D02)	05:40 20:30	05:39 20:36	06:02 20:43	06:32 19:49	07:03 19:24	19:00 (D02) 19:12 (D02)	07:35 18:09
31	07:20 17:22	06:44 17:58	06:54 19:29	06:10 20:02	24:40 (D02) 24:52 (D02)	05:39 20:31	05:39 20:36	06:03 20:43	06:33 19:54	07:04 19:25	19:00 (D02) 19:12 (D02)	07:36 18:07
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			619	380				286	672	55		
Sun reduction			0.73	0.82				0.96	0.93	0.84		
Oper. time red.			1.00	1.00				1.00	1.00	1.00		
Wind dir. red.			0.73	0.60				0.72	0.72	0.73		
Total reduction			0.54	0.49				0.58	0.67	0.62		
Total, real			333	188				165	449	34		

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 19 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (94)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	February	March		[April	May	June	July	August		September		October		November	December
1	07:32 16:50	07:19 17:23	06:43 17:57		06:52 19:31	22 18:10 (D03) 18:32 (D03)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	20 18:59 (D02) 19:19 (D02)	07:04 18:53	31 17:49 (D03) 18:20 (D03)	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58		06:51 19:32	16 18:12 (D03) 18:28 (D03)	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	17 19:00 (D02) 19:17 (D02)	07:05 18:51	28 17:50 (D03) 18:18 (D03)	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00		06:49 19:33	7 18:16 (D03) 18:23 (D03)	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	13 19:02 (D02) 19:15 (D02)	07:06 18:49	23 17:52 (D03) 18:15 (D03)	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01		06:48 19:34	18:08 (D03) 17:27	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	06:37 19:38	07:07 18:48	18 17:55 (D03) 18:13 (D03)	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02		06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:07 19:36	06:38 19:36	06:38 19:36	07:08 18:46	10 17:59 (D03) 18:09 (D03)	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03		06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:08 19:35	06:39 19:35	06:39 19:35	07:09 18:44	10 18:09 (D03)	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04		06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:09 19:33	06:40 19:33	06:40 19:33	07:10 18:43	10 18:09 (D03)	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	07:32 19:05		06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:10 19:31	06:41 19:31	06:41 19:31	07:11 18:41	10 18:09 (D03)	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:30	07:30 19:06	15 18:19 (D03)	06:39 18:19 (D03)	05:57 19:05 (D02)	05:36 18:34 (D03)	05:44 20:11	06:11 20:37	06:11 20:17	06:42 18:11 (D03)	06:42 18:11 (D03)	07:12 18:39	10 18:16 (D03)	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	07:29 19:07	15 18:15 (D03)	06:38 18:37 (D03)	05:56 19:02 (D02)	05:36 20:10	05:45 20:38	06:12 20:42	06:12 20:15	06:43 18:05 (D03)	06:43 18:05 (D03)	07:13 18:38	10 18:05 (D03)	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	07:27 19:09	25 18:14 (D03)	06:36 18:39 (D03)	05:55 19:00 (D02)	05:36 20:13	05:46 20:39	06:13 20:41	06:13 20:14	06:44 18:02 (D03)	06:44 18:02 (D03)	07:14 18:36	22 18:02 (D03)	06:50 16:51	07:22 16:40
12	07:32 17:00	07:07 17:37	07:26 19:10	29 18:11 (D03)	06:35 18:40 (D03)	05:54 18:59 (D02)	05:36 20:14	05:46 20:39	06:14 20:41	06:14 20:12	06:45 18:00 (D03)	06:45 18:00 (D03)	07:15 18:35	25 18:00 (D03)	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	07:24 19:11	32 18:09 (D03)	06:33 18:41 (D03)	05:53 18:57 (D02)	05:36 20:15	05:47 20:40	06:15 20:11	06:15 20:11	06:46 17:58 (D03)	06:46 17:58 (D03)	07:16 18:33	29 18:00 (D03)	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	07:22 19:12	35 18:08 (D03)	06:32 18:43 (D03)	05:52 18:57 (D02)	05:36 20:16	05:48 20:40	06:16 20:10	06:16 20:10	06:47 17:56 (D03)	06:47 17:56 (D03)	07:17 18:32	29 18:00 (D03)	06:53 16:54	07:24 16:40
15	07:31 17:03	07:03 17:41	07:21 19:13	36 18:07 (D03)	06:30 18:44 (D03)	05:51 18:55 (D02)	05:36 20:17	05:49 20:41	06:17 20:08	06:17 19:20 (D02)	06:48 17:54 (D03)	06:48 17:54 (D03)	07:19 18:30	32 18:00 (D03)	06:54 16:55	07:25 16:40
16	07:30 17:03	07:02 17:42	07:19 19:14	37 18:06 (D03)	06:28 18:45 (D03)	05:50 18:55 (D02)	05:36 20:18	05:49 20:41	06:18 20:09	06:18 19:20 (D02)	06:49 17:53 (D03)	06:49 17:53 (D03)	07:20 18:30	34 18:00 (D03)	06:56 16:51	07:26 16:41
17	07:30 17:05	07:00 17:43	07:17 19:15	38 18:05 (D03)	06:27 18:44 (D03)	05:49 18:54 (D02)	05:36 20:19	05:50 20:41	06:19 20:06	06:19 19:20 (D02)	06:50 17:52 (D03)	06:50 17:52 (D03)	07:21 18:27	36 18:00 (D03)	06:57 16:54	07:26 16:40
18	07:29 17:07	06:59 17:44	07:16 19:16	40 18:04 (D03)	06:25 18:44 (D03)	05:48 18:54 (D02)	05:36 20:20	05:51 20:42	06:20 20:06	06:20 19:22 (D02)	06:51 17:51 (D03)	06:51 17:51 (D03)	07:22 18:27	37 18:00 (D03)	06:58 16:59	07:27 16:40
19	07:29 17:08	06:58 17:46	07:14 19:17	40 18:03 (D03)	06:24 18:43 (D03)	05:47 18:54 (D02)	05:36 20:21	05:52 20:43	06:21 20:03	06:21 19:01 (D02)	06:52 17:49 (D03)	06:52 17:49 (D03)	07:23 18:24	39 18:00 (D03)	06:59 16:58	07:28 16:40
20	07:28 17:09	06:56 17:47	07:12 19:18	41 18:04 (D03)	06:22 18:44 (D03)	05:47 18:54 (D02)	05:36 20:22	05:53 20:44	06:22 20:01	06:22 19:00 (D02)	06:53 17:48 (D03)	06:53 17:48 (D03)	07:24 18:22	41 18:00 (D03)	07:00 16:47	07:28 16:40
21	07:28 17:10	06:55 17:48	07:11 19:19	41 18:03 (D03)	06:21 18:44 (D03)	05:46 18:54 (D02)	05:36 20:23	05:54 20:45	06:23 20:00	06:23 18:59 (D02)	06:54 17:48 (D03)	06:54 17:48 (D03)	07:25 18:21	41 18:00 (D03)	07:01 16:46	07:29 16:40
22	07:27 17:11	06:53 17:49	07:09 19:21	41 18:02 (D03)	06:19 18:43 (D03)	05:45 18:55 (D02)	05:36 20:24	05:54 20:46	06:24 19:58	06:24 18:59 (D02)	06:55 17:47 (D03)	06:55 17:47 (D03)	07:26 18:20	41 18:00 (D03)	07:03 16:46	07:29 16:40
23	07:26 17:12	06:52 17:50	07:07 19:22	41 18:03 (D03)	06:18 18:43 (D03)	05:44 18:54 (D02)	05:36 20:25	05:55 20:47	06:25 19:57	06:25 18:58 (D02)	06:56 17:47 (D03)	06:56 17:47 (D03)	07:27 18:18	41 18:00 (D03)	07:04 16:45	07:30 16:40
24	07:26 17:14	06:50 17:51	07:06 19:23	41 18:03 (D03)	06:17 18:44 (D03)	05:43 18:56 (D02)	05:37 20:26	05:56 20:48	06:26 19:55	06:26 18:58 (D02)	06:57 17:47 (D03)	06:57 17:47 (D03)	07:29 18:17	41 18:00 (D03)	07:05 16:44	07:30 16:40
25	07:25 17:15	06:49 17:53	07:04 19:24	41 18:03 (D03)	06:15 18:41 (D03)	05:43 18:57 (D02)	05:37 20:26	05:57 20:49	06:27 19:54	06:27 18:57 (D02)	06:58 17:47 (D03)	06:58 17:47 (D03)	07:30 18:15	41 18:00 (D03)	07:06 16:44	07:31 16:40
26	07:24 17:16	06:48 17:54	07:02 19:25	41 18:03 (D03)	06:14 18:40 (D03)	05:42 18:57 (D02)	05:38 20:27	05:58 20:49	06:28 19:52	06:28 18:57 (D02)	06:59 17:47 (D03)	06:59 17:47 (D03)	07:31 18:14	41 18:00 (D03)	07:07 16:43	07:31 16:40
27	07:23 17:17	06:46 17:55	07:01 19:26	41 18:04 (D03)	06:12 18:40 (D03)	05:41 18:59 (D02)	05:38 20:28	05:59 20:50	06:29 19:51	06:29 18:57 (D02)	07:00 17:47 (D03)	07:00 17:47 (D03)	07:32 18:13	41 18:00 (D03)	07:08 16:43	07:31 16:40
28	07:22 17:18	06:45 17:56	06:59 19:27	41 18:04 (D03)	06:11 18:40 (D03)	05:41 19:02 (D02)	05:38 20:29	06:00 20:51	06:30 19:51	06:30 18:57 (D02)	07:01 17:47 (D03)	07:01 17:47 (D03)	07:33 18:13	41 18:00 (D03)	07:09 16:43	07:32 16:40
29	07:22 17:20	06:57 17:58	06:57 19:28	41 18:05 (D03)	06:10 18:40 (D03)	05:40 19:02 (D02)	05:39 20:30	06:01 20:52	06:31 19:48	06:31 18:58 (D02)	07:02 17:48 (D03)	07:02 17:48 (D03)	07:34 18:10	41 18:00 (D03)	07:10 16:42	07:32 16:40
30	07:21 17:21	06:56 17:59	06:56 19:29	41 18:06 (D03)	06:08 18:40 (D03)	05:40 19:02 (D02)	05:39 20:31	06:02 20:53	06:32 19:46	06:32 18:58 (D02)	07:03 17:48 (D03)	07:03 17:48 (D03)	07:35 18:10	41 18:00 (D03)	07:11 16:42	07:32 16:40
31	07:20 17:22	06:54 18:00	06:54 19:30	41 18:07 (D03)	06:07 18:40 (D03)	05:39 19:02 (D02)	05:39 20:31	06:03 20:54	06:33 19:45	06:33 18:59 (D02)	07:04 17:47 (D03)	07:04 17:47 (D03)	07:36 18:07	41 18:00 (D03)	07:12 16:43	07:32 16:40
Potential sun hours	298	297	369		398		448	452	458	428	375		346		298	288
Total, worst case																
Sun reduction																
Oper. time red.																
Wind dir. red.																
Total reduction																
Total, real																

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 20 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June
1	07:32	07:19	06:43	06:52	18:08 (D03)	06:07
	16:50	17:23	17:57	19:31	20	18:28 (D03)
2	07:33	07:18	06:41	06:51	18:11 (D03)	06:06
	16:50	17:25	17:58	19:32	13	18:24 (D03)
3	07:33	07:17	06:40	06:49		06:05
	16:51	17:26	18:00	19:33		20:05
4	07:33	07:16	06:38	06:48		06:03
	16:52	17:27	18:01	19:34		20:06
5	07:33	07:15	06:37	06:46		06:02
	16:53	17:28	18:02	19:35		20:07
6	07:33	07:14	06:35	06:44		06:01
	16:54	17:30	18:03	19:36		20:08
7	07:33	07:13	06:34	17:18 (D03)		06:00
	16:55	17:31	18:04	17:30 (D03)		20:09
8	07:32	07:12	07:32	18:14 (D03)		19:09 (D02)
	16:56	17:32	19:05	18:33 (D03)	4	19:13 (D02)
9	07:32	07:10	07:30	18:12 (D03)		19:04 (D02)
	16:57	17:33	19:06	18:36 (D03)	14	19:18 (D02)
10	07:32	07:09	07:29	18:09 (D03)		19:01 (D02)
	16:58	17:35	19:07	18:38 (D03)	19	19:20 (D02)
11	07:32	07:08	07:27	18:08 (D03)		18:59 (D02)
	16:59	17:36	19:09	18:40 (D03)	21	19:20 (D02)
12	07:32	07:07	07:26	18:06 (D03)		18:58 (D02)
	17:00	17:37	19:10	18:40 (D03)	24	19:22 (D02)
13	07:31	07:06	07:24	18:04 (D03)		18:56 (D02)
	17:01	17:38	19:11	18:41 (D03)	26	19:22 (D02)
14	07:31	07:04	07:22	18:04 (D03)		18:56 (D02)
	17:02	17:39	19:12	18:42 (D03)	27	19:23 (D02)
15	07:31	07:03	07:21	18:02 (D03)		18:55 (D02)
	17:03	17:41	19:13	18:42 (D03)	28	19:23 (D02)
16	07:30	07:02	07:19	18:01 (D03)		18:55 (D02)
	17:04	17:42	19:14	18:42 (D03)	29	19:24 (D02)
17	07:30	07:00	07:17	18:01 (D03)		18:54 (D02)
	17:05	17:43	19:15	18:43 (D03)	29	19:23 (D02)
18	07:29	06:59	07:16	18:00 (D03)		18:54 (D02)
	17:07	17:44	19:16	18:43 (D03)	30	19:24 (D02)
19	07:29	06:58	07:14	18:00 (D03)		18:53 (D02)
	17:08	17:46	19:17	18:42 (D03)	30	19:23 (D02)
20	07:28	06:56	07:12	18:00 (D03)		18:53 (D02)
	17:09	17:47	19:18	18:43 (D03)	30	19:23 (D02)
21	07:28	06:55	07:11	17:59 (D03)		18:53 (D02)
	17:10	17:48	19:19	18:42 (D03)	29	19:22 (D02)
22	07:27	06:53	07:09	17:59 (D03)		18:54 (D02)
	17:11	17:49	19:21	18:41 (D03)	28	19:22 (D02)
23	07:26	06:52	07:07	18:00 (D03)		18:54 (D02)
	17:12	17:50	19:22	18:41 (D03)	26	19:20 (D02)
24	07:26	06:50	07:06	18:00 (D03)		18:55 (D02)
	17:14	17:51	19:23	18:40 (D03)	25	19:20 (D02)
25	07:25	06:49	07:04	18:00 (D03)		18:56 (D02)
	17:15	17:53	19:24	18:39 (D03)	23	19:19 (D02)
26	07:24	06:48	07:02	18:01 (D03)		18:56 (D02)
	17:16	17:54	19:25	18:39 (D03)	21	19:17 (D02)
27	07:23	06:46	07:01	18:01 (D03)		18:58 (D02)
	17:17	17:55	19:26	18:37 (D03)	17	19:15 (D02)
28	07:22	06:45	06:59	18:02 (D03)		19:00 (D02)
	17:18	17:56	19:27	18:35 (D03)	13	19:13 (D02)
29	07:22		06:57	18:02 (D03)		19:03 (D02)
	17:20		19:28	18:34 (D03)	5	19:08 (D02)
30	07:21		06:56	18:04 (D03)		05:40
	17:21		19:29	18:32 (D03)		20:31
31	07:20		06:54	18:05 (D03)		05:39
	17:22		19:30	18:30 (D03)		20:31
Potential sun hours	298	297	369	398	448	452
Total, worst case			873	531		
Sun reduction			0.73	0.82		
Oper. time red.			1.00	1.00		
Wind dir. red.			0.75	0.60		
Total reduction			0.55	0.50		
Total, real			481	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)
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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 20 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	18:58 (D02) 19:19 (D02)	07:04 18:19 (D03)	06:38 18:06
2	05:40 20:44	06:05 20:24	06:35 19:41	18:59 (D02) 19:18 (D02)	07:05 18:18 (D03)	06:39 17:05
3	05:41 20:43	06:05 20:23	06:36 19:40	19:01 (D02) 19:15 (D02)	07:06 18:16 (D03)	06:40 17:04
4	05:41 20:43	06:06 20:22	06:37 19:38	19:06 (D02) 19:10 (D02)	07:07 18:15 (D03)	06:41 17:02
5	05:42 20:43	06:07 20:21	06:38 19:36		07:08 18:12 (D03)	06:43 17:01
6	05:42 20:43	06:08 20:20	06:39 19:35		07:09 18:09 (D03)	06:44 17:00
7	05:43 20:43	06:09 20:19	06:40 19:33		07:10 18:00 (D03)	06:45 16:59
8	05:44 20:42	06:10 20:17	06:41 19:31		07:11 18:01 (D03)	06:46 16:58
9	05:44 20:42	06:11 20:16	06:42 19:30		07:12 18:39	06:47 16:57
10	05:45 20:42	06:12 20:15	06:43 19:28	18:05 (D03) 18:16 (D03)	07:13 18:38	06:48 16:56
11	05:46 20:41	06:13 20:14	06:44 19:26	18:01 (D03) 18:20 (D03)	07:14 18:36	06:50 16:55
12	05:46 20:41	06:14 20:12	06:45 19:25	17:58 (D03) 18:22 (D03)	07:15 18:35	06:51 16:54
13	05:47 20:40	06:15 20:11	06:46 19:23	17:56 (D03) 18:23 (D03)	07:16 18:33	06:52 16:53
14	05:48 20:40	06:16 20:10	06:47 19:21	17:54 (D03) 18:25 (D03)	07:17 18:32	06:53 16:52
15	05:49 20:39	06:17 20:08	06:48 19:20	17:52 (D03) 18:25 (D03)	07:19 18:30	06:54 16:51
16	05:49 20:39	06:18 20:07	06:49 19:18	17:51 (D03) 18:26 (D03)	07:20 18:28	06:56 16:50
17	05:50 20:38	06:19 20:06	06:50 19:16	17:49 (D03) 18:27 (D03)	07:21 18:27	06:57 16:49
18	05:51 20:37	06:20 20:04	06:51 19:15	17:48 (D03) 18:27 (D03)	07:22 18:25	06:58 16:48
19	05:52 20:37	06:21 20:03	06:52 19:13	17:47 (D03) 18:27 (D03)	07:23 18:24	06:59 16:48
20	05:53 20:36	06:22 20:01	06:53 19:11	17:45 (D03) 18:26 (D03)	07:24 18:22	07:00 16:47
21	05:54 20:35	06:23 20:00	06:54 19:10	17:45 (D03) 18:26 (D03)	07:25 18:21	07:01 16:46
22	05:54 20:35	06:24 19:58	06:55 19:08	17:44 (D03) 18:26 (D03)	07:26 18:20	07:03 16:46
23	05:55 20:34	06:25 19:57	06:56 19:06	17:43 (D03) 18:26 (D03)	07:27 18:18	07:04 16:45
24	05:56 20:33	06:26 19:55	06:57 19:04	17:43 (D03) 18:26 (D03)	07:29 18:17	07:05 16:44
25	05:57 20:32	06:27 19:54	06:58 19:03	17:43 (D03) 18:25 (D03)	07:30 18:15	07:06 16:44
26	05:58 20:31	06:28 19:52	06:59 19:01	17:43 (D03) 18:24 (D03)	07:31 18:14	07:07 16:43
27	05:59 20:30	06:29 19:51	07:00 18:59	17:43 (D03) 18:24 (D03)	07:32 18:13	07:08 16:43
28	06:00 20:29	06:30 19:49	07:01 18:58	17:43 (D03) 18:23 (D03)	07:33 18:11	07:09 16:42
29	06:01 20:28	06:31 19:48	07:02 18:57	17:43 (D03) 18:22 (D03)	07:34 18:10	07:10 16:42
30	06:02 20:27	06:32 19:46	07:03 18:54	17:43 (D03) 18:21 (D03)	07:35 18:09	07:11 16:42
31	06:03 20:26	06:33 19:45	07:04 18:53		07:36 18:08	07:12 16:41
Potential sun hours	458	428	375	346	298	288
Total, worst case		449	806	164		215
Sun reduction		0.96	0.93	0.84		0.47
Oper. time red.		1.00	1.00	1.00		1.00
Wind dir. red.		0.59	0.73	0.75		0.89
Total reduction		0.57	0.69	0.63		0.43
Total, real		256	557	104		91

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 21 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February March			April			May			June		
1	07:32	15:47 (D04)	07:19	06:43		06:52			06:07	05:39				
	16:50	8 15:55 (D04)	17:23	17:57		19:31			20:03	20:32				
2	07:33	15:49 (D04)	07:18	06:41		06:51			06:06	05:38				
	16:50	5 15:54 (D04)	17:25	17:58		19:32			20:04	20:33				
3	07:33		07:17	06:40		06:49			06:05	05:38				
	16:51		17:26	18:00		19:33			20:05	20:34				
4	07:33		07:16	06:38		06:48			06:03	05:38				
	16:52		17:27	18:01		19:34			20:06	20:34				
5	07:33		07:15	06:37	17:19 (D03)	06:46			06:02	05:37				
	16:53		17:28	18:02	7 17:26 (D03)	19:35			20:07	20:35				
6	07:33		07:14	06:35	17:14 (D03)	06:44		19:03 (D02)	06:01	05:37				
	16:54		17:30	18:03	17 17:31 (D03)	19:36		9 19:12 (D02)	20:08	20:36				
7	07:33		07:13	06:34	17:11 (D03)	06:43		19:00 (D02)	06:00	05:37				
	16:55		17:31	18:04	22 17:33 (D03)	19:37		16 19:16 (D02)	20:09	20:36				
8	07:32		07:12	07:32	18:08 (D03)	06:41		18:58 (D02)	05:59	05:36				
	16:56		17:32	19:05	27 18:35 (D03)	19:39		19 19:17 (D02)	20:10	20:37				
9	07:32		07:10	07:30	18:07 (D03)	06:39		18:57 (D02)	05:57	05:36				
	16:57		17:33	19:06	30 18:37 (D03)	19:40		22 19:19 (D02)	20:11	20:38				
10	07:32		07:09	07:29	18:05 (D03)	06:38		18:55 (D02)	05:56	05:36				
	16:58		17:35	19:07	33 18:38 (D03)	19:41		24 19:19 (D02)	20:12	20:38				
11	07:32		07:08	07:27	18:05 (D03)	06:36		18:53 (D02)	05:55	05:36				
	16:59		17:36	19:09	34 18:39 (D03)	19:42		26 19:19 (D02)	20:13	20:39				
12	07:32		07:07	07:26	18:03 (D03)	06:35		18:53 (D02)	05:54	05:36				
	17:00		17:37	19:10	36 18:39 (D03)	19:43		27 19:20 (D02)	20:14	20:39				
13	07:31		07:06	07:24	18:02 (D03)	06:33		18:52 (D02)	05:53	05:36				
	17:01		17:38	19:11	37 18:39 (D03)	19:44		28 19:20 (D02)	20:15	20:40				
14	07:31		07:04	07:22	18:02 (D03)	06:32		18:52 (D02)	05:52	05:36				
	17:02		17:39	19:12	38 18:40 (D03)	19:45		29 19:21 (D02)	20:16	20:40				
15	07:31		07:03	07:21	18:01 (D03)	06:30		18:51 (D02)	05:51	05:36				
	17:03		17:41	19:13	39 18:40 (D03)	19:46		29 19:20 (D02)	20:17	20:41				
16	07:30		07:02	07:19	18:00 (D03)	06:28		18:51 (D02)	05:50	05:36				
	17:04		17:42	19:14	40 18:40 (D03)	19:47		29 19:20 (D02)	20:18	20:41				
17	07:30		07:00	07:17	18:00 (D03)	06:27		18:51 (D02)	05:49	05:36				
	17:05		17:43	19:15	40 18:40 (D03)	19:48		28 19:19 (D02)	20:19	20:41				
18	07:29		06:59	07:16	17:59 (D03)	06:25		18:51 (D02)	05:48	05:36				
	17:07		17:44	19:16	41 18:40 (D03)	19:49		28 19:19 (D02)	20:20	20:42				
19	07:29		06:58	07:14	17:59 (D03)	06:24		18:51 (D02)	05:47	05:36				
	17:08		17:46	19:17	40 18:39 (D03)	19:50		27 19:18 (D02)	20:21	20:42				
20	07:28		06:56	07:12	18:00 (D03)	06:22		18:52 (D02)	05:47	05:36				
	17:09		17:47	19:18	39 18:39 (D03)	19:51		26 19:18 (D02)	20:22	20:42				
21	07:28		06:55	07:11	17:59 (D03)	06:21		18:52 (D02)	05:46	05:36				
	17:10		17:48	19:19	39 18:38 (D03)	19:52		24 19:16 (D02)	20:23	20:43				
22	07:27		06:53	07:09	17:59 (D03)	06:19		18:54 (D02)	05:45	05:36				
	17:11		17:49	19:21	38 18:37 (D03)	19:53		21 19:15 (D02)	20:24	20:43				
23	07:26		06:52	07:07	18:00 (D03)	06:18		18:54 (D02)	05:44	05:37				
	17:12		17:50	19:22	37 18:37 (D03)	19:54		19 19:13 (D02)	20:25	20:43				
24	07:26		06:50	07:06	18:01 (D03)	06:17		18:56 (D02)	05:43	05:37				
	17:14		17:51	19:23	34 18:35 (D03)	19:55		15 19:11 (D02)	20:26	20:43				
25	07:25		06:49	07:04	18:01 (D03)	06:15		18:59 (D02)	05:43	05:37				
	17:15		17:53	19:24	33 18:34 (D03)	19:56		10 19:09 (D02)	20:26	20:43				
26	07:24		06:48	07:02	18:02 (D03)	06:14			05:42	05:38				
	17:16		17:54	19:25	30 18:32 (D03)	19:57			20:27	20:44				
27	07:23		06:46	07:01	18:04 (D03)	06:12			05:41	05:38				
	17:17		17:55	19:26	27 18:31 (D03)	19:59			20:28	20:44				
28	07:22		06:45	06:59	18:05 (D03)	06:11			05:41	05:38				
	17:18		17:56	19:27	23 18:28 (D03)	20:00			20:29	20:44				
29	07:22			06:57	18:07 (D03)	06:10			05:40	05:39				
	17:20			19:28	18:25 (D03)	20:01			20:30	20:44				
30	07:21			06:56	18:11 (D03)	06:08			05:40	05:39				
	17:21			19:29	11 18:22 (D03)	20:02			20:31	20:44				
31	07:20			06:54					05:39					
	17:22			19:30					20:31					
Potential sun hours	298		297	369		398		448		452				
Total, worst case	13			810		456								
Sun reduction	0.45			0.73		0.82								
Oper. time red.	1.00			1.00		1.00								
Wind dir. red.	0.89			0.75		0.60								
Total reduction	0.41			0.56		0.50								
Total, real	5			452		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)
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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 21 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04		06:34	18:52 (D02)	07:04		17:41 (D03)	06:38	07:12	
	20:44	20:25		19:43	26	19:18 (D02)	18:53	37	18:18 (D03)	18:06	16:41
2	05:40	06:05		06:35		18:53 (D02)	07:05		17:42 (D03)	06:39	07:13
	20:44	20:24		19:41	24	19:17 (D02)	18:51	35	18:17 (D03)	17:05	16:41
3	05:41	06:05		06:36		18:54 (D02)	07:06		17:42 (D03)	06:40	07:14
	20:43	20:23		19:40	22	19:16 (D02)	18:49	34	18:16 (D03)	17:04	16:41
4	05:41	06:06		06:37		18:55 (D02)	07:07		17:44 (D03)	06:41	07:15
	20:43	20:22		19:38	19	19:14 (D02)	18:48	31	18:15 (D03)	17:02	16:40
5	05:42	06:07		06:38		18:56 (D02)	07:08		17:45 (D03)	06:43	07:16
	20:43	20:21		19:36	16	19:12 (D02)	18:46	28	18:13 (D03)	17:01	16:40
6	05:42	06:08		06:39		18:59 (D02)	07:09		17:47 (D03)	06:44	07:17
	20:43	20:20		19:35	10	19:09 (D02)	18:44	24	18:11 (D03)	17:00	16:40
7	05:43	06:09		06:40			07:10		17:49 (D03)	06:45	07:18
	20:43	20:19		19:33			18:43	19	18:08 (D03)	16:59	16:40
8	05:44	06:10		06:41			07:11		17:52 (D03)	06:46	07:19
	20:42	20:17		19:31			18:41	13	18:05 (D03)	16:58	16:40
9	05:44	06:11		06:42			07:12			06:47	07:20
	20:42	20:16		19:30			18:39			16:57	16:40
10	05:45	06:12		06:43			07:13			06:48	07:21
	20:42	20:15		19:28			18:38			16:56	16:40
11	05:46	06:13		06:44			07:14			06:50	07:22
	20:41	20:14		19:26			18:36			16:55	16:40
12	05:46	06:14		06:45			07:15			06:51	07:23
	20:41	20:12		19:25			18:35			16:54	16:40
13	05:47	06:15		06:46		18:03 (D03)	07:16			06:52	07:23
	20:40	20:11		19:23	9	18:12 (D03)	18:33			16:53	16:40
14	05:48	06:16		06:47		17:58 (D03)	07:17			06:53	07:24
	20:40	20:10		19:21	18	18:16 (D03)	18:32			16:52	16:40
15	05:49	06:17		06:48		17:55 (D03)	07:19			06:54	07:25
	20:39	20:08		19:20	23	18:18 (D03)	18:30			16:51	16:41
16	05:49	06:18		06:49		17:53 (D03)	07:20			06:56	07:26
	20:39	20:07		19:18	27	18:20 (D03)	18:28			16:50	16:41
17	05:50	06:19		06:50		17:51 (D03)	07:21			06:57	07:26
	20:38	20:06		19:16	30	18:21 (D03)	18:27			16:49	16:41
18	05:51	06:20		06:51		17:50 (D03)	07:22			06:58	07:27
	20:37	20:04	11	19:15 (D02)	19:15	32	18:22 (D03)	18:25		16:48	16:41
19	05:52	06:21		06:52		17:47 (D03)	07:23			06:59	07:28
	20:37	20:03	15	19:17 (D02)	19:13	35	18:22 (D03)	18:24		16:48	16:42
20	05:53	06:22		06:53		17:46 (D03)	07:24			07:00	07:28
	20:36	20:01	19	19:19 (D02)	19:11	36	18:22 (D03)	18:22		16:47	16:42
21	05:54	06:23		06:54		17:45 (D03)	07:25			07:01	07:29
	20:35	20:00	22	19:20 (D02)	19:10	37	18:22 (D03)	18:21		16:46	16:43
22	05:54	06:24		06:55		17:44 (D03)	07:26			07:03	07:29
	20:35	19:58	24	19:21 (D02)	19:08	38	18:22 (D03)	18:20		16:46	16:43
23	05:55	06:25		06:56		17:43 (D03)	07:27			07:04	07:30
	20:34	19:57	25	19:21 (D02)	19:06	39	18:22 (D03)	18:18		16:45	16:43
24	05:56	06:26		06:57		17:42 (D03)	07:29			07:05	07:30
	20:33	19:55	27	19:22 (D02)	19:04	40	18:22 (D03)	18:17		16:44	16:44
25	05:57	06:27		06:58		17:42 (D03)	07:30			07:06	07:31
	20:32	19:54	28	19:22 (D02)	19:03	40	18:22 (D03)	18:15		16:44	16:45
26	05:58	06:28		06:59		17:42 (D03)	07:31			07:07	07:31
	20:31	19:52	28	19:22 (D02)	19:01	40	18:22 (D03)	18:14		16:43	16:45
27	05:59	06:29		07:00		17:41 (D03)	07:32			07:08	07:31
	20:30	19:51	29	19:22 (D02)	18:59	40	18:21 (D03)	18:13		16:43	16:46
28	06:00	06:30		07:01		17:41 (D03)	07:33			07:09	07:32
	20:29	19:49	29	19:22 (D02)	18:58	40	18:21 (D03)	18:11		16:42	16:46
29	06:01	06:31		07:02		17:41 (D03)	07:34			07:10	07:32
	20:28	19:48	28	19:21 (D02)	18:56	39	18:20 (D03)	18:10		16:42	16:47
30	06:02	06:32		07:03		17:41 (D03)	07:35			07:11	07:32
	20:27	19:46	28	19:21 (D02)	18:54	38	18:19 (D03)	18:09		16:42	16:48
31	06:03	06:33		07:04			07:36				07:32
	20:26	19:45	27	19:20 (D02)			18:07			16:49	16:49
Potential sun hours	458	428		375		346		298		288	
Total, worst case			340	718		221				289	
Sun reduction			0.96	0.93		0.84				0.47	
Oper. time red.			1.00	1.00		1.00				1.00	
Wind dir. red.			0.60	0.73		0.75				0.89	
Total reduction			0.59	0.69		0.64				0.43	
Total, real			199	494		142				123	

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 22 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (97)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	[January	February	March	April	May	June	July	August	September	October	November	December				
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	18:53 (D02)	07:04	17:36 (D03)	06:38	07:12		
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	26	19:19 (D02)	18:53	41	18:17 (D03)	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	18:53 (D02)	07:05	17:36 (D03)	06:39	07:13		
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	25	19:18 (D02)	18:51	40	18:16 (D03)	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	18:54 (D02)	07:06	17:36 (D03)	06:40	07:14		
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	22	19:16 (D02)	18:49	39	18:15 (D03)	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	18:56 (D02)	07:07	17:38 (D03)	06:41	07:15		
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18	19:14 (D02)	18:48	36	18:14 (D03)	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	18:58 (D02)	07:08	17:39 (D03)	06:43	07:16		
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	14	19:12 (D02)	18:46	34	18:13 (D03)	17:01	16:40
6	07:33	07:14	06:35	06:44	19:06 (D02)	06:01	05:37	05:42	06:39	19:02 (D02)	07:09	17:40 (D03)	06:44	07:17		
	16:54	17:30	18:03	19:36	19:10 (D02)	20:08	20:36	20:43	19:35	5	19:07 (D02)	18:44	31	18:11 (D03)	17:00	16:40
7	07:33	07:13	06:34	06:43	19:02 (D02)	06:00	05:37	05:43	06:40	07:10	17:41 (D03)	06:45	07:18			
	16:55	17:31	18:04	19:37	19:15 (D02)	20:09	20:36	20:43	19:33	18:43	28	18:09 (D03)	16:59	16:40		
8	07:32	07:12	06:32	06:41	18:59 (D02)	05:59	05:36	05:44	06:41	07:11	17:43 (D03)	06:46	07:19			
	16:56	17:32	19:05	19:39	19:17 (D02)	20:10	20:37	20:42	19:31	18:41	24	18:07 (D03)	16:58	16:40		
9	07:32	07:10	06:30	06:39	18:57 (D02)	05:57	05:36	05:44	06:42	07:12	17:45 (D03)	06:47	07:20			
	16:57	17:33	19:06	19:40	22	19:19 (D02)	20:11	20:38	19:30	18:40	19	18:04 (D03)	16:57	16:40		
10	07:32	07:09	06:29	06:38	18:55 (D02)	05:56	05:36	05:45	06:43	07:13	17:49 (D03)	06:48	07:21			
	16:58	17:35	19:07	19:41	25	19:20 (D02)	20:12	20:38	19:28	18:38	10	17:59 (D03)	16:56	16:40		
11	07:32	07:08	06:27	06:36	18:54 (D02)	05:55	05:36	05:46	06:44	07:14	17:50 (D03)	06:50	07:22			
	16:59	17:36	19:09	19:42	26	19:20 (D02)	20:13	20:39	19:26	18:36	16:55	16:40				
12	07:32	07:07	06:26	06:35	18:53 (D02)	05:54	05:36	05:46	06:45	07:15	17:51 (D03)	06:51	07:23			
	17:00	17:37	19:10	19:43	28	19:21 (D02)	20:14	20:39	19:25	18:35	16:54	16:40				
13	07:31	07:06	06:24	06:33	18:52 (D02)	05:53	05:36	05:47	06:46	07:16	17:52 (D03)	06:52	07:23			
	17:01	17:38	19:11	19:44	29	19:21 (D02)	20:15	20:40	19:23	11	18:10 (D03)	18:33	16:53	16:40		
14	07:31	07:04	06:22	06:32	18:52 (D02)	05:52	05:36	05:48	06:47	07:17	17:54 (D03)	06:53	07:24			
	17:02	17:39	19:12	19:45	29	19:21 (D02)	20:16	20:40	19:21	19	18:13 (D03)	18:32	16:52	16:40		
15	07:31	07:03	06:21	06:30	18:51 (D02)	05:51	05:36	05:49	06:48	07:18	17:52 (D03)	06:54	07:25			
	17:03	17:41	19:13	19:46	30	19:21 (D02)	20:17	20:41	19:20	24	18:16 (D03)	18:30	16:51	16:41		
16	07:30	07:02	06:19	06:28	18:51 (D02)	05:50	05:36	05:49	06:49	07:19	17:59 (D03)	06:56	07:26			
	17:04	17:42	19:14	19:47	30	19:21 (D02)	20:18	20:41	19:14 (D02)	19:18	18:17 (D03)	18:28	16:50	16:41		
17	07:30	07:00	06:17	06:27	18:50 (D02)	05:49	05:36	05:50	19:03 (D02)	06:50	17:47 (D03)	07:21	16:57	16:41		
	17:05	17:43	19:15	19:48	31	19:21 (D02)	20:19	20:41	19:17 (D02)	19:16	18:18 (D03)	18:27	16:49	16:41		
18	07:29	06:59	06:16	06:25	18:51 (D02)	05:48	05:36	05:51	19:01 (D02)	06:51	17:46 (D03)	07:22	16:58	16:41		
	17:07	17:44	19:16	19:49	30	19:21 (D02)	20:20	20:42	18:19 (D02)	19:15	18:19 (D03)	18:25	16:48	16:41		
19	07:29	06:58	06:14	06:24	18:50 (D02)	05:47	05:36	05:52	18:59 (D02)	06:52	17:44 (D03)	07:23	16:59	16:41		
	17:08	17:46	19:17	19:50	29	19:19 (D02)	20:21	20:42	19:20 (D02)	19:13	18:20 (D03)	18:24	16:48	16:42		
20	07:28	06:56	06:12	06:22	18:51 (D02)	05:47	05:36	05:53	18:58 (D02)	06:53	17:42 (D03)	07:24	16:50	16:42		
	17:09	17:47	19:18	19:51	28	19:19 (D02)	20:22	20:42	19:21 (D02)	19:11	18:20 (D03)	18:22	16:47	16:42		
21	07:28	06:55	06:11	06:21	18:51 (D02)	05:46	05:36	05:54	18:57 (D02)	06:54	17:41 (D03)	07:25	16:51	16:42		
	17:10	17:48	19:19	19:52	27	19:18 (D02)	20:23	20:43	19:22 (D02)	19:10	18:20 (D03)	18:21	16:46	16:43		
22	07:27	06:53	06:09	06:19	18:52 (D02)	05:45	05:36	05:54	18:56 (D02)	06:55	17:40 (D03)	07:26	16:57	16:43		
	17:11	17:49	19:21	19:53	25	19:17 (D02)	20:24	20:43	19:23 (D02)	19:08	18:20 (D03)	18:20	16:46	16:43		
23	07:26	06:52	06:07	06:18	18:52 (D02)	05:44	05:37	05:55	18:55 (D02)	06:56	17:39 (D03)	07:27	16:54	16:43		
	17:12	17:50	19:22	19:54	23	19:15 (D02)	20:25	20:43	19:23 (D02)	19:06	18:20 (D03)	18:18	16:45	16:43		
24	07:26	06:50	06:06	06:17	18:54 (D02)	05:43	05:37	05:56	18:54 (D02)	06:57	17:38 (D03)	07:29	16:55	16:43		
	17:14	17:51	19:23	19:55	20	19:14 (D02)	20:26	20:43	19:23 (D02)	19:04	18:20 (D03)	18:17	16:44	16:44		
25	07:25	06:49	06:04	06:15	18:55 (D02)	05:43	05:37	05:57	18:54 (D02)	06:58	17:37 (D03)	07:30	16:56	16:44		
	17:15	17:53	19:24	19:56	18	19:13 (D02)	20:26	20:43	19:23 (D02)	19:03	18:20 (D03)	18:15	16:44	16:45		
26	07:24	06:48	06:02	06:14	18:57 (D02)	05:42	05:38	05:58	18:53 (D02)	06:59	17:37 (D03)	07:31	16:57	16:45		
	17:16	17:54	19:25	19:57	13	19:10 (D02)	20:27	20:44	19:23 (D02)	19:01	18:20 (D03)	18:14	16:43	16:45		
27	07:23	06:46	06:01	06:12	19:01 (D02)	05:41	05:38	05:59	18:53 (D02)	07:00	17:36 (D03)	07:32	16:58	16:45		
	17:17	17:55	19:26	19:59	5	19:06 (D02)	20:28	20:44	19:23 (D02)	18:59	18:19 (D03)	18:13	16:43	16:46		
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	18:53 (D02)	07:01	17:36 (D03)	07:33	16:59	16:46		
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	19:23 (D02)	18:58	18:19 (D03)	18:11	16:42	16:46		
29	07:22	06:57	18:03 (D03)	06:10	05:40	05:39	06:01	06:31	18:53 (D02)	07:02	17:36 (D03)	07:34	16:50	16:46		
	17:20	19:28	20:03 (D03)	20:01	20:30	20:44	20:28	19:48	19:22 (D02)	18:56	18:18 (D03)	18:10	16:42	16:47		
30	07:21	06:56	18:07 (D03)	06:08	05:40	05:39	06:02	06:32	18:53 (D02)	07:03	17:36 (D03)	07:35	16:51	16:47		
	17:21	19:29	20:04 (D03)	20:02	20:31	20:44	20:27	19:46	19:22 (D02)	18:54	18:18 (D03)	18:09	16:42	16:48		
31	07:20	06:54	18:19 (D03)	06:04	05:39	06:03	06:33	06:33	18:53 (D02)	07:04	17:37 (D03)	07:36	16:52	16:48		
	17:22	19:30	20:05 (D03)	20:03	20:31	20:44	20:26	19:45	19:21 (D02)	18:55	18:19 (D03)	18:11	16:43	16:49		
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288				
Total, worst case			926	503				398	748							
Sun reduction			0.73	0.82				0.96	0.93							
Oper. time red.			1.00	1.00				1.00	1.00							
Wind dir. red.			0.76	0.60				0.60	0.74							
Total reduction			0.56	0.49				0.58	0.69							
Total, real			516	248			229	514	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)
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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 23 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (98)**

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

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	17:10 (D03) 06:52 17:24 (D03) 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	18:48 (D02) 07:04 19:17 (D02) 18:53	17:32 (D03) 06:38 18:14 (D03) 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	17:06 (D03) 06:51 17:27 (D03) 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	18:48 (D02) 07:05 19:16 (D02) 18:51	17:32 (D03) 06:39 18:13 (D03) 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	17:03 (D03) 06:49 17:28 (D03) 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	18:48 (D02) 07:06 19:15 (D02) 18:49	17:32 (D03) 06:40 18:12 (D03) 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	17:02 (D03) 06:48 17:31 (D03) 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	18:48 (D02) 07:07 19:14 (D02) 18:48	17:33 (D03) 06:41 18:13 (D03) 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	17:00 (D03) 06:46 17:31 (D03) 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	18:49 (D02) 07:08 19:13 (D02) 18:46	17:33 (D03) 06:43 18:12 (D03) 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	16:59 (D03) 06:44 17:33 (D03) 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	18:50 (D02) 07:09 19:11 (D02) 18:44	17:33 (D03) 06:44 18:11 (D03) 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	16:57 (D03) 06:43 17:33 (D03) 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	18:52 (D02) 07:10 19:09 (D02) 18:43	17:34 (D03) 06:45 18:09 (D03) 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	17:56 (D03) 06:41 18:34 (D03) 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	18:54 (D02) 07:11 19:06 (D02) 18:41	17:35 (D03) 06:46 18:08 (D03) 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	17:53 (D03) 06:39 18:35 (D03) 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	17:36 (D03) 06:47 18:39 (D03) 17:37	17:45 (D03) 06:52 18:06 (D03) 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	17:54 (D03) 06:38 18:35 (D03) 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	17:40 (D03) 06:48 18:38 (D03) 17:39	17:45 (D03) 06:53 18:04 (D03) 16:56	07:21 16:41
11	07:32 16:59	07:08 17:36	06:27 19:09	17:54 (D03) 06:36 18:35 (D03) 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	17:41 (D03) 06:49 18:36 (D03) 17:39	17:46 (D03) 06:54 18:02 (D03) 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	17:54 (D03) 06:35 18:35 (D03) 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	17:42 (D03) 06:50 18:35 (D03) 17:59	17:47 (D03) 06:51 18:03 (D03) 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	17:53 (D03) 06:33 18:35 (D03) 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	17:43 (D03) 06:51 18:33 (D03) 17:54	17:48 (D03) 06:52 18:04 (D03) 16:53	07:24 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	17:53 (D03) 06:32 18:35 (D03) 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	17:44 (D03) 06:52 18:32 (D03) 17:54	17:49 (D03) 06:53 18:05 (D03) 16:54	07:25 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	17:53 (D03) 06:30 18:34 (D03) 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	17:45 (D03) 06:53 18:30 (D03) 17:54	17:50 (D03) 06:54 18:06 (D03) 16:55	07:26 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	17:52 (D03) 06:28 18:34 (D03) 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	17:46 (D03) 06:54 18:28 (D03) 17:55	17:51 (D03) 06:55 18:07 (D03) 16:56	07:27 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	17:53 (D03) 06:27 18:34 (D03) 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	17:47 (D03) 06:55 18:29 (D03) 17:56	17:52 (D03) 06:56 18:08 (D03) 16:57	07:28 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	17:53 (D03) 06:25 18:33 (D03) 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	17:48 (D03) 06:56 18:30 (D03) 17:57	17:53 (D03) 06:57 18:09 (D03) 16:58	07:29 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	17:53 (D03) 06:24 18:31 (D03) 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	17:49 (D03) 06:57 18:31 (D03) 17:58	17:54 (D03) 06:58 18:10 (D03) 16:59	07:30 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	17:54 (D03) 06:22 18:31 (D03) 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:12	17:50 (D03) 06:58 18:32 (D03) 17:59	17:55 (D03) 06:59 18:11 (D03) 16:59	07:31 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	17:55 (D03) 06:21 18:29 (D03) 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:14	17:51 (D03) 06:59 18:33 (D03) 17:59	17:56 (D03) 07:00 18:12 (D03) 16:59	07:32 16:42
22	07:27 17:11	06:53 17:49	06:09 19:21	17:55 (D03) 06:19 18:28 (D03) 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:16	17:52 (D03) 07:01 18:34 (D03) 17:59	17:57 (D03) 07:02 18:13 (D03) 16:59	07:33 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	17:57 (D03) 06:18 18:27 (D03) 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:17	17:53 (D03) 07:02 18:35 (D03) 17:59	17:58 (D03) 07:03 18:14 (D03) 16:59	07:34 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	17:58 (D03) 06:17 18:24 (D03) 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:18	17:54 (D03) 07:03 18:36 (D03) 17:59	17:59 (D03) 07:04 18:15 (D03) 16:59	07:35 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	18:00 (D03) 06:15 18:22 (D03) 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:18	17:55 (D03) 07:04 18:37 (D03) 17:59	18:00 (D03) 07:05 18:16 (D03) 16:59	07:36 16:44
26	07:24 17:16	06:48 17:54	06:02 19:25	18:03 (D03) 06:14 18:19 (D03) 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:19	17:56 (D03) 07:05 18:38 (D03) 17:59	18:01 (D03) 07:06 18:17 (D03) 16:59	07:37 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	18:09 (D03) 06:12 18:12 (D03) 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	06:59 19:19	17:57 (D03) 07:06 18:39 (D03) 17:59	18:02 (D03) 07:07 18:18 (D03) 16:59	07:38 16:46
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	06:59 19:19	17:58 (D03) 07:07 18:40 (D03) 17:59	18:03 (D03) 07:08 18:19 (D03) 16:59	07:39 16:46
29	07:22 17:20	06:57 17:28	06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	06:59 19:19	17:59 (D03) 07:08 18:41 (D03) 17:59	18:04 (D03) 07:09 18:20 (D03) 16:59	07:40 16:47
30	07:21 17:21	06:56 17:29	06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	06:59 19:19	18:00 (D03) 07:09 18:42 (D03) 17:59	18:05 (D03) 07:10 18:21 (D03) 16:59	07:41 16:48
31	07:20 17:22	06:54 17:30	06:54 19:30	06:07 20:03	05:39 20:31	05:39 20:26	06:03 19:45	06:33 19:45	06:59 19:18	18:01 (D03) 07:10 18:43 (D03) 17:59	18:06 (D03) 07:11 18:22 (D03) 16:59	07:42 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case				877				297		659		415
Sun reduction				0.73				0.96		0.93		0.84
Oper. time red.				1.00				1.00		1.00		1.00
Wind dir. red.				0.77				0.61		0.73		0.77
Total reduction				0.57				0.59		0.68		0.65
Total, real				496				175		448		270

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 24 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June
1	07:32 16:50	07:19 17:23	06:43 17:57	17:04 (D03) 23 17:27 (D03)	06:52 19:31	06:07 20:03
2	07:33 16:50	07:18 17:25	06:41 17:58	17:02 (D03) 26 17:28 (D03)	06:51 19:32	18:58 (D02) 20:04
3	07:33 16:51	07:17 17:26	06:40 18:00	17:00 (D03) 29 17:29 (D03)	06:49 19:33	18:55 (D02) 20:05
4	07:33 16:52	07:16 17:27	06:38 18:01	16:59 (D03) 32 17:31 (D03)	06:48 19:34	18:53 (D02) 20:06
5	07:33 16:53	07:15 17:28	06:37 18:02	16:57 (D03) 35 17:32 (D03)	06:46 19:35	18:51 (D02) 20:07
6	07:33 16:54	07:14 17:30	06:35 18:03	16:57 (D03) 36 17:33 (D03)	06:44 19:36	18:49 (D02) 20:08
7	07:33 16:55	07:13 17:31	06:34 18:04	16:55 (D03) 38 17:33 (D03)	06:43 19:37	18:49 (D02) 20:09
8	07:32 16:56	07:12 17:32	07:32 19:05	17:54 (D03) 39 18:33 (D03)	06:41 19:39	18:48 (D02) 20:10
9	07:32 16:57	07:10 17:33	07:30 19:06	17:54 (D03) 40 18:34 (D03)	06:39 19:40	18:48 (D02) 20:11
10	07:32 16:58	07:09 17:35	07:29 19:07	17:53 (D03) 40 18:33 (D03)	06:38 19:41	18:47 (D02) 20:12
11	07:32 16:59	07:08 17:36	07:27 19:09	17:54 (D03) 40 18:34 (D03)	06:36 19:42	18:46 (D02) 20:13
12	07:32 17:00	07:07 17:37	07:26 19:10	17:53 (D03) 40 18:33 (D03)	06:35 19:43	18:47 (D02) 20:14
13	07:31 17:01	07:06 17:38	07:24 19:11	17:53 (D03) 40 18:33 (D03)	06:33 19:44	18:46 (D02) 20:15
14	07:31 17:02	07:04 17:39	07:22 19:12	17:53 (D03) 40 18:33 (D03)	06:32 19:45	18:47 (D02) 20:16
15	07:31 17:03	07:03 17:41	07:21 19:13	17:53 (D03) 39 18:32 (D03)	06:30 19:46	18:47 (D02) 20:17
16	07:30 17:04	07:02 17:42	07:19 19:14	17:53 (D03) 38 18:31 (D03)	06:28 19:47	18:48 (D02) 20:18
17	07:30 17:05	07:00 17:43	07:17 19:15	17:54 (D03) 36 18:30 (D03)	06:27 19:48	18:48 (D02) 20:19
18	07:29 17:07	06:59 17:44	07:16 19:16	17:54 (D03) 35 18:29 (D03)	06:25 19:49	18:50 (D02) 20:20
19	07:29 17:08	06:58 17:46	07:14 19:17	17:55 (D03) 32 18:27 (D03)	06:24 19:50	18:51 (D02) 20:21
20	07:28 17:09	06:56 17:47	07:12 19:18	17:56 (D03) 31 18:27 (D03)	06:22 19:51	18:53 (D02) 20:22
21	07:28 17:10	06:55 17:48	07:11 19:19	17:57 (D03) 27 18:24 (D03)	06:21 19:52	19:05 (D02) 20:23
22	07:27 17:11	06:53 17:49	07:09 19:21	17:59 (D03) 23 18:22 (D03)	06:19 19:53	05:45 20:24
23	07:26 17:12	06:52 17:50	07:07 19:22	18:02 (D03) 18 18:20 (D03)	06:18 19:54	05:44 20:25
24	07:26 17:14	06:50 17:51	07:06 19:23	18:05 (D03) 10 18:15 (D03)	06:17 19:55	05:43 20:26
25	07:25 17:15	06:49 17:53	07:04 19:24		06:15 19:56	05:43 20:26
26	07:24 17:16	06:48 17:54	07:02 19:25		06:14 19:57	05:42 20:27
27	07:23 17:17	06:46 17:55	17:12 (D03) 8 17:20 (D03)	07:01 19:26	06:12 19:59	05:41 20:28
28	07:22 17:18	06:45 17:56	17:07 (D03) 17 17:24 (D03)	06:59 19:27	06:11 20:00	05:41 20:29
29	07:22 17:20			06:57 19:28	06:10 20:01	05:40 20:30
30	07:21 17:21			06:56 19:29	06:08 20:02	05:40 20:31
31	07:20 17:22			06:54 19:30		05:39 20:31
Potential sun hours	298	297	369	398	448	452
Total, worst case		25	787		444	
Sun reduction		0.62	0.73		0.82	
Oper. time red.		1.00	1.00		1.00	
Wind dir. red.		0.78	0.78		0.62	
Total reduction		0.48	0.57		0.51	
Total, real		12	449		228	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 24 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	18:45 (D02) 19:14 (D02)	07:04 18:53	17:32 (D03) 18:06
2	05:40 20:44	06:05 20:24	06:35 19:41	18:45 (D02) 19:14 (D02)	07:05 18:51	17:31 (D03) 17:05
3	05:41 20:43	06:05 20:23	06:36 19:40	18:45 (D02) 19:13 (D02)	07:06 18:49	17:31 (D03) 17:04
4	05:41 20:43	06:06 20:22	06:37 19:38	18:45 (D02) 19:13 (D02)	07:07 18:48	17:32 (D03) 17:02
5	05:42 20:43	06:07 20:21	06:38 19:36	18:45 (D02) 19:12 (D02)	07:08 18:46	17:32 (D03) 17:01
6	05:42 20:43	06:08 20:20	06:39 19:35	18:46 (D02) 19:11 (D02)	07:09 18:44	17:32 (D03) 17:00
7	05:43 20:43	06:09 20:19	06:40 19:33	18:46 (D02) 19:10 (D02)	07:10 18:43	17:32 (D03) 16:59
8	05:44 20:42	06:10 20:17	06:41 19:31	18:47 (D02) 19:08 (D02)	07:11 18:41	17:32 (D03) 16:58
9	05:44 20:42	06:11 20:16	06:42 19:30	18:49 (D02) 19:06 (D02)	07:12 18:39	17:33 (D03) 16:57
10	05:45 20:42	06:12 20:15	06:43 19:28	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
11	05:46 20:41	06:13 20:14	06:44 19:26	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
12	05:46 20:41	06:14 20:12	06:45 19:25	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
13	05:47 20:40	06:15 20:11	06:46 19:23	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
14	05:48 20:40	06:16 20:10	06:47 19:21	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
15	05:49 20:39	06:17 20:08	06:48 19:20	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
16	05:49 20:39	06:18 20:07	06:49 19:18	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
17	05:50 20:38	06:19 20:06	06:50 19:16	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
18	05:51 20:37	06:20 20:04	06:51 19:15	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
19	05:52 20:37	06:21 20:03	06:52 19:13	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
20	05:53 20:36	06:22 20:01	06:53 19:11	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
21	05:54 20:35	06:23 20:00	06:54 19:10	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
22	05:54 20:35	06:24 19:58	06:55 19:08	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
23	05:55 20:34	06:25 19:57	06:56 19:06	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
24	05:56 20:33	06:26 19:55	06:57 19:04	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
25	05:57 20:32	06:27 19:54	06:58 19:03	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
26	05:58 20:31	06:28 19:52	06:59 19:01	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
27	05:59 20:30	06:29 19:51	07:00 18:50	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
28	06:00 20:29	06:30 19:49	07:01 18:49	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
29	06:01 20:28	06:31 19:48	07:02 18:48	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
30	06:02 20:27	06:32 19:46	07:03 18:47	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
31	06:03 20:26	06:33 19:45	07:04 18:46	18:51 (D02) 19:03 (D02)	07:13 18:38	17:34 (D03) 16:56
Potential sun hours	458	428	375	346	298	288
Total, worst case		206	596	461		
Sun reduction		0.96	0.93	0.84		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.62	0.72	0.78		
Total reduction		0.60	0.67	0.66		
Total, real		124	398	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)
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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 25 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (100)

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

Assumptions for shadow calculationsJan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57		06:52 19:31		06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25		
2	07:33 16:50	07:18 17:25	06:41 17:58	7 17:18 (D03)	06:51 19:32	12 18:58 (D02)	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24		
3	07:33 16:51	07:17 17:26	06:40 18:00	16 17:13 (D03)	06:49 19:33	17 19:12 (D02)	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23		
4	07:33 16:52	07:16 17:27	06:38 18:01	21 17:11 (D03)	06:48 19:34	20 19:14 (D02)	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22		
5	07:33 16:53	07:15 17:28	06:37 18:02	25 17:08 (D03)	06:46 19:35	23 19:15 (D02)	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21		
6	07:33 16:54	07:14 17:30	06:35 18:03	28 17:07 (D03)	06:44 19:36	24 19:15 (D02)	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20		
7	07:33 16:55	07:13 17:31	06:34 18:04	30 17:05 (D03)	06:43 19:37	26 19:16 (D02)	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19		
8	07:32 16:56	07:12 17:32	06:32 19:05	32 18:04 (D03)	06:41 19:38	26 19:15 (D02)	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17		
9	07:32 16:57	07:10 17:33	06:30 19:06	34 18:36 (D03)	06:39 19:40	27 19:15 (D02)	05:57 20:11	05:36 20:38	05:47 20:42	06:11 20:16		
10	07:32 16:58	07:09 17:35	06:29 19:07	35 18:02 (D03)	06:38 19:41	27 19:15 (D02)	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15		
11	07:32 16:59	07:08 17:36	06:27 19:09	36 18:02 (D03)	06:36 19:42	27 19:15 (D02)	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14		
12	07:32 17:00	07:07 17:37	06:26 19:10	36 18:01 (D03)	06:35 19:43	27 19:15 (D02)	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12		
13	07:31 17:01	07:06 17:38	06:24 19:11	37 18:00 (D03)	06:33 19:44	26 18:48 (D02)	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11		
14	07:31 17:02	07:04 17:39	06:22 19:12	36 18:01 (D03)	06:32 19:45	24 18:49 (D02)	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10		
15	07:31 17:03	07:03 17:41	06:21 19:13	37 18:00 (D03)	06:30 19:46	23 18:49 (D02)	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08		
16	07:30 17:04	07:02 17:42	06:19 19:14	37 18:00 (D03)	06:28 19:47	23 18:51 (D02)	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07		
17	07:30 17:05	07:00 17:43	06:17 19:15	36 18:01 (D03)	06:27 19:48	20 19:11 (D02)	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06		
18	07:29 17:07	06:59 17:44	06:16 19:16	35 18:01 (D03)	06:25 19:49	18 18:54 (D02)	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04		
19	07:29 17:08	06:58 17:46	06:14 19:17	32 18:01 (D03)	06:24 19:50	7 18:56 (D02)	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03		
20	07:28 17:09	06:56 17:47	06:12 19:18	30 18:03 (D03)	06:22 19:51		05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01		
21	07:28 17:10	06:55 17:48	06:11 19:19	28 18:03 (D03)	06:21 19:52		05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00		
22	07:27 17:11	06:53 17:49	06:09 19:21	25 18:04 (D03)	06:19 19:53		05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58		
23	07:26 17:12	06:52 17:50	06:07 19:22	21 18:06 (D03)	06:18 19:54		05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57		
24	07:26 17:14	06:50 17:51	06:06 19:23	15 18:09 (D03)	06:17 19:55		05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55		
25	07:25 17:15	06:49 17:53	06:04 19:24	5 18:13 (D03)	06:15 19:56		05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54		
26	07:24 17:16	06:48 17:54	06:02 19:25	5 18:18 (D03)	06:14 19:57		05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52		
27	07:23 17:17	06:46 17:55	06:01 19:26		06:12 19:59		05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51		
28	07:22 17:18	06:45 17:56	06:59 19:27		06:11 20:00		05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49		
29	07:22 17:20		06:57 19:28		06:10 20:01		05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48		
30	07:21 17:21		06:56 19:29		06:08 20:02		05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46		
31	07:20 17:22		06:54 19:30				05:39 20:31	05:39 20:26	06:03 19:45	06:33 19:15 (D02)		
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			670	387					587	318		
Sun reduction			0.73	0.82					0.93	0.84		
Oper. time red.			1.00	1.00					1.00	1.00		
Wind dir. red.			0.77	0.62					0.71	0.77		
Total reduction			0.56	0.51					0.66	0.65		
Total, real			376	199				96	389	205		

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 26 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (101)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	February	March	April	May	June	July	August	September	October	November	December	
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	26 18:49 (D02) 18:15 (D02)	07:04 18:20 (D03)	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	26 18:49 (D02) 18:15 (D02)	07:05 18:19 (D03)	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 19:01 (D02) 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	25 18:49 (D02) 18:14 (D02)	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 16 18:58 (D02) 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	25 18:49 (D03) 19:14 (D02) 18:48	06:41 18:17 (D03) 17:02	06:42 17:50 (D03)	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 19:15 (D02) 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	23 18:50 (D02) 19:13 (D02) 18:46	07:08 18:52 (D02) 18:44	06:43 17:51 (D03)	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 17:33 (D03) 19:36	06:01 21 19:15 (D02) 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	21 18:50 (D02) 18:11 (D02) 18:44	07:09 17:52 (D03) 17:00	06:44 18:13 (D03)	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 17:17 (D03) 19:37	06:00 23 19:17 (D02) 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	21 18:51 (D02) 19:10 (D02) 18:43	07:10 18:52 (D02) 17:11	06:45 17:54 (D03)	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 18:14 (D03) 19:38	05:59 25 18:52 (D02) 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	16 18:52 (D02) 19:08 (D02) 17:11	07:11 18:06 (D03) 16:58	06:46 17:58 (D03)	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 18:37 (D03) 19:40	05:57 25 18:13 (D03) 20:39	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	11 18:51 (D02) 19:05 (D02) 18:39	07:12 18:07 (D03) 16:57	06:47 17:02 (D03)	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 18:11 (D03) 19:41	05:56 26 18:51 (D02) 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	11 19:05 (D02) 18:38	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 18:10 (D03) 19:42	05:55 26 18:50 (D02) 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	11 18:39 (D03) 18:36	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 18:09 (D03) 19:43	05:54 25 18:51 (D02) 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	11 18:40 (D02) 18:35	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 18:08 (D03) 19:44	05:53 25 18:50 (D02) 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	11 18:46 (D02) 18:33	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 18:08 (D03) 19:45	05:52 24 18:51 (D02) 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	11 18:47 (D02) 18:32	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 18:07 (D03) 19:46	05:51 23 18:51 (D02) 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	11 18:48 (D02) 18:30	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 18:06 (D03) 19:47	05:50 23 18:52 (D02) 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	11 18:49 (D02) 18:28	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 18:07 (D03) 19:48	05:49 18 18:53 (D02) 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	11 18:03 (D03) 18:17 (D03)	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 18:06 (D03) 19:49	05:48 15 18:55 (D02) 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	14 18:00 (D03) 18:19 (D03)	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 18:06 (D03) 19:50	05:47 9 18:57 (D02) 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	19 17:57 (D03) 18:20 (D03)	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 18:07 (D03) 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	26 17:55 (D03) 18:21 (D03)	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 18:07 (D03) 19:52	05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	06:54 19:10	29 17:53 (D03) 18:22 (D03)	07:25 18:21	07:01 16:46	07:29 16:42
22	07:27 17:11	06:53 17:49	06:09 19:21	06:19 18:08 (D03) 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	30 17:52 (D03) 18:22 (D03)	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 18:09 (D03) 19:54	05:44 27 18:56 (D03) 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	32 17:51 (D03) 18:23 (D03)	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 18:10 (D03) 19:55	05:43 24 18:36 (D03) 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:11	32 17:50 (D03) 18:23 (D03)	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 18:11 (D03) 19:56	05:43 20 18:31 (D03) 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 16 18:57 (D02) 19:13 (D02)	34 17:49 (D03) 18:23 (D03)	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 18:13 (D03) 19:57	05:42 15 18:52 (D02) 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 18 18:56 (D02) 19:14 (D02)	34 17:48 (D03) 18:23 (D03)	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 18:18 (D03) 19:59	05:41 6 18:24 (D03) 20:28	05:38 20:44	05:59 20:30	06:29 19:51	06:59 21 18:54 (D02) 18:53 (D02)	35 17:48 (D03) 18:22 (D03)	07:32 18:13	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 18:09 (D03) 20:00	05:41 28 18:53 (D02) 20:29	05:38 20:44	06:00 20:29	06:30 19:49	06:59 23 18:53 (D02) 18:52 (D02)	34 17:48 (D03) 18:21 (D03)	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20	06:57 17:28	06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	06:59 24 18:52 (D02) 19:16 (D02)	34 17:47 (D03) 18:21 (D03)	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21	06:56 17:29	06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	06:59 25 18:51 (D02) 19:16 (D02)	34 17:47 (D03) 18:21 (D03)	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22	06:54 17:30	06:54 19:30	06:07 20:03	05:39 20:31	05:39 20:26	06:03 19:45	06:33 19:45	06:59 25 18:51 (D02) 19:16 (D02)	34 18:07 (D02) 18:07 (D02)	07:37 18:07	07:12 16:49	07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288	
Total, worst case			592	351				163		603	189		
Sun reduction			0.73	0.82				0.96		0.93	0.84		
Oper. time red.			1.00	1.00				1.00		1.00	1.00		
Wind dir. red.			0.75	0.62				0.62		0.71	0.75		
Total reduction			0.55	0.51				0.60		0.66	0.63		
Total, real			326	179				97		399	120		

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 28 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (102)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	February	March	April	May	June	July	August	September	October	November	December			
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	19:03 (D02) 19:07 (D02)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	18:49 (D02) 19:13 (D02)	07:04 18:53	17:50 (D03) 18:21 (D03)	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	18:59 (D02) 19:11 (D02)	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	18:49 (D02) 19:13 (D02)	07:05 18:51	17:50 (D03) 18:20 (D03)	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	18:56 (D02) 19:12 (D02)	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	18:48 (D02) 19:13 (D02)	07:06 18:49	17:50 (D03) 18:18 (D03)	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	18:55 (D02) 19:14 (D02)	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	18:48 (D02) 19:12 (D02)	07:07 18:48	17:52 (D03) 18:18 (D03)	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	18:54 (D02) 19:15 (D02)	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	18:48 (D02) 19:12 (D02)	07:08 18:46	17:53 (D03) 18:16 (D03)	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	17:22 (D03) 17:34 (D03)	06:44 19:36	18:52 (D02) 19:15 (D02)	05:37 20:08	05:42 20:36	06:08 20:20	06:39 19:35	18:48 (D02) 19:11 (D02)	07:09 18:44	17:54 (D03) 18:14 (D03)	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	17:19 (D03) 17:37 (D03)	06:43 19:37	18:52 (D02) 19:16 (D02)	05:37 20:09	05:43 20:36	06:09 20:19	06:40 19:33	18:49 (D02) 19:10 (D02)	07:10 18:43	17:56 (D03) 18:12 (D03)	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	18:16 (D03) 18:38 (D03)	06:41 19:38	18:51 (D02) 19:15 (D02)	05:59 20:10	05:44 20:37	06:10 20:17	06:41 19:31	18:49 (D02) 19:08 (D02)	07:11 18:41	18:00 (D03) 18:07 (D03)	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	18:15 (D03) 18:40 (D03)	06:39 19:40	18:50 (D02) 19:15 (D02)	05:57 20:11	05:44 20:38	06:11 20:16	06:42 19:30	18:50 (D02) 19:07 (D02)	07:12 18:39	18:07 (D03) 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	18:13 (D03) 18:40 (D03)	06:38 19:41	18:51 (D02) 19:15 (D02)	05:56 20:12	05:45 20:38	06:12 20:15	06:43 19:28	18:52 (D02) 19:05 (D02)	07:13 18:38	18:38 (D03) 18:55 (D02)	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	18:12 (D03) 18:41 (D03)	06:36 19:42	18:50 (D02) 19:14 (D02)	05:55 20:13	05:46 20:39	06:13 20:14	06:44 19:26	18:55 (D02) 19:01 (D02)	07:14 18:36	18:36 (D03) 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	18:12 (D03) 18:42 (D03)	06:35 19:43	18:51 (D02) 19:14 (D02)	05:54 20:14	05:46 20:39	06:14 20:12	06:45 19:25	18:56 (D02) 19:02 (D02)	07:15 18:35	18:35 (D03) 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:05 17:38	06:24 19:11	18:10 (D03) 18:42 (D03)	06:33 19:44	18:51 (D02) 19:12 (D02)	05:53 20:15	05:47 20:40	06:15 20:11	06:46 19:23	18:57 (D02) 19:03 (D02)	07:16 18:33	18:33 (D03) 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	18:11 (D03) 18:42 (D03)	06:32 19:45	18:52 (D02) 19:12 (D02)	05:52 20:16	05:48 20:40	06:16 20:10	06:47 19:21	18:58 (D02) 19:04 (D02)	07:17 18:32	18:32 (D03) 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	18:10 (D03) 18:42 (D03)	06:30 19:46	18:53 (D02) 19:10 (D02)	05:51 20:17	05:49 20:41	06:17 20:08	06:48 19:20	19:05 (D02) 19:05	07:19 18:30	18:30 (D03) 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	18:09 (D03) 18:41 (D03)	06:28 19:47	18:55 (D02) 19:08 (D02)	05:50 20:18	05:49 20:41	06:18 20:07	06:49 19:18	19:06 (D02) 19:06	07:20 18:28	18:28 (D03) 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	18:10 (D03) 18:42 (D03)	06:27 19:48	18:58 (D02) 19:04 (D02)	05:49 20:19	05:50 20:41	06:19 20:06	06:50 19:16	19:07 (D02) 19:07	07:21 18:27	18:27 (D03) 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	18:09 (D03) 18:41 (D03)	06:25 19:49	19:04 (D02) 20:20	05:48 20:42	05:51 20:37	06:20 20:04	06:51 19:15	18:06 (D03) 18:16 (D03)	07:22 18:25	18:25 (D03) 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	18:09 (D03) 18:40 (D03)	06:24 19:50	20:21 20:42	05:47 20:36	05:52 20:37	06:21 20:03	06:52 19:13	18:01 (D03) 18:18 (D03)	07:23 18:24	18:24 (D03) 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	18:10 (D03) 18:39 (D03)	06:22 19:51	20:22 20:42	05:47 20:36	05:53 20:36	06:22 20:01	06:53 19:11	17:59 (D03) 18:20 (D03)	07:24 18:22	18:22 (D03) 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	18:11 (D03) 18:38 (D03)	06:21 19:52	20:23 20:43	05:46 20:35	05:53 20:35	06:23 20:00	06:54 19:10	17:57 (D03) 18:21 (D03)	07:25 18:21	18:21 (D03) 18:21	07:01 16:46	07:29 16:42
22	07:27 17:11	06:53 17:49	06:09 19:21	18:11 (D03) 18:36 (D03)	06:19 19:53	20:24 20:43	05:45 20:35	05:54 20:35	06:24 19:58	06:55 19:08	17:55 (D03) 18:22 (D03)	07:26 18:19	18:22 (D03) 18:19	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	18:13 (D03) 18:35 (D03)	06:18 19:54	20:25 20:43	05:44 20:34	05:55 20:34	06:25 19:57	06:56 19:06	17:54 (D03) 18:22 (D03)	07:27 18:18	18:22 (D03) 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	18:15 (D03) 18:32 (D03)	06:17 19:55	20:26 20:43	05:43 20:33	05:56 20:33	06:26 19:55	06:57 19:04	17:53 (D03) 18:23 (D03)	07:29 18:17	18:23 (D03) 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	18:17 (D03) 18:29 (D03)	06:15 19:56	20:27 20:43	05:43 20:32	05:57 20:32	06:27 19:54	06:58 19:03	17:52 (D03) 18:23 (D03)	07:30 18:15	18:23 (D03) 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	18:14 (D03) 18:27 (D03)	06:14 19:57	20:28 20:44	05:42 20:31	05:58 20:31	06:28 19:52	06:59 18:57 (D02)	17:51 (D03) 18:23 (D03)	07:31 18:14	18:23 (D03) 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	18:12 (D03) 18:28 (D03)	06:12 19:58	20:29 20:44	05:41 20:30	05:59 20:30	06:29 19:51	07:00 19:10 (D02)	18:23 (D03) 18:59 (D02)	07:32 18:12	18:59 (D02) 18:12	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:59 19:27	18:11 (D03) 18:29 (D03)	06:11 19:59	20:30 20:45	05:41 20:31	06:00 20:31	06:30 19:49	07:01 19:12 (D02)	18:55 (D02) 18:58 (D02)	07:33 18:11	18:58 (D02) 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20	06:57 17:58	06:57 19:28	18:10 (D03) 18:28 (D03)	06:10 19:58	20:31 20:44	05:40 20:32	06:01 20:32	06:31 19:48	07:02 19:13 (D02)	18:53 (D02) 18:56 (D02)	07:34 18:10	18:56 (D02) 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21	06:56 17:59	06:56 19:29	18:09 (D03) 18:27 (D03)	06:08 19:59	20:32 20:44	05:40 20:33	06:02 20:33	06:32 19:46	07:03 19:14 (D02)	18:52 (D02) 18:54 (D02)	07:35 18:09	18:54 (D02) 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22	06:54 18:00	06:54 19:30	18:08 (D03) 18:26 (D03)	06:07 19:58	20:33 20:48	05:39 20:34	06:03 20:34	06:33 19:47	07:37 19:15 (D02)	18:50 (D02) 18:52 (D02)	07:37 18:07	18:50 (D02) 18:07	07:32 16:49	07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288	288	288	288
Total, worst case			517	316				101	567	181					
Sun reduction			0.73	0.82				0.96	0.93	0.84					
Oper. time red.			1.00	1.00				1.00	1.00	1.00					
Wind dir. red.			0.75	0.63				0.63	0.70	0.75					
Total reduction			0.55	0.51				0.60	0.66	0.63					
Total, real			284	163				61	372	115					

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 29 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (103)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	19:04 (D02) 20:03	06:07 20:32	05:39 20:44	06:04 20:25	06:34 19:43	18:49 (D02) 18:53	07:04 18:20 (D03)	06:38 18:06
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	18:59 (D02) 20:04	06:06 20:33	05:40 20:44	06:05 20:24	06:35 19:41	18:48 (D02) 18:51	07:05 18:19 (D03)	06:39 17:05
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	18:56 (D02) 20:05	06:05 20:34	05:41 20:43	06:05 20:23	06:36 19:40	18:48 (D02) 18:49	07:06 18:18 (D03)	06:40 17:04
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	18:55 (D02) 20:06	06:03 20:34	05:41 20:43	06:06 20:22	06:37 19:38	18:48 (D02) 18:48	07:07 18:17 (D03)	06:41 17:02
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	17:24 (D03) 19:29 (D03)	06:02 20:07	05:37 20:43	06:07 20:21	06:38 19:36	18:48 (D02) 18:46	07:08 18:16 (D03)	06:43 17:01
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	17:20 (D03) 17:35 (D03)	06:01 20:08	05:37 20:43	06:08 20:20	06:39 19:35	18:48 (D02) 19:11 (D02)	07:09 18:44	06:44 17:00
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	17:17 (D03) 17:36 (D03)	06:00 20:09	05:37 20:43	06:09 20:19	06:40 19:33	18:48 (D02) 19:10 (D02)	07:10 18:43	06:45 16:59
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:38	18:14 (D03) 18:38 (D03)	06:41 20:10	05:36 20:37	06:10 20:17	06:41 19:31	18:49 (D02) 19:08 (D02)	07:11 18:41	06:46 16:58
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	18:13 (D03) 18:39 (D03)	06:39 20:11	05:36 20:42	06:11 20:16	06:42 19:30	18:50 (D02) 19:07 (D02)	07:12 18:39	06:47 16:57
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	18:12 (D03) 18:40 (D03)	06:38 20:12	05:36 20:42	06:12 20:15	06:43 19:28	18:52 (D02) 19:04 (D02)	07:13 18:38	06:48 16:56
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	18:10 (D03) 18:40 (D03)	06:36 20:13	05:36 20:41	06:13 20:14	06:44 19:26	18:55 (D02) 19:00 (D02)	07:14 18:36	06:50 16:55
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	18:10 (D03) 18:41 (D03)	06:35 20:14	05:36 20:39	06:14 20:12	06:45 19:25	19:00 (D02) 19:15	07:15 18:35	06:51 16:54
13	07:31 17:01	07:05 17:38	06:24 19:11	06:33 19:44	18:09 (D03) 18:41 (D03)	06:33 20:15	05:36 20:40	06:15 20:11	06:46 19:23	19:06 (D02) 19:23	07:16 18:33	06:52 16:53
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	18:09 (D03) 18:42 (D03)	06:32 20:16	05:36 20:40	06:16 20:10	06:47 19:21	19:07 (D02) 19:21	07:17 18:32	06:53 16:52
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	18:08 (D03) 18:41 (D03)	06:30 20:17	05:36 20:41	06:17 20:08	06:48 19:20	19:08 (D02) 19:20	07:19 18:30	06:54 16:51
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	18:08 (D03) 18:40 (D03)	06:28 20:18	05:36 20:41	06:18 20:07	06:49 19:18	19:09 (D02) 19:18	07:20 18:28	06:56 16:50
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	18:08 (D03) 18:41 (D03)	06:27 20:19	05:36 20:41	06:19 20:06	06:50 19:16	19:10 (D02) 19:16	07:21 18:27	06:57 16:49
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	18:08 (D03) 18:40 (D03)	06:25 20:20	05:36 20:42	06:20 20:04	06:51 19:15	18:05 (D03) 18:15 (D03)	07:22 18:25	06:58 16:48
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	18:08 (D03) 18:39 (D03)	06:24 20:21	05:36 20:42	06:21 20:03	06:52 19:13	18:00 (D03) 18:17 (D03)	07:23 18:24	06:59 16:48
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	18:09 (D03) 18:38 (D03)	06:22 20:22	05:36 20:42	06:22 20:01	06:53 19:11	17:58 (D03) 18:19 (D03)	07:24 18:22	07:00 16:47
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	18:10 (D03) 18:37 (D03)	06:21 20:23	05:36 20:43	06:23 20:00	06:54 19:10	17:56 (D03) 18:20 (D03)	07:25 18:21	07:01 16:46
22	07:27 17:11	06:53 17:49	06:09 19:21	06:19 19:53	18:10 (D03) 18:35 (D03)	06:19 20:24	05:36 20:43	06:24 19:58	06:55 19:08	17:54 (D03) 18:21 (D03)	07:26 18:19	07:03 16:46
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	18:12 (D03) 18:34 (D03)	06:18 20:25	05:37 20:43	06:25 19:57	06:56 19:06	17:53 (D03) 18:21 (D03)	07:27 18:18	07:04 16:45
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 19:55	18:13 (D03) 18:31 (D03)	06:17 20:26	05:37 20:43	06:26 19:55	06:57 19:04	17:52 (D03) 18:22 (D03)	07:29 18:17	07:05 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	18:16 (D03) 18:27 (D03)	06:15 20:26	05:37 20:43	06:27 19:54	06:58 19:03	17:51 (D03) 18:22 (D03)	07:30 18:15	07:06 16:44
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:57	18:17 (D03) 18:27 (D03)	06:14 20:27	05:38 20:44	06:28 19:52	06:59 18:59 (D02)	17:50 (D03) 19:01	07:31 18:22 (D03)	07:07 16:43
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:58	18:18 (D03) 18:28 (D03)	06:12 20:28	05:38 20:44	06:29 19:51	06:59 18:56 (D02)	18:22 (D03) 19:00	07:32 18:12	07:08 16:43
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 20:00	18:19 (D03) 18:29 (D03)	06:11 20:29	05:38 20:44	06:30 19:49	06:59 18:54 (D02)	19:08 (D02) 19:01	07:33 18:11	07:09 16:42
29	07:22 17:20	06:57 17:58	06:57 19:28	06:10 20:01	18:30 (D03) 18:40 (D03)	06:10 20:30	05:39 20:44	06:31 19:48	06:59 18:53 (D02)	19:09 (D02) 19:02	07:34 18:10	07:10 16:42
30	07:21 17:21	06:56 17:59	06:56 19:29	06:08 20:02	18:31 (D03) 18:41 (D03)	06:08 20:31	05:39 20:44	06:32 19:46	06:59 18:54 (D02)	19:10 (D02) 19:03	07:35 18:11	07:11 16:48
31	07:20 17:22	06:54 18:00	06:54 19:30	06:07 20:03	18:32 (D03) 18:42 (D03)	06:07 20:32	05:40 20:45	06:33 19:47	06:59 18:55 (D02)	19:11 (D02) 19:04	07:36 18:12	07:12 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			536	321				107		572	195	
Sun reduction			0.73	0.82				0.96		0.93	0.84	
Oper. time red.			1.00	1.00				1.00		1.00	1.00	
Wind dir. red.			0.75	0.63				0.63		0.70	0.75	
Total reduction			0.55	0.51				0.60		0.66	0.63	
Total, real			296	165				65		376	124	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 30 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June
1	07:32	07:19	06:43	16:50 (D03)	06:52	18:47 (D02)
	16:50	17:23	17:57	37 17:27 (D03)	19:31	24 19:11 (D02)
2	07:33	07:18	06:41	16:49 (D03)	06:51	18:45 (D02)
	16:50	17:25	17:58	38 17:27 (D03)	19:32	26 19:11 (D02)
3	07:33	07:17	06:40	16:48 (D03)	06:49	18:44 (D02)
	16:51	17:26	18:00	39 17:27 (D03)	19:33	27 19:11 (D02)
4	07:33	07:16	06:38	16:48 (D03)	06:48	18:44 (D02)
	16:52	17:27	18:01	39 17:27 (D03)	19:34	28 19:12 (D02)
5	07:33	07:15	06:37	16:47 (D03)	06:46	18:43 (D02)
	16:53	17:28	18:02	40 17:27 (D03)	19:35	28 19:11 (D02)
6	07:33	07:14	06:35	16:48 (D03)	06:44	18:42 (D02)
	16:54	17:30	18:03	39 17:27 (D03)	19:36	29 19:11 (D02)
7	07:33	07:13	06:34	16:47 (D03)	06:43	18:42 (D02)
	16:55	17:31	18:04	40 17:27 (D03)	19:37	29 19:11 (D02)
8	07:32	07:12	07:32	17:47 (D03)	06:41	18:42 (D02)
	16:56	17:32	19:05	39 18:26 (D03)	19:39	28 19:10 (D02)
9	07:32	07:10	07:30	17:48 (D03)	06:39	18:43 (D02)
	16:57	17:33	19:06	38 18:26 (D03)	19:40	27 19:10 (D02)
10	07:32	07:09	07:29	17:47 (D03)	06:38	18:42 (D02)
	16:58	17:35	19:07	38 18:25 (D03)	19:41	27 19:09 (D02)
11	07:32	07:08	07:27	17:48 (D03)	06:36	18:42 (D02)
	16:59	17:36	19:09	37 18:25 (D03)	19:42	26 19:08 (D02)
12	07:32	07:07	07:26	17:49 (D03)	06:35	18:44 (D02)
	17:00	17:37	19:10	35 18:24 (D03)	19:43	23 19:07 (D02)
13	07:31	07:06	07:24	17:49 (D03)	06:33	18:44 (D02)
	17:01	17:38	19:11	33 18:22 (D03)	19:44	21 19:05 (D02)
14	07:31	07:04	07:22	17:51 (D03)	06:32	18:46 (D02)
	17:02	17:39	19:12	30 18:21 (D03)	19:45	18 19:04 (D02)
15	07:31	07:03	07:21	17:51 (D03)	06:30	18:48 (D02)
	17:03	17:41	19:13	28 18:19 (D03)	19:46	13 19:01 (D02)
16	07:30	07:02	07:19	17:53 (D03)	06:28	18:52 (D02)
	17:04	17:42	19:14	24 18:17 (D03)	19:47	5 18:57 (D02)
17	07:30	07:00	07:17	17:55 (D03)	06:27	
	17:05	17:43	19:15	20 18:15 (D03)	19:48	
18	07:29	06:59	07:16	17:58 (D03)	06:25	
	17:07	17:44	19:16	13 18:11 (D03)	19:49	
19	07:29	06:58	07:14		06:24	
	17:08	17:46	19:17		19:50	
20	07:28	06:56	07:12		06:22	
	17:09	17:47	19:18		19:51	
21	07:28	06:55	07:11		06:21	
	17:10	17:48	19:19		19:52	
22	07:27	06:53	17:02 (D03)	07:09	06:19	
	17:11	17:49	14 17:16 (D03)	19:21	19:53	
23	07:26	06:52	16:59 (D03)	07:07	06:18	
	17:12	17:50	21 17:20 (D03)	19:22	19:54	
24	07:26	06:50	16:56 (D03)	07:06	06:17	
	17:14	17:51	25 17:21 (D03)	19:23	19:55	
25	07:25	06:49	16:55 (D03)	07:04	06:15	
	17:15	17:53	28 17:23 (D03)	19:24	19:56	
26	07:24	06:48	16:53 (D03)	07:02	06:14	
	17:16	17:54	31 17:24 (D03)	19:25	19:57	
27	07:23	06:46	16:52 (D03)	07:01	06:12	
	17:17	17:55	33 17:25 (D03)	19:26	19:59	
28	07:22	06:45	16:51 (D03)	06:59	06:11	
	17:18	17:56	35 17:26 (D03)	19:27	20:00	
29	07:22		06:57		18:52 (D02)	06:10
	17:20		19:28	13 19:05 (D02)	20:01	
30	07:21		06:56		18:50 (D02)	06:08
	17:21		19:29	18 19:08 (D02)	20:02	
31	07:20		06:54		18:48 (D02)	
	17:22		19:30	21 19:09 (D02)		
Potential sun hours	298	297	369		398	448
Total, worst case		187	659		379	
Sun reduction		0.62	0.73		0.82	
Oper. time red.		1.00	1.00		1.00	
Wind dir. red.		0.80	0.79		0.64	
Total reduction		0.50	0.58		0.53	
Total, real		93	380		201	

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 30 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04		06:34	18:41 (D02)	07:04		17:28 (D03)	06:38	07:12	
	20:44	20:25		19:43	26 19:07 (D02)	18:53	34	18:02 (D03)	18:06	16:41	
2	05:40	06:05		06:35	18:40 (D02)	07:05		17:26 (D03)	06:39	07:13	
	20:44	20:24		19:41	27 19:07 (D02)	18:51	36	18:02 (D03)	17:05	16:41	
3	05:41	06:05		06:36	18:40 (D02)	07:06		17:25 (D03)	06:40	07:14	
	20:43	20:23		19:40	27 19:07 (D02)	18:49	37	18:02 (D03)	17:04	16:41	
4	05:41	06:06		06:37	18:39 (D02)	07:07		17:25 (D03)	06:41	07:15	
	20:43	20:22		19:38	28 19:07 (D02)	18:48	39	18:04 (D03)	17:02	16:40	
5	05:42	06:07		06:38	18:38 (D02)	07:08		17:25 (D03)	06:43	07:16	
	20:43	20:21		19:36	29 19:07 (D02)	18:46	39	18:04 (D03)	17:01	16:40	
6	05:42	06:08		06:39	18:38 (D02)	07:09		17:24 (D03)	06:44	07:17	
	20:43	20:20		19:35	29 19:07 (D02)	18:44	39	18:03 (D03)	17:00	16:40	
7	05:43	06:09		06:40	18:38 (D02)	07:10		17:23 (D03)	06:45	07:18	
	20:43	20:19		19:33	29 19:07 (D02)	18:43	40	18:03 (D03)	16:59	16:40	
8	05:44	06:10		06:41	18:38 (D02)	07:11		17:23 (D03)	06:46	07:19	
	20:42	20:17		19:31	28 19:06 (D02)	18:41	40	18:03 (D03)	16:58	16:40	
9	05:44	06:11		06:42	18:38 (D02)	07:12		17:23 (D03)	06:47	07:20	
	20:42	20:16		19:30	27 19:05 (D02)	18:39	39	18:02 (D03)	16:57	16:40	
10	05:45	06:12		06:43	18:38 (D02)	07:13		17:23 (D03)	06:48	07:21	
	20:42	20:15		19:28	26 19:04 (D02)	18:38	39	18:02 (D03)	16:56	16:40	
11	05:46	06:13		06:44	18:39 (D02)	07:14		17:23 (D03)	06:50	07:22	
	20:41	20:14		19:26	24 19:03 (D02)	18:36	38	18:01 (D03)	16:55	16:40	
12	05:46	06:14		06:45	18:40 (D02)	07:15		17:23 (D03)	06:51	07:23	
	20:41	20:12		19:25	21 19:01 (D02)	18:35	37	18:00 (D03)	16:54	16:40	
13	05:47	06:15		06:46	18:41 (D02)	07:16		17:23 (D03)	06:52	07:23	
	20:40	20:11		19:23	19 19:00 (D02)	18:33	36	17:59 (D03)	16:53	16:40	
14	05:48	06:16		06:47	18:43 (D02)	07:17		17:23 (D03)	06:53	07:24	
	20:40	20:10		19:21	14 18:57 (D02)	18:32	35	17:58 (D03)	16:52	16:40	
15	05:49	06:17		06:48	18:47 (D02)	07:19		17:25 (D03)	06:54	07:25	
	20:39	20:08		19:20	5 18:52 (D02)	18:30	32	17:57 (D03)	16:51	16:41	
16	05:49	06:18		06:49		07:20		17:26 (D03)	06:56	07:26	
	20:39	20:07		19:18		18:28	30	17:56 (D03)	16:50	16:41	
17	05:50	06:19		06:50		07:21		17:27 (D03)	06:57	07:26	
	20:38	20:06		19:16		18:27	27	17:54 (D03)	16:49	16:41	
18	05:51	06:20		06:51		07:22		17:28 (D03)	06:58	07:27	
	20:37	20:04		19:15		18:25	24	17:52 (D03)	16:48	16:41	
19	05:52	06:21		06:52		07:23		17:30 (D03)	06:59	07:28	
	20:37	20:03		19:13		18:24	19	17:49 (D03)	16:48	16:42	
20	05:53	06:22		06:53		07:24		17:34 (D03)	07:00	07:28	
	20:36	20:01		19:11		18:22	11	17:45 (D03)	16:47	16:42	
21	05:54	06:23		06:54		07:25			07:01	07:29	
	20:35	20:00		19:10		18:21			16:46	16:43	
22	05:54	06:24		06:55		07:26			07:03	07:29	
	20:35	19:58		19:08		18:20			16:46	16:43	
23	05:55	06:25		06:56		07:27			07:04	07:30	
	20:34	19:57		19:06		18:18			16:45	16:43	
24	05:56	06:26		06:57		07:29			07:05	07:30	
	20:33	19:55		19:04		18:17			16:44	16:44	
25	05:57	06:27		06:58	17:42 (D03)	07:30			07:06	07:31	
	20:32	19:54		19:03	10 17:52 (D03)	18:15			16:44	16:45	
26	05:58	06:28		06:59	17:38 (D03)	07:31			07:07	07:31	
	20:31	19:52		19:01	18 17:56 (D03)	18:14			16:43	16:45	
27	05:59	06:29	18:53 (D02)	07:00	17:35 (D03)	07:32			07:08	07:31	
	20:30	19:51	7 19:00 (D02)	18:59	23 17:58 (D03)	18:13			16:43	16:46	
28	06:00	06:30	18:49 (D02)	07:01	17:33 (D03)	07:33			07:09	07:32	
	20:29	19:49	14 19:03 (D02)	18:58	26 17:59 (D03)	18:11			16:42	16:46	
29	06:01	06:31	18:47 (D02)	07:02	17:31 (D03)	07:34			07:10	07:32	
	20:28	19:48	18 19:05 (D02)	18:56	29 18:00 (D03)	18:10			16:42	16:47	
30	06:02	06:32	18:45 (D02)	07:03	17:29 (D03)	07:35			07:11	07:32	
	20:27	19:46	21 19:06 (D02)	18:54	32 18:01 (D03)	18:09			16:42	16:48	
31	06:03	06:33	18:44 (D02)			07:37				07:32	
	20:26	19:45	23 19:07 (D02)			18:07				16:49	
Potential sun hours	458	428		375		346		298		288	
Total, worst case		83		497		671					
Sun reduction		0.96		0.93		0.84					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.64		0.69		0.80					
Total reduction		0.62		0.64		0.67					
Total, real		52		319		453					

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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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 31 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March		April		May		June	
1	07:32	07:19			06:43		16:57 (D03)	06:52		18:48 (D02)	06:07	05:39
	16:50	17:23			17:57	32	17:29 (D03)	19:31	23	19:11 (D02)	20:03	20:32
2	07:33	07:18			06:41		16:56 (D03)	06:51		18:46 (D02)	06:06	05:38
	16:50	17:25			17:58	33	17:29 (D03)	19:32	25	19:11 (D02)	20:04	20:33
3	07:33	07:17			06:40		16:54 (D03)	06:49		18:45 (D02)	06:05	05:38
	16:51	17:26			18:00	35	17:29 (D03)	19:33	26	19:11 (D02)	20:05	20:34
4	07:33	07:16			06:38		16:54 (D03)	06:48		18:45 (D02)	06:03	05:38
	16:52	17:27			18:01	36	17:30 (D03)	19:34	27	19:12 (D02)	20:06	20:34
5	07:33	07:15			06:37		16:53 (D03)	06:46		18:44 (D02)	06:02	05:37
	16:53	17:28			18:02	37	17:30 (D03)	19:35	27	19:11 (D02)	20:07	20:35
6	07:33	07:14			06:35		16:54 (D03)	06:44		18:43 (D02)	06:01	05:37
	16:54	17:30			18:03	36	17:30 (D03)	19:36	28	19:11 (D02)	20:08	20:36
7	07:33	07:13			06:34		16:53 (D03)	06:43		18:44 (D02)	06:00	05:37
	16:55	17:31			18:04	37	17:30 (D03)	19:37	27	19:11 (D02)	20:09	20:36
8	07:32	07:12			07:32		17:52 (D03)	06:41		18:43 (D02)	05:59	05:36
	16:56	17:32			19:05	37	18:29 (D03)	19:39	27	19:10 (D02)	20:10	20:37
9	07:32	07:10			07:30		17:53 (D03)	06:39		18:44 (D02)	05:57	05:36
	16:57	17:33			19:06	37	18:30 (D03)	19:40	26	19:10 (D02)	20:11	20:38
10	07:32	07:09			07:29		17:53 (D03)	06:38		18:44 (D02)	05:56	05:36
	16:58	17:35			19:07	36	18:29 (D03)	19:41	24	19:08 (D02)	20:12	20:38
11	07:32	07:08			07:27		17:53 (D03)	06:36		18:44 (D02)	05:55	05:36
	16:59	17:36			19:09	36	18:29 (D03)	19:42	23	19:07 (D02)	20:13	20:39
12	07:32	07:07			07:26		17:53 (D03)	06:35		18:46 (D02)	05:54	05:36
	17:00	17:37			19:10	35	18:28 (D03)	19:43	20	19:06 (D02)	20:14	20:39
13	07:31	07:06			07:24		17:54 (D03)	06:33		18:47 (D02)	05:53	05:36
	17:01	17:38			19:11	32	18:26 (D03)	19:44	17	19:04 (D02)	20:15	20:40
14	07:31	07:04			07:22		17:55 (D03)	06:32		18:49 (D02)	05:52	05:36
	17:02	17:39			19:12	31	18:26 (D03)	19:45	13	19:02 (D02)	20:16	20:40
15	07:31	07:03			07:21		17:56 (D03)	06:30		18:53 (D02)	05:51	05:36
	17:03	17:41			19:13	28	18:24 (D03)	19:46	4	18:57 (D02)	20:17	20:41
16	07:30	07:02			07:19		17:56 (D03)	06:28			05:50	05:36
	17:04	17:42			19:14	26	18:22 (D03)	19:47			20:18	20:41
17	07:30	07:00			07:17		17:59 (D03)	06:27			05:49	05:36
	17:05	17:43			19:15	21	18:20 (D03)	19:48			20:19	20:41
18	07:29	06:59			07:16		18:01 (D03)	06:25			05:48	05:36
	17:07	17:44			19:16	16	18:17 (D03)	19:49			20:20	20:42
19	07:29	06:58			07:14		18:05 (D03)	06:24			05:47	05:36
	17:08	17:46			19:17	7	18:12 (D03)	19:50			20:21	20:42
20	07:28	06:56			07:12			06:22			05:47	05:36
	17:09	17:47			19:18			19:51			20:22	20:42
21	07:28	06:55			07:11			06:21			05:46	05:36
	17:10	17:48			19:19			19:52			20:23	20:43
22	07:27	06:53			07:09			06:19			05:45	05:36
	17:11	17:49			19:21			19:53			20:24	20:43
23	07:26	06:52			07:07			06:18			05:44	05:37
	17:12	17:50			19:22			19:54			20:25	20:43
24	07:26	06:50		17:07 (D03)	07:06			06:17			05:43	05:37
	17:14	17:51	12	17:19 (D03)	19:23			19:55			20:26	20:43
25	07:25	06:49		17:04 (D03)	07:04			06:15			05:43	05:37
	17:15	17:53	19	17:23 (D03)	19:24			19:56			20:26	20:43
26	07:24	06:48		17:01 (D03)	07:02			06:14			05:42	05:38
	17:16	17:54	23	17:24 (D03)	19:25			19:57			20:27	20:44
27	07:23	06:46		17:00 (D03)	07:01			06:12			05:41	05:38
	17:17	17:55	27	17:27 (D03)	19:26			19:59			20:28	20:44
28	07:22	06:45		16:58 (D03)	06:59		18:59 (D02)	06:11			05:41	05:38
	17:18	17:56	29	17:27 (D03)	19:27	2	19:01 (D02)	20:00			20:29	20:44
29	07:22				06:57		18:53 (D02)	06:10			05:40	05:39
	17:20				19:28	13	19:06 (D02)	20:01			20:30	20:44
30	07:21				06:56		18:51 (D02)	06:08			05:40	05:39
	17:21				19:29	17	19:08 (D02)	20:02			20:31	20:44
31	07:20				06:54		18:49 (D02)				05:39	
	17:22				19:30	20	19:09 (D02)				20:31	
Potential sun hours	298	297			369		398			448	452	
Total, worst case		110			640		337					
Sun reduction		0.62			0.73		0.82					
Oper. time red.		1.00			1.00		1.00					
Wind dir. red.		0.79			0.78		0.65					
Total reduction		0.49			0.57		0.53					
Total, real		54			366		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)
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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 31 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July		August		September		October		November		December	
1	05:40	06:04		06:34	18:43 (D02)	07:04		17:32 (D03)	06:38	07:12	
	20:44	20:25		19:43	23 19:06 (D02)	18:53	34	18:06 (D03)	18:06	16:41	
2	05:40	06:05		06:35	18:42 (D02)	07:05		17:31 (D03)	06:39	07:13	
	20:44	20:24		19:41	24 19:06 (D02)	18:51	35	18:06 (D03)	17:05	16:41	
3	05:41	06:05		06:36	18:41 (D02)	07:06		17:30 (D03)	06:40	07:14	
	20:43	20:23		19:40	26 19:07 (D02)	18:49	36	18:06 (D03)	17:04	16:41	
4	05:41	06:06		06:37	18:40 (D02)	07:07		17:31 (D03)	06:41	07:15	
	20:43	20:22		19:38	27 19:07 (D02)	18:48	36	18:07 (D03)	17:02	16:40	
5	05:42	06:07		06:38	18:40 (D02)	07:08		17:30 (D03)	06:43	07:16	
	20:43	20:21		19:36	27 19:07 (D02)	18:46	37	18:07 (D03)	17:01	16:40	
6	05:42	06:08		06:39	18:39 (D02)	07:09		17:29 (D03)	06:44	07:17	
	20:43	20:20		19:35	28 19:07 (D02)	18:44	38	18:07 (D03)	17:00	16:40	
7	05:43	06:09		06:40	18:39 (D02)	07:10		17:29 (D03)	06:45	07:18	
	20:43	20:19		19:33	27 19:06 (D02)	18:43	37	18:06 (D03)	16:59	16:40	
8	05:44	06:10		06:41	18:39 (D02)	07:11		17:29 (D03)	06:46	07:19	
	20:42	20:17		19:31	27 19:06 (D02)	18:41	37	18:06 (D03)	16:58	16:40	
9	05:44	06:11		06:42	18:39 (D02)	07:12		17:29 (D03)	06:47	07:20	
	20:42	20:16		19:30	26 19:05 (D02)	18:39	36	18:05 (D03)	16:57	16:40	
10	05:45	06:12		06:43	18:39 (D02)	07:13		17:29 (D03)	06:48	07:21	
	20:42	20:15		19:28	25 19:04 (D02)	18:38	35	18:04 (D03)	16:56	16:40	
11	05:46	06:13		06:44	18:40 (D02)	07:14		17:29 (D03)	06:50	07:22	
	20:41	20:14		19:26	23 19:03 (D02)	18:36	34	18:03 (D03)	16:55	16:40	
12	05:46	06:14		06:45	18:41 (D02)	07:15		17:30 (D03)	06:51	07:23	
	20:41	20:12		19:25	21 19:02 (D02)	18:35	32	18:02 (D03)	16:54	16:40	
13	05:47	06:15		06:46	18:42 (D02)	07:16		17:30 (D03)	06:52	07:23	
	20:40	20:11		19:23	18 19:00 (D02)	18:33	31	18:01 (D03)	16:53	16:40	
14	05:48	06:16		06:47	18:44 (D02)	07:17		17:31 (D03)	06:53	07:24	
	20:40	20:10		19:21	13 18:57 (D02)	18:32	28	17:59 (D03)	16:52	16:40	
15	05:49	06:17		06:48	18:47 (D02)	07:19		17:33 (D03)	06:54	07:25	
	20:39	20:08		19:20	6 18:53 (D02)	18:30	25	17:58 (D03)	16:51	16:41	
16	05:49	06:18		06:49		07:20		17:35 (D03)	06:56	07:26	
	20:39	20:07		19:18		18:28	21	17:56 (D03)	16:50	16:41	
17	05:50	06:19		06:50		07:21		17:37 (D03)	06:57	07:26	
	20:38	20:06		19:16		18:27	16	17:53 (D03)	16:49	16:41	
18	05:51	06:20		06:51		07:22		17:40 (D03)	06:58	07:27	
	20:37	20:04		19:15		18:25	9	17:49 (D03)	16:48	16:41	
19	05:52	06:21		06:52		07:23			06:59	07:28	
	20:37	20:03		19:13		18:24			16:48	16:42	
20	05:53	06:22		06:53		07:24			07:00	07:28	
	20:36	20:01		19:11		18:22			16:47	16:42	
21	05:54	06:23		06:54		07:25			07:01	07:29	
	20:35	20:00		19:10		18:21			16:46	16:43	
22	05:54	06:24		06:55		07:26			07:03	07:29	
	20:35	19:58		19:08		18:20			16:46	16:43	
23	05:55	06:25		06:56		07:27			07:04	07:30	
	20:34	19:57		19:06		18:18			16:45	16:43	
24	05:56	06:26		06:57		07:29			07:05	07:30	
	20:33	19:55		19:04		18:17			16:44	16:44	
25	05:57	06:27		06:58	17:44 (D03)	07:30			07:06	07:31	
	20:32	19:54		19:03	15 17:59 (D03)	18:15			16:44	16:45	
26	05:58	06:28		06:59	17:41 (D03)	07:31			07:07	07:31	
	20:31	19:52		19:01	20 18:01 (D03)	18:14			16:43	16:45	
27	05:59	06:29		07:00	17:39 (D03)	07:32			07:08	07:31	
	20:30	19:51		18:59	24 18:03 (D03)	18:13			16:43	16:46	
28	06:00	06:30	18:54 (D02)	07:01	17:37 (D03)	07:33			07:09	07:32	
	20:29	19:49	5 18:59 (D02)	18:58	27 18:04 (D03)	18:11			16:42	16:46	
29	06:01	06:31	18:50 (D02)	07:02	17:35 (D03)	07:34			07:10	07:32	
	20:28	19:48	13 19:03 (D02)	18:56	30 18:05 (D03)	18:10			16:42	16:47	
30	06:02	06:32	18:47 (D02)	07:03	17:33 (D03)	07:35			07:11	07:32	
	20:27	19:46	18 19:05 (D02)	18:54	32 18:05 (D03)	18:09			16:42	16:48	
31	06:03	06:33	18:46 (D02)			07:37				07:32	
	20:26	19:45	20 19:06 (D02)			18:07				16:49	
Potential sun hours	458	428		375		346		298		288	
Total, worst case		56		489		557					
Sun reduction		0.96		0.93		0.84					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.65		0.69		0.79					
Total reduction		0.62		0.64		0.67					
Total, real		35		315		372					

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 32 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (106)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	[January	[February	[March		[April		[May		[June		[July		[August		[September		[October		[November	[December
1	07:32	07:19	06:43		06:52		18:53 (D02)	06:07	05:39	05:40	06:04		06:34		18:51 (D02)	07:04	17:50 (D03)	06:38	07:12	
	16:50	17:23	17:57		19:31	17	19:10 (D02)	20:03	20:32	20:44	20:25		19:43	15	19:06 (D02)	18:53	18:20 (D03)	18:06	16:41	
2	07:33	07:18	06:41		06:51		18:52 (D02)	06:06	05:38	05:40	06:04		06:35		18:50 (D02)	07:05	17:50 (D03)	06:39	07:13	
	16:50	17:25	17:58		19:32	20	19:12 (D02)	20:04	20:33	20:44	20:24		19:41	17	19:07 (D02)	18:51	18:20 (D03)	17:05	16:41	
3	07:33	07:17	06:40		17:25 (D03)	06:49	18:51 (D02)	06:05	05:38	05:41	06:05		06:36		18:48 (D02)	07:06	17:50 (D03)	06:40	07:14	
	16:51	17:26	18:00	6	17:31 (D03)	19:33	21	19:12 (D02)	20:05	20:34	20:23		19:40	20	19:08 (D02)	18:46	18:19 (D03)	17:04	16:41	
4	07:33	07:16	06:38		06:48		18:51 (D02)	06:03	05:38	05:41	06:06		06:37		18:47 (D02)	07:07	17:51 (D03)	06:41	07:15	
	16:52	17:27	18:01	15	17:36 (D03)	19:34	23	19:14 (D02)	20:06	20:34	20:22		19:38	21	19:08 (D02)	18:48	18:19 (D03)	17:02	16:40	
5	07:33	07:15	06:37		17:19 (D03)	06:46	18:50 (D02)	06:02	05:37	05:42	06:07		06:38		18:46 (D02)	07:08	17:51 (D03)	06:43	07:16	
	16:53	17:28	18:02	19	17:38 (D03)	19:35	23	19:13 (D02)	20:07	20:35	20:43		19:36	23	19:09 (D02)	18:46	18:18 (D03)	17:01	16:40	
6	07:33	07:14	06:35		17:17 (D03)	06:44	18:50 (D02)	06:01	05:37	05:42	06:08		06:39		18:46 (D02)	07:09	17:52 (D03)	06:44	07:17	
	16:54	17:30	18:03	23	17:40 (D03)	19:36	23	19:13 (D02)	20:08	20:36	20:43		19:35	23	19:09 (D02)	18:44	18:17 (D03)	17:00	16:40	
7	07:33	07:13	06:34		17:15 (D03)	06:43	18:50 (D02)	06:00	05:37	05:43	06:09		06:40		18:45 (D02)	07:10	17:52 (D03)	06:45	07:18	
	16:55	17:31	18:04	25	17:40 (D03)	19:37	23	19:13 (D02)	20:09	20:36	20:43		19:33	23	19:08 (D02)	18:43	18:16 (D03)	16:59	16:40	
8	07:32	07:12	07:32		18:14 (D03)	06:41	18:50 (D02)	05:58	05:36	05:44	06:10		06:41		18:45 (D02)	07:11	17:53 (D03)	06:46	07:19	
	16:56	17:32	19:05	26	18:40 (D03)	19:38	21	19:11 (D02)	20:10	20:47	20:42		19:31	23	19:08 (D02)	07:12	18:14 (D03)	16:58	16:40	
9	07:32	07:10	07:30		18:14 (D03)	06:39	18:50 (D02)	05:57	05:36	05:44	06:11		06:46		18:45 (D02)	07:12	17:55 (D03)	06:47	07:20	
	16:57	17:33	19:06	28	18:42 (D03)	19:40	20	19:10 (D02)	20:11	20:38	20:42		19:30	22	19:07 (D02)	18:39	17:18 (D03)	16:57	16:40	
10	07:32	07:09	07:29		18:12 (D03)	06:38	18:52 (D02)	05:56	05:36	05:45	06:12		06:43		18:45 (D02)	07:13	17:57 (D03)	06:48	07:21	
	16:58	17:35	19:07	29	18:41 (D03)	19:41	17	19:09 (D02)	20:12	20:38	20:42		19:28	20	19:05 (D02)	18:38	18:09 (D03)	16:56	16:40	
11	07:32	07:08	07:27		18:12 (D03)	06:36	18:53 (D02)	05:55	05:36	05:46	06:13		06:44		18:46 (D02)	07:14	17:57 (D03)	06:49	07:22	
	16:59	17:36	19:09	29	18:41 (D03)	19:42	14	19:07 (D02)	20:13	20:39	20:41		19:26	17	19:03 (D02)	18:36	18:03 (D03)	16:55	16:40	
12	07:32	07:07	07:26		18:12 (D03)	06:35	18:55 (D02)	05:54	05:36	05:46	06:14		06:45		18:46 (D02)	07:15	17:57 (D03)	06:51	07:23	
	17:00	17:37	19:10	30	18:42 (D03)	19:43	10	19:05 (D02)	20:14	20:39	20:41		19:25	16	19:02 (D02)	18:35	18:02 (D03)	16:54	16:40	
13	07:31	07:05	07:24		18:11 (D03)	06:33	18:53 (D02)	05:53	05:36	05:47	06:15		06:46		18:48 (D02)	07:16	17:55 (D03)	06:52	07:23	
	17:01	17:38	19:11	30	18:41 (D03)	19:44	20:15	20:40	20:40	20:40	20:41		19:23	12	19:00 (D02)	07:17	18:00 (D03)	16:53	16:40	
14	07:31	07:04	07:22		18:12 (D03)	06:32	18:54 (D02)	05:52	05:36	05:48	06:16		06:47		18:50 (D02)	07:17	18:00 (D03)	06:53	07:24	
	17:02	17:39	19:12	29	18:41 (D03)	19:45	20:16	20:40	20:40	20:40	20:10		19:21	8	18:58 (D02)	18:32	18:05 (D03)	16:52	16:40	
15	07:31	07:03	07:21		18:12 (D03)	06:30	18:56 (D02)	05:51	05:36	05:49	06:17		06:48		18:47 (D02)	07:19	17:58 (D03)	06:54	07:25	
	17:03	17:41	19:13	28	18:40 (D03)	19:46	20:17	20:41	20:39	20:39	20:08		19:20		18:48 (D02)	07:20	18:00 (D03)	16:51	16:41	
16	07:30	07:02	07:19		18:12 (D03)	06:28	18:57 (D02)	05:50	05:36	05:49	06:18		06:49		18:49 (D02)	07:21	18:01 (D03)	06:56	07:26	
	17:04	17:42	19:14	27	18:39 (D03)	19:47	20:18	20:41	20:39	20:37	20:07		19:18		18:49 (D02)	07:22	18:02 (D03)	16:50	16:41	
17	07:30	07:00	07:17		18:13 (D03)	06:27	18:58 (D02)	05:49	05:36	05:50	06:19		06:50		18:50 (D02)	07:23	18:03 (D03)	06:57	07:26	
	17:05	17:43	19:15	26	18:39 (D03)	19:48	20:19	20:41	20:38	20:38	20:06		19:16		18:51 (D02)	07:24	18:04 (D03)	16:49	16:41	
18	07:29	06:59	07:16		18:13 (D03)	06:25	18:58 (D02)	05:48	05:36	05:51	06:20		06:51		18:52 (D02)	07:25	18:05 (D03)	06:58	07:27	
	17:07	17:44	19:16	24	18:37 (D03)	19:49	20:20	20:42	20:37	20:37	20:04		19:15		18:53 (D02)	07:26	18:06 (D03)	16:48	16:41	
19	07:29	06:58	07:14		18:14 (D03)	06:24	18:59 (D02)	05:47	05:36	05:52	06:21		06:52		18:54 (D02)	07:27	18:07 (D03)	06:59	07:28	
	17:08	17:46	19:17	21	18:35 (D03)	19:50	20:21	20:42	20:37	20:37	20:03		19:13		18:55 (D02)	07:28	18:08 (D03)	16:48	16:42	
20	07:28	06:56	07:12		18:16 (D03)	06:22	18:59 (D02)	05:47	05:36	05:53	06:22		06:53		18:56 (D02)	07:29	18:09 (D03)	16:49	07:28	
	17:09	17:47	19:18	18	18:34 (D03)	19:51	20:22	20:42	20:36	20:36	20:01		19:11		18:57 (D02)	07:30	18:10 (D03)	16:47	16:42	
21	07:28	06:55	07:11		18:18 (D03)	06:21	18:59 (D02)	05:46	05:36	05:53	06:23		06:54		18:58 (D02)	07:31	18:11 (D03)	16:46	16:42	
	17:10	17:48	19:19	12	18:30 (D03)	19:52	20:23	20:43	20:35	20:35	20:00		19:10		18:59 (D02)	07:32	18:12 (D03)	16:45	16:42	
22	07:27	06:53	07:09		18:30 (D03)	06:19	18:59 (D02)	05:45	05:36	05:54	06:24		06:55		18:59 (D02)	07:33	18:13 (D03)	16:44	16:42	
	17:11	17:49	19:21	19:53	06:18	18:59 (D02)	20:24	20:43	20:35	20:35	20:00		19:08	10	18:04 (D03)	07:34	18:14 (D03)	16:43	16:43	
23	07:26	06:52	07:07		06:18	06:18	18:59 (D02)	05:44	05:37	05:55	06:25		06:56		18:00 (D03)	07:35	18:15 (D03)	16:42	16:43	
	17:12	17:50	19:22	19:54	06:17	18:59 (D02)	20:25	20:43	20:34	20:34	20:05		19:06	16	18:16 (D03)	07:36	18:16 (D03)	16:41	16:43	
24	07:26	06:50	07:06		06:17	06:17	18:59 (D02)	05:43	05:37	05:56	06:26		06:57		17:58 (D03)	07:37	18:17 (D03)	16:40	16:43	
	17:14	17:51	19:23	19:55	06:15	18:59 (D02)	20:26	20:43	20:33	20:33	20:05		19:04	20	18:18 (D03)	07:38	18:18 (D03)	16:39	16:44	
25	07:25	06:49	07:04		06:15	06:15	18:59 (D02)	05:43	05:37	05:57	06:27		06:58		17:56 (D03)	07:39	18:19 (D03)	16:38	16:44	
	17:15	17:53	19:24	19:56	06:14	18:59 (D02)	20:26	20:43	20:32	20:32	20:04		19:03	23	18:19 (D03)	07:40	18:20 (D03)	16:37	16:44	
26	07:24	06:48	07:02		06:14	06:14	18:59 (D02)	05:42	05:38	05:58	06:28		06:59		17:55 (D03)	07:41	18:21 (D03)	16:36	16:44	
	17:16	17:54	19:25	19:57	06:12	18:59 (D02)	20:27	20:44	20:31	20:31	20:02		19:01	25	18:20 (D03)	07:42	18:22 (D03)	16:35	16:44	
27	07:23	06:46	07:01		06:12	06:12	18:59 (D02)	05:41	05:38	05:59	06:29		07:00		17:53 (D03)	07:43	18:23 (D03)	16:34	16:44	
	17:17	17:55	19:26	19:58	06:11	18:59 (D02)	20:28	20:44	20:30	20:30	20:01		18:59	27	18:20 (D03)	07:44	18:24 (D03)	16:33	16:44	
28	07:22	06:45	06:59		06:11	06:11	18:59 (D02)	05:41	05:38	06:00	06:30		07:01		17:52 (D03)	07:45	18:25 (D03)	16:32	16:44	
	17:18	17:56	19:27	20:00	06:10	18:59 (D02)	20:29	20:44	20:29	20:29	20:00		18:58	29	18:21 (D03)	07:46	18:26 (D03)	16:31	16:44	
29	07:22		06:57		06:10	06:10	18:59 (D02)	05:40	05:39	06:01	06:31		07:02		17:52 (D03)	07:47	18:27 (D03)	16:30	16:44	
	17:20		19:28	8	19:07 (D02)	20:01	20:30	20:44	20:28	20:28	20:00		18:56	29	18:21 (D03)	07:48	18:28 (D03)	16:29	16:44	
30	07:21		06:56		06:08	06:08	18:57 (D02)	05:40	05:39	06:02	06:32		07:03		17:51 (D03)	07:49	18:29 (D03)	16:28	16:44	
	17:21		19:29	12	19:09 (D02)	20:02	20:31	20:44	20:27	20:27	20:00		18:54	30	18:21 (D03)	07:50	18:30 (D03)	16:27	16:44	
31	07:20		06:54		06:07	06:07	18:54 (D02)	05:39	05:38	06:03	06:33		18:54		18:54 (D02)	07:51	18:31 (D03)	16:26	16:44	
	17:22		19:30	15	19:09 (D02)	20:03	20:31	20:44	20:26	20:26	20:00		18:54	10	19:04 (D02)	07:52	18:32 (D03)	16:25	16:44	
Potential sun hours	298	297	369		398		448		452	458										

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 33 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (107)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	February	March		[April	May	June	July	August		September	October		[NovemberDecember				
1	[07:32 16:50	[07:19 17:23	[06:43 17:57		[06:52 19:31	8	19:02 (D02) 19:12 (D02)	[06:07 20:32	[05:39 20:44	[06:04 20:25	[06:34 19:43	21	18:52 (D02) 19:13 (D02)	[07:04 18:53	28	17:56 (D03) 18:24 (D03)	[06:38 18:06	[07:12 16:41
2	[07:33 16:50	[07:18 17:25	[06:41 17:58		[06:51 19:32	13	18:59 (D02) 19:12 (D02)	[06:06 20:04	[05:38 20:33	[06:05 20:44	[06:35 19:41	22	18:51 (D02) 19:13 (D02)	[07:05 18:51	27	17:56 (D03) 18:23 (D03)	[06:39 17:05	[07:13 16:41
3	[07:33 16:51	[07:17 17:26	[06:40 18:00		[06:49 19:33	15	18:57 (D02) 19:12 (D02)	[06:05 20:05	[05:38 20:34	[06:05 20:43	[06:36 19:40	23	18:50 (D02) 19:13 (D02)	[07:06 18:49	24	17:57 (D03) 18:21 (D03)	[06:40 17:04	[07:14 16:41
4	[07:33 16:52	[07:16 17:27	[06:38 18:01		[06:48 19:34	18	18:56 (D02) 19:14 (D02)	[06:03 20:06	[05:38 20:34	[06:06 20:43	[06:37 19:38	23	18:50 (D02) 19:13 (D02)	[07:07 18:48	23	17:58 (D03) 18:21 (D03)	[06:41 17:02	[07:15 16:40
5	[07:33 16:53	[07:15 17:28	[06:37 18:02		[06:46 19:35	20	18:55 (D02) 19:15 (D02)	[06:02 20:07	[05:37 20:35	[06:07 20:43	[06:38 19:36	23	18:50 (D02) 19:13 (D02)	[07:08 18:46	19	18:00 (D03) 18:19 (D03)	[06:43 17:01	[07:16 16:40
6	[07:33 16:54	[07:14 17:30	[06:35 18:03		[06:44 19:36	21	18:54 (D02) 19:15 (D02)	[06:01 20:08	[05:37 20:36	[06:08 20:43	[06:39 19:35	21	18:50 (D02) 19:11 (D02)	[07:09 18:44	14	18:02 (D03) 18:16 (D03)	[06:44 17:00	[07:17 16:40
7	[07:33 16:55	[07:13 17:31	[06:34 18:04		[06:43 19:37	21	18:54 (D02) 19:17 (D02)	[06:00 20:09	[05:37 20:36	[06:09 20:43	[06:40 19:33	21	18:50 (D02) 19:10 (D02)	[07:10 18:43	6	18:06 (D03) 18:12 (D03)	[06:45 16:59	[07:18 16:40
8	[07:32 16:56	[07:12 17:32	[06:32 19:05	11	[06:41 19:38	23	18:53 (D02) 18:40 (D03)	[05:58 19:38	[06:36 20:10	[06:10 20:17	[06:41 19:31	18	18:50 (D02) 19:08 (D02)	[07:11 18:41		18:02 (D03) 18:51 (D02)	[06:46 17:15	[07:19 16:40
9	[07:32 16:57	[07:10 17:33	[06:30 19:06	17	[06:39 19:40	23	18:52 (D02) 18:42 (D03)	[05:57 19:40	[06:36 20:11	[06:11 20:16	[06:47 19:30	16	18:51 (D02) 19:07 (D02)	[07:12 18:39		18:00 (D03) 18:52 (D02)	[06:47 16:57	[07:20 16:40
10	[07:32 16:58	[07:09 17:35	[06:29 19:07		[06:38 19:41	22	18:53 (D02) 19:12 (D02)	[05:56 20:12	[06:36 20:38	[06:12 20:15	[06:43 19:28	13	18:52 (D02) 19:05 (D02)	[07:13 18:38		18:00 (D03) 18:54 (D02)	[06:48 16:50	[07:21 16:40
11	[07:32 16:59	[07:08 17:36	[06:27 19:09		[06:36 19:42	21	18:53 (D02) 19:14 (D02)	[05:55 20:13	[06:36 20:39	[06:13 20:41	[06:44 19:26	9	18:54 (D02) 19:03 (D02)	[07:14 18:36		18:00 (D03) 18:54 (D02)	[06:50 16:55	[07:22 16:40
12	[07:32 17:00	[07:07 17:37	[06:26 19:10		[06:35 19:43	20	18:54 (D02) 19:14 (D02)	[05:54 20:14	[06:36 20:39	[06:14 20:41	[06:45 19:25		18:54 (D02) 19:05 (D02)	[07:15 18:35		18:00 (D03) 18:54 (D02)	[06:51 16:54	[07:23 16:40
13	[07:31 17:01	[07:05 17:38	[06:24 19:11	28	[06:33 19:44	20	18:46 (D03) 19:15 (D02)	[06:35 20:16	[05:47 20:40	[06:15 20:10	[06:46 19:21		18:46 (D03) 19:07 (D02)	[07:16 18:32		18:00 (D03) 18:54 (D02)	[06:52 16:54	[07:24 16:40
14	[07:31 17:02	[07:04 17:39	[06:22 19:12	29	[06:32 19:45	18	18:45 (D03) 19:11 (D02)	[06:32 20:16	[05:48 20:40	[06:16 20:10	[06:47 19:21		18:45 (D03) 19:07 (D02)	[07:17 18:32		18:00 (D03) 18:54 (D02)	[06:53 16:54	[07:25 16:40
15	[07:31 17:03	[07:03 17:41	[06:21 19:13	30	[06:30 19:46	11	18:45 (D03) 19:08 (D02)	[06:29 20:17	[05:49 20:41	[06:17 20:08	[06:48 19:20		18:45 (D03) 19:07 (D02)	[07:19 18:30		18:00 (D03) 18:54 (D02)	[06:54 16:51	[07:26 16:41
16	[07:30 17:04	[07:02 17:42	[06:19 19:14	30	[06:28 19:47		18:45 (D03) 19:09 (D02)	[06:26 20:18	[05:49 20:41	[06:18 20:07	[06:49 19:18		18:45 (D03) 19:07 (D02)	[07:20 18:28		18:00 (D03) 18:54 (D02)	[06:55 16:50	[07:27 16:41
17	[07:30 17:05	[07:00 17:43	[06:17 19:15	30	[06:27 19:48		18:45 (D03) 19:10 (D02)	[06:25 20:19	[05:50 20:41	[06:19 20:06	[06:50 19:16		18:45 (D03) 19:07 (D02)	[07:21 18:27		18:00 (D03) 18:54 (D02)	[06:56 16:49	[07:28 16:41
18	[07:29 17:07	[06:59 17:44	[06:16 19:16	29	[06:25 19:49		18:45 (D03) 19:10 (D02)	[06:24 20:20	[05:51 20:37	[06:20 20:04	[06:51 19:15	7	18:46 (D03) 19:07 (D02)	[07:22 18:25		18:00 (D03) 18:54 (D02)	[06:57 16:48	[07:29 16:41
19	[07:29 17:08	[06:58 17:46	[06:14 19:17	28	[06:24 19:50		18:46 (D03) 19:10 (D02)	[06:23 20:21	[05:52 20:37	[06:21 20:03	[06:52 19:13	15	18:47 (D03) 19:07 (D02)	[07:23 18:24		18:00 (D03) 18:54 (D02)	[06:58 16:48	[07:30 16:41
20	[07:28 17:09	[06:56 17:47	[06:12 19:18	27	[06:22 19:51		18:47 (D03) 19:10 (D02)	[06:22 20:22	[05:53 20:36	[06:22 20:01	[06:53 19:11	19	18:48 (D03) 19:07 (D02)	[07:24 18:22		18:00 (D03) 18:54 (D02)	[06:59 16:47	[07:31 16:41
21	[07:28 17:10	[06:55 17:48	[06:11 19:19	25	[06:21 19:52		18:48 (D03) 19:10 (D02)	[06:21 20:23	[05:53 20:35	[06:23 20:00	[06:54 19:10	23	18:49 (D03) 19:07 (D02)	[07:25 18:21		18:00 (D03) 18:54 (D02)	[07:00 16:46	[07:32 16:41
22	[07:27 17:11	[06:53 17:49	[06:09 19:21	23	[06:19 19:53		18:49 (D03) 19:10 (D02)	[06:20 20:24	[05:54 20:35	[06:24 19:58	[06:55 19:08	25	18:50 (D03) 19:07 (D02)	[07:26 18:19		18:00 (D03) 18:54 (D02)	[07:01 16:46	[07:33 16:41
23	[07:26 17:12	[06:52 17:50	[06:07 19:22	21	[06:18 19:54		18:49 (D03) 19:10 (D02)	[06:19 20:25	[05:55 20:34	[06:25 19:57	[06:56 19:06	27	18:51 (D03) 19:07 (D02)	[07:27 18:18		18:00 (D03) 18:54 (D02)	[07:02 16:45	[07:34 16:41
24	[07:26 17:14	[06:50 17:51	[06:06 19:23	16	[06:17 19:55		18:50 (D03) 19:10 (D02)	[06:16 20:26	[05:56 20:33	[06:26 19:55	[06:57 19:04	28	18:52 (D03) 19:07 (D02)	[07:28 18:17		18:00 (D03) 18:54 (D02)	[07:03 16:44	[07:35 16:41
25	[07:25 17:15	[06:49 17:53	[06:04 19:24	9	[06:15 19:56		18:51 (D03) 19:10 (D02)	[06:15 20:26	[05:57 20:32	[06:27 19:54	[06:58 19:03	30	18:53 (D03) 19:07 (D02)	[07:29 18:15		18:00 (D03) 18:54 (D02)	[07:04 16:44	[07:36 16:41
26	[07:24 17:16	[06:48 17:54	[06:02 19:25		[06:14 19:57		18:52 (D03) 19:10 (D02)	[06:14 20:27	[05:58 20:31	[06:28 19:52	[06:59 19:01	30	18:54 (D03) 19:07 (D02)	[07:30 18:14		18:00 (D03) 18:54 (D02)	[07:05 16:43	[07:37 16:41
27	[07:23 17:17	[06:46 17:55	[06:01 19:26		[06:12 19:58		18:53 (D03) 19:10 (D02)	[06:12 20:28	[05:59 20:30	[06:29 19:51	[07:00 18:59	30	18:55 (D03) 19:07 (D02)	[07:31 18:12		18:00 (D03) 18:54 (D02)	[07:06 16:43	[07:38 16:41
28	[07:22 17:18	[06:45 17:56	[06:59 19:27		[06:11 20:00		18:54 (D03) 19:10 (D02)	[06:11 20:29	[06:00 20:29	[06:30 19:49	[07:01 19:10	30	18:56 (D03) 19:07 (D02)	[07:32 18:11		18:00 (D03) 18:54 (D02)	[07:07 16:42	[07:39 16:41
29	[07:22 17:20	[06:57 17:58	[06:57 19:28		[06:10 20:01		18:55 (D03) 19:10 (D02)	[06:10 20:30	[06:01 20:44	[06:31 19:48	[07:02 18:57	29	18:57 (D03) 19:07 (D02)	[07:33 18:10		18:00 (D03) 18:54 (D02)	[07:08 16:42	[07:40 16:41
30	[07:21 17:21	[06:56 17:59	[06:56 19:29		[06:08 20:02		18:56 (D03) 19:10 (D02)	[06:09 20:31	[06:02 20:44	[06:32 19:46	[07:03 18:58	29	18:58 (D03) 19:07 (D02)	[07:34 18:09		18:00 (D03) 18:54 (D02)	[07:09 16:42	[07:41 16:41
31	[07:20 17:22	[06:54 17:30	[06:54 19:30		[06:07 20:03		18:57 (D03) 19:10 (D02)	[06:08 20:31	[06:03 20:26	[06:33 19:44	[07:04 18:59	20	18:59 (D03) 19:07 (D02)	[07:35 18:07		18:00 (D03) 18:54 (D02)	[07:10 16:43	[07:42 16:41
Potential sun hours	298	297	369		398		448	452	458	428	375		346		298		288	
Total, worst case			452		271					64	531		141					
Sun reduction			0.73		0.82					0.96	0.93		0.84					
Oper. time red.			1.00		1.00					1.00	1.00		1.00					
Wind dir. red.			0.74		0.63					0.63	0.70		0.74					
Total reduction			0.55		0.52					0.60	0.65		0.63					
Total, real			247		140					39	346		88					

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 34 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March			April			May			June		
1	07:33		15:45 (D03)	07:19		06:43		17:05 (D02)	06:52		06:07		05:39					
	16:50	31	16:16 (D03)	17:23		17:57	17	17:22 (D02)	19:31		20:03		20:32					
2	07:33		15:45 (D03)	07:18		06:41		17:06 (D02)	06:51		06:06		05:38					
	16:50	31	16:16 (D03)	17:25		17:58	13	17:19 (D02)	19:32		20:04		20:33					
3	07:33		15:45 (D03)	07:17		06:40		17:09 (D02)	06:49		06:05		05:38					
	16:51	32	16:17 (D03)	17:26		18:00	5	17:14 (D02)	19:33		20:05		20:34					
4	07:33		15:46 (D03)	07:16		06:38			06:48		06:03		05:38					
	16:52	31	16:17 (D03)	17:27		18:01			19:34		20:06		20:34					
5	07:33		15:46 (D03)	07:15		06:37			06:46		06:02		05:37					
	16:53	32	16:18 (D03)	17:28		18:02			19:35		20:07		20:35					
6	07:33		15:47 (D03)	07:14		06:35			06:44		06:01		05:37					
	16:54	31	16:18 (D03)	17:30		18:03			19:36		20:08		20:36					
7	07:33		15:47 (D03)	07:13		06:34			06:43		06:00		05:37					
	16:55	32	16:19 (D03)	17:31		18:04			19:37		20:09		20:36					
8	07:32		15:47 (D03)	07:12		07:32			06:41		05:58		05:36					
	16:56	31	16:18 (D03)	17:32		19:05			19:39		20:10		20:37					
9	07:32		15:48 (D03)	07:10		07:30			06:39		05:57		05:36					
	16:57	31	16:19 (D03)	17:33		19:06			19:40		20:11		20:38					
10	07:32		15:49 (D03)	07:09		07:29			06:38		05:56		05:36					
	16:58	30	16:19 (D03)	17:35		19:07			19:41		20:12		20:38					
11	07:32		15:50 (D03)	07:08		07:27			06:36		05:55		05:36					
	16:59	30	16:20 (D03)	17:36		19:09			19:42		20:13		20:39					
12	07:32		15:49 (D03)	07:07		07:26			06:35		05:54		05:36					
	17:00	30	16:19 (D03)	17:37		19:10			19:43		20:14		20:39					
13	07:31		15:50 (D03)	07:06		07:24			06:33		05:53		05:36					
	17:01	30	16:20 (D03)	17:38		19:11			19:44		20:15		20:40					
14	07:31		15:51 (D03)	07:04		07:22		17:13 (D02)	06:32		05:52		05:36					
	17:02	28	16:19 (D03)	17:39	2	17:15 (D02)		19:12	06:32		20:16		20:40					
15	07:31		15:52 (D03)	07:03		07:21		17:08 (D02)	06:30		05:51		05:36					
	17:03	28	16:20 (D03)	17:41	11	17:19 (D02)		19:13	19:46		20:17		20:41					
16	07:30		15:52 (D03)	07:02		07:19		17:05 (D02)	06:28		05:50		05:36					
	17:04	27	16:19 (D03)	17:42	15	17:20 (D02)		19:14	19:47		20:18		20:41					
17	07:30		15:53 (D03)	07:00		07:17		17:04 (D02)	06:27		05:49		05:36					
	17:05	27	16:20 (D03)	17:43	18	17:22 (D02)		19:15	19:48		20:19		20:42					
18	07:29		15:54 (D03)	06:59		07:16		17:03 (D02)	06:25		05:48		05:36					
	17:07	25	16:19 (D03)	17:44	20	17:23 (D02)		19:16	19:49		20:20		20:42					
19	07:29		15:55 (D03)	06:58		07:14		17:02 (D02)	06:24		05:47		05:36					
	17:08	24	16:19 (D03)	17:46	22	17:24 (D02)		19:17	19:50		20:21		20:42					
20	07:28		15:56 (D03)	06:56		07:12		17:02 (D02)	06:22		05:47		05:36					
	17:09	22	16:18 (D03)	17:47	24	17:26 (D02)		19:18	19:51		20:22		20:42					
21	07:28		15:58 (D03)	06:55		07:11		17:01 (D02)	06:21		05:46		05:36					
	17:10	20	16:18 (D03)	17:48	25	17:26 (D02)		19:19	19:52		20:23		20:43					
22	07:27		15:59 (D03)	06:53		07:09		17:01 (D02)	06:19		05:45		05:36					
	17:11	18	16:17 (D03)	17:49	25	17:26 (D02)		19:21	19:53		20:24		20:43					
23	07:26		16:01 (D03)	06:52		07:07		17:01 (D02)	06:18		05:44		05:37					
	17:12	15	16:16 (D03)	17:50	26	17:27 (D02)		19:22	19:54		20:25		20:43					
24	07:26		16:03 (D03)	06:50		07:06		17:01 (D02)	06:17		05:43		05:37					
	17:14	10	16:13 (D03)	17:51	25	17:26 (D02)		19:23	19:55		20:26		20:43					
25	07:25			06:49		07:04		17:01 (D02)	06:15		05:43		05:37					
	17:15			17:53	25	17:26 (D02)		19:24	19:56		20:26		20:43					
26	07:24			06:48		07:02		17:01 (D02)	06:14		05:42		05:38					
	17:16			17:54	24	17:25 (D02)		19:25	19:57		20:27		20:44					
27	07:23			06:46		07:01		17:02 (D02)	06:12		05:41		05:38					
	17:17			17:55	22	17:24 (D02)		19:26	19:59		20:28		20:44					
28	07:22			06:45		06:59		17:03 (D02)	06:11		05:41		05:38					
	17:18			17:56	20	17:23 (D02)		19:27	20:00		20:29		20:44					
29	07:22					06:57			06:10		05:40		05:39					
	17:20					19:28			20:01		20:30		20:44					
30	07:21					06:56			06:08		05:40		05:39					
	17:21					19:29			20:02		20:31		20:44					
31	07:20					06:54					05:39							
	17:22					19:30					20:31							
Potential sun hours	298		297		369		398		448		452							
Total, worst case	646		304		35													
Sun reduction	0.45		0.62		0.73													
Oper. time red.	1.00		1.00		1.00													
Wind dir. red.	0.89		0.81		0.81													
Total reduction	0.40		0.51		0.60													
Total, real	261		155		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)
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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 34 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	July	August	September	October	November	December
1	05:40	06:04	06:34	07:04	06:38	07:12
	20:44	20:25	19:43	18:53	18:06	16:41
2	05:40	06:04	06:35	07:05	06:39	07:13
	20:44	20:24	19:41	18:51	17:05	16:41
3	05:41	06:05	06:36	07:06	06:40	07:14
	20:43	20:23	19:40	18:49	17:04	16:41
4	05:41	06:06	06:37	07:07	06:41	07:15
	20:43	20:22	19:38	18:48	17:02	16:40
5	05:42	06:07	06:38	07:08	06:43	07:16
	20:43	20:21	19:36	18:46	17:01	16:40
6	05:42	06:08	06:39	07:09	06:44	07:17
	20:43	20:20	19:35	18:44	17:00	16:40
7	05:43	06:09	06:40	07:10	06:45	07:18
	20:43	20:19	19:33	18:43	16:59	16:40
8	05:44	06:10	06:41	07:11	06:46	07:19
	20:42	20:17	19:31	18:41	16:58	16:40
9	05:44	06:11	06:42	07:12	06:47	07:20
	20:42	20:16	19:30	18:39	16:57	16:40
10	05:45	06:12	06:43	07:13	06:48	07:21
	20:42	20:15	19:28	18:38	16:56	16:40
11	05:46	06:13	06:44	07:14	17:42 (D02)	06:50
	20:41	20:14	19:26	18:36	17:51 (D02)	16:55
12	05:46	06:14	06:45	07:15	17:38 (D02)	06:51
	20:41	20:12	19:25	18:35	17:53 (D02)	16:54
13	05:47	06:15	06:46	07:16	17:36 (D02)	06:52
	20:40	20:11	19:23	18:33	17:55 (D02)	16:53
14	05:48	06:16	06:47	07:17	17:35 (D02)	06:53
	20:40	20:10	19:21	18:32	17:56 (D02)	16:52
15	05:49	06:17	06:48	07:19	17:35 (D02)	06:54
	20:39	20:08	19:20	18:30	17:57 (D02)	16:51
16	05:49	06:18	06:49	07:20	17:33 (D02)	06:56
	20:39	20:07	19:18	18:28	17:57 (D02)	16:50
17	05:50	06:19	06:50	07:21	17:33 (D02)	06:57
	20:38	20:06	19:16	18:27	17:57 (D02)	16:49
18	05:51	06:20	06:51	07:22	17:32 (D02)	06:58
	20:37	20:04	19:15	18:25	17:57 (D02)	16:48
19	05:52	06:21	06:52	07:23	17:32 (D02)	06:59
	20:37	20:03	19:13	18:24	17:57 (D02)	16:48
20	05:53	06:22	06:53	07:24	17:31 (D02)	07:00
	20:36	20:01	19:11	18:22	17:57 (D02)	16:47
21	05:53	06:23	06:54	07:25	17:31 (D02)	07:01
	20:35	20:00	19:10	18:21	17:56 (D02)	16:46
22	05:54	06:24	06:55	07:26	17:32 (D02)	07:03
	20:35	19:58	19:08	18:19	17:56 (D02)	16:46
23	05:55	06:25	06:56	07:27	17:33 (D02)	07:04
	20:34	19:57	19:06	18:18	17:54 (D02)	16:45
24	05:56	06:26	06:57	07:29	17:33 (D02)	07:05
	20:33	19:55	19:04	18:17	17:52 (D02)	16:44
25	05:57	06:27	06:58	07:30	17:34 (D02)	07:06
	20:32	19:54	19:03	18:15	17:51 (D02)	16:44
26	05:58	06:28	06:59	07:31	17:35 (D02)	07:07
	20:31	19:52	19:01	18:14	17:49 (D02)	16:43
27	05:59	06:29	07:00	07:32	17:39 (D02)	07:08
	20:30	19:51	18:59	18:12	17:49 (D02)	16:43
28	06:00	06:30	07:01	07:33	07:09	16:42
	20:29	19:49	18:58	18:11	16:42	16:00 (D03)
29	06:01	06:31	07:02	07:34	07:10	15:31 (D03)
	20:28	19:48	18:56	18:10	16:42	16:00 (D03)
30	06:02	06:32	07:03	07:35	07:11	15:31 (D03)
	20:27	19:46	18:54	18:09	16:42	16:00 (D03)
31	06:03	06:33	07:04	07:36	07:12	15:31 (D03)
	20:26	19:45	18:53	18:07	16:41	16:15 (D03)
Potential sun hours	458	428	375	346	298	288
Total, worst case				340	303	956
Sun reduction				0.84	0.61	0.47
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.81	0.89	0.89
Total reduction				0.69	0.55	0.42
Total, real				234	166	403

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 35 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:33	15:54 (D03)	07:19			06:43			17:07 (D02)	06:52	06:07	05:39					
	16:50	27	16:21 (D03)	17:23		17:57	19		17:26 (D02)	19:31	20:03	20:32					
2	07:33	15:54 (D03)	07:18			06:41			17:08 (D02)	06:51	06:06	05:38					
	16:50	28	16:22 (D03)	17:25		17:58	16		17:24 (D02)	19:32	20:04	20:33					
3	07:33	15:55 (D03)	07:17			06:40			17:10 (D02)	06:49	06:05	05:38					
	16:51	28	16:23 (D03)	17:26		18:00	11		17:21 (D02)	19:33	20:05	20:34					
4	07:33	15:55 (D03)	07:16			06:38				06:48	06:03	05:38					
	16:52	28	16:23 (D03)	17:27		18:01				19:34	20:06	20:34					
5	07:33	15:55 (D03)	07:15			06:37				06:46	06:02	05:37					
	16:53	29	16:24 (D03)	17:28		18:02				19:35	20:07	20:35					
6	07:33	15:56 (D03)	07:14			06:35				06:44	06:01	05:37					
	16:54	29	16:25 (D03)	17:30		18:03				19:36	20:08	20:36					
7	07:33	15:56 (D03)	07:13			06:34				06:43	06:00	05:37					
	16:55	29	16:25 (D03)	17:31		18:04				19:37	20:09	20:36					
8	07:32	15:56 (D03)	07:12			07:32				06:41	05:58	05:36					
	16:56	29	16:25 (D03)	17:32		19:05				19:38	20:10	20:37					
9	07:32	15:56 (D03)	07:10			07:30				06:39	05:57	05:36					
	16:57	30	16:26 (D03)	17:33		19:06				19:40	20:11	20:38					
10	07:32	15:57 (D03)	07:09			07:29				06:38	05:56	05:36					
	16:58	29	16:26 (D03)	17:35		19:07				19:41	20:12	20:38					
11	07:32	15:58 (D03)	07:08			07:27				06:36	05:55	05:36					
	16:59	29	16:27 (D03)	17:36		19:09				19:42	20:13	20:39					
12	07:32	15:57 (D03)	07:07			07:26				06:35	05:54	05:36					
	17:00	30	16:27 (D03)	17:37		19:10				19:43	20:14	20:39					
13	07:31	15:58 (D03)	07:06			07:24				06:33	05:53	05:36					
	17:01	30	16:28 (D03)	17:38		19:11				19:44	20:15	20:40					
14	07:31	15:58 (D03)	07:04			07:22				06:32	05:52	05:36					
	17:02	29	16:27 (D03)	17:39		19:12				19:45	20:16	20:40					
15	07:31	15:59 (D03)	07:03			07:21				06:30	05:51	05:36					
	17:03	29	16:28 (D03)	17:41		19:13				19:46	20:17	20:41					
16	07:30	15:59 (D03)	07:02		17:13 (D02)	07:19				06:28	05:50	05:36					
	17:04	29	16:28 (D03)	17:42	7	17:20 (D02)	19:14			19:47	20:18	20:41					
17	07:30	16:00 (D03)	07:00		17:11 (D02)	07:17				06:27	05:49	05:36					
	17:05	28	16:28 (D03)	17:43	11	17:22 (D02)	19:15			19:48	20:19	20:41					
18	07:29	16:00 (D03)	06:59		17:09 (D02)	07:16				06:25	05:48	05:36					
	17:07	28	16:28 (D03)	17:44	14	17:23 (D02)	19:16			19:49	20:20	20:42					
19	07:29	16:01 (D03)	06:58		17:07 (D02)	07:14				06:24	05:47	05:36					
	17:08	28	16:29 (D03)	17:46	17	17:24 (D02)	19:17			19:50	20:21	20:42					
20	07:28	16:02 (D03)	06:56		17:07 (D02)	07:12				06:22	05:47	05:36					
	17:09	26	16:28 (D03)	17:47	19	17:26 (D02)	19:18			19:51	20:22	20:42					
21	07:28	16:03 (D03)	06:55		17:05 (D02)	07:11				06:21	05:46	05:36					
	17:10	26	16:29 (D03)	17:48	21	17:26 (D02)	19:19			19:52	20:23	20:43					
22	07:27	16:04 (D03)	06:53		17:05 (D02)	07:09				06:19	05:45	05:36					
	17:11	24	16:28 (D03)	17:49	23	17:28 (D02)	19:21			19:53	20:24	20:43					
23	07:26	16:04 (D03)	06:52		17:05 (D02)	07:07				06:18	05:44	05:37					
	17:12	23	16:27 (D03)	17:50	24	17:29 (D02)	19:22			19:54	20:25	20:43					
24	07:26	16:05 (D03)	06:50		17:05 (D02)	07:06				06:17	05:43	05:37					
	17:14	21	16:26 (D03)	17:51	24	17:29 (D02)	19:23			19:55	20:26	20:43					
25	07:25	16:08 (D03)	06:49		17:05 (D02)	07:04				06:15	05:43	05:37					
	17:15	18	16:26 (D03)	17:53	24	17:29 (D02)	19:24			19:56	20:26	20:43					
26	07:24	16:09 (D03)	06:48		17:05 (D02)	07:02				06:14	05:42	05:38					
	17:16	16	16:25 (D03)	17:54	23	17:28 (D02)	19:25			19:57	20:27	20:44					
27	07:23	16:11 (D03)	06:46		17:06 (D02)	07:01				06:12	05:41	05:38					
	17:17	12	16:23 (D03)	17:55	22	17:28 (D02)	19:26			19:59	20:28	20:44					
28	07:22	16:15 (D03)	06:45		17:06 (D02)	06:59				06:11	05:41	05:38					
	17:18	5	16:20 (D03)	17:56	21	17:27 (D02)	19:27			20:00	20:29	20:44					
29	07:22					06:57				06:10	05:40	05:39					
	17:20					19:28				20:01	20:30	20:44					
30	07:21					06:56				06:08	05:40	05:39					
	17:21					19:29				20:02	20:31	20:44					
31	07:20					06:54					05:39						
	17:22					19:30					20:31						
Potential sun hours	298		297			369			398	448	452						
Total, worst case	717		250			46											
Sun reduction	0.45		0.62			0.73											
Oper. time red.	1.00		1.00			1.00											
Wind dir. red.	0.89		0.81			0.81											
Total reduction	0.40		0.51			0.59											
Total, real	288		126			27											

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 35 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	05:40 20:44	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	29 16:09 (D03) 15:40 (D03)
3	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	29 16:09 (D03) 15:40 (D03)
4	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	30 16:10 (D03) 15:41 (D03)
5	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	29 16:10 (D03) 15:41 (D03)
6	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	29 16:10 (D03) 15:42 (D03)
7	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	29 16:11 (D03) 15:42 (D03)
8	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	29 16:11 (D03) 15:43 (D03)
9	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57	28 16:11 (D03) 15:43 (D03)
10	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	28 16:11 (D03) 15:44 (D03)
11	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	27 16:11 (D03) 15:44 (D03)
12	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	27 16:12 (D03) 15:45 (D03)
13	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	26 16:12 (D03) 15:46 (D03)
14	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	26 16:12 (D03) 15:46 (D03)
15	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	27 16:13 (D03) 15:47 (D03)
16	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	26 16:13 (D03) 15:47 (D03)
17	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	26 16:13 (D03) 15:48 (D03)
18	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48	26 16:14 (D03) 15:49 (D03)
19	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	26 16:15 (D03) 15:49 (D03)
20	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	25 16:14 (D03) 15:50 (D03)
21	05:53 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	25 16:15 (D03) 15:50 (D03)
22	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:19	07:03 16:46	25 16:15 (D03) 15:51 (D03)
23	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	25 16:16 (D03) 15:51 (D03)
24	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	25 16:16 (D03) 15:51 (D03)
25	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	26 16:17 (D03) 15:52 (D03)
26	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	26 16:18 (D03) 15:52 (D03)
27	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	07:08 16:43	26 16:18 (D03) 15:52 (D03)
28	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	26 16:18 (D03) 15:53 (D03)
29	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	26 16:19 (D03) 15:54 (D03)
30	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	26 16:20 (D03) 15:54 (D03)
31	06:03 20:26	06:33 19:45	07:04 18:07	07:36 18:07	07:12 16:41	27 16:21 (D03)
Potential sun hours	458	428	375	346	298	833
Total, worst case				302	403	0.47
Sun reduction				0.84	0.61	1.00
Oper. time red.				1.00	0.89	0.42
Wind dir. red.				0.81	0.55	220
Total reduction				0.68	0.42	350
Total, real				207		

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 36 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:33	16:00 (D03)	07:19			06:43			17:08 (D02)	06:52	06:07	05:39					
	16:50	23	16:23 (D03)	17:23		17:57	21		17:29 (D02)	19:31	20:03	20:32					
2	07:33		16:00 (D03)	07:18		06:41			17:09 (D02)	06:51	06:06	05:38					
	16:50	24	16:24 (D03)	17:25		17:58	18		17:27 (D02)	19:32	20:04	20:33					
3	07:33		16:00 (D03)	07:17		06:40			17:10 (D02)	06:49	06:05	05:38					
	16:51	25	16:25 (D03)	17:26		18:00	15		17:25 (D02)	19:33	20:05	20:34					
4	07:33		16:00 (D03)	07:16		06:38			17:12 (D02)	06:48	06:03	05:38					
	16:52	25	16:25 (D03)	17:27		18:01	11		17:23 (D02)	19:34	20:06	20:34					
5	07:33		16:00 (D03)	07:15		06:37				06:46	06:02	05:37					
	16:53	26	16:26 (D03)	17:28		18:02				19:35	20:07	20:35					
6	07:33		16:01 (D03)	07:14		06:35				06:44	06:01	05:37					
	16:54	26	16:27 (D03)	17:30		18:03				19:36	20:08	20:36					
7	07:33		16:01 (D03)	07:13		06:34				06:43	06:00	05:37					
	16:55	27	16:28 (D03)	17:31		18:04				19:37	20:09	20:36					
8	07:32		16:00 (D03)	07:12		07:32				06:41	05:58	05:36					
	16:56	28	16:28 (D03)	17:32		19:05				19:38	20:10	20:37					
9	07:32		16:01 (D03)	07:10		07:30				06:39	05:57	05:36					
	16:57	27	16:28 (D03)	17:33		19:06				19:40	20:11	20:38					
10	07:32		16:01 (D03)	07:09		07:29				06:38	05:56	05:36					
	16:58	28	16:29 (D03)	17:35		19:07				19:41	20:12	20:38					
11	07:32		16:02 (D03)	07:08		07:27				06:36	05:55	05:36					
	16:59	28	16:30 (D03)	17:36		19:09				19:42	20:13	20:39					
12	07:32		16:01 (D03)	07:07		07:26				06:35	05:54	05:36					
	17:00	29	16:30 (D03)	17:37		19:10				19:43	20:14	20:39					
13	07:31		16:02 (D03)	07:06		07:24				06:33	05:53	05:36					
	17:01	29	16:31 (D03)	17:38		19:11				19:44	20:15	20:40					
14	07:31		16:02 (D03)	07:04		07:22				06:32	05:52	05:36					
	17:02	29	16:31 (D03)	17:39		19:12				19:45	20:16	20:40					
15	07:31		16:02 (D03)	07:03		07:21				06:30	05:51	05:36					
	17:03	30	16:32 (D03)	17:41		19:13				19:46	20:17	20:41					
16	07:30		16:02 (D03)	07:02		07:19				06:28	05:50	05:36					
	17:04	30	16:32 (D03)	17:42		19:14				19:47	20:18	20:41					
17	07:30		16:03 (D03)	07:00		17:18 (D02)	07:17			06:27	05:49	05:36					
	17:05	29	16:32 (D03)	17:43	2	17:20 (D02)	19:15			19:48	20:19	20:41					
18	07:29		16:03 (D03)	06:59		17:14 (D02)	07:16			06:25	05:48	05:36					
	17:07	29	16:32 (D03)	17:44	9	17:23 (D02)	19:16			19:49	20:20	20:42					
19	07:29		16:04 (D03)	06:58		17:11 (D02)	07:14			06:24	05:47	05:36					
	17:08	29	16:33 (D03)	17:46	13	17:24 (D02)	19:17			19:50	20:21	20:42					
20	07:28		16:04 (D03)	06:56		17:10 (D02)	07:12			06:22	05:47	05:36					
	17:09	29	16:33 (D03)	17:47	16	17:26 (D02)	19:18			19:51	20:22	20:42					
21	07:28		16:06 (D03)	06:55		17:08 (D02)	07:11			06:21	05:46	05:36					
	17:10	27	16:33 (D03)	17:48	18	17:26 (D02)	19:19			19:52	20:23	20:43					
22	07:27		16:06 (D03)	06:53		17:08 (D02)	07:09			06:19	05:45	05:36					
	17:11	27	16:33 (D03)	17:49	20	17:28 (D02)	19:21			19:53	20:24	20:43					
23	07:26		16:07 (D03)	06:52		17:08 (D02)	07:07			06:18	05:44	05:37					
	17:12	25	16:32 (D03)	17:50	22	17:30 (D02)	19:22			19:54	20:25	20:43					
24	07:26		16:07 (D03)	06:50		17:07 (D02)	07:06			06:17	05:43	05:37					
	17:14	25	16:32 (D03)	17:51	23	17:30 (D02)	19:23			19:55	20:26	20:43					
25	07:25		16:09 (D03)	06:49		17:07 (D02)	07:04			06:15	05:43	05:37					
	17:15	23	16:32 (D03)	17:53	24	17:31 (D02)	19:24			19:56	20:26	20:43					
26	07:24		16:10 (D03)	06:48		17:07 (D02)	07:02			06:14	05:42	05:38					
	17:16	21	16:31 (D03)	17:54	23	17:30 (D02)	19:25			19:57	20:27	20:44					
27	07:23		16:11 (D03)	06:46		17:07 (D02)	07:01			06:12	05:41	05:38					
	17:17	19	16:30 (D03)	17:55	23	17:30 (D02)	19:26			19:59	20:28	20:44					
28	07:22		16:13 (D03)	06:45		17:07 (D02)	06:59			06:11	05:41	05:38					
	17:18	16	16:29 (D03)	17:56	22	17:29 (D02)	19:27			20:00	20:29	20:44					
29	07:22		16:15 (D03)			06:57				06:10	05:40	05:39					
	17:20	12	16:27 (D03)			19:28				20:01	20:30	20:44					
30	07:21		16:18 (D03)			06:56				06:08	05:40	05:39					
	17:21	6	16:24 (D03)			19:29				20:02	20:31	20:44					
31	07:20					06:54					05:39						
	17:22					19:30					20:31						
Potential sun hours	298		297			369			398		448		452				
Total, worst case	751		215			65											
Sun reduction	0.45		0.62			0.73											
Oper. time red.	1.00		1.00			1.00											
Wind dir. red.	0.88		0.80			0.80											
Total reduction	0.40		0.50			0.59											
Total, real	301		108			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)
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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
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(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 36 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41 28 16:12 (D03)
2	05:40 20:44	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41 28 16:12 (D03)
3	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41 28 16:13 (D03)
4	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40 28 16:13 (D03)
5	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40 27 16:13 (D03)
6	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40 26 16:13 (D03)
7	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40 26 16:13 (D03)
8	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40 25 16:13 (D03)
9	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	17:49 (D02) 06:47 17:56 (D02) 16:57	07:20 16:40 25 16:13 (D03)
10	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	17:46 (D02) 06:48 17:59 (D02) 16:56	07:21 16:40 24 16:13 (D03)
11	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	17:43 (D02) 06:50 18:00 (D02) 16:55	07:22 16:40 23 16:13 (D03)
12	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	17:42 (D02) 06:51 18:01 (D02) 16:54	15:50 (D03) 07:23 15:57 (D03) 16:40 23 16:14 (D03)
13	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	17:40 (D02) 06:52 18:02 (D02) 16:53	15:46 (D03) 07:23 16:00 (D03) 16:40 23 16:14 (D03)
14	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	17:39 (D02) 06:53 18:02 (D02) 16:52	15:45 (D03) 07:24 16:01 (D03) 16:40 23 16:14 (D03)
15	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	17:40 (D02) 06:54 18:03 (D02) 16:51	15:44 (D03) 07:25 16:03 (D03) 16:41 22 16:14 (D03)
16	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	17:39 (D02) 06:56 18:03 (D02) 16:50	15:43 (D03) 07:26 16:04 (D03) 16:41 22 16:15 (D03)
17	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	17:39 (D02) 06:57 18:03 (D02) 16:49	15:42 (D03) 07:26 16:05 (D03) 16:41 21 16:14 (D03)
18	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	17:39 (D02) 06:58 18:01 (D02) 16:48	15:41 (D03) 07:27 16:06 (D03) 16:41 21 16:15 (D03)
19	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	17:39 (D02) 06:59 18:00 (D02) 16:48	15:42 (D03) 07:28 16:07 (D03) 16:42 21 16:16 (D03)
20	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	17:39 (D02) 07:00 17:58 (D02) 16:47	15:41 (D03) 07:28 16:08 (D03) 16:42 21 16:16 (D03)
21	05:53 20:35	06:23 20:00	06:54 19:10	07:25 18:21	17:39 (D02) 07:01 17:56 (D02) 16:46	15:41 (D03) 07:29 16:08 (D03) 16:42 20 16:16 (D03)
22	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:19	17:41 (D02) 07:03 17:56 (D02) 16:46	15:41 (D03) 07:29 16:09 (D03) 16:43 20 16:16 (D03)
23	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	17:42 (D02) 07:04 17:54 (D02) 16:45	15:40 (D03) 07:30 16:09 (D03) 16:43 21 16:18 (D03)
24	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	17:44 (D02) 07:05 17:52 (D02) 16:44	15:41 (D03) 07:30 16:10 (D03) 16:44 21 16:18 (D03)
25	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	15:41 (D03) 07:31 16:10 (D03) 16:45 21 16:18 (D03)
26	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	15:41 (D03) 07:31 16:11 (D03) 16:45 21 16:19 (D03)
27	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	07:08 16:43	15:42 (D03) 07:31 16:11 (D03) 16:46 21 16:19 (D03)
28	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	15:42 (D03) 07:32 16:11 (D03) 16:46 22 16:20 (D03)
29	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	15:42 (D03) 07:32 16:11 (D03) 16:47 22 16:20 (D03)
30	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	15:42 (D03) 07:32 16:11 (D03) 16:48 23 16:22 (D03)
31	06:03 20:26	06:33 19:45	07:04 18:07	07:36 18:07	07:12 16:43	15:42 (D03) 07:32 16:11 (D03) 16:49 22 16:22 (D03)
Potential sun hours	458	428	375	346	298	288
Total, worst case				286	465	719
Sun reduction				0.84	0.61	0.47
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.80	0.88	0.88
Total reduction				0.68	0.54	0.42
Total, real				195	253	301

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 37 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:32	16:06 (D03)	07:19	16:23 (D03)	06:43	17:10 (D02)	06:52	06:07	05:39								
	16:50	18	16:24 (D03)	17:23	5	16:28 (D03)	17:57	21	17:31 (D02)	19:31	20:03	20:32					
2	07:33	16:06 (D03)	07:18		06:41	17:10 (D02)	06:51	06:06	05:38								
	16:50	19	16:25 (D03)	17:25		17:58	20	17:30 (D02)	19:32	20:04	20:33						
3	07:33	16:06 (D03)	07:17		06:40	17:11 (D02)	06:49	06:05	05:38								
	16:51	20	16:26 (D03)	17:26		18:00	17	17:28 (D02)	19:33	20:05	20:34						
4	07:33	16:06 (D03)	07:16		06:38	17:13 (D02)	06:48	06:03	05:38								
	16:52	21	16:27 (D03)	17:27		18:01	14	17:27 (D02)	19:34	20:06	20:34						
5	07:33	16:06 (D03)	07:15		06:37	17:15 (D02)	06:46	06:02	05:37								
	16:53	22	16:28 (D03)	17:28		18:02	8	17:23 (D02)	19:35	20:07	20:35						
6	07:33	16:07 (D03)	07:14		06:35		06:44	06:01	05:37								
	16:54	22	16:29 (D03)	17:30		18:03		19:36	20:08	20:36							
7	07:33	16:07 (D03)	07:13		06:34		06:43	06:00	05:37								
	16:55	23	16:30 (D03)	17:31		18:04		19:37	20:09	20:36							
8	07:32	16:06 (D03)	07:12		07:32		06:41	05:58	05:36								
	16:56	24	16:30 (D03)	17:32		19:05		19:38	20:10	20:37							
9	07:32	16:06 (D03)	07:10		07:30		06:39	05:57	05:36								
	16:57	25	16:31 (D03)	17:33		19:06		19:40	20:11	20:38							
10	07:32	16:06 (D03)	07:09		07:29		06:38	05:56	05:36								
	16:58	26	16:32 (D03)	17:35		19:07		19:41	20:12	20:38							
11	07:32	16:07 (D03)	07:08		07:27		06:36	05:55	05:36								
	16:59	26	16:33 (D03)	17:36		19:09		19:42	20:13	20:39							
12	07:32	16:06 (D03)	07:07		07:26		06:35	05:54	05:36								
	17:00	27	16:33 (D03)	17:37		19:10		19:43	20:14	20:39							
13	07:31	16:07 (D03)	07:06		07:24		06:33	05:53	05:36								
	17:01	27	16:34 (D03)	17:38		19:11		19:44	20:15	20:40							
14	07:31	16:06 (D03)	07:04		07:22		06:32	05:52	05:36								
	17:02	28	16:34 (D03)	17:39		19:12		19:45	20:16	20:40							
15	07:31	16:07 (D03)	07:03		07:21		06:30	05:51	05:36								
	17:03	28	16:35 (D03)	17:41		19:13		19:46	20:17	20:41							
16	07:30	16:07 (D03)	07:02		07:19		06:28	05:50	05:36								
	17:04	28	16:35 (D03)	17:42		19:14		19:47	20:18	20:41							
17	07:30	16:07 (D03)	07:00		07:17		06:27	05:49	05:36								
	17:05	29	16:36 (D03)	17:43		19:15		19:48	20:19	20:41							
18	07:29	16:07 (D03)	06:59		07:16		06:25	05:48	05:36								
	17:07	29	16:36 (D03)	17:44		19:16		19:49	20:20	20:42							
19	07:29	16:08 (D03)	06:58		07:14		06:24	05:47	05:36								
	17:08	29	16:37 (D03)	17:46	9	17:24 (D02)	19:17	19:50	20:21	20:42							
20	07:28	16:08 (D03)	06:56		07:12		06:22	05:47	05:36								
	17:09	28	16:36 (D03)	17:47	12	17:26 (D02)	19:18	19:51	20:22	20:42							
21	07:28	16:09 (D03)	06:55		07:11		06:21	05:46	05:36								
	17:10	28	16:37 (D03)	17:48	15	17:26 (D02)	19:19	19:52	20:23	20:43							
22	07:27	16:09 (D03)	06:53		07:09		06:19	05:45	05:36								
	17:11	28	16:37 (D03)	17:49	17	17:28 (D02)	19:21	19:53	20:24	20:43							
23	07:26	16:10 (D03)	06:52		07:07		06:18	05:44	05:37								
	17:12	27	16:37 (D03)	17:50	20	17:30 (D02)	19:22	19:54	20:25	20:43							
24	07:26	16:10 (D03)	06:50		07:06		06:17	05:43	05:37								
	17:14	27	16:37 (D03)	17:51	21	17:30 (D02)	19:23	19:55	20:26	20:43							
25	07:25	16:12 (D03)	06:49		07:04		06:15	05:43	05:37								
	17:15	25	16:37 (D03)	17:53	23	17:32 (D02)	19:24	19:56	20:26	20:43							
26	07:24	16:12 (D03)	06:48		07:02		06:14	05:42	05:38								
	17:16	25	16:37 (D03)	17:54	23	17:32 (D02)	19:25	19:57	20:27	20:44							
27	07:23	16:13 (D03)	06:46		07:01		06:12	05:41	05:38								
	17:17	23	16:36 (D03)	17:55	23	17:32 (D02)	19:26	19:59	20:28	20:44							
28	07:22	16:14 (D03)	06:45		06:59		06:11	05:41	05:38								
	17:18	21	16:35 (D03)	17:56	22	17:31 (D02)	19:27	20:00	20:29	20:44							
29	07:22	16:15 (D03)			06:57		06:10	05:40	05:39								
	17:20	19	16:34 (D03)		19:28		20:01	20:30	20:44								
30	07:21	16:17 (D03)			06:56		06:08	05:40	05:39								
	17:21	16	16:33 (D03)		19:29		20:02	20:31	20:44								
31	07:20	16:19 (D03)			06:54			05:39									
	17:22	12	16:31 (D03)		19:30			20:31									
Potential sun hours	298		297		369		398	448	452								
Total, worst case	750		190		80												
Sun reduction	0.45		0.62		0.73												
Oper. time red.	1.00		1.00		1.00												
Wind dir. red.	0.88		0.80		0.80												
Total reduction	0.40		0.50		0.59												
Total, real	300		95		47												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 37 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	05:40 20:44	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	26 16:15 (D03)
3	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	25 16:15 (D03)
4	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	24 16:15 (D03)
5	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	23 16:15 (D03)
6	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	22 16:15 (D03)
7	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	22 16:15 (D03)
8	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	21 16:15 (D03)
9	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	17:49 (D02) 18:00 (D02)	20 16:14 (D03)
10	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	17:46 (D02) 18:02 (D02)	19 16:14 (D03)
11	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	17:44 (D02) 18:03 (D02)	18 16:14 (D03)
12	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	17:43 (D02) 18:03 (D02)	17 16:14 (D03)
13	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	17:42 (D02) 18:04 (D02)	16 16:15 (D03)
14	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	17:41 (D02) 18:04 (D02)	15 16:14 (D03)
15	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	17:41 (D02) 18:04 (D02)	14 16:14 (D03)
16	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	17:41 (D02) 18:04 (D02)	14 16:15 (D03)
17	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	17:41 (D02) 18:03 (D02)	13 16:14 (D03)
18	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	17:41 (D02) 18:01 (D02)	13 16:15 (D03)
19	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	17:41 (D02) 18:00 (D02)	12 16:15 (D03)
20	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	17:42 (D02) 17:58 (D02)	12 16:15 (D03)
21	05:53 20:35	06:23 20:00	06:54 19:10	07:25 18:21	17:42 (D02) 17:56 (D02)	12 16:16 (D03)
22	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:19	17:45 (D02) 17:56 (D02)	12 16:16 (D03)
23	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	17:47 (D02) 17:54 (D02)	12 16:17 (D03)
24	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	17:05 16:44	12 16:17 (D03)
25	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	17:06 16:44	12 16:17 (D03)
26	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	17:07 16:43	13 16:19 (D03)
27	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	17:08 16:43	13 16:19 (D03)
28	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	17:09 16:42	14 16:20 (D03)
29	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	17:10 16:42	15 16:21 (D03)
30	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	17:11 16:42	15 16:22 (D03)
31	06:03 20:26	06:33 19:45	07:04 18:07	07:36 18:07	17:12 16:43	17 16:23 (D03)
Potential sun hours	458	428	375	346	298	288
Total, worst case				266	510	519
Sun reduction				0.84	0.61	0.47
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.80	0.88	0.88
Total reduction				0.68	0.54	0.42
Total, real				180	277	217

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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 38 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (112)****Assumptions for shadow calculations**

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

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Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:32		07:19		16:24 (D03)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38			07:12		16:02 (D03)				16:02 (D03)	
	16:50		17:23	19	16:43 (D03)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06			16:41	15	16:17 (D03)				16:17 (D03)	
2	07:33		07:18		16:26 (D03)	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39			07:13		16:03 (D03)				16:03 (D03)	
	16:50		17:25	15	16:41 (D03)	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05			16:41	13	16:16 (D03)				16:16 (D03)	
3	07:33		07:17		16:28 (D03)	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40			07:14		16:05 (D03)				16:05 (D03)	
	16:51		17:26	12	16:40 (D03)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04			16:41	11	16:16 (D03)				16:16 (D03)	
4	07:33		07:16		16:32 (D03)	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41			07:15		16:06 (D03)				16:06 (D03)	
	16:52		17:27	4	16:36 (D03)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02			16:40	10	16:16 (D03)				16:16 (D03)	
5	07:33		07:15			06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43			07:16		16:09 (D03)				16:09 (D03)	
	16:53		17:28			18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01			16:40	5	16:14 (D03)				16:14 (D03)	
6	07:33		07:14			06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44			07:17						07:17	
	16:54		17:30			18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00			16:40						16:40	
7	07:33		16:24 (D03)		07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45			16:01 (D03)		07:18				07:18	
	16:55	5	16:29 (D03)		17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	6		16:07 (D03)		16:40				16:40	
8	07:32		16:21 (D03)		07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46			15:58 (D03)		07:19				07:19	
	16:56	9	16:30 (D03)		17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	13		16:11 (D03)		16:40				16:40	
9	07:32		16:21 (D03)		07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47			15:56 (D03)		07:20				07:20	
	16:57	11	16:32 (D03)		17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16		16:12 (D03)		16:40				16:40	
10	07:32		16:20 (D03)		07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48			15:55 (D03)		07:21				07:21	
	16:58	13	16:33 (D03)		17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	19		16:14 (D03)		16:40				16:40	
11	07:32		16:20 (D03)		07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50			15:55 (D03)		07:22				07:22	
	16:59	14	16:34 (D03)		17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	20		16:15 (D03)		16:40				16:40	
12	07:32		16:19 (D03)		07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51			15:54 (D03)		07:23				07:23	
	17:00	16	16:35 (D03)		17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	22		16:16 (D03)		16:40				16:40	
13	07:31		16:19 (D03)		07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52			15:53 (D03)		07:23				07:23	
	17:01	17	16:36 (D03)		17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	24		16:17 (D03)		16:40				16:40	
14	07:31		16:18 (D03)		07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53			15:52 (D03)		07:24				07:24	
	17:02	19	16:37 (D03)		17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	25		16:17 (D03)		16:40				16:40	
15	07:31		16:18 (D03)		07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54			15:53 (D03)		07:25				07:25	
	17:03	21	16:39 (D03)		17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	25		16:18 (D03)		16:40				16:40	
16	07:30		16:17 (D03)		07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56			15:53 (D03)		07:26				07:26	
	17:04	22	16:39 (D03)		17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	25		16:18 (D03)		16:41				16:41	
17	07:30		16:18 (D03)		07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57			15:52 (D03)		07:26				07:26	
	17:05	23	16:41 (D03)		17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	27		16:19 (D03)		16:41				16:41	
18	07:29		16:17 (D03)		06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58			15:52 (D03)		07:27				07:27	
	17:07	25	16:42 (D03)		17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	27		16:19 (D03)		16:41				16:41	
19	07:29		16:18 (D03)		06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59			15:53 (D03)		07:28				07:28	
	17:08	25	16:43 (D03)		17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	27		16:20 (D03)		16:42				16:42	
20	07:28		16:18 (D03)		06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00			15:53 (D03)		07:28				07:28	
	17:09	25	16:43 (D03)		17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	27		16:20 (D03)		16:42				16:42	
21	07:28		16:18 (D03)		06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01			15:53 (D03)		07:29				07:29	
	17:10	26	16:44 (D03)		17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	26		16:19 (D03)		16:42				16:42	
22	07:27		16:18 (D03)		06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03			15:54 (D03)		07:29				07:29	
	17:11	27	16:45 (D03)		17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	25		16:19 (D03)		16:43				16:43	
23	07:26		16:18 (D03)		06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04			15:54 (D03)		07:30				07:30	
	17:12	27	16:45 (D03)		17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	25		16:19 (D03)		16:43				16:43	
24	07:26		16:18 (D03)		06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05			15:55 (D03)		07:30				07:30	
	17:14	27	16:45 (D03)		17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	25		16:20 (D03)		16:44				16:44	
25	07:25		16:19 (D03)		06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06			15:56 (D03)		07:31				07:31	
	17:15	27	16:46 (D03)		17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	23		16:19 (D03)		16:45				16:45	
26	07:24		16:20 (D03)		06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07			15:56 (D03)		07:31				07:31	
	17:16	25	16:45 (D03)		17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	22		16:18 (D03)		16:45				16:45	
27	07:23		16:20 (D03)		06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08			15:57 (D03)		07:31				07:31	
	17:17	25	16:45 (D03)		17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	21		16:18 (D03)		16:46				16:46	
28	07:22		16:20 (D03)		06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09			15:58 (D03)		07:32				07:32	
	17:18	25	16:45 (D03)		17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	19		16:17 (D03)		16:46				16:46	
29	07:22		16:21 (D03)			06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10			15:59 (D03)		07:32				07:32	
	17:20	24	16:45 (D03)		</																			

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January			February			March			April			May			June		
1	07:33	15:54 (D03)	07:19			06:43			17:07 (D02)	06:52	06:07	05:39					
	16:50	27	16:21 (D03)	17:23		17:57	24		17:31 (D02)	19:31	20:03	20:32					
2	07:33	15:55 (D03)	07:18			06:41			17:07 (D02)	06:51	06:06	05:38					
	16:50	26	16:21 (D03)	17:25		17:58	23		17:30 (D02)	19:32	20:04	20:33					
3	07:33	15:55 (D03)	07:17			06:40			17:07 (D02)	06:49	06:05	05:38					
	16:51	27	16:22 (D03)	17:26		18:00	21		17:28 (D02)	19:33	20:05	20:34					
4	07:33	15:55 (D03)	07:16			06:38			17:08 (D02)	06:48	06:03	05:38					
	16:52	28	16:23 (D03)	17:27		18:01	19		17:27 (D02)	19:34	20:06	20:34					
5	07:33	15:55 (D03)	07:15			06:37			17:09 (D02)	06:46	06:02	05:37					
	16:53	29	16:24 (D03)	17:28		18:02	16		17:25 (D02)	19:35	20:07	20:35					
6	07:33	15:56 (D03)	07:14			06:35			17:12 (D02)	06:44	06:01	05:37					
	16:54	28	16:24 (D03)	17:30		18:03	11		17:23 (D02)	19:36	20:08	20:36					
7	07:33	15:56 (D03)	07:13			06:34				06:43	06:00	05:37					
	16:55	29	16:25 (D03)	17:31		18:04				19:37	20:09	20:36					
8	07:32	15:55 (D03)	07:12			07:32				06:41	05:58	05:36					
	16:56	30	16:25 (D03)	17:32		19:05				19:39	20:10	20:37					
9	07:32	15:56 (D03)	07:10			07:30				06:39	05:57	05:36					
	16:57	30	16:26 (D03)	17:33		19:06				19:40	20:11	20:38					
10	07:32	15:56 (D03)	07:09			07:29				06:38	05:56	05:36					
	16:58	31	16:27 (D03)	17:35		19:07				19:41	20:12	20:38					
11	07:32	15:57 (D03)	07:08			07:27				06:36	05:55	05:36					
	16:59	30	16:27 (D03)	17:36		19:09				19:42	20:13	20:39					
12	07:32	15:56 (D03)	07:07			07:26				06:35	05:54	05:36					
	17:00	31	16:27 (D03)	17:37		19:10				19:43	20:14	20:39					
13	07:31	15:57 (D03)	07:06			07:24				06:33	05:53	05:36					
	17:01	31	16:28 (D03)	17:38		19:11				19:44	20:15	20:40					
14	07:31	15:57 (D03)	07:04			07:22				06:32	05:52	05:36					
	17:02	31	16:28 (D03)	17:39		19:12				19:45	20:16	20:40					
15	07:31	15:58 (D03)	07:03			07:21				06:30	05:51	05:36					
	17:03	31	16:29 (D03)	17:41		19:13				19:46	20:17	20:41					
16	07:30	15:58 (D03)	07:02			07:19				06:28	05:50	05:36					
	17:04	31	16:29 (D03)	17:42		19:14				19:47	20:18	20:41					
17	07:30	15:58 (D03)	07:00			07:17				06:27	05:49	05:36					
	17:05	31	16:29 (D03)	17:43		19:15				19:48	20:19	20:41					
18	07:29	15:58 (D03)	06:59			07:16				06:25	05:48	05:36					
	17:07	31	16:29 (D03)	17:44		19:16				19:49	20:20	20:42					
19	07:29	16:00 (D03)	06:58		17:14 (D02)	07:14				06:24	05:47	05:36					
	17:08	30	16:30 (D03)	17:46	10	17:24 (D02)	19:17			19:50	20:21	20:42					
20	07:28	16:00 (D03)	06:56		17:12 (D02)	07:12				06:22	05:47	05:36					
	17:09	30	16:30 (D03)	17:47	14	17:26 (D02)	19:18			19:51	20:22	20:42					
21	07:28	16:01 (D03)	06:55		17:09 (D02)	07:11				06:21	05:46	05:36					
	17:10	29	16:30 (D03)	17:48	17	17:26 (D02)	19:19			19:52	20:23	20:43					
22	07:27	16:01 (D03)	06:53		17:09 (D02)	07:09				06:19	05:45	05:36					
	17:11	29	16:30 (D03)	17:49	19	17:28 (D02)	19:21			19:53	20:24	20:43					
23	07:26	16:02 (D03)	06:52		17:08 (D02)	07:07				06:18	05:44	05:37					
	17:12	28	16:30 (D03)	17:50	22	17:30 (D02)	19:22			19:54	20:25	20:43					
24	07:26	16:02 (D03)	06:50		17:07 (D02)	07:06				06:17	05:43	05:37					
	17:14	27	16:29 (D03)	17:51	23	17:30 (D02)	19:23			19:55	20:26	20:43					
25	07:25	16:04 (D03)	06:49		17:07 (D02)	07:04				06:15	05:43	05:37					
	17:15	25	16:29 (D03)	17:53	24	17:31 (D02)	19:24			19:56	20:26	20:43					
26	07:24	16:05 (D03)	06:48		17:06 (D02)	07:02				06:14	05:42	05:38					
	17:16	24	16:29 (D03)	17:54	25	17:31 (D02)	19:25			19:57	20:27	20:44					
27	07:23	16:06 (D03)	06:46		17:06 (D02)	07:01				06:12	05:41	05:38					
	17:17	22	16:28 (D03)	17:55	25	17:31 (D02)	19:26			19:59	20:28	20:44					
28	07:22	16:08 (D03)	06:45		17:06 (D02)	06:59				06:11	05:41	05:38					
	17:18	19	16:27 (D03)	17:56	25	17:31 (D02)	19:27			20:00	20:29	20:44					
29	07:22	16:09 (D03)				06:57				06:10	05:40	05:39					
	17:20	16	16:25 (D03)			19:28				20:01	20:30	20:44					
30	07:21	16:12 (D03)				06:56				06:08	05:40	05:39					
	17:21	11	16:23 (D03)			19:29				20:02	20:31	20:44					
31	07:20					06:54					05:39						
	17:22					19:30					20:31						
Potential sun hours	298		297			369				398	448	452					
Total, worst case		822		204		114											
Sun reduction		0.45		0.62		0.73											
Oper. time red.		1.00		1.00		1.00											
Wind dir. red.		0.89		0.80		0.80											
Total reduction		0.40		0.50		0.59											
Total, real		331		102		67											

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	July	August	September	October	November	December
1	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	05:40 20:44	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	30 16:09 (D03)
3	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	31 16:10 (D03)
4	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	30 16:10 (D03)
5	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	29 16:10 (D03)
6	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	28 16:10 (D03)
7	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	17:50 (D02) 17:57 (D02)	28 16:11 (D03)
8	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	17:46 (D02) 18:00 (D02)	29 16:11 (D03)
9	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	17:44 (D02) 18:01 (D02)	28 16:11 (D03)
10	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	17:42 (D02) 18:02 (D02)	27 16:11 (D03)
11	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	17:41 (D02) 18:03 (D02)	27 16:11 (D03)
12	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	17:40 (D02) 18:03 (D02)	11 15:44 (D03)
13	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	17:39 (D02) 18:03 (D02)	16 15:57 (D03)
14	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	17:38 (D02) 18:03 (D02)	19 15:59 (D03)
15	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	17:39 (D02) 18:04 (D02)	22 16:01 (D03)
16	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	17:39 (D02) 18:04 (D02)	24 16:02 (D03)
17	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	17:38 (D02) 18:03 (D02)	25 16:02 (D03)
18	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	17:39 (D02) 18:01 (D02)	27 16:03 (D03)
19	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	17:39 (D02) 18:00 (D02)	28 16:05 (D03)
20	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	17:40 (D02) 17:58 (D02)	29 16:05 (D03)
21	05:53 20:35	06:23 20:00	06:54 19:10	07:25 18:21	17:40 (D02) 17:56 (D02)	29 16:05 (D03)
22	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:19	17:43 (D02) 17:56 (D02)	30 16:06 (D03)
23	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	17:45 (D02) 17:54 (D02)	30 16:06 (D03)
24	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	17:05 16:44	30 16:07 (D03)
25	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	17:06 16:44	30 16:07 (D03)
26	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	17:07 16:43	31 16:08 (D03)
27	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	17:08 16:43	31 16:08 (D03)
28	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	17:09 16:42	31 16:08 (D03)
29	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	17:10 16:42	31 16:08 (D03)
30	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	17:11 16:42	30 16:08 (D03)
31	06:03 20:26	06:33 19:45	07:04 18:53	07:36 18:07	17:12 16:43	26 16:20 (D03)
Potential sun hours	458	428	375	346	298	288
Total, worst case				326	504	804
Sun reduction				0.84	0.61	0.47
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.80	0.89	0.89
Total reduction				0.68	0.55	0.42
Total, real				221	275	338

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 40 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (114)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	16:32 (D03)	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38
	16:50			17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06
2	07:33	17:23 25	16:57 (D03)	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06
	16:50		16:32 (D03)	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39
3	07:33	17:25 26	16:58 (D03)	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05
	16:51		16:32 (D03)	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40
4	07:33	17:26 26	16:58 (D03)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04
	16:52		16:32 (D03)	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41
5	07:33	17:27 26	16:58 (D03)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02
	16:53		16:32 (D03)	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43
6	07:33	17:28 26	16:58 (D03)	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01
	16:54		16:33 (D03)	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44
7	07:33	17:30 25	16:58 (D03)	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00
	16:55		16:33 (D03)	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45
8	07:32	17:31 25	16:58 (D03)	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59
	16:56		16:34 (D03)	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46
9	07:32	17:32 24	16:58 (D03)	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58
	16:57		16:34 (D03)	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47
10	07:32	17:33 22	16:56 (D03)	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57
	16:58		16:35 (D03)	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48
11	07:32	17:35 21	16:56 (D03)	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56
	16:59		16:37 (D03)	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50
12	07:32	17:36 18	16:55 (D03)	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55
	17:00		16:39 (D03)	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51
13	07:31	17:37 14	16:53 (D03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54
	17:01		16:41 (D03)	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52
14	07:31	17:38 9	16:50 (D03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53
	17:02			07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53
15	07:31	17:39		19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52
	17:03			07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54
16	07:30	17:41		19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51
	17:04			07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56
17	07:30	17:42		19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50
	17:05			07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57
18	07:29	17:43		19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49
	17:07			07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58
19	07:29	17:44		19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48
	17:08			07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59
20	07:28	17:46		19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48
	17:09			07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00
21	07:28	17:47		19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47
	17:10			07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01
22	07:27	17:48		19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46
	17:11			07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03
23	07:26	17:49		19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46
	17:12			07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04
24	07:26	16:41 (D03)	06:52	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45
	17:14		16:44 (D03)	17:50	19:22	19:54	20:25	20:43	19:57	19:06	18:18	16:45
25	07:25	16:37 (D03)	06:50	17:51	19:23	19:55	20:26	20:43	19:55	19:04	18:17	16:44
	17:15		16:48 (D03)	17:51	19:23	19:55	20:26	20:43	19:55	19:04	18:17	16:44
26	07:24	16:36 (D03)	06:49	17:52	19:24	19:56	20:26	20:43	19:54	19:03	18:15	16:44
	17:16		16:51 (D03)	17:53	19:24	19:56	20:26	20:43	19:54	19:03	18:15	16:44
27	07:23	16:35 (D03)	06:48	17:54	19:25	19:57	20:27	20:44	19:52	19:01	18:14	16:43
	17:17		16:52 (D03)	17:54	19:25	19:57	20:27	20:44	19:52	19:01	18:14	16:43
28	07:22	16:34 (D03)	06:46	17:55	19:26	19:58	20:28	20:44	19:51	18:59	18:12	16:43
	17:18		16:53 (D03)	17:55	19:26	19:58	20:28	20:44	19:51	18:59	18:12	16:43
29	07:22	16:33 (D03)	06:45	17:56	19:27	19:59	20:29	20:44	19:52	18:58	18:11	16:42
	17:20		16:54 (D03)	17:56	19:27	19:59	20:29	20:44	19:52	18:58	18:11	16:42
30	07:21	16:33 (D03)			19:28	20:01	20:30	20:44	19:48	18:56	18:10	16:42
	17:21		16:55 (D03)		19:28	20:01	20:30	20:44	19:48	18:56	18:10	16:42
31	07:20	16:32 (D03)			19:29	20:02	20:31	20:44	19:46	18:54	18:09	16:42
	17:22		16:57 (D03)		19:30	20:03	20:32	20:45	19:47	18:55	18:10	16:42
Potential sun hours	298											
Total, worst case	157	297		369	398	448	452	458	428	375	346	298
Sun reduction	0.45	0.62									46	405
Oper. time red.	1.00	1.00									0.84	0.61
Wind dir. red.	0.86	0.86									1.00	1.00
Total reduction	0.39	0.54									0.86	0.86
Total, real	61	154									0.73	0.53
											33	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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 41 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (115)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January		February		March	April	May	June	July	August	September	October	November	December
1	07:33	15:48 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	11 15:59 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	15:49 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39	07:13
	16:50	10 15:59 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	15:51 (D03)	07:17	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	7 15:58 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	15:54 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	2 15:56 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33		07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53		17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33		07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54		17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33		07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55		17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32		07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56		17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32		07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57		17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32		07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58		17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32		07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59		17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32		07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00		17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31		07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01		17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31		07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02		17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31		07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03		17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:40
16	07:30		07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04		17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30		07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05		17:43	19:15	19:48	20:19	20:42	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29		06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07		17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29		06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08		17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28		06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09		17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28		06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01	07:29
	17:10		17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:42
22	07:27		06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11		17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	16:43
23	07:26		06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12		17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26		06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14		17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25		06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15		17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24		06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16		17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23		06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17		17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	16:46
28	07:22		06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18		17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22			06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20			19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21			06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21			19:29	20:02	20:31	20:44		19:46	18:54	18:09	16:42	16:48
31	07:20			06:54		05:39		06:03	06:33		07:37		07:32
	17:22			19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298		297	369	398	448	452	458	428	375	346	298	288
Total, worst case		30											342
Sun reduction		0.45											0.47
Oper. time red.		1.00											1.00
Wind dir. red.		0.89											0.89
Total reduction		0.40											0.42
Total, real		12											144

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 42 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (116)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January		February		March	April	May	June	July	August	September	October	November	December	
1	07:33	15:51 (D03)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38		07:12	15:40 (D03)
2	16:50	16:16 (D03)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	20	16:41	16:00 (D03)
	07:33	15:51 (D03)	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39		07:13	15:40 (D03)
3	16:50	16:17 (D03)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	21	16:41	16:01 (D03)
	07:33	15:52 (D03)	07:17	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40		07:14	15:40 (D03)
4	16:51	16:17 (D03)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	22	16:41	16:02 (D03)
	07:33	15:53 (D03)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41		07:15	15:40 (D03)
5	16:52	16:17 (D03)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	23	16:40	16:03 (D03)
	07:33	15:53 (D03)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43		07:16	15:40 (D03)
6	16:53	16:18 (D03)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	23	16:40	16:03 (D03)
	07:33	15:54 (D03)	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44		07:17	15:40 (D03)
7	16:54	16:18 (D03)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	24	16:40	16:04 (D03)
	07:33	15:55 (D03)	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45		07:18	15:40 (D03)
8	16:55	16:18 (D03)	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	25	16:40	16:05 (D03)
	07:32	15:55 (D03)	07:12	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46		07:19	15:41 (D03)
9	16:56	16:18 (D03)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	24	16:40	16:05 (D03)
	07:32	15:56 (D03)	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47		07:20	15:40 (D03)
10	16:57	16:18 (D03)	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	25	16:40	16:05 (D03)
	07:32	15:57 (D03)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		07:21	15:40 (D03)
11	16:58	16:18 (D03)	17:35	09:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	26	16:40	16:06 (D03)
	07:32	15:58 (D03)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		07:22	15:41 (D03)
12	16:59	16:18 (D03)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	25	16:40	16:06 (D03)
	07:32	15:59 (D03)	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		07:23	15:41 (D03)
13	17:00	16:17 (D03)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	26	16:40	16:07 (D03)
	07:31	16:00 (D03)	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		07:23	15:42 (D03)
14	17:01	16:17 (D03)	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	26	16:40	16:08 (D03)
	07:31	16:01 (D03)	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		07:24	15:42 (D03)
15	17:02	16:16 (D03)	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	26	16:40	16:08 (D03)
	07:31	16:03 (D03)	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		07:25	15:42 (D03)
16	17:03	16:16 (D03)	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	26	16:40	16:08 (D03)
	07:30	16:05 (D03)	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		07:26	15:43 (D03)
17	17:04	16:14 (D03)	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	26	16:41	16:09 (D03)
	07:30	16:09 (D03)	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		07:26	15:43 (D03)
18	17:05	16:11 (D03)	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	26	16:41	16:09 (D03)
	07:29	16:59	17:43	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		07:27	15:44 (D03)
19	17:07	17:44		19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	26	16:41	16:10 (D03)
	07:29	16:58	17:44	06:58	07:14	06:24	05:47	05:36	06:21	06:52	07:23	06:59		07:28	15:44 (D03)
20	17:08	17:46		19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	27	16:42	16:11 (D03)
	07:28	16:56	17:46	06:56	07:12	06:22	05:47	05:36	06:22	06:53	07:24	07:00		07:28	15:44 (D03)
21	17:09	17:47		19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	27	16:42	16:11 (D03)
	07:28	16:55	17:47	06:55	07:11	06:21	05:46	05:36	06:23	06:54	07:25	07:01		07:29	15:45 (D03)
22	17:10	17:48		19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	27	16:42	16:12 (D03)
	07:27	16:53	17:48	06:53	07:09	06:19	05:45	05:36	06:24	06:55	07:26	07:03		07:29	15:45 (D03)
23	17:11	17:49		19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	27	16:43	16:12 (D03)
	07:26	16:52	17:49	06:52	07:07	06:18	05:44	05:37	06:25	06:56	07:27	07:04		07:30	15:46 (D03)
24	17:12	17:50		19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	27	16:43	16:13 (D03)
	07:26	16:50	17:50	06:50	07:06	06:17	05:43	05:37	06:26	06:57	07:29	07:05		07:30	15:46 (D03)
25	17:14	17:51		19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	27	16:44	16:13 (D03)
	07:25	16:49	17:51	06:49	07:04	06:15	05:43	05:37	06:27	06:58	07:30	07:06		07:31	15:47 (D03)
26	17:15	17:53		19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	26	16:45	16:13 (D03)
	07:24	16:48	17:53	06:48	07:02	06:14	05:42	05:38	06:28	06:59	07:31	07:07		07:31	15:48 (D03)
27	17:16	17:54		19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	9	15:53 (D03)	16:45
	07:23	16:46	17:54	06:46	07:01	06:12	05:41	05:38	06:29	07:00	07:32	07:08		15:42 (D03)	07:31
28	17:17	17:55		19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:12	16:43	13	15:55 (D03)	16:46
	07:22	16:45	17:56	06:45	06:59	06:11	05:41	05:38	06:30	07:01	07:33	07:09		15:41 (D03)	07:32
29	17:18	17:56		19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	15	15:56 (D03)	16:46
	07:22	16:44	17:56	06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10		15:40 (D03)	07:32
30	17:20	17:58		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	17	15:57 (D03)	16:47
	07:21	16:56	17:58	06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11		15:40 (D03)	07:32
31	17:21	17:59		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	18	15:58 (D03)	16:48
	07:20	16:54	17:59	06:54	06:07	05:39	05:38	06:03	06:33	07:04	07:37	07:12		07:32	15:50 (D03)
	17:22	18:00		19:30	20:03	20:31	20:44	20:26	19:45	18:07	17:12	16:49	26	16:49	16:16 (D03)
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288			
Total, worst case	332													785	
Sun reduction	0.45										0.61			0.47	
Oper. time red.	1.00										1.00			1.00	
Wind dir. red.	0.89										0.89			0.89	
Total reduction	0.40										0.54			0.42	
Total, real	133										39			329	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 43 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (117)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:49	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:39 20:43	06:03 20:25	06:34 19:43	07:04 18:52	06:38 18:06	07:12 16:41
2	07:32 16:50	07:18 17:24	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:43	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:32 16:51	07:17 17:26	06:40 17:59	06:49 19:33	06:04 20:05	05:38 20:33	05:40 20:43	06:05 20:23	06:36 19:39	07:06 18:49	06:40 17:03	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:47 19:34	06:03 20:06	05:37 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:47	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:42 17:01	07:16 16:40
6	07:32 16:54	07:14 17:29	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:32 16:55	07:12 17:31	06:33 18:04	06:42 19:37	05:59 20:09	05:36 20:36	05:43 20:42	06:09 20:18	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:11 17:32	06:32 19:05	06:41 19:38	05:58 20:10	05:36 20:37	05:43 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:39	05:57 20:11	05:36 20:37	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:34	06:29 19:07	06:38 19:40	05:56 20:12	05:36 20:38	05:45 20:41	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:08	06:36 19:41	05:55 20:13	05:36 20:39	05:45 20:41	06:13 20:13	06:44 19:26	07:14 18:36	06:49 16:55	07:22 16:40
12	07:31 17:00	07:07 17:37	06:25 19:09	06:34 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:22 16:40
13	07:31 17:01	07:05 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:35 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:31 19:45	05:52 20:16	05:35 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:31	06:53 16:52	07:24 16:40
15	07:30 17:03	07:03 17:41	06:20 19:13	06:30 19:46	05:51 20:17	05:35 20:40	05:48 20:39	06:17 20:08	06:48 19:20	07:18 18:30	06:54 16:51	07:25 16:40
16	07:30 17:04	07:01 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:35 20:41	05:49 20:38	06:18 20:07	06:49 19:18	07:19 18:28	06:55 16:50	07:25 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	05:35 20:41	05:50 20:38	06:19 20:05	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:06	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:14	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:57 17:45	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:27 16:41
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:46 20:22	05:36 20:42	05:52 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:27 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	06:54 19:09	07:25 18:21	07:01 16:46	07:28 16:42
22	07:27 17:11	06:53 17:49	06:09 19:20	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:34	06:24 19:58	06:55 19:08	07:26 18:19	07:02 16:45	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:21	06:18 19:54	05:44 20:24	05:36 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:29 16:43
24	07:25 17:13	06:50 17:51	06:06 19:22	06:16 19:55	05:43 20:25	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:28 18:16	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:52	06:04 19:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:30 16:44
26	07:24 17:16	06:47 17:54	06:02 19:25	06:14 19:57	05:42 20:27	05:37 20:43	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:58	05:41 20:28	05:38 20:43	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	07:08 16:43	07:31 16:46
28	07:22 17:18	06:44 17:56	06:59 19:27	06:11 19:59	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:57	07:33 18:11	07:09 16:42	07:31 16:46
29	07:21 17:19		06:57 19:28	06:10 20:00	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:47	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 19:29	06:08 20:01	05:40 20:30	05:39 20:43	06:01 20:27	06:32 19:46	07:03 18:54	07:35 18:08	07:11 16:41	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:02 20:26	06:33 19:44		07:36 18:07		07:32 16:48
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 44 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (118)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33 16:50	07:19 17:24	06:43 17:57		06:53 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:26	06:34 19:43		07:04 18:53
2	07:33 16:51	07:18 17:25	06:42 17:59	10	07:18 (D01) 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:25	06:35 19:41	33	07:05 18:51
3	07:33 16:51	07:17 17:26	06:40 18:00	17	07:15 (D01) 19:33	06:49 20:05	05:38 20:34	05:41 20:44	06:06 20:23	06:36 19:40	33	07:06 18:49
4	07:33 16:52	07:16 17:27	06:39 18:01	21	07:12 (D01) 19:34	06:48 20:06	05:38 20:35	05:41 20:43	06:07 20:22	06:37 19:38	33	07:07 18:48
5	07:33 16:53	07:15 17:28	06:37 18:02	24	07:10 (D01) 19:35	06:46 20:07	05:37 20:35	05:42 20:43	06:08 20:21	06:38 19:37	32	07:08 18:46
6	07:33 16:54	07:14 17:30	06:35 18:03	27	07:09 (D01) 19:37	06:44 20:08	05:37 20:36	05:42 20:43	06:09 20:20	06:39 19:35	31	07:09 18:45
7	07:33 16:55	07:13 17:31	06:34 18:04	29	07:07 (D01) 19:38	06:43 20:09	05:36 20:37	05:43 20:43	06:09 20:19	06:40 19:33	29	07:10 18:43
8	07:33 16:56	07:12 17:32	07:32 19:05	30	08:07 (D01) 19:39	06:41 20:10	05:59 20:37	05:44 20:42	06:10 20:18	06:41 19:32	28	07:11 18:41
9	07:32 16:57	07:11 17:33	07:31 19:07	31	08:06 (D01) 19:40	06:40 20:11	05:57 20:38	05:44 20:42	06:11 20:16	06:42 19:30	26	07:12 18:40
10	07:32 16:58	07:09 17:35	07:29 19:08	32	08:05 (D01) 19:41	06:38 20:12	05:56 20:38	05:45 20:42	06:12 20:15	06:43 19:28	23	07:13 18:38
11	07:32 16:59	07:08 17:36	07:27 19:09	33	08:05 (D01) 19:42	06:36 20:13	05:55 20:39	05:46 20:41	06:13 20:14	06:44 19:27	20	07:14 18:36
12	07:32 17:00	07:07 17:37	07:26 19:10	33	08:04 (D01) 19:43	06:35 20:14	05:54 20:39	05:46 20:41	06:14 20:13	06:45 19:25	14	07:15 18:35
13	07:32 17:01	07:06 17:38	07:24 19:11	33	08:03 (D01) 19:44	06:33 20:15	05:53 20:40	05:47 20:40	06:15 20:11	06:46 19:23	3	07:17 18:33
14	07:31 17:02	07:04 17:40	07:22 19:12	33	08:04 (D01) 19:45	06:32 20:16	05:52 20:40	05:48 20:40	06:16 20:10	06:47 19:22	2	07:18 18:32
15	07:31 17:03	07:03 17:41	07:21 19:13	31	08:04 (D01) 19:46	06:30 20:17	05:51 20:41	05:49 20:39	06:17 20:09	06:48 19:20	1	07:19 18:30
16	07:30 17:04	07:02 17:42	07:19 19:14	30	08:04 (D01) 19:47	06:29 20:18	05:50 20:41	05:49 20:39	06:18 20:07	06:49 19:18	0	07:20 18:29
17	07:30 17:06	07:00 17:43	07:18 19:15	29	08:05 (D01) 19:48	06:27 20:19	05:49 20:42	05:50 20:38	06:19 20:06	06:50 19:16	0	07:21 18:27
18	07:29 17:07	06:59 17:44	07:16 19:16	27	08:05 (D01) 19:49	06:26 20:20	05:48 20:42	05:51 20:38	06:20 20:04	06:51 19:15	0	07:22 18:26
19	07:29 17:08	06:58 17:46	07:14 19:17	25	08:05 (D01) 19:50	06:24 20:21	05:48 20:42	05:52 20:37	06:21 20:03	06:52 19:13	0	07:23 18:24
20	07:28 17:09	06:56 17:47	07:13 19:19	22	08:07 (D01) 19:51	06:23 20:22	05:47 20:43	05:53 20:36	06:22 20:01	06:53 19:11	0	07:24 18:23
21	07:28 17:10	06:55 17:48	07:11 19:20	17	08:09 (D01) 19:52	06:21 20:23	05:46 20:43	05:54 20:35	06:23 20:00	06:54 19:10	9	07:25 18:21
22	07:27 17:11	06:54 17:49	07:09 19:21	12	08:26 (D01) 19:53	06:20 20:24	05:45 20:43	05:54 20:35	06:24 19:59	06:55 19:08	9	07:26 18:20
23	07:26 17:13	06:52 17:50	07:08 19:22		08:11 (D01) 19:54	06:18 20:25	05:44 20:43	05:55 20:34	06:25 19:57	06:56 19:06	16	07:27 18:18
24	07:26 17:14	06:51 17:52	07:06 19:23		07:52 (D01) 19:55	06:17 20:26	05:44 20:43	05:56 20:33	06:26 19:56	06:57 19:05	21	07:28 18:17
25	07:25 17:15	06:49 17:53	07:04 19:24		07:50 (D01) 19:57	06:15 20:27	05:43 20:44	05:57 20:32	06:27 19:54	06:58 19:03	24	07:29 18:15
26	07:24 17:16	06:48 17:54	07:03 19:25		07:47 (D01) 19:58	06:14 20:27	05:42 20:44	05:58 20:31	06:28 19:52	06:59 19:01	26	07:30 18:14
27	07:23 17:17	06:46 17:55	07:01 19:26		07:46 (D01) 19:59	06:13 20:28	05:42 20:44	05:59 20:30	06:29 19:51	07:00 19:00	29	07:31 18:13
28	07:23 17:19	06:45 17:56	06:59 19:27		08:16 (D01) 20:00	06:11 20:29	05:41 20:44	06:00 20:30	07:01 19:49	07:33 18:58	31	07:32 18:11
29	07:22 17:20		06:58 19:28		08:17 (D01) 20:01	06:10 20:30	05:40 20:44	06:01 20:29	07:02 19:48	07:34 18:56	32	07:33 18:10
30	07:21 17:21		06:56 19:29		08:18 (D01) 20:02	06:09 20:31	05:39 20:44	06:02 20:28	07:03 19:46	07:35 18:54	33	07:34 18:09
31	07:20 17:22		06:54 19:30			06:08 20:32		06:03 20:27	06:33 19:45	07:36 18:07		07:37 18:07
Potential sun hours	298	297	369		398	448	452	458	428	375		346
Total, worst case				546						253		305
Sun reduction				0.73						0.93		0.84
Oper. time red.				1.00						1.00		1.00
Wind dir. red.				0.54						0.54		0.54
Total reduction				0.40						0.51		0.46
Total, real				217						128		139

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 45 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (119)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December	
1	07:33 16:50	07:19 17:24	06:43 17:57	25 07:16 (D01) 19:31	06:53 20:03	06:07 20:32	05:39 20:44	05:40 20:26	06:04 19:43	06:34 18:53	29 07:51 (D01) 08:20 (D01)	06:38 18:06	07:13 16:41
2	07:33 16:51	07:18 17:25	06:42 17:59	28 07:14 (D01) 19:32	06:51 20:04	06:06 20:33	05:38 20:44	05:40 20:25	06:05 19:41	06:35 18:51	30 07:50 (D01) 08:20 (D01)	06:39 17:05	07:14 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	29 07:14 (D01) 19:33	06:49 20:05	06:05 20:34	05:41 20:44	06:06 20:23	06:36 19:40	06:36 18:49	31 07:49 (D01) 08:20 (D01)	06:40 17:04	07:15 16:41
4	07:33 16:52	07:16 17:27	06:39 18:01	30 07:13 (D01) 19:34	06:48 20:06	06:03 20:35	05:41 20:43	06:07 20:22	06:37 19:38	06:37 18:48	32 07:48 (D01) 08:20 (D01)	06:42 17:02	07:16 16:41
5	07:33 16:53	07:15 17:28	06:37 18:02	31 07:12 (D01) 19:35	06:46 20:07	06:02 20:35	05:42 20:43	06:08 20:21	06:38 19:37	06:38 18:46	32 07:48 (D01) 08:20 (D01)	06:43 17:01	07:17 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	32 07:12 (D01) 19:37	06:44 20:08	06:01 20:36	05:42 20:43	06:09 20:20	06:39 19:35	06:39 18:45	33 07:47 (D01) 08:20 (D01)	06:44 17:00	07:18 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	32 07:11 (D01) 19:38	06:43 20:09	06:00 20:37	05:43 20:43	06:09 20:19	06:40 19:33	06:40 18:43	32 07:47 (D01) 08:19 (D01)	06:45 16:59	07:18 16:40
8	07:33 16:56	07:12 17:32	07:32 19:05	32 08:11 (D01) 19:39	06:41 20:10	05:59 20:37	05:44 20:42	06:10 20:18	06:41 19:32	06:41 18:41	32 07:47 (D01) 08:19 (D01)	06:46 16:58	07:19 16:40
9	07:32 16:57	07:11 17:33	07:31 19:07	32 08:11 (D01) 19:40	06:40 20:11	05:57 20:38	05:44 20:42	06:11 20:16	06:42 19:30	06:42 18:40	31 07:47 (D01) 08:18 (D01)	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	07:29 19:08	32 08:10 (D01) 19:41	06:38 20:12	05:56 20:38	05:45 20:42	06:12 20:15	06:43 19:28	06:43 18:38	30 07:47 (D01) 08:17 (D01)	06:49 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	07:27 19:09	31 08:11 (D01) 19:42	06:36 20:13	05:55 20:39	05:46 20:41	06:13 20:14	06:44 19:27	06:44 18:36	28 07:48 (D01) 08:16 (D01)	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	07:26 19:10	29 08:11 (D01) 19:43	06:35 20:14	05:54 20:39	05:46 20:41	06:14 20:13	06:45 19:25	06:45 18:35	27 07:48 (D01) 08:15 (D01)	06:51 16:54	07:23 16:40
13	07:32 17:01	07:06 17:38	07:24 19:11	28 08:11 (D01) 19:44	06:33 20:15	05:53 20:40	05:47 20:40	06:15 20:11	06:46 19:23	06:46 18:33	24 07:49 (D01) 08:13 (D01)	06:52 16:53	07:24 16:40
14	07:31 17:02	07:04 17:40	07:22 19:12	25 08:13 (D01) 19:45	06:32 20:16	05:52 20:40	05:48 20:40	06:16 20:10	06:47 19:22	06:47 18:32	21 07:49 (D01) 08:12 (D01)	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	07:21 19:13	22 08:14 (D01) 19:46	06:30 20:17	05:51 20:41	05:49 20:39	06:17 20:09	06:48 19:20	06:48 18:30	17 07:53 (D01) 08:10 (D01)	06:55 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	07:19 19:14	18 08:15 (D01) 19:47	06:29 20:18	05:50 20:41	05:49 20:39	06:18 20:07	06:49 19:18	06:49 18:29	10 07:54 (D01) 08:06 (D01)	06:56 16:50	07:26 16:41
17	07:30 17:06	07:00 17:43	07:18 19:15	13 08:18 (D01) 19:48	06:27 20:19	05:49 20:42	05:50 20:38	06:19 20:06	06:50 19:16	06:50 18:27	07:55 (D01)	06:56 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	07:16 19:16	07:16 19:16	06:26 19:49	05:48 20:20	05:51 20:38	06:20 20:04	06:51 19:15	06:51 18:22	07:56 (D01)	06:57 16:49	07:27 16:41
19	07:29 17:08	06:58 17:46	07:14 19:17	07:14 19:17	06:24 19:50	05:48 20:21	05:52 20:37	06:21 20:03	06:52 19:13	06:52 18:24	07:57 (D01)	06:58 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	07:13 19:19	07:13 19:19	06:23 19:51	05:47 20:22	05:53 20:36	06:22 20:01	06:53 19:11	06:53 18:23	07:58 (D01)	06:59 16:47	07:29 16:42
21	07:28 17:10	06:55 17:48	07:11 19:20	07:11 19:20	06:21 19:52	05:46 20:23	05:54 20:35	06:23 20:00	06:54 19:10	06:54 18:21	07:59 (D01)	06:59 16:46	07:30 16:43
22	07:27 17:11	06:54 17:49	07:09 19:21	07:09 19:21	06:20 19:53	05:45 20:24	05:54 20:35	06:24 19:59	06:55 19:08	06:55 18:20	08:02 (D01)	06:59 16:45	07:31 16:43
23	07:26 17:13	06:52 17:50	07:08 19:22	07:08 19:22	06:18 19:54	05:44 20:25	05:55 20:34	06:25 19:57	06:56 19:06	06:56 18:18	08:12 (D01)	06:57 16:44	07:32 16:43
24	07:26 17:14	06:51 17:52	07:06 19:23	07:06 19:23	06:17 19:56	05:44 20:26	05:56 20:43	06:26 20:33	06:57 19:05	06:57 18:17	08:13 (D01)	06:58 16:45	07:33 16:44
25	07:25 17:15	06:49 17:53	07:04 19:24	07:04 19:24	06:15 19:57	05:43 20:27	05:57 20:44	06:27 20:32	06:58 19:03	06:58 18:15	08:14 (D01)	06:58 16:46	07:34 16:45
26	07:24 17:16	06:48 17:54	07:03 19:25	07:03 19:25	06:14 19:58	05:42 20:27	05:58 20:44	06:28 20:31	06:59 19:01	06:59 18:12	08:15 (D01)	06:59 16:47	07:35 16:46
27	07:23 17:17	06:46 17:55	07:01 19:26	07:01 19:26	06:13 19:59	05:42 20:28	05:59 20:44	06:29 20:30	07:00 19:51	07:00 18:15	08:16 (D01)	06:59 16:48	07:36 16:47
28	07:23 17:19	06:45 17:56	07:01 19:27	07:01 19:27	06:11 20:00	05:41 20:29	05:58 20:44	06:30 20:30	07:01 19:49	07:01 18:58	08:17 (D01)	06:59 16:49	07:37 16:48
29	07:22 17:20	06:44 17:57	07:00 19:28	07:00 19:28	06:10 20:01	05:40 20:30	05:59 20:44	06:31 20:29	07:02 19:48	07:02 18:56	08:18 (D01)	06:59 16:50	07:38 16:49
30	07:21 17:21	06:43 17:58	06:56 19:29	06:56 19:29	06:09 20:02	05:40 20:31	05:59 20:44	06:32 20:28	07:03 19:46	07:03 18:54	08:19 (D01)	06:59 16:51	07:39 16:49
31	07:20 17:22	06:42 17:59	06:54 19:30	06:54 19:30	06:08 20:32	05:39 20:32	06:03 20:48	06:33 19:45	07:04 18:54	07:04 18:07	08:20 (D01)	06:59 16:52	07:40 16:50
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288	
Total, worst case		54	469						99	439			
Sun reduction		0.62	0.73						0.93	0.84			
Oper. time red.		1.00	1.00						1.00	1.00			
Wind dir. red.		0.53	0.53						0.53	0.53			
Total reduction		0.33	0.39						0.49	0.45			
Total, real		18	182						49	196			

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 46 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (120)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:40	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
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18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:43
22	07:27 17:11	06:53 17:49	06:09 19:21	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
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30	07:21 17:21		06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:03 20:26	06:33 19:45		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 47 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (121)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

January		February		March	April	May	June	July	August	September	October	November	December
1	07:32	15:43 (D04)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	12 15:55 (D04)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	15:45 (D04)	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	10 15:55 (D04)	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	15:46 (D04)	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	8 15:54 (D04)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	15:49 (D04)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	4 15:53 (D04)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33		07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53		17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33		07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54		17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33		07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55		17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32		07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56		17:32	19:05	19:39	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32		07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57		17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:40	16:57	16:40
10	07:32		07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58		17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32		07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59		17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32		07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00		17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31		07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01		17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31		07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02		17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31		07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03		17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30		07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04		17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30		07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05		17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29		06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07		17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29		06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08		17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28		06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09		17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28		06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10		17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27		06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11		17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26		06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12		17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26		06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14		17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25		06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15		17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24		06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16		17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23		06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17		17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22		06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18		17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22			06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20			19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21			06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21			19:29	20:02	20:31	20:44		19:46	18:54	18:09	16:42	16:48
31	07:20			06:54		05:39		06:03	06:33		07:37		07:32
	17:22			19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298		297	369	398	448	452	458	428	375	346	298	288
Total, worst case		34											364
Sun reduction		0.45											0.47
Oper. time red.		1.00											1.00
Wind dir. red.		0.89											0.89
Total reduction		0.40											0.42
Total, real		14											153

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 48 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (122)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:40	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:49	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:43
22	07:27 17:11	06:53 17:49	06:09 19:21	06:20 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:00 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20		06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:03 20:26	06:33 19:45		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 49 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (123)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:40	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:49	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:43
22	07:27 17:11	06:53 17:49	06:09 19:21	06:20 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:00 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20		06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:03 20:26	06:33 19:45		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 50 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (124)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	February	March	April	May	June	July	August	September	October	November	December			
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	18:48 (D03) 19:25 (D03)	05:39 20:32	19:38 (D02) 19:47 (D02)	05:40 20:44	06:04 20:25	19:10 (D03) 20:01 (D02)	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	18:48 (D03) 19:25 (D03)	05:38 20:33	19:42 (D02) 19:44 (D02)	05:40 20:44	06:05 20:24	19:07 (D03) 20:00 (D02)	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	18:48 (D03) 19:42 (D02)	05:38 20:34	05:41 20:44	05:43 20:43	06:05 20:23	19:05 (D03) 19:04 (D03)	06:36 06:37	07:06 07:07	06:40 06:41	07:14 07:15
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	18:49 (D03) 19:43 (D02)	05:38 20:34	05:43 20:43	05:43 20:43	06:06 20:22	19:04 (D03) 19:58 (D02)	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	18:50 (D03) 19:44 (D02)	05:37 20:35	05:42 20:43	05:42 20:43	06:07 20:21	19:02 (D03) 19:57 (D02)	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	18:51 (D03) 19:46 (D02)	05:37 20:36	05:42 20:43	05:42 20:43	06:08 20:20	19:01 (D03) 19:56 (D02)	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	18:52 (D03) 19:47 (D02)	05:37 20:36	05:43 20:43	05:43 20:43	06:09 20:19	19:00 (D03) 19:55 (D02)	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:38	05:59 20:10	18:53 (D03) 19:48 (D02)	05:36 20:37	05:44 20:42	05:44 20:42	06:10 20:17	18:59 (D03) 19:54 (D02)	06:41 19:21	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	05:57 20:11	18:55 (D03) 19:49 (D02)	05:36 20:38	05:44 20:42	05:44 20:42	06:11 20:16	18:58 (D03) 19:53 (D02)	06:42 19:30	07:12 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	05:56 20:12	18:56 (D03) 19:49 (D02)	05:36 20:38	05:45 20:42	05:45 20:42	06:12 20:15	18:58 (D03) 19:33 (D03)	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	18:58 (D03) 19:50 (D02)	05:36 20:39	05:46 20:41	05:46 20:41	19:48 (D02) 19:54 (D02)	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	19:01 (D03) 19:51 (D02)	05:36 20:39	05:46 20:41	05:46 20:41	19:46 (D02) 19:56 (D02)	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	19:00 (D03) 19:52 (D02)	05:36 20:40	05:47 20:45	05:47 20:45	19:44 (D02) 19:57 (D02)	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 19:12	06:32 19:45	05:52 20:16	18:58 (D03) 19:21 (D03)	05:36 20:40	05:48 20:40	05:48 20:40	19:44 (D02) 19:58 (D02)	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	18:56 (D03) 19:23 (D03)	05:36 20:41	05:49 20:39	05:49 20:39	19:43 (D02) 20:00 (D02)	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	18:54 (D03) 19:24 (D03)	05:36 20:41	05:49 20:39	05:49 20:39	19:42 (D02) 20:01 (D02)	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	18:52 (D03) 19:25 (D03)	05:36 20:41	05:50 20:38	05:50 20:38	20:01 (D02) 20:01 (D02)	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:27 16:41
18	07:29 17:07	06:59 17:46	06:16 19:16	06:25 19:49	05:48 20:20	18:52 (D03) 19:26 (D03)	05:36 20:42	05:51 20:37	05:51 20:37	20:02 (D02) 20:02 (D02)	06:20 20:03	06:51 19:15	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:47	06:14 19:17	06:24 19:50	05:47 20:21	18:50 (D03) 19:26 (D03)	05:36 20:42	05:52 20:37	05:52 20:37	20:02 (D02) 20:03 (D02)	06:21 20:04	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	18:50 (D03) 19:27 (D03)	05:36 20:42	05:53 20:36	05:53 20:36	20:04 (D02) 20:04 (D02)	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:19	06:21 19:52	05:46 20:23	18:49 (D03) 19:27 (D03)	05:36 20:43	05:54 20:35	05:54 20:35	20:04 (D02) 20:04 (D02)	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:43
22	07:27 17:11	06:53 17:49	06:09 19:21	06:19 19:53	05:45 20:24	18:48 (D03) 19:27 (D03)	05:36 20:43	05:54 20:35	05:54 20:35	19:39 (D02) 20:04 (D02)	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	05:44 20:25	18:47 (D03) 19:27 (D03)	05:37 20:43	05:55 20:34	05:55 20:34	19:39 (D02) 20:04 (D02)	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 19:23	06:17 19:55	05:43 20:26	18:47 (D03) 19:27 (D03)	05:37 20:43	05:56 20:33	05:56 20:33	19:38 (D02) 20:05 (D02)	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	05:43 20:26	18:47 (D03) 19:27 (D03)	05:37 20:43	05:57 20:32	05:57 20:32	19:38 (D02) 20:05 (D02)	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:57	05:42 20:27	18:47 (D03) 19:27 (D03)	05:38 20:44	05:58 20:31	05:58 20:31	19:38 (D02) 20:06 (D02)	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:59	05:41 20:28	18:47 (D03) 19:27 (D03)	05:38 20:44	05:59 20:30	05:59 20:30	19:38 (D02) 20:06 (D02)	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43	07:31 16:46
28	07:22 17:18	06:45 17:56	06:59 19:27	06:11 20:00	05:41 20:29	18:47 (D03) 19:27 (D03)	05:38 20:44	06:00 20:29	06:00 20:29	19:38 (D02) 20:05 (D02)	06:30 19:49	07:01 18:58	07:22 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20	06:57 17:58	06:10 19:28	06:20 20:01	05:40 20:30	18:47 (D03) 19:26 (D03)	05:39 20:44	06:01 20:28	06:01 20:28	19:37 (D02) 20:03 (D02)	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21	06:56 17:59	06:08 19:29	06:18 20:02	05:40 20:31	18:47 (D03) 19:25 (D03)	05:39 20:44	06:02 20:27	06:02 20:27	19:38 (D02) 20:03 (D02)	06:32 19:46	07:03 18:54	07:35 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22	06:54 17:59	06:07 19:30	06:17 20:03	05:39 20:31	19:37 (D02) 19:49 (D02)		06:03 20:26	06:03 20:26	19:38 (D02) 20:02 (D02)	06:33 19:45	07:04 19:16	07:37 18:07	07:32 16:49	
Potential sun hours	298	297	369	398	448	452	458	428	1120	375	346	298	288		
Total, worst case				644	905	11	453	1120							
Sun reduction				0.82	0.92	0.94	0.97	0.96							
Oper. time red.				1.00	1.00	1.00	1.00	1.00							
Wind dir. red.				0.57	0.52	0.50	0.50	0.56							
Total reduction				0.46	0.48	0.47	0.48	0.53							
Total, real				299	434	5	219	599							

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 51 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (125)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 52 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (126)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:05	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04	16:41
4	07:33	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:06	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:41
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:07	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:28
	17:08	17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46	16:43
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:31
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:45
26	07:24	06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:59	20:28	20:44	20:30	19:51	18:59	18:13	16:43	16:46
28	07:22	06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:09	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:45		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 53 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (127)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	[January	February	March		[April		[May		[June	July		[August		[September		[October	November	December	
1	07:32	07:19	06:43		06:52	18:24 (D03)	06:07	9	19:11 (D02)	05:39	05:40	06:04		06:34	18:33 (D03)	07:04	06:38	07:12	
	16:50	17:23	17:57		19:31	18:58 (D03)	20:03		19:20 (D02)	20:32	20:44	20:25		19:43	18:42 (D03)	18:53	18:06	16:41	
2	07:33	07:18	06:41		06:51	18:25 (D03)	06:06			05:38	05:40	06:05		06:35	18:29 (D03)	07:05	06:39	07:13	
	16:50	17:25	17:58		19:32	18:58 (D03)	20:04	33		20:33	20:44	20:24		19:41	18:45 (D03)	18:51	17:05	16:41	
3	07:33	07:17	06:40		06:49	18:24 (D03)	06:05			05:38	05:41	06:05		06:36	18:27 (D03)	07:06	06:40	07:14	
	16:51	17:26	18:00		19:33	18:57 (D03)	20:05	33		20:34	20:43	20:23		19:40	18:47 (D03)	18:49	17:04	16:41	
4	07:33	07:16	06:38		06:48	18:25 (D03)	06:03			05:38	05:41	06:06		06:37	18:25 (D03)	07:07	06:41	07:15	
	16:52	17:27	18:01		19:34	18:57 (D03)	20:06	32		20:34	20:43	20:22		19:38	18:48 (D03)	18:48	17:02	16:40	
5	07:33	07:15	06:37		06:46	18:25 (D03)	06:02			05:37	05:42	06:07		06:38	18:23 (D03)	07:08	06:43	07:16	
	16:53	17:28	18:02		19:35	18:56 (D03)	20:07	31		20:35	20:43	20:21		19:36	18:49 (D03)	18:46	17:01	16:40	
6	07:33	07:14	06:35		06:44	18:25 (D03)	06:01			05:37	05:42	06:08		06:39	18:22 (D03)	07:09	06:44	07:17	
	16:54	17:30	18:03		19:36	18:54 (D03)	20:08	29		20:36	20:43	20:20		19:35	18:50 (D03)	18:44	17:00	16:40	
7	07:33	07:13	06:34		06:43	18:27 (D03)	06:00			05:37	05:43	06:09		06:40	18:20 (D03)	07:10	06:45	07:18	
	16:55	17:31	18:04		19:37	18:53 (D03)	20:09	26		20:36	20:43	20:19		19:33	18:51 (D03)	18:43	16:59	16:40	
8	07:32	07:12	07:32		06:41	18:28 (D03)	05:59			05:36	05:44	06:10		06:41	18:19 (D03)	07:11	06:46	07:19	
	16:56	17:32	19:05		19:38	18:51 (D03)	20:10			20:37	20:42	20:17		19:31	18:51 (D03)	18:41	16:58	16:40	
9	07:32	07:10	07:30		06:39	18:29 (D03)	05:57			05:36	05:44	06:11		06:42	18:19 (D03)	07:12	06:47	07:20	
	16:57	17:33	19:06		19:40	20	18:49 (D03)	20:11		20:38	20:42	20:16		19:30	18:51 (D03)	18:39	16:57	16:40	
10	07:32	07:09	07:29		06:38	18:31 (D03)	05:56			05:36	05:45	06:12		06:43	18:18 (D03)	07:13	06:48	07:21	
	16:58	17:35	19:07		19:41	18:47 (D03)	20:12	16		20:38	20:42	20:15		19:28	18:51 (D03)	18:38	16:56	16:40	
11	07:32	07:08	07:27		06:36	18:34 (D03)	05:55			05:36	05:46	06:13		06:44	18:17 (D03)	07:14	06:50	07:22	
	16:59	17:36	19:09		19:42	18:43 (D03)	20:13	9		20:39	20:41	20:14		19:26	18:51 (D03)	18:36	16:55	16:40	
12	07:32	07:07	07:26		06:35		05:54			05:36	05:46	06:14			18:17 (D03)	07:15	06:51	07:23	
	17:00	17:37	19:10		19:43		20:14			20:39	20:41	20:12	10	19:19 (D02)	19:25	34	18:51 (D03)	18:35	16:54
13	07:31	07:05	07:24		06:33		05:53			05:36	05:47	06:15			19:16 (D02)	06:46		06:52	07:23
	17:01	17:38	19:11		19:44		20:15			20:40	20:40	20:11	14	19:30 (D02)	19:23	33	18:50 (D03)	18:33	16:53
14	07:31	07:04	07:22		06:32		19:14 (D02)	05:52		05:36	05:48	06:16			19:14 (D02)	06:47		06:53	07:24
	17:02	17:39	19:12		19:45	10	19:24 (D02)	20:16		20:40	20:40	20:10	17	19:31 (D02)	19:21	33	18:50 (D03)	18:32	16:52
15	07:31	07:03	07:21		06:30		19:11 (D02)	05:51		05:36	05:49	06:17			19:13 (D02)	06:48		06:54	07:25
	17:03	17:41	19:13		19:46	14	19:25 (D02)	20:17		20:41	20:39	20:08	19	19:32 (D02)	19:20	32	18:49 (D03)	18:30	16:51
16	07:30	07:02	07:19		06:28		19:09 (D02)	05:50		05:36	05:49	06:18			19:12 (D02)	06:49		06:56	07:26
	17:04	17:42	19:14		19:47	17	19:26 (D02)	20:18		20:41	20:39	20:07	21	19:33 (D02)	19:18	31	18:48 (D03)	18:28	16:50
17	07:30	07:00	07:17		06:27		19:07 (D02)	05:49		05:36	05:50	06:19			19:11 (D02)	06:50		06:57	07:26
	17:05	17:43	19:15		19:48	20	19:27 (D02)	20:19		20:41	20:38	20:06	23	19:34 (D02)	19:16	30	18:47 (D03)	18:27	16:49
18	07:29	06:59	07:16		06:25		19:07 (D02)	05:48		05:36	05:51	06:20			19:10 (D02)	06:51		06:58	07:27
	17:07	17:44	19:16		19:49	21	19:28 (D02)	20:20		20:42	20:37	20:04	24	19:34 (D02)	19:15	28	18:46 (D03)	18:25	16:48
19	07:29	06:58	07:14		06:24		19:05 (D02)	05:47		05:36	05:52	06:21			19:10 (D02)	06:52		06:59	07:28
	17:08	17:46	19:17		19:50	23	19:28 (D02)	20:21		20:42	20:37	20:03	24	19:34 (D02)	19:13	25	18:43 (D03)	18:24	16:48
20	07:28	06:56	07:12		06:22		19:05 (D02)	05:47		05:36	05:53	06:22			19:09 (D02)	06:53		07:00	07:28
	17:09	17:47	19:18		19:51	25	19:30 (D02)	20:22		20:42	20:36	20:01	25	19:34 (D02)	19:11	22	18:41 (D03)	18:22	16:47
21	07:28	06:55	07:11				19:04 (D02)	05:46		05:36	05:54	06:23			19:09 (D02)	06:54		07:01	07:29
	17:10	17:48	19:19	10	18:50 (D03)	19:52	25	20:43	20:35	20:00	25	19:34 (D02)	19:10	19	18:39 (D03)	18:21	16:46	16:43	
22	07:27	06:53	07:09				19:04 (D02)	05:45		05:36	05:54	06:24			19:09 (D02)	06:55		07:03	07:29
	17:11	17:49	19:21	17	18:53 (D03)	19:53	25	20:43	20:35	19:58	25	19:34 (D02)	19:08	13	18:36 (D03)	18:20	16:46	16:43	
23	07:26	06:52	07:07				18:34 (D03)	06:18		05:37	05:55	06:25			19:09 (D02)	06:56		07:04	07:30
	17:12	17:50	19:22	22	18:56 (D03)	19:54	24	20:43	20:34	19:57	24	19:33 (D02)	19:06		18:18	16:45	16:43		
24	07:26	06:50	07:06				18:32 (D03)	06:17		05:37	05:56	06:26			19:09 (D02)	06:57		07:29	07:05
	17:14	17:51	19:23	25	18:57 (D03)	19:55	24	20:43	20:33	19:55	23	19:32 (D02)	19:04		18:17	16:44	16:44		
25	07:25	06:49	07:04				18:30 (D03)	06:15		05:37	05:57	06:27			19:10 (D02)	06:58		07:30	07:06
	17:15	17:53	19:24	27	18:57 (D03)	19:56	23	20:43	20:32	19:54	21	19:31 (D02)	19:03		18:15	16:44	16:45		
26	07:24	06:48	07:02				18:28 (D03)	06:14		05:38	05:58	06:28			19:10 (D02)	06:59		07:31	07:07
	17:16	17:54	19:25	30	18:58 (D03)	19:57	23	20:44	20:31	19:52	19	19:29 (D02)	19:01		18:14	16:43	16:45		
27	07:23	06:46	07:01				18:28 (D03)	06:12		05:38	05:59	06:29			19:11 (D02)	07:00		07:32	07:08
	17:17	17:55	19:26	31	18:59 (D03)	19:58	21	20:44	20:30	19:51	17	19:28 (D02)	18:59		18:13	16:43	16:46		
28	07:22	06:45	06:59				18:26 (D03)	06:11		05:38	06:00	06:30			19:13 (D02)	07:01		07:33	07:09
	17:18	17:56	19:27	33	18:59 (D03)	20:00	20	20:44	20:29	19:49	13	19:26 (D02)	18:58		18:11	16:42	16:46		
29	07:22		06:57				18:25 (D03)	06:10		05:39	06:01	06:31			19:15 (D02)	07:02		07:34	07:10
	17:20		19:28	33	18:58 (D03)	20:01	16	20:44	20:28	19:48	10	19:25 (D02)	18:56		18:10	16:42	16:47		
30	07:21		06:56				18:26 (D03)	06:08		05:39	06:02	06:32			18:17	07:03		07:35	07:11
	17:21		19:29	33	18:59 (D03)	20:02	14	20:44	20:27	19:46					18:09	16:42	16:48		
31	07:20		06:54				18:25 (D03)				06:03	06:33				07:37		07:32	
	17:22		19:30	34	18:59 (D03)		20:31			20:26	19:44					18:07		16:49	
Potential sun hours	298	297	369		398		448		452	458	428		375		346	298	288		
Total, worst case				295	631		9					354		584					
Sun reduction				0.73	0.82		0.92					0.96		0.93					
Oper. time red.				1.00	1.00		1.00					1.00		1.00					
Wind dir. red.				0.69	0.62		0.56					0.56		0.69					
Total reduction				0.50	0.51		0.52					0.54		0.64					
Total, real			148		320		5					190		374					

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 54 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (128)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	[January	[February	[March		[April		[May	[June	[July	[August		[September		[October	[November	[December
1	07:32	07:19	06:43		06:52	18:24 (D03)	06:07	05:39	05:40	06:04		06:34		07:04	06:38	07:12
	16:50	17:23	17:57		19:31	18:57 (D03)	20:03	20:32	20:44	20:25		19:43		18:53	18:06	16:41
2	07:33	07:18	06:41		06:51	18:25 (D03)	06:06	05:38	05:40	06:05		06:35	9	18:32 (D03)	07:05	06:39
	16:50	17:25	17:58		19:32	18:57 (D03)	20:04	20:33	20:44	20:24		19:41		18:41 (D03)	18:51	17:05
3	07:33	07:17	06:40		06:49	18:24 (D03)	06:05	05:38	05:41	06:05		06:36		18:28 (D03)	07:06	06:40
	16:51	17:26	18:00		19:33	18:56 (D03)	20:05	20:34	20:43	20:23		19:40	16	18:44 (D03)	18:49	17:04
4	07:33	07:16	06:38		06:48	18:25 (D03)	06:03	05:38	05:41	06:06		06:37		18:26 (D03)	07:07	06:41
	16:52	17:27	18:01		19:34	18:55 (D03)	20:06	20:34	20:43	20:22		19:38	20	18:46 (D03)	18:48	17:02
5	07:33	07:15	06:37		06:46	18:26 (D03)	06:02	05:37	05:42	06:07		06:38		18:24 (D03)	07:08	06:43
	16:53	17:28	18:02		19:35	18:54 (D03)	20:07	20:35	20:43	20:21		19:36	23	18:47 (D03)	18:46	17:01
6	07:33	07:14	06:35		06:44	18:26 (D03)	06:01	05:37	05:42	06:08		06:39		18:22 (D03)	07:09	06:44
	16:54	17:30	18:03		19:36	18:52 (D03)	20:08	20:36	20:43	20:20		19:35	26	18:48 (D03)	18:44	17:00
7	07:33	07:13	06:34		06:43	18:28 (D03)	06:00	05:37	05:43	06:09		06:40		18:21 (D03)	07:10	06:45
	16:55	17:31	18:04		19:37	18:51 (D03)	20:09	20:36	20:43	20:19		19:33	28	18:49 (D03)	18:43	16:59
8	07:32	07:12	07:32		06:41	18:29 (D03)	05:59	05:36	05:44	06:10		06:41		18:20 (D03)	07:11	06:46
	16:56	17:32	19:05		19:38	18:49 (D03)	20:10	20:37	20:42	20:17		19:31	30	18:50 (D03)	18:41	16:58
9	07:32	07:10	07:30		06:39	18:30 (D03)	05:57	05:36	05:44	06:11		06:42		18:19 (D03)	07:12	06:47
	16:57	17:33	19:06		19:40	18:46 (D03)	20:11	20:38	20:42	20:16		19:30	31	18:50 (D03)	18:39	16:57
10	07:32	07:09	07:29		06:38	18:34 (D03)	05:56	05:36	05:45	06:12		06:43		18:18 (D03)	07:13	06:48
	16:58	17:35	19:07		19:41	18:43 (D03)	20:12	20:38	20:42	20:15		19:28	32	18:50 (D03)	18:38	16:56
11	07:32	07:08	07:27		06:36		05:55	05:36	05:46	06:13		06:44		18:17 (D03)	07:14	06:50
	16:59	17:36	19:09		19:42		20:13	20:39	20:41	20:14		19:26	33	18:50 (D03)	18:36	16:55
12	07:32	07:07	07:26		06:35		05:54	05:36	05:46	06:14		06:45		18:17 (D03)	07:15	06:51
	17:00	17:37	19:10		19:43		20:14	20:39	20:41	20:12		19:25	33	18:50 (D03)	18:35	16:54
13	07:31	07:05	07:24		06:33		05:53	05:36	05:47	06:15	19:17 (D02)	06:46		18:16 (D03)	07:16	06:52
	17:01	17:38	19:11		19:44	8	19:22 (D02)	20:15	20:40	20:11	19:27 (D02)	19:23	33	18:49 (D03)	18:33	16:53
14	07:31	07:04	07:22		06:32		05:52	05:36	05:48	06:16	19:15 (D02)	06:47		18:16 (D03)	07:17	06:53
	17:02	17:39	19:12		19:45	13	19:24 (D02)	20:16	20:40	20:10	19:29 (D02)	19:21	33	18:49 (D03)	18:32	16:52
15	07:31	07:03	07:21		06:30		05:51	05:36	05:49	06:17	19:13 (D02)	06:48		18:16 (D03)	07:19	06:54
	17:03	17:41	19:13		19:46	17	19:25 (D02)	20:17	20:41	20:39	19:30 (D02)	19:20	32	18:48 (D03)	18:30	16:51
16	07:30	07:02	07:19		06:28		05:50	05:36	05:49	06:18	19:12 (D02)	06:49		18:16 (D03)	07:20	06:56
	17:04	17:42	19:14		19:47	19	19:26 (D02)	20:18	20:41	20:39	19:31 (D02)	19:18	32	18:48 (D03)	18:28	16:50
17	07:30	07:00	07:17		06:27		05:49	05:36	05:50	06:19	19:11 (D02)	06:50		18:16 (D03)	07:21	06:57
	17:05	17:43	19:15		19:48	21	19:27 (D02)	20:19	20:41	20:38	19:32 (D02)	19:16	31	18:47 (D03)	18:27	16:49
18	07:29	06:59	07:16		06:25		05:48	05:36	05:51	06:20	19:10 (D02)	06:51		18:17 (D03)	07:22	06:58
	17:07	17:44	19:16		19:49	23	19:28 (D02)	20:20	20:42	20:37	19:33 (D02)	19:15	29	18:46 (D03)	18:25	16:48
19	07:29	06:58	07:14		06:24		05:47	05:36	05:52	06:21	19:09 (D02)	06:52		18:16 (D03)	07:23	06:59
	17:08	17:46	19:17		19:50	24	19:28 (D02)	20:21	20:42	20:37	19:33 (D02)	19:13	27	18:43 (D03)	18:24	16:48
20	07:28	06:56	07:12		06:22		05:47	05:36	05:53	06:22	19:09 (D02)	06:53		18:17 (D03)	07:24	07:00
	17:09	17:47	19:18	4	18:47 (D03)	25	19:29 (D02)	20:22	20:42	20:36	19:33 (D02)	19:11	25	18:42 (D03)	18:22	16:47
21	07:28	06:55	07:11		18:37 (D03)		06:21	19:03 (D02)	05:46	05:36	19:08 (D02)	06:54		18:19 (D03)	07:25	07:01
	17:10	17:48	19:19	15	18:52 (D03)	25	19:28 (D02)	20:23	20:43	20:35	19:33 (D02)	19:10	21	18:40 (D03)	18:21	16:46
22	07:27	06:53	07:09		18:34 (D03)		06:19	19:04 (D02)	05:45	05:36	19:08 (D02)	06:55		18:21 (D03)	07:26	07:03
	17:11	17:49	19:21	20	18:54 (D03)	24	19:28 (D02)	20:24	20:43	20:35	19:33 (D02)	19:08	16	18:37 (D03)	18:20	16:46
23	07:26	06:52	07:07		18:32 (D03)		06:18	19:03 (D02)	05:44	05:37	19:08 (D02)	06:56		18:24 (D03)	07:27	07:04
	17:12	17:50	19:22	24	18:56 (D03)	24	19:27 (D02)	20:25	20:43	20:34	19:32 (D02)	19:06	9	18:33 (D03)	18:18	16:45
24	07:26	06:50	07:06		18:30 (D03)		06:17	19:04 (D02)	05:43	05:37	19:08 (D02)	06:57			07:29	07:05
	17:14	17:51	19:23	27	18:57 (D03)	23	19:27 (D02)	20:26	20:43	20:33	19:32 (D02)	19:04	24	18:32 (D02)	19:04	16:44
25	07:25	06:49	07:04		18:29 (D03)		06:15	19:04 (D02)	05:43	05:37	19:08 (D02)	06:58		18:30 (D02)	07:06	07:31
	17:15	17:53	19:24	28	18:57 (D03)	23	19:27 (D02)	20:26	20:43	20:32	19:31 (D02)	19:03		18:15	16:44	16:45
26	07:24	06:48	07:02		18:27 (D03)		06:14	19:04 (D02)	05:42	05:38	19:08 (D02)	06:59		07:31	07:07	07:31
	17:16	17:54	19:25	30	18:57 (D03)	21	19:25 (D02)	20:27	20:44	20:31	19:32	19:01	20	18:14	16:43	16:45
27	07:23	06:46	07:01		18:27 (D03)		06:12	19:05 (D02)	05:41	05:38	19:09 (D02)	07:00		07:32	07:08	07:31
	17:17	17:55	19:26	31	18:58 (D03)	19	19:24 (D02)	20:28	20:44	20:30	19:31	19:02	19	18:12	16:43	16:46
28	07:22	06:45	06:59		18:26 (D03)		06:11	19:07 (D02)	05:41	05:38	19:11 (D02)	07:01		07:33	07:09	07:32
	17:18	17:56	19:27	32	18:58 (D03)	16	19:23 (D02)	20:29	20:44	20:29	19:32 (D02)	18:58	15	18:16	16:42	16:46
29	07:22		06:57		18:25 (D03)		06:10	19:07 (D02)	05:40	05:39	19:12 (D02)	07:02		07:34	07:10	07:32
	17:20		19:28	33	18:58 (D03)	14	19:21 (D02)	20:30	20:44	20:28	19:35 (D02)	18:56	13	18:15	16:42	16:47
30	07:21		06:56		18:25 (D03)		06:08	19:10 (D02)	05:40	05:39	19:15 (D02)	07:03		07:35	07:11	07:32
	17:21		19:29	33	18:58 (D03)	8	19:18 (D02)	20:31	20:44	20:27	19:22 (D02)	18:54	7	18:09	16:42	16:48
31	07:20		06:54		18:24 (D03)			05:39		06:03				07:37		07:32
	17:22		19:30	34	18:58 (D03)			20:31		20:26	19:44			18:07		16:49
Potential sun hours	298	297	369		398		448	452	458	428		375		346	298	288
Total, worst case			311		596					347		569				
Sun reduction			0.73		0.82					0.96		0.93				
Oper. time red.			1.00		1.00					1.00		1.00				
Wind dir. red.			0.69		0.62					0.56		0.69				
Total reduction			0.50		0.51					0.54		0.64				
Total, real			157		302					188		366				

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 57 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (129)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January		February		March	April	May	June	July	August	September	October	November	December	
1	07:32	15:44 (E01)	07:19	06:43	06:52	06:07	05:39	05:40	06:04	06:34	07:04	06:38		07:12	15:36 (E01)
2	16:50	16:06 (E01)	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06		16:41	10 15:46 (E01)
	07:33	15:45 (E01)	07:18	06:41	06:51	06:06	05:38	05:40	06:05	06:35	07:05	06:39		07:13	15:36 (E01)
3	16:50	16:07 (E01)	17:25	17:58	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05		16:41	13 15:49 (E01)
	07:33	15:45 (E01)	07:17	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40		07:14	15:35 (E01)
4	16:51	16:07 (E01)	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:04		16:41	15 15:50 (E01)
	07:33	15:46 (E01)	07:16	06:38	06:48	06:03	05:38	05:41	06:06	06:37	07:07	06:41		07:15	15:35 (E01)
5	16:52	16:07 (E01)	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02		16:41	16 15:51 (E01)
	07:33	15:47 (E01)	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43		07:16	15:34 (E01)
6	16:53	16:07 (E01)	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01		16:40	18 15:52 (E01)
	07:33	15:48 (E01)	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44		07:17	15:34 (E01)
7	16:54	16:07 (E01)	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00		16:40	19 15:53 (E01)
	07:33	15:48 (E01)	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45		07:18	15:34 (E01)
8	16:55	16:06 (E01)	17:31	18:04	19:37	20:09	20:36	20:42	20:19	19:33	18:43	16:59		16:40	20 15:54 (E01)
	07:32	15:49 (E01)	07:11	07:32	06:41	05:59	05:36	05:44	06:10	06:41	07:11	06:46		07:19	15:33 (E01)
9	16:56	16:06 (E01)	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58		16:40	21 15:54 (E01)
	07:32	15:51 (E01)	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47		07:20	15:34 (E01)
10	16:57	16:06 (E01)	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57		16:40	21 15:55 (E01)
	07:32	15:52 (E01)	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48		07:21	15:34 (E01)
11	16:58	16:06 (E01)	17:35	19:07	19:41	20:12	20:38	20:41	20:15	19:28	18:38	16:56		16:40	22 15:56 (E01)
	07:32	15:53 (E01)	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50		07:22	15:34 (E01)
12	16:59	16:04 (E01)	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55		16:40	22 15:56 (E01)
	07:32	15:56 (E01)	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51		07:23	15:35 (E01)
13	17:00	7 16:03 (E01)	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54		16:40	22 15:57 (E01)
	07:31		07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52		07:23	15:35 (E01)
14	17:01		17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53		16:40	23 15:58 (E01)
	07:31		07:04	07:22	06:32	05:52	05:36	05:48	06:16	06:47	07:17	06:53		07:24	15:35 (E01)
15	17:02		17:40	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52		16:40	23 15:58 (E01)
	07:31		07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54		07:25	15:35 (E01)
16	17:03		17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51		16:41	24 15:59 (E01)
	07:30		07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56		07:26	15:36 (E01)
17	17:04		17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50		16:41	24 16:00 (E01)
	07:30		07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57		07:26	15:36 (E01)
18	17:05		17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49		16:41	23 15:59 (E01)
	07:29		06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58		07:27	15:36 (E01)
19	17:07		17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:49		16:41	24 16:00 (E01)
	07:29		06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59		07:27	15:37 (E01)
20	17:08		17:46	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48		16:42	24 16:01 (E01)
	07:28		06:56	07:12	06:22	05:47	05:36	05:53	06:22	06:53	07:24	07:00		07:28	15:37 (E01)
21	17:09		17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47		16:42	24 16:01 (E01)
	07:28		06:55	07:11	06:21	05:46	05:36	05:54	06:23	06:54	07:25	07:01		07:29	15:38 (E01)
22	17:10		17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:10	18:21	16:46		16:43	24 16:02 (E01)
	07:27		06:53	07:09	06:20	05:45	05:36	05:54	06:24	06:55	07:26	07:03		07:29	15:38 (E01)
23	17:11		17:49	19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	16:46		16:43	24 16:02 (E01)
	07:26		06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04		07:30	15:39 (E01)
24	17:12		17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45		16:43	24 16:03 (E01)
	07:26		06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05		07:30	15:39 (E01)
25	17:14		17:51	19:23	19:55	20:25	20:43	20:33	19:55	19:04	18:17	16:44		16:44	24 16:03 (E01)
	07:25		06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06		07:30	15:39 (E01)
26	17:15		17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44		16:45	24 16:03 (E01)
	07:24		06:48	07:02	06:14	05:42	05:38	05:58	06:28	06:59	07:31	07:07		07:31	15:41 (E01)
27	17:16		17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43		16:45	23 16:04 (E01)
	07:23		06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08		07:31	15:41 (E01)
28	17:17		17:55	19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:13	16:43		16:46	24 16:05 (E01)
	07:22		06:45	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09		07:31	15:41 (E01)
29	17:18		17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42		16:46	24 16:05 (E01)
	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10			07:32	15:41 (E01)
30	17:20		19:28	20:01	20:30	20:44	20:28		19:48	18:56	18:10	16:42		16:47	24 16:05 (E01)
	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	15:37 (E01)	07:32		15:43 (E01)
31	17:21		19:29	20:02	20:31	20:44		20:27	19:46	18:54	18:09	16:42	7 15:44 (E01)	16:48	23 16:06 (E01)
	07:20		06:54		05:39		06:03	06:33	19:46		07:37			07:32	15:43 (E01)
	17:22		19:30		20:31		20:26	19:44		18:07				16:49	23 16:06 (E01)
Potential sun hours	298		297	369	398	448	451	458	428	375	346	298		288	
Total, worst case	208												7		669
Sun reduction	0.45												0.61		0.47
Oper. time red.	1.00												1.00		1.00
Wind dir. red.	0.89												0.89		0.89
Total reduction	0.40												0.54		0.42
Total, real	84												4		281

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 58 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

January			February			March			April			May			June		
1	07:32		08:17 (N05)	07:19		16:50 (N02)	06:43		06:53			06:07			06:46 (M10)	05:39	19:19 (M08)
	16:50	28	08:45 (N05)	17:24	11	17:01 (N02)	17:57		19:31			20:03	29		19:40 (M08)	20:32	49 20:08 (M08)
2	07:32		08:18 (N05)	07:18		16:50 (N02)	06:41		06:51			06:06			06:46 (M10)	05:39	19:19 (M08)
	16:51	27	08:45 (N05)	17:25	12	17:02 (N02)	17:59		19:32			20:04	33		19:42 (M08)	20:33	49 20:08 (M08)
3	07:32		08:18 (N05)	07:17		16:50 (N02)	06:40		06:49			06:05			06:46 (M10)	05:38	19:19 (M08)
	16:52	27	08:45 (N05)	17:26	13	17:03 (N02)	18:00		19:33			20:05	34		19:42 (M08)	20:33	50 20:09 (M08)
4	07:32		08:19 (N05)	07:16		16:50 (N02)	06:38		06:48			06:03			06:46 (M10)	05:38	19:19 (M08)
	16:52	27	08:46 (N05)	17:27	15	17:05 (N02)	18:01		19:34			20:06	37		19:43 (M08)	20:34	50 20:09 (M08)
5	07:32		08:18 (N05)	07:15		16:50 (N02)	06:37		06:46			06:02			06:47 (M10)	05:37	19:19 (M08)
	16:53	27	08:45 (N05)	17:29	16	17:06 (N02)	18:02		19:35			20:07	38		19:44 (M08)	20:35	51 20:10 (M08)
6	07:32		08:19 (N05)	07:14		16:50 (N02)	06:35		06:44			06:01			06:48 (M10)	05:37	19:20 (M08)
	16:54	27	08:46 (N05)	17:30	18	17:08 (N02)	18:03		19:36			20:08	38		19:45 (M08)	20:35	51 20:11 (M08)
7	07:32		08:20 (N05)	07:12		16:51 (N02)	06:34		06:43			06:00			06:49 (M10)	05:37	19:20 (M08)
	16:55	26	08:46 (N05)	17:31	18	17:09 (N02)	18:04		19:37			20:09	38		19:46 (M08)	20:36	52 20:12 (M08)
8	07:32		08:21 (N05)	07:11		16:50 (N02)	07:32		06:41			05:59			06:51 (M10)	05:37	19:19 (M08)
	16:56	25	08:46 (N05)	17:32	20	17:10 (N02)	19:05		19:38			20:10	37		19:47 (M08)	20:37	53 20:12 (M08)
9	07:32		08:21 (N05)	07:10		16:51 (N02)	07:30		06:40			05:58			06:52 (M10)	05:36	19:20 (M08)
	16:57	26	08:47 (N05)	17:33	20	17:11 (N02)	19:06		19:39			20:11	36		19:48 (M08)	20:37	52 20:12 (M08)
10	07:32		08:22 (N05)	07:09		16:51 (N02)	07:29		06:38			05:56			06:55 (M10)	05:36	19:20 (M08)
	16:58	25	08:47 (N05)	17:35	22	17:13 (N02)	19:08		19:41			20:12	33		19:49 (M08)	20:38	53 20:13 (M08)
11	07:32		08:22 (N05)	07:08		16:52 (N02)	07:27		06:36			05:55			19:24 (M08)	05:36	19:20 (M08)
	16:59	24	08:46 (N05)	17:36	22	17:14 (N02)	19:09		19:42			20:13	26		19:50 (M08)	20:38	54 20:14 (M08)
12	07:31		08:24 (N05)	07:07		16:53 (N02)	07:26		06:35			05:54			19:23 (M08)	05:36	19:21 (M08)
	17:00	23	08:47 (N05)	17:37	23	17:16 (N02A)	19:10		19:43			20:14	28		19:51 (M08)	20:39	53 20:14 (M08)
13	07:31		08:25 (N05)	07:05		16:54 (N02)	07:24		06:33			05:53			19:23 (M08)	05:36	19:21 (M08)
	17:01	22	08:47 (N05)	17:38	22	17:16 (N02A)	19:11		19:44			20:15	29		19:52 (M08)	20:40	54 20:15 (M08)
14	07:31		08:25 (N05)	07:04		16:55 (N02)	07:22		06:32			05:52			19:22 (M08)	05:36	19:21 (M08)
	17:02	21	08:46 (N05)	17:40	23	17:18 (N02A)	19:12		19:45			20:16	31		19:53 (M08)	20:40	54 20:15 (M08)
15	07:30		08:27 (N05)	07:03		16:57 (N02)	07:21		06:30			05:51			19:21 (M08)	05:36	19:21 (M08)
	17:03	19	08:46 (N05)	17:41	23	17:20 (N02A)	19:13		19:46			20:17	33		19:54 (M08)	20:40	54 20:15 (M08)
16	07:30		08:27 (N05)	07:02		16:59 (N02)	07:19		06:29			05:50			19:21 (M08)	05:36	19:22 (M08)
	17:05	18	08:45 (N05)	17:42	21	17:20 (N02A)	19:14		19:47			20:18	34		19:55 (M08)	20:41	54 20:16 (M08)
17	07:30		08:29 (N05)	07:00		17:03 (N02)	07:17		06:27			05:49			19:20 (M08)	05:36	19:22 (M08)
	17:06	16	08:45 (N05)	17:43	19	17:22 (N02A)	19:15		19:48			20:19	35		19:55 (M08)	20:41	54 20:16 (M08)
18	07:29		08:30 (N05)	06:59		17:10 (N02A)	07:16		06:26			05:49			19:20 (M08)	05:36	19:22 (M08)
	17:07	13	08:43 (N05)	17:44	14	17:24 (N02A)	19:16		19:49	7	06:59 (M10)	20:20	36		19:56 (M08)	20:42	54 20:16 (M08)
19	07:29		08:33 (N05)	06:57		17:10 (N02A)	07:14		06:24			05:48			19:19 (M08)	05:36	19:22 (M08)
	17:08	9	08:42 (N05)	17:46	14	17:24 (N02A)	19:17		19:50	14	07:09 (M10)	20:21	38		19:57 (M08)	20:42	54 20:16 (M08)
20	07:28			06:56		17:10 (N02A)	07:12		06:23			05:47			19:20 (M08)	05:36	19:22 (M08)
	17:09			17:47	16	17:26 (N02A)	19:18		19:51	18	07:11 (M10)	20:22	39		19:59 (M08)	20:42	54 20:16 (M08)
21	07:27			06:55		17:10 (N02A)	07:11		06:21			05:46			19:19 (M08)	05:36	19:23 (M08)
	17:10			17:48	17	17:27 (N02A)	19:19		19:52	21	07:12 (M10)	20:23	40		19:59 (M08)	20:42	55 20:18 (M08)
22	07:27			06:53		17:11 (N02A)	07:09		06:20			05:45			19:19 (M08)	05:37	19:23 (M08)
	17:11			17:49	17	17:28 (N02A)	19:21		19:53	23	07:13 (M10)	20:23	41		20:00 (M08)	20:43	54 20:17 (M08)
23	07:26			06:52		17:12 (N02A)	07:07		06:18			05:44			19:18 (M08)	05:37	19:23 (M08)
	17:13			17:50	17	17:29 (N02A)	19:22		19:54	26	07:15 (M10)	20:24	42		20:00 (M08)	20:43	54 20:17 (M08)
24	07:25			06:50		17:13 (N02A)	07:06		06:17			05:44			19:19 (M08)	05:37	19:23 (M08)
	17:14			17:52	16	17:29 (N02A)	19:23		19:55	26	07:14 (M10)	20:25	43		20:02 (M08)	20:43	54 20:17 (M08)
25	07:25			06:49		17:15 (N02A)	07:04		06:15			05:43			19:18 (M08)	05:37	19:24 (M08)
	17:15			17:53	11	17:26 (N02A)	19:24		19:56	28	07:15 (M10)	20:26	44		20:02 (M08)	20:43	54 20:18 (M08)
26	07:24			06:47		17:20 (N02A)	07:02		06:14			05:42			19:18 (M08)	05:38	19:24 (M08)
	17:16			17:54	2	17:22 (N02A)	19:25		19:57	29	07:15 (M10)	20:27	45		20:03 (M08)	20:43	54 20:18 (M08)
27	07:23		16:53 (N02)	06:46			07:01		06:13			05:42			19:18 (M08)	05:38	19:24 (M08)
	17:17	1	16:54 (N02)	17:55			19:26		19:58	29	07:15 (M10)	20:28	46		20:04 (M08)	20:43	54 20:18 (M08)
28	07:22		16:52 (N02)	06:44			06:59		06:11			05:41			19:18 (M08)	05:39	19:24 (M08)
	17:19	3	16:55 (N02)	17:56			19:27		19:59	29	07:15 (M10)	20:29	46		20:04 (M08)	20:43	54 20:18 (M08)
29	07:21		16:51 (N02)				06:57		06:10			05:41			19:19 (M08)	05:39	19:24 (M08)
	17:20	6	16:57 (N02)				19:28		20:00	29	07:14 (M10)	20:30	47		20:06 (M08)	20:43	54 20:18 (M08)
30	07:21		16:51 (N02)				06:56		06:09			05:40			19:18 (M08)	05:39	19:25 (M08)
	17:21	7	16:58 (N02)				19:29		20:02	29	07:14 (M10)	20:30	48		20:06 (M08)	20:43	53 20:18 (M08)
31	07:20		16:50 (N02)				06:54					05:39			19:19 (M08)		
	17:22	9	16:59 (N02)				19:30					20:31	48		20:07 (M08)		
Potential sun hours	298			297			369		398			447			451		
Total, worst case		456		442					308			1172			1589		
Sun reduction		0.45		0.62					0.82			0.92			0.94		
Oper. time red.		1.00		1.00					1.00			1.00			1.00		
Wind dir. red.		0.41		0.83					0.76			0.52			0.47		
Total reduction		0.18		0.51					0.62			0.48			0.43		
Total, real		84		227					192			557			691		

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 58 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	July		August		September		October		November		December					
1	05:40		19:25 (M08)	06:04	19:33 (M08)	06:34	07:04		06:38	16:21 (N02)	07:12	08:04 (N05)				
	20:43	53	20:18 (M08)	20:25	28	20:01 (M08)	19:43	18:53	18:06	21	16:42 (N02)	16:41	24	08:28 (N05)		
2	05:40		19:25 (M08)	06:05		07:07 (M10)	06:35	07:05	06:39		16:20 (N02)	07:13		08:04 (N05)		
	20:43	53	20:18 (M08)	20:24	30	20:00 (M08)	19:41	18:51	17:05	21	16:41 (N02)	16:41	25	08:29 (N05)		
3	05:41		19:25 (M08)	06:06		07:03 (M10)	06:36	07:06	06:40		16:20 (N02)	07:14		08:05 (N05)		
	20:43	53	20:18 (M08)	20:23	36	19:59 (M08)	19:40	18:49	17:04	19	16:39 (N02)	16:41	25	08:30 (N05)		
4	05:41		19:26 (M08)	06:07		07:01 (M10)	06:37	07:07	06:41		16:19 (N02)	07:15		08:05 (N05)		
	20:43	52	20:18 (M08)	20:22	38	19:58 (M08)	19:38	18:48	17:03	19	16:38 (N02)	16:41	25	08:30 (N05)		
5	05:42		19:25 (M08)	06:08		07:00 (M10)	06:38	07:08	06:42		16:20 (N02)	07:16		08:05 (N05)		
	20:43	52	20:17 (M08)	20:21	38	19:57 (M08)	19:36	18:46	17:01	17	16:37 (N02)	16:41	26	08:31 (N05)		
6	05:43		19:26 (M08)	06:09		06:58 (M10)	06:39	07:09	06:44		16:20 (N02)	07:17		08:05 (N05)		
	20:43	51	20:17 (M08)	20:20	39	19:56 (M08)	19:35	18:44	17:00	16	16:36 (N02)	16:40	27	08:32 (N05)		
7	05:43		19:25 (M08)	06:10		06:57 (M10)	06:40	07:10	06:45		16:20 (N02)	07:18		08:05 (N05)		
	20:42	52	20:17 (M08)	20:18	39	19:55 (M08)	19:33	18:43	16:59	14	16:34 (N02)	16:40	27	08:32 (N05)		
8	05:44		19:26 (M08)	06:11		06:57 (M10)	06:41	07:11	06:46		16:21 (N02)	07:19		08:06 (N05)		
	20:42	51	20:17 (M08)	20:17	36	19:53 (M08)	19:31	18:41	16:58	13	16:34 (N02)	16:40	27	08:33 (N05)		
9	05:45		19:26 (M08)	06:12		06:56 (M10)	06:42	07:12	06:47		16:21 (N02)	07:20		08:06 (N05)		
	20:42	51	20:17 (M08)	20:16	36	19:52 (M08)	19:30	18:40	16:57	12	16:33 (N02)	16:40	27	08:33 (N05)		
10	05:45		19:26 (M08)	06:12		06:55 (M10)	06:43	07:13	06:48		16:21 (N02)	07:21		08:07 (N05)		
	20:41	50	20:16 (M08)	20:15	34	19:51 (M08)	19:28	18:38	16:56	10	16:31 (N02)	16:40	27	08:34 (N05)		
11	05:46		19:26 (M08)	06:13		06:55 (M10)	06:44	07:14	06:49		16:21 (N02)	07:22		08:07 (N05)		
	20:41	50	20:16 (M08)	20:14	32	19:50 (M08)	19:26	18:36	16:55	9	16:30 (N02)	16:40	28	08:35 (N05)		
12	05:47		19:27 (M08)	06:14		06:54 (M10)	06:45	07:15	06:51		16:23 (N02)	07:22		08:08 (N05)		
	20:40	49	20:16 (M08)	20:12	30	19:49 (M08)	19:25	18:35	16:54	7	16:30 (N02)	16:40	27	08:35 (N05)		
13	05:47		19:26 (M08)	06:15		06:54 (M10)	06:46	07:16	06:52		16:23 (N02)	07:23		08:08 (N05)		
	20:40	48	20:14 (M08)	20:11	29	07:23 (M10)	19:23	18:33	16:53	6	16:29 (N02)	16:40	27	08:35 (N05)		
14	05:48		19:27 (M08)	06:16		06:54 (M10)	06:47	07:17	06:53		16:24 (N02)	07:24		08:08 (N05)		
	20:39	47	20:14 (M08)	20:10	29	07:23 (M10)	19:21	18:32	16:52	3	16:27 (N02)	16:41	28	08:36 (N05)		
15	05:49		19:27 (M08)	06:17		06:53 (M10)	06:48	07:18	06:54		16:25 (N02)	07:25		08:09 (N05)		
	20:39	47	20:14 (M08)	20:08	29	07:22 (M10)	19:20	18:30	16:51	1	16:26 (N02)	16:41	28	08:37 (N05)		
16	05:50		19:28 (M08)	06:18		06:53 (M10)	06:49	07:20	06:55		17:50 (N02A)			08:10 (N05)		
	20:38	46	20:14 (M08)	20:07	29	07:22 (M10)	19:18	18:29	7	17:57 (N02A)	16:50			08:37 (N05)		
17	05:50		19:27 (M08)	06:19		06:53 (M10)	06:50	07:21			17:47 (N02A)	06:57		07:26	08:10 (N05)	
	20:38	45	20:12 (M08)	20:05	28	07:21 (M10)	19:16	18:27	13	18:00 (N02A)	16:49			16:41	27	08:37 (N05)
18	05:51		19:28 (M08)	06:20		06:53 (M10)	06:51	07:22			17:44 (N02A)	06:58		07:27	08:10 (N05)	
	20:37	44	20:12 (M08)	20:04	28	07:21 (M10)	19:15	18:26	17	18:01 (N02A)	16:49			16:42	28	08:38 (N05)
19	05:52		19:28 (M08)	06:21		06:54 (M10)	06:52	07:23			17:43 (N02A)	06:59		07:27	08:10 (N05)	
	20:37	44	20:12 (M08)	20:03	26	07:20 (M10)	19:13	18:24	17	18:00 (N02A)	16:48			16:42	28	08:38 (N05)
20	05:53		19:28 (M08)	06:22		06:54 (M10)	06:53	07:24			17:42 (N02A)	07:00		07:28	08:11 (N05)	
	20:36	43	20:11 (M08)	20:01	25	07:19 (M10)	19:11	18:23	16	17:58 (N02A)	16:47			16:42	28	08:39 (N05)
21	05:54		19:29 (M08)	06:23		06:55 (M10)	06:54	07:25			17:41 (N02A)	07:01		07:28	08:11 (N05)	
	20:35	42	20:11 (M08)	20:00	23	07:18 (M10)	19:10	18:21	16	17:57 (N02A)	16:47			16:43	28	08:39 (N05)
22	05:55		19:29 (M08)	06:24		06:56 (M10)	06:55	07:26			17:40 (N02A)	07:02		07:29	08:12 (N05)	
	20:34	41	20:10 (M08)	19:58	21	07:17 (M10)	19:08	18:20	15	17:55 (N02A)	16:46			16:43	28	08:40 (N05)
23	05:55		19:29 (M08)	06:25		06:57 (M10)	06:56	07:27			17:40 (N02A)	07:03		08:09 (N05)	07:29	08:12 (N05)
	20:34	39	20:08 (M08)	19:57	18	07:15 (M10)	19:06	18:18	14	17:54 (N02A)	16:45	9	08:18 (N05)	16:44	28	08:40 (N05)
24	05:56		19:29 (M08)	06:26		06:59 (M10)	06:57	07:28			17:40 (N02A)	07:05		08:07 (N05)	07:30	08:13 (N05)
	20:33	39	20:08 (M08)	19:55	14	07:13 (M10)	19:04	18:17	13	17:53 (N02A)	16:45	13	08:20 (N05)	16:44	28	08:41 (N05)
25	05:57		19:30 (M08)	06:27		07:03 (M10)	06:58	07:30			17:31 (N02)	07:06		08:07 (N05)	07:30	08:13 (N05)
	20:32	37	20:07 (M08)	19:54	5	07:08 (M10)	19:03	18:15	20	17:51 (N02A)	16:44	16	08:23 (N05)	16:45	28	08:41 (N05)
26	05:58		19:30 (M08)	06:28			06:59	07:31			17:28 (N02)	07:07		08:06 (N05)	07:31	08:14 (N05)
	20:31	36	20:06 (M08)	19:52			19:01	18:14	22	17:50 (N02A)	16:44	18	08:24 (N05)	16:45	27	08:41 (N05)
27	05:59		19:31 (M08)	06:29			07:00	07:32			17:26 (N02)	07:08		08:06 (N05)	07:31	08:15 (N05)
	20:30	35	20:06 (M08)	19:51			18:59	18:13	23	17:49 (N02A)	16:43	19	08:25 (N05)	16:46	27	08:42 (N05)
28	06:00		19:32 (M08)	06:30			07:01	07:33			17:25 (N02)	07:09		08:05 (N05)	07:31	08:15 (N05)
	20:29	33	20:05 (M08)	19:49			18:58	18:11	22	17:47 (N02A)	16:43	21	08:26 (N05)	16:47	27	08:42 (N05)
29	06:01		19:32 (M08)	06:31			07:02	07:34			17:23 (N02)	07:10		08:05 (N05)	07:32	08:15 (N05)
	20:28	32	20:04 (M08)	19:48			18:56	18:10	23	17:46 (N02A)	16:42	22	08:27 (N05)	16:47	28	08:43 (N05)
30	06:02		19:33 (M08)	06:32			07:03	07:35			17:22 (N02)	07:11		08:05 (N05)	07:32	08:15 (N05)
	20:27	30	20:03 (M08)	19:46			18:54	18:09	22	17:44 (N02A)	16:42	23	08:28 (N05)	16:48	28	08:43 (N05)
31	06:03		19:32 (M08)	06:33				07:37			17:21 (N02)				07:32	08:16 (N05)
	20:26	29	20:01 (M08)	19:44				18:07	22	17:43 (N02)				16:49	27	08:43 (N05)
Potential sun hours	458			428			375	346		299			288			
Total, worst case		1374			720			282		329				840		
Sun reduction		0.97			0.96			0.84		0.61				0.47		
Oper. time red.		1.00			1.00			1.00		1.00				1.00		
Wind dir. red.		0.47			0.69			0.83		0.65				0.38		
Total reduction		0.45			0.65			0.69		0.39				0.18		
Total, real		617			471			195		129				151		

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:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 59 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (131)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

		January	February	March	April		May		June	July	August		September	October	November	December
1	07:32	07:19	06:43	06:53		06:07		07:36 (M04)	05:39	05:40	06:04		06:34	07:04	06:38	07:12
	16:50	17:24	17:58	19:31		20:03	21	07:57 (M04)	20:32	20:44	20:25		19:43	18:53	18:06	16:42
2	07:33	07:18	06:42	06:51		06:06		07:38 (M04)	05:39	05:41	06:05		06:35	07:05	06:39	07:13
	16:51	17:25	17:59	19:32		20:04	18	07:56 (M04)	20:33	20:43	20:24		19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49		06:05		07:39 (M04)	05:38	05:41	06:06		06:36	07:06	06:40	07:14
	16:52	17:26	18:00	19:33		20:05	15	07:54 (M04)	20:34	20:43	20:23		19:40	18:50	17:04	16:41
4	07:33	07:16	06:38	06:48		06:04		07:41 (M04)	05:38	05:42	06:07		06:37	07:07	06:41	07:15
	16:53	17:27	18:01	19:34		20:06	10	07:51 (M04)	20:34	20:43	20:22		19:38	18:48	17:03	16:41
5	07:33	07:15	06:37	06:46		06:02			05:38	05:42	06:08		06:38	07:08	06:43	07:16
	16:53	17:29	18:02	19:35		20:07			20:35	20:43	20:21		19:37	18:46	17:01	16:41
6	07:33	07:14	06:35	06:45		06:01			05:37	05:43	06:09		06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:37		20:08			20:36	20:43	20:20		19:35	18:45	17:00	16:40
7	07:33	07:13	06:34	06:43		06:00			05:37	05:43	06:10		06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:38		20:09			20:36	20:43	20:19		19:33	18:43	16:59	16:40
8	07:32	07:12	07:32	06:41		05:59			05:37	05:44	06:11	07:54 (M04)	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:39		20:10			20:37	20:42	20:17	3	07:57 (M04)	19:32	18:41	16:58
9	07:32	07:10	07:31	06:40		05:58			05:37	05:45	06:12		07:49 (M04)	06:42	07:12	06:47
	16:57	17:34	19:07	19:40		20:11			20:38	20:42	20:16	12	08:01 (M04)	19:30	18:40	16:57
10	07:32	07:09	07:29	06:38		05:57			05:36	05:45	06:13		07:47 (M04)	06:43	07:13	06:49
	16:58	17:35	19:08	19:41		20:12			20:38	20:42	20:15	16	08:03 (M04)	19:28	18:38	16:56
11	07:32	07:08	07:27	06:37		05:56			05:36	05:46	06:14		07:46 (M04)	06:44	07:14	06:50
	16:59	17:36	19:09	19:42		20:13			20:39	20:41	20:14	19	08:05 (M04)	19:27	18:37	16:55
12	07:32	07:07	07:26	06:35		05:54			05:36	05:47	06:15		07:45 (M04)	06:45	07:15	06:51
	17:00	17:37	19:10	19:43		20:14			20:39	20:41	20:12	21	08:06 (M04)	19:25	18:35	16:54
13	07:31	07:06	07:24	06:33		05:53			05:36	05:47	06:16		07:43 (M04)	06:46	07:17	06:52
	17:01	17:39	19:11	19:44	6	07:54 (M04)	20:15		20:40	20:40	20:11	24	08:07 (M04)	19:23	18:33	16:53
14	07:31	07:04	07:22	06:32		07:44 (M04)	05:52		05:36	05:48	06:17		07:43 (M04)	06:47	07:18	06:53
	17:02	17:40	19:12	19:45	14	07:58 (M04)	20:16		20:40	20:40	20:10	25	08:08 (M04)	19:22	18:32	16:52
15	07:31	07:03	07:21	06:30		07:41 (M04)	05:51		05:36	05:49	06:18		07:42 (M04)	06:48	07:19	06:54
	17:04	17:41	19:13	19:46	19	08:00 (M04)	20:17		20:41	20:39	20:08	26	08:08 (M04)	19:20	18:30	16:51
16	07:30	07:02	07:19	06:29		07:40 (M04)	05:50		05:36	05:50	06:19		07:41 (M04)	06:49	07:20	06:56
	17:05	17:42	19:14	19:47	21	08:01 (M04)	20:18		05:36	20:39	20:07	28	08:09 (M04)	19:18	18:29	16:50
17	07:30	07:00	07:18	06:27		07:38 (M04)	05:50		05:36	05:51	06:20		07:41 (M04)	06:50	07:21	06:57
	17:06	17:43	19:15	19:48	24	08:02 (M04)	20:19		20:41	20:38	20:06	28	08:09 (M04)	19:16	18:27	16:50
18	07:29	06:59	07:16	06:26		07:37 (M04)	05:49		05:36	05:51	06:21		07:39 (M04)	06:51	07:22	06:58
	17:07	17:45	19:16	19:49	26	08:03 (M04)	20:20		20:42	20:37	20:04	29	08:08 (M04)	19:15	18:26	16:49
19	07:29	06:58	07:14	06:24		07:36 (M04)	05:48		05:36	05:52	06:22		07:39 (M04)	06:52	07:23	06:59
	17:08	17:46	19:17	19:50	27	08:03 (M04)	20:21		20:42	20:37	20:03	29	08:08 (M04)	19:13	18:24	16:48
20	07:28	06:56	07:13	06:23		07:35 (M04)	05:47		05:36	05:53	06:22		07:39 (M04)	06:53	07:24	07:00
	17:09	17:47	19:19	19:51	28	08:03 (M04)	20:22		20:42	20:36	20:01	29	08:08 (M04)	19:11	18:23	16:47
21	07:28	06:55	07:11	06:21		07:35 (M04)	05:46		05:37	05:54	06:23		07:39 (M04)	06:54	07:25	07:01
	17:10	17:48	19:20	19:52	29	08:04 (M04)	20:23		20:43	20:35	20:00	29	08:08 (M04)	19:10	18:21	16:47
22	07:27	06:53	07:09	06:20		07:34 (M04)	05:45		05:37	05:55	06:24		07:39 (M04)	06:55	07:26	07:03
	17:12	17:49	19:21	19:53	29	08:03 (M04)	20:24		20:43	20:35	19:58	29	08:08 (M04)	19:08	18:20	16:46
23	07:26	06:52	07:08	06:18		07:34 (M04)	05:45		05:37	05:56	06:25		07:39 (M04)	06:56	07:28	07:04
	17:13	17:51	19:22	19:54	30	08:04 (M04)	20:25		20:43	20:34	19:57	28	08:07 (M04)	19:06	18:18	16:45
24	07:26	06:51	07:06	06:17		07:33 (M04)	05:44		05:37	05:56	06:26		07:40 (M04)	06:57	07:29	07:05
	17:14	17:52	19:23	19:55	30	08:03 (M04)	20:26		20:43	20:33	19:55	27	08:07 (M04)	19:05	18:17	16:45
25	07:25	06:49	07:04	06:15		07:34 (M04)	05:43		05:38	05:57	06:27		07:40 (M04)	06:58	07:30	07:06
	17:15	17:53	19:24	19:56	29	08:03 (M04)	20:26		20:43	20:32	19:54	26	08:06 (M04)	19:03	18:16	16:44
26	07:24	06:48	07:03	06:14		07:34 (M04)	05:42		05:38	05:58	06:28		07:41 (M04)	06:59	07:31	07:07
	17:16	17:54	19:25	19:58	28	08:02 (M04)	20:27		20:44	20:31	19:52	24	08:05 (M04)	19:01	18:14	16:44
27	07:23	06:46	07:01	06:13		07:34 (M04)	05:42		05:38	05:59	06:29		07:42 (M04)	07:00	07:32	07:08
	17:18	17:55	19:26	19:59	27	08:01 (M04)	20:28		20:44	20:30	19:51	21	08:03 (M04)	19:00	18:13	16:43
28	07:23	06:45	06:59	06:11		07:34 (M04)	05:41		05:39	06:00	06:30		07:43 (M04)	07:01	07:33	07:09
	17:19	17:56	19:27	20:00	27	08:01 (M04)	20:29		20:44	20:29	19:49	18	08:01 (M04)	18:58	18:11	16:43
29	07:22		06:58	06:10		07:35 (M04)	05:41		05:39	06:01	06:31		07:45 (M04)	07:02	07:34	07:10
	17:20		19:28	20:01	25	08:00 (M04)	20:30		20:44	20:28	19:48	14	07:59 (M04)	18:56	18:10	16:42
30	07:21		06:56	06:09		07:35 (M04)	05:40		05:40	06:02	06:32		07:49 (M04)	07:03	07:36	07:11
	17:21		19:29	20:02	23	07:58 (M04)	20:31		20:44	20:27	19:46	5	07:54 (M04)	18:55	18:09	16:42
31	07:20		06:54			05:40				06:03	06:33			07:37		07:32
	17:22		19:30			20:31				20:26	19:45			18:08		16:49
Potential sun hours	298	297	369	398		448			451	458	428		375	346	299	288
Total, worst case				442			64					510				
Sun reduction				0.82			0.92					0.96				
Oper. time red.				1.00			1.00					1.00				
Wind dir. red.				0.70			0.70					0.70				
Total reduction				0.57			0.64					0.67				
Total, real				252			41					340				

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 60 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (132)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June
1	07:32	07:19	06:43	06:53	06:07	05:39
	16:50	17:24	17:58	19:31	20:03	20:32
2	07:33	07:18	06:42	06:51	06:06	05:39
	16:51	17:25	17:59	19:32	20:04	20:33
3	07:33	07:17	06:40	06:49	06:05	05:38
	16:52	17:26	18:00	19:33	20:05	20:34
4	07:33	07:16	06:39	06:48	06:04	05:38
	16:53	17:27	18:01	19:34	20:06	20:34
5	07:33	07:15	06:37	06:46	06:02	05:38
	16:53	17:29	18:02	19:35	20:07	20:35
6	07:33	07:14	06:35	06:45	06:01	05:37
	16:54	17:30	18:03	19:37	20:08	20:36
7	07:33	07:13	06:34	06:43	06:00	05:37
	16:55	17:31	18:04	19:38	20:09	20:36
8	07:32	07:12	07:32	06:41	07:47 (M04)	05:59
	16:56	17:32	19:05	19:39	07:56 (M04)	20:10
9	07:32	07:10	07:31	06:40	07:45 (M04)	05:58
	16:57	17:34	19:07	19:40	07:59 (M04)	20:11
10	07:32	07:09	07:29	06:38	07:43 (M04)	05:57
	16:58	17:35	19:08	19:41	08:00 (M04)	20:12
11	07:32	07:08	07:27	06:37	07:42 (M04)	05:56
	16:59	17:36	19:09	19:42	08:01 (M04)	20:13
12	07:32	07:07	07:26	06:35	07:40 (M04)	05:54
	17:00	17:37	19:10	19:43	08:01 (M04)	20:14
13	07:31	07:06	07:24	06:33	07:39 (M04)	05:53
	17:01	17:39	19:11	19:44	08:01 (M04)	20:15
14	07:31	07:04	07:22	06:32	07:39 (M04)	05:52
	17:02	17:40	19:12	19:45	08:01 (M04)	20:16
15	07:31	07:03	07:21	06:30	07:38 (M04)	05:51
	17:04	17:41	19:13	19:46	08:01 (M04)	20:17
16	07:30	07:02	07:19	06:29	07:39 (M04)	05:50
	17:05	17:42	19:14	19:47	08:01 (M04)	20:18
17	07:30	07:00	07:18	06:27	07:38 (M04)	05:50
	17:06	17:43	19:15	19:48	08:00 (M04)	20:19
18	07:29	06:59	07:16	06:26	07:39 (M04)	05:49
	17:07	17:45	19:16	19:49	07:59 (M04)	20:20
19	07:29	06:58	07:14	06:24	07:39 (M04)	05:48
	17:08	17:46	19:18	19:50	07:58 (M04)	20:21
20	07:28	06:56	07:13	06:23	07:40 (M04)	05:47
	17:09	17:47	19:19	19:51	07:57 (M04)	20:22
21	07:28	06:55	07:11	06:21	07:41 (M04)	05:46
	17:10	17:48	19:20	19:52	07:56 (M04)	20:23
22	07:27	06:53	07:09	06:20	07:42 (M04)	05:45
	17:12	17:49	19:21	19:53	07:53 (M04)	20:24
23	07:26	06:52	07:08	06:18	07:46 (M04)	05:45
	17:13	17:51	19:22	19:54	07:50 (M04)	20:25
24	07:26	06:51	07:06	06:17		05:44
	17:14	17:52	19:23	19:55		20:26
25	07:25	06:49	07:04	06:15		05:43
	17:15	17:53	19:24	19:56		20:26
26	07:24	06:48	07:03	06:14		05:42
	17:16	17:54	19:25	19:58		20:27
27	07:23	06:46	07:01	06:13		05:42
	17:18	17:55	19:26	19:59		20:28
28	07:23	06:45	06:59	06:11		05:41
	17:19	17:56	19:27	20:00		20:29
29	07:22		06:58	06:10		05:41
	17:20		19:28	20:01		20:30
30	07:21		06:56	06:09		05:40
	17:21		19:29	20:02		20:31
31	07:20		06:54			05:40
	17:22		19:30			20:31
Potential sun hours	298	297	369	398	448	451
Total, worst case				277	386	800
Sun reduction				0.82	0.92	0.94
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.80	0.80
Total reduction				0.55	0.74	0.75
Total, real				153	284	602

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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Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 60 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (132)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

July			August			September			October			November			December		
1	05:40		07:00 (M03)	06:04		06:34			07:41 (M04)	07:04	06:38	07:12					
	20:44	27	07:27 (M03)	20:25		19:43	19	08:00 (M04)	18:53	18:06	16:42						
2	05:41		07:00 (M03)	06:05		06:35			07:42 (M04)	07:05	06:39	07:13					
	20:43	28	07:28 (M03)	20:24		19:41	17	07:59 (M04)	18:51	17:05	16:41						
3	05:41		07:00 (M03)	06:06		06:36			07:43 (M04)	07:06	06:40	07:14					
	20:43	27	07:27 (M03)	20:23		19:40	14	07:57 (M04)	18:50	17:04	16:41						
4	05:42		07:01 (M03)	06:07		06:37			07:45 (M04)	07:07	06:41	07:15					
	20:43	27	07:28 (M03)	20:22		19:38	9	07:54 (M04)	18:48	17:03	16:41						
5	05:42		07:00 (M03)	06:08		06:38			07:08	06:43	07:16						
	20:43	28	07:28 (M03)	20:21		19:37			18:46	17:01	16:41						
6	05:43		07:01 (M03)	06:09		06:39			07:09	06:44	07:17						
	20:43	28	07:29 (M03)	20:20		19:35			18:45	17:00	16:41						
7	05:43		07:01 (M03)	06:10		06:40			07:10	06:45	07:18						
	20:43	28	07:29 (M03)	20:19		19:33			18:43	16:59	16:40						
8	05:44		07:01 (M03)	06:11		06:41			07:11	06:46	07:19						
	20:42	28	07:29 (M03)	20:17		19:32			18:41	16:58	16:40						
9	05:45		07:01 (M03)	06:12		06:42			07:12	06:47	07:20						
	20:42	28	07:29 (M03)	20:16		19:30			18:40	16:57	16:40						
10	05:45		07:02 (M03)	06:13		06:43			07:13	06:49	07:21						
	20:42	28	07:30 (M03)	20:15		19:28			18:38	16:56	16:40						
11	05:46		07:01 (M03)	06:14		06:44			07:14	06:50	07:22						
	20:41	28	07:29 (M03)	20:14		19:27			18:37	16:55	16:40						
12	05:47		07:02 (M03)	06:15		06:45			07:15	06:51	07:23						
	20:41	28	07:30 (M03)	20:12		19:25			18:35	16:54	16:40						
13	05:47		07:02 (M03)	06:16		06:46			07:17	06:52	07:23						
	20:40	28	07:30 (M03)	20:11		19:23			18:33	16:53	16:41						
14	05:48		07:02 (M03)	06:17		06:47			07:18	06:53	07:24						
	20:40	28	07:30 (M03)	20:10		19:22			18:32	16:52	16:41						
15	05:49		07:02 (M03)	06:18		06:48			07:19	06:54	07:25						
	20:39	28	07:30 (M03)	20:08		19:20			18:30	16:51	16:41						
16	05:50		07:03 (M03)	06:19		06:49			07:20	06:56	07:26						
	20:39	27	07:30 (M03)	20:07		19:18			18:29	16:50	16:41						
17	05:51		07:03 (M03)	06:20		06:50			07:21	06:57	07:26						
	20:38	27	07:30 (M03)	20:06		19:16			18:27	16:50	16:41						
18	05:51		07:03 (M03)	06:21		06:51			07:22	06:58	07:27						
	20:37	27	07:30 (M03)	20:04		19:15			18:26	16:49	16:42						
19	05:52		07:03 (M03)	06:22		06:52			07:23	06:59	07:28						
	20:37	27	07:30 (M03)	20:03		19:13			18:24	16:48	16:42						
20	05:53		07:04 (M03)	06:23		07:50 (M04)	06:53		07:24	07:00	07:28						
	20:36	26	07:30 (M03)	20:01	6	07:56 (M04)	19:11		18:23	16:47	16:42						
21	05:54		07:05 (M03)	06:24		07:47 (M04)	06:54		07:25	07:01	07:29						
	20:35	24	07:29 (M03)	20:00	11	07:58 (M04)	19:10		18:21	16:47	16:43						
22	05:55		07:05 (M03)	06:24		07:45 (M04)	06:55		07:26	07:03	07:29						
	20:35	24	07:29 (M03)	19:58	15	08:00 (M04)	19:08		18:20	16:46	16:43						
23	05:56		07:06 (M03)	06:25		07:43 (M04)	06:56		07:28	07:04	07:30						
	20:34	23	07:29 (M03)	19:57	18	08:01 (M04)	19:06		18:18	16:45	16:44						
24	05:56		07:06 (M03)	06:26		07:42 (M04)	06:57		07:29	07:05	07:30						
	20:33	21	07:27 (M03)	19:55	20	08:02 (M04)	19:05		18:17	16:45	16:44						
25	05:57		07:07 (M03)	06:27		07:41 (M04)	06:58		07:30	07:06	07:31						
	20:32	20	07:27 (M03)	19:54	21	08:02 (M04)	19:03		18:16	16:44	16:45						
26	05:58		07:09 (M03)	06:28		07:41 (M04)	06:59		07:31	07:07	07:31						
	20:31	17	07:26 (M03)	19:52	22	08:03 (M04)	19:01		18:14	16:44	16:46						
27	05:59		07:10 (M03)	06:29		07:40 (M04)	07:00		07:32	07:08	07:31						
	20:30	14	07:24 (M03)	19:51	23	08:03 (M04)	19:00		18:13	16:43	16:46						
28	06:00		07:12 (M03)	06:30		07:40 (M04)	07:01		07:33	07:09	07:32						
	20:29	10	07:22 (M03)	19:49	23	08:03 (M04)	18:58		18:11	16:43	16:47						
29	06:01			06:31		07:40 (M04)	07:02		07:34	07:10	07:32						
	20:28			19:48	22	08:02 (M04)	18:56		18:10	16:42	16:48						
30	06:02			06:32		07:40 (M04)	07:03		07:36	07:11	07:32						
	20:27			19:46	22	08:02 (M04)	18:55		18:09	16:42	16:48						
31	06:03			06:33		07:40 (M04)			07:37		07:32						
	20:26			19:45	21	08:01 (M04)			18:08		16:49						
Potential sun hours	458			428		375			346	299	288						
Total, worst case		704		224		59											
Sun reduction		0.97		0.96		0.93											
Oper. time red.		1.00		1.00		1.00											
Wind dir. red.		0.80		0.68		0.68											
Total reduction		0.78		0.65		0.63											
Total, real		546		145		37											

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
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Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 61 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (133)**Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:24	06:43 17:58	06:53 19:31	06:07 20:03	05:39 20:32	06:52 (M03) 20:44	06:58 (M03) 20:25	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06
2	07:33 16:51	07:18 17:25	06:42 17:59	06:51 19:32	06:06 20:04	05:39 20:33	06:51 (M03) 20:43	06:58 (M03) 20:24	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05
3	07:33 16:52	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	06:52 (M03) 20:43	06:58 (M03) 20:23	06:06 20:23	06:36 19:40	07:06 18:50	06:40 17:04
4	07:33 16:53	07:16 17:27	06:39 18:01	06:48 19:34	06:04 20:06	05:38 20:34	06:52 (M03) 20:43	06:58 (M03) 20:22	06:07 20:22	06:37 19:38	07:07 18:48	06:41 17:03
5	07:33 16:53	07:15 17:29	06:37 18:02	06:46 19:35	06:02 20:07	05:38 20:35	06:52 (M03) 20:43	06:58 (M03) 20:21	06:08 20:21	06:38 19:37	07:08 18:46	06:43 17:01
6	07:33 16:54	07:14 17:30	06:35 18:03	06:45 19:37	06:01 20:08	05:37 20:36	06:52 (M03) 20:43	06:59 (M03) 20:20	06:09 20:20	06:39 19:35	07:09 18:45	06:44 17:00
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:38	06:00 20:09	05:37 20:36	06:53 (M03) 20:43	06:59 (M03) 20:19	06:10 20:19	06:40 19:33	07:10 18:43	06:45 16:59
8	07:32 16:56	07:12 17:32	07:32 19:05	06:41 19:39	05:59 20:10	05:37 20:37	06:53 (M03) 20:42	06:59 (M03) 20:17	06:11 20:17	06:41 19:32	07:11 18:41	06:46 16:58
9	07:32 16:57	07:10 17:34	07:31 19:07	06:40 19:40	05:58 20:11	05:37 20:38	06:53 (M03) 20:42	06:59 (M03) 20:16	06:12 20:16	06:42 19:30	07:12 18:38	06:47 16:57
10	07:32 16:58	07:09 17:35	07:29 19:08	06:38 19:41	05:57 20:12	05:36 20:38	06:53 (M03) 20:42	07:00 (M03) 20:15	06:13 20:15	06:43 19:28	07:13 18:38	06:49 16:56
11	07:32 16:59	07:08 17:36	07:27 19:09	06:37 19:42	05:56 20:13	05:36 20:39	06:53 (M03) 20:41	06:59 (M03) 20:14	06:14 20:14	06:44 19:27	07:14 18:37	06:50 16:55
12	07:32 17:00	07:07 17:37	07:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	06:54 (M03) 20:41	07:00 (M03) 20:12	06:15 20:12	06:45 19:25	07:15 18:35	06:51 16:54
13	07:31 17:01	07:06 17:39	07:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	06:54 (M03) 20:40	07:00 (M03) 20:11	06:16 20:11	06:46 19:23	07:17 18:33	06:52 16:53
14	07:31 17:02	07:04 17:40	07:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	06:54 (M03) 20:40	07:00 (M03) 20:10	06:17 20:10	06:47 19:22	07:18 18:32	06:53 16:52
15	07:31 17:04	07:03 17:41	07:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	06:55 (M03) 20:39	07:00 (M03) 20:08	06:18 20:08	06:48 19:20	07:19 18:30	06:54 16:51
16	07:30 17:05	07:02 17:42	07:19 19:14	06:29 19:47	05:50 20:18	05:36 20:41	06:55 (M03) 20:39	07:01 (M03) 20:07	06:19 20:07	06:49 19:18	07:20 18:29	06:56 16:50
17	07:30 17:06	07:00 17:43	07:18 19:15	06:27 19:48	05:50 20:19	05:36 20:41	06:55 (M03) 20:38	07:01 (M03) 20:06	06:20 20:06	06:50 19:16	07:21 18:27	06:57 16:51
18	07:29 17:07	06:59 17:45	07:16 19:16	06:26 19:49	05:49 20:20	05:36 20:42	06:55 (M03) 20:37	07:01 (M03) 20:04	06:21 20:04	06:51 19:15	07:22 18:26	06:58 16:49
19	07:29 17:08	06:58 17:46	07:14 19:18	06:24 19:50	05:48 20:21	05:36 20:42	06:55 (M03) 20:37	07:02 (M03) 20:03	06:22 20:03	06:52 19:13	07:23 18:24	06:59 16:48
20	07:28 17:09	06:56 17:47	07:13 19:19	06:23 19:51	05:47 20:22	05:36 20:42	06:56 (M03) 20:36	07:02 (M03) 20:01	06:23 20:01	06:53 19:11	07:24 18:23	07:00 16:47
21	07:28 17:10	06:55 17:48	07:11 19:20	06:21 19:52	05:46 20:23	05:37 20:43	06:56 (M03) 20:35	07:03 (M03) 20:00	06:24 20:00	06:54 19:10	07:25 18:21	07:01 16:47
22	07:27 17:12	06:53 17:49	07:09 19:21	06:20 19:53	05:45 20:24	05:37 20:43	06:56 (M03) 20:35	07:04 (M03) 19:58	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46
23	07:26 17:13	06:52 17:51	07:08 19:22	06:18 19:54	05:45 20:25	05:37 20:43	06:56 (M03) 20:34	07:05 (M03) 19:57	06:25 19:57	06:56 19:06	07:28 18:18	07:04 16:45
24	07:26 17:14	06:51 17:52	07:06 19:23	06:17 19:55	05:44 20:26	05:37 20:43	06:57 (M03) 20:33	07:05 (M03) 19:55	06:26 19:55	06:57 19:05	07:29 18:17	07:05 16:44
25	07:25 17:15	06:49 17:53	07:04 19:24	06:15 19:56	05:43 20:26	05:38 20:43	06:57 (M03) 20:32	07:07 (M03) 19:54	06:27 19:54	06:58 19:03	07:30 18:16	07:06 16:44
26	07:24 17:16	06:48 17:54	07:03 19:25	06:14 19:58	05:42 20:27	05:38 20:44	06:57 (M03) 20:31	07:08 (M03) 19:52	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:44
27	07:23 17:18	06:46 17:55	07:01 19:26	06:13 19:59	05:42 20:28	05:38 20:44	06:58 (M03) 20:30	07:11 (M03) 19:51	06:29 19:51	07:00 19:00	07:32 18:13	07:08 16:43
28	07:23 17:19	06:45 17:56	06:59 19:27	06:11 20:00	05:41 20:29	05:39 20:44	06:57 (M03) 20:29	07:12 (M03) 19:49	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:43
29	07:22 17:20	06:58 19:28	06:10 20:01	05:41 20:30	05:39 20:44	05:39 20:44	06:57 (M03) 20:28	07:13 (M03) 19:48	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42
30	07:21 17:21	06:56 19:29	06:09 20:02	05:40 20:31	05:40 20:44	05:40 20:44	06:58 (M03) 20:27	07:14 (M03) 19:46	06:32 19:46	07:03 18:55	07:36 18:09	07:11 16:42
31	07:20 17:22	06:54 19:30	06:04 20:31	05:40 20:31	05:40 20:31	05:40 20:31	06:59 (M03) 20:26	07:15 (M03) 19:45	06:33 19:45	07:37 18:08	07:37 18:08	07:32 16:49
Potential sun hours	298	297	369	398	448	451	458	428	375	346	299	288
Total, worst case					348	804	666					
Sun reduction					0.92	0.94	0.97					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.80	0.80	0.80					
Total reduction					0.74	0.76	0.78					
Total, real					258	608	520					

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 62 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (134)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March		April		May		June		July		August		September		October		November		December			
1	07:32		07:19		08:40 (M04)	06:43	06:53	06:07	05:39	05:40	06:04	06:34	07:04		06:38				06:38		08:00 (M03)	07:12				
	16:50		17:24	24	09:04 (M04)	17:58	19:31	20:03	20:32	20:44	20:25	19:43	18:53		18:06	32			18:06	32	08:32 (M03)	16:42				
2	07:33		07:18		08:41 (M04)	06:42	06:51	06:06	05:39	05:40	06:05	06:35	07:05		06:39				06:39		08:00 (M03)	07:13				
	16:51		17:25	22	09:03 (M04)	17:59	19:32	20:04	20:33	20:44	20:24	19:41	18:51		17:05	31			17:05	31	08:31 (M03)	16:41				
3	07:33		07:17		08:39 (M03)	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06		06:40				06:40		08:01 (M03)	07:14				
	16:52		17:26	24	09:03 (M04)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:50		17:04	29			17:04	29	08:30 (M03)	16:41				
4	07:33		07:16		08:37 (M03)	06:38	06:48	06:04	05:38	05:42	06:07	06:37	07:07		06:41				06:41		08:03 (M03)	07:15				
	16:52		17:27	25	09:02 (M04)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48		17:03	27			17:03	27	08:30 (M03)	16:41				
5	07:33		07:15		08:35 (M03)	06:37	06:46	06:02	05:38	05:42	06:08	06:38	07:08		06:43				06:43		08:04 (M03)	07:16				
	16:53		17:29	26	09:01 (M04)	18:02	19:35	20:07	20:35	20:43	20:21	19:37	18:46		17:01	25			17:01	25	08:29 (M04)	16:41				
6	07:33		07:14		08:34 (M03)	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09		06:44				06:44		08:05 (M03)	07:17				
	16:54		17:30	25	08:59 (M03)	18:03	19:37	20:08	20:36	20:43	20:20	19:35	18:45		17:00	26			17:00	26	08:31 (M04)	16:40				
7	07:33		07:13		08:33 (M03)	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10		06:45				06:45		08:07 (M03)	07:18				
	16:55		17:31	27	09:00 (M03)	18:04	19:38	20:09	20:36	20:43	20:19	19:33	18:43		16:59	25			16:59	25	08:32 (M04)	16:40				
8	07:32		07:12		08:32 (M03)	07:32	06:41	05:59	05:37	05:44	06:11	06:41	07:11		06:46				06:46		08:10 (M03)	07:19				
	16:56		17:32	29	09:01 (M03)	19:05	19:39	20:10	20:37	20:42	20:17	19:32	18:41		16:58	24			16:58	24	08:34 (M04)	16:40				
9	07:32		07:10		08:30 (M03)	07:31	06:40	05:58	05:36	05:45	06:12	06:42	07:12		06:47				06:47		08:11 (M04)	07:20				
	16:57		17:34	31	09:01 (M03)	19:07	19:40	20:11	20:38	20:42	20:16	19:30	18:40		16:57	23			16:57	23	08:34 (M04)	16:40				
10	07:32		07:09		08:30 (M03)	07:29	06:38	05:57	05:36	05:45	06:13	06:43	07:13		06:49				06:49		08:11 (M04)	07:21				
	16:58		17:35	32	09:02 (M03)	19:08	19:41	20:12	20:38	20:42	20:15	19:28	18:38		16:56	24			16:56	24	08:35 (M04)	16:40				
11	07:32		07:08		08:30 (M03)	07:27	06:36	05:55	05:36	05:46	06:14	06:44	07:14		06:50				06:50		08:11 (M04)	07:22				
	16:59		17:36	33	09:03 (M03)	19:09	19:42	20:13	20:39	20:41	20:14	19:27	18:36		16:55	25			16:55	25	08:36 (M04)	16:40				
12	07:32		07:07		08:30 (M03)	07:26	06:35	05:54	05:36	05:47	06:15	06:45	07:15		06:51				06:51		08:11 (M04)	07:23				
	17:00		17:37	33	09:03 (M03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35		16:54	25			16:54	25	08:36 (M04)	16:40				
13	07:31		07:06		08:29 (M03)	07:24	06:33	05:53	05:36	05:47	06:16	06:46	07:17		06:52				06:52		08:11 (M04)	07:23				
	17:01		17:39	34	09:03 (M03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33		16:53	25			16:53	25	08:36 (M04)	16:41				
14	07:31		07:04		08:29 (M03)	07:22	06:32	05:52	05:36	05:48	06:17	06:47	07:18		06:53				06:53		08:11 (M04)	07:24				
	17:02		17:40	34	09:03 (M03)	19:12	19:45	20:16	20:40	20:40	20:10	19:22	18:32		16:52	25			16:52	25	08:36 (M04)	16:41				
15	07:31		07:03		08:29 (M03)	07:21	06:30	05:51	05:36	05:49	06:18	06:48	07:19		06:54				06:54		08:12 (M04)	07:25				
	17:04		17:41	35	09:04 (M03)	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30		6				09:14 (M03)	16:54		08:37 (M04)	16:41			
16	07:30		07:02		08:29 (M03)	07:19	06:29	05:50	05:36	05:50	06:19	06:49	07:20		06:56				06:56		08:12 (M04)	07:26				
	17:05	7	08:51 (M04)	17:42	35	09:04 (M03)	19:14	19:47	20:18	20:41	20:39	20:07	19:18		15				09:24 (M03)	16:50		25	08:37 (M04)	16:41		
17	07:30		08:43 (M04)	07:00	08:29 (M03)	07:18	06:27	05:49	05:36	05:51	06:20	06:50	07:21					09:06 (M03)	16:57		08:12 (M04)	07:26				
	17:06	11	08:54 (M04)	17:43	34	09:03 (M03)	19:15	19:48	20:19	20:41	20:38	20:06	19:16		20				09:26 (M03)	16:50		24	08:36 (M04)	16:41		
18	07:29		08:41 (M04)	06:59	08:29 (M03)	07:16	06:26	05:49	05:36	05:51	06:21	06:51	07:22					09:04 (M03)	16:58		08:12 (M04)	07:27				
	17:07	15	08:56 (M04)	17:45	34	09:03 (M03)	19:16	19:49	20:20	20:42	20:37	20:04	19:15		24				09:28 (M03)	16:49		24	08:36 (M04)	16:42		
19	07:29		08:41 (M04)	06:58	08:29 (M03)	07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23					09:03 (M03)	16:59		08:14 (M04)	07:28				
	17:08	17	08:58 (M04)	17:46	33	09:02 (M03)	19:17	19:50	20:21	20:42	20:37	20:03	19:13		26				09:29 (M03)	16:48		22	08:36 (M04)	16:42		
20	07:28		08:40 (M04)	06:56	08:30 (M03)	07:13	06:23	05:47	05:36	05:53	06:22	06:53	07:24					09:01 (M03)	16:47		21	08:36 (M04)	16:42			
	17:09	19	08:59 (M04)	17:47	31	09:01 (M03)	19:19	19:51	20:22	20:42	20:36	20:01	19:11		29				09:30 (M03)	16:47		20	08:35 (M04)	16:43		
21	07:28		08:40 (M04)	06:55	08:31 (M03)	07:11	06:21	05:46	05:37	05:54	06:23	06:54	07:25					09:01 (M03)	16:47		20	08:35 (M04)	16:43			
	17:10	20	09:00 (M04)	17:48	30	09:01 (M03)	19:20	19:52	20:23	20:43	20:35	20:00	19:10		31				09:32 (M03)	16:47		20	08:35 (M04)	16:43		
22	07:27		08:40 (M04)	06:53	08:31 (M03)	07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26					09:00 (M03)	16:47		19	08:35 (M04)	16:43			
	17:12	21	09:01 (M04)	17:49	28	08:59 (M03)	19:21	19:53	20:24	20:43	20:35	20:00	19:10		32				09:32 (M03)	16:46		19	08:35 (M04)	16:43		
23	07:26		08:39 (M04)	06:52	08:33 (M03)	07:08	06:18	05:45	05:37	05:56	06:25	06:56	07:28					08:59 (M03)	16:45		17	08:34 (M04)	16:44			
	17:13	22	09:01 (M04)	17:51	25	08:58 (M03)	19:22	19:54	20:25	20:43	20:34	20:00	19:10		33				09:32 (M03)	16:45		17	08:34 (M04)	16:44		
24	07:26		08:39 (M04)	06:51	08:33 (M03)	07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29					08:59 (M03)	16:45		15	08:34 (M04)	16:44			
	17:14	23	09:02 (M04)	17:52	23	08:56 (M03)	19:23	19:55	20:26	20:43	20:33	20:00	19:10		34				09:33 (M03)	16:45		15	08:34 (M04)	16:44		
25	07:25		08:39 (M04)	06:49	08:36 (M03)	07:04	06:15	05:43	05:38	05:57	06:27	06:58	07:30					08:58 (M03)	16:45		11	08:32 (M04)	16:45			
	17:15	24	09:03 (M04)	17:53	18	08:54 (M03)	19:24	19:56	20:26	20:43	20:32	20:00	19:10		35				09:33 (M03)	16:44		11	08:32 (M04)	16:45		
26	07:24		08:39 (M04)	06:48	08:38 (M03)	07:03	06:14	05:42	05:38	05:58	06:28	06:59	07:31					08:59 (M03)	16:44		7	08:30 (M04)	16:45			
	17:16	25	09:04 (M04)	17:54	12	08:50 (M03)	19:25	19:58	20:27	20:44	20:31	20:00	19:10		35				09:34 (M03)	16:44		7	08:30 (M04)	16:45		
27	07:23		08:39 (M04)	06:46		07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32					08:59 (M03)	16:44							
	17:18	25	09:04 (M04)	17:55		19:26	19:59	20:28	20:44	20:30	20:00	19:10	18:13		34				09:33 (M03)	16:43						
28	07:23		08:39 (M04)	06:45		06:59	06:11	05:41	05:39	06:00	06:30	07:01	07:33	</												

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 63 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (135)****Assumptions for shadow calculations**

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1 07:32		07:19	08:37 (M04) 06:43	08:24 (M03) 06:53	06:07	05:39	05:40	06:04	06:34	07:04	06:38	08:10 (M04) 07:12
16:50		17:24	26 09:03 (M04) 17:58	34 08:58 (M03) 19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	21 08:31 (M04) 16:42
2 07:33		07:18	08:37 (M04) 06:42	08:24 (M03) 06:51	06:06	05:39	05:40	06:05	06:35	07:05	06:39	08:09 (M04) 07:13
16:51		17:25	27 09:04 (M04) 17:59	33 08:57 (M03) 19:32	20:04	20:33	20:44	20:24	19:41	18:51	17:05	23 08:32 (M04) 16:41
3 07:33		07:17	08:37 (M04) 06:40	08:25 (M03) 06:49	06:05	05:38	05:41	06:06	06:36	07:06	06:40	08:08 (M04) 07:14
16:52		17:26	27 09:04 (M04) 18:00	30 08:55 (M03) 19:33	20:05	20:34	20:43	20:23	19:40	18:50	17:04	24 08:32 (M04) 16:41
4 07:33		07:16	08:37 (M04) 06:38	08:26 (M03) 06:48	06:04	05:38	05:42	06:07	06:37	07:07	06:41	08:08 (M04) 07:15
16:52		17:27	27 09:04 (M04) 18:01	28 08:54 (M03) 19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:03	26 08:34 (M04) 16:41
5 07:33		07:15	08:38 (M04) 06:37	08:27 (M03) 06:46	06:02	05:38	05:42	06:08	06:38	07:08	06:43	08:08 (M04) 07:16
16:53		17:29	26 09:04 (M04) 18:02	24 08:51 (M03) 19:35	20:07	20:35	20:43	20:21	19:37	18:46	17:01	26 08:34 (M04) 16:41
6 07:33		07:14	08:38 (M04) 06:35	08:29 (M03) 06:44	06:01	05:37	05:43	06:09	06:39	07:09	09:10 (M03) 06:44	08:07 (M04) 07:17
16:54		17:30	26 09:04 (M04) 18:03	21 08:50 (M03) 19:37	20:08	20:36	20:43	20:20	19:35	18:45	10 09:20 (M03) 17:00	27 08:34 (M04) 16:40
7 07:33		07:13	08:39 (M04) 06:34	08:31 (M03) 06:43	06:00	05:37	05:43	06:10	06:40	07:10	09:06 (M03) 06:45	08:07 (M04) 07:18
16:55		17:31	25 09:04 (M04) 18:04	15 08:46 (M03) 19:38	20:09	20:36	20:43	20:19	19:33	18:43	18 09:24 (M03) 16:59	27 08:34 (M04) 16:40
8 07:32		07:12	08:39 (M04) 07:32	06:41	05:59	05:37	05:44	06:11	06:41	07:11	09:04 (M03) 06:46	08:08 (M04) 07:19
16:56		17:32	24 09:03 (M04) 19:05	19:39	20:10	20:37	20:42	20:17	19:32	18:41	22 09:26 (M03) 16:58	27 08:35 (M04) 16:40
9 07:32		07:10	08:39 (M04) 07:31	06:40	05:58	05:36	05:45	06:12	06:42	07:12	09:02 (M03) 06:47	08:08 (M04) 07:20
16:57		17:34	23 09:02 (M04) 19:07	19:40	20:11	20:38	20:42	20:16	19:30	18:40	26 09:28 (M03) 16:57	27 08:35 (M04) 16:40
10 07:32		07:09	08:41 (M04) 07:29	06:38	05:57	05:36	05:45	06:13	06:43	07:13	09:00 (M03) 06:49	08:08 (M04) 07:21
16:58		17:35	20 09:01 (M04) 19:08	19:41	20:12	20:38	20:42	20:15	19:28	18:38	29 09:29 (M03) 16:56	26 08:34 (M04) 16:40
11 07:32		07:08	08:37 (M03) 07:27	06:36	05:55	05:36	05:46	06:14	06:44	07:14	08:59 (M03) 06:50	08:09 (M04) 07:22
16:59		17:36	23 09:00 (M04) 19:09	19:42	20:13	20:39	20:41	20:14	19:27	18:36	31 09:30 (M03) 16:55	26 08:35 (M04) 16:40
12 07:32		07:07	08:34 (M03) 07:26	06:35	05:54	05:36	05:47	06:15	06:45	07:15	08:57 (M03) 06:51	08:09 (M04) 07:23
17:00		17:37	24 08:58 (M04) 19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	34 09:31 (M03) 16:54	25 08:34 (M04) 16:40
13 07:31		07:06	08:32 (M03) 07:24	06:33	05:53	05:36	05:47	06:16	06:46	07:17	08:56 (M03) 06:52	08:10 (M04) 07:23
17:01		17:39	22 08:54 (M03) 19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	35 09:31 (M03) 16:53	24 08:34 (M04) 16:41
14 07:31		07:04	08:30 (M03) 07:22	06:32	05:52	05:36	05:48	06:17	06:47	07:18	08:56 (M03) 06:53	08:10 (M04) 07:24
17:02		17:40	26 08:56 (M03) 19:12	19:45	20:16	20:40	20:40	20:10	19:22	18:32	35 09:31 (M03) 16:52	23 08:33 (M04) 16:41
15 07:31		07:03	08:29 (M03) 07:21	06:30	05:51	05:36	05:49	06:18	06:48	07:19	08:56 (M03) 06:54	08:12 (M04) 07:25
17:04		17:41	29 08:58 (M03) 19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	37 09:33 (M03) 16:51	21 08:33 (M04) 16:41
16 07:30		07:02	08:28 (M03) 07:19	06:29	05:50	05:36	05:50	06:19	06:49	07:20	08:55 (M03) 06:56	08:13 (M04) 07:26
17:05		17:42	31 08:59 (M03) 19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:29	38 09:33 (M03) 16:50	19 08:32 (M04) 16:41
17 07:30		07:00	08:26 (M03) 07:18	06:27	05:49	05:36	05:51	06:20	06:50	07:21	08:55 (M03) 06:57	08:14 (M04) 07:26
17:06		17:43	33 08:59 (M03) 19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	38 09:33 (M03) 16:50	17 08:31 (M04) 16:41
18 07:29		06:59	08:26 (M03) 07:16	06:26	05:49	05:36	05:51	06:20	06:51	07:22	08:54 (M03) 06:58	08:16 (M04) 07:27
17:07		17:45	35 09:01 (M03) 19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:26	39 09:33 (M03) 16:49	13 08:29 (M04) 16:42
19 07:29		06:58	08:25 (M03) 07:14	06:24	05:48	05:36	05:52	06:21	06:52	07:23	08:54 (M03) 06:59	08:19 (M04) 07:28
17:08		17:46	35 09:00 (M03) 19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	38 09:32 (M03) 16:48	9 08:28 (M04) 16:42
20 07:28		06:56	08:24 (M03) 07:13	06:23	05:47	05:36	05:53	06:22	06:53	07:24	08:54 (M03) 07:00	07:28
17:09		17:47	37 09:01 (M03) 19:19	19:51	20:22	20:42	20:36	20:01	19:11	18:23	38 09:32 (M03) 16:47	16:42
21 07:28		06:55	08:24 (M03) 07:11	06:21	05:46	05:37	05:54	06:23	06:54	07:25	08:55 (M03) 07:01	07:29
17:10		17:48	38 09:02 (M03) 19:20	19:52	20:23	20:43	20:35	20:00	19:10	18:21	37 09:32 (M03) 16:47	16:43
22 07:27		06:53	08:23 (M03) 07:09	06:20	05:45	05:37	05:55	06:24	06:55	07:26	08:55 (M03) 07:03	07:29
17:12		17:49	38 09:01 (M03) 19:21	19:53	20:24	20:43	20:35	19:58	19:08	18:20	37 09:32 (M03) 16:46	16:43
23 07:26		06:52	08:24 (M03) 07:08	06:18	05:45	05:37	05:56	06:25	06:56	07:28	08:55 (M03) 07:04	07:30
17:13	9 08:53 (M04) 17:51	38 09:02 (M03) 19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	17:24	36 09:31 (M03) 16:45	16:44
24 07:26		06:51	08:23 (M03) 07:06	06:17	05:44	05:37	05:56	06:26	06:57	07:29	08:56 (M03) 07:05	07:30
17:14	13 08:55 (M04) 17:52	38 09:01 (M03) 19:23	19:55	20:26	20:43	20:33	19:55	19:05	18:17	17:34	34 09:30 (M03) 16:45	16:44
25 07:25		06:49	08:23 (M03) 07:04	06:15	05:43	05:38	05:57	06:27	06:58	07:30	08:56 (M03) 07:06	07:31
17:15	17 08:58 (M04) 17:53	38 09:01 (M03) 19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	17:33	33 09:29 (M03) 16:44	16:45
26 07:24		06:48	08:23 (M03) 07:03	06:14	05:42	05:38	05:58	06:28	06:59	07:31	08:58 (M03) 07:07	07:31
17:16	19 08:59 (M04) 17:54	37 09:00 (M03) 19:25	19:58	20:27	20:44	20:31	19:52	19:01	18:14	17:31	31 09:29 (M03) 16:44	16:45
27 07:23		06:46	08:23 (M03) 07:01	06:13	05:42	05:38	05:59	06:29	07:00	07:32	08:59 (M03) 07:08	07:31
17:18	21 09:00 (M04) 17:55	37 09:00 (M03) 19:26	19:59	20:28	20:44	20:30	19:51	19:00	18:13	17:28	28 09:27 (M03) 16:43	16:46
28 07:23		06:45	08:23 (M03) 06:59	06:11	05:41	05:39	06:00	06:30	07:01	07:33	09:00 (M03) 07:09	07:32
17:19	23 09:01 (M04) 17:56	36 08:59 (M03) 19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	17:26	26 09:26 (M03) 16:43	16:47
29 07:22		06:44	06:58	06:10	05:41	05:39	06:01	06:31	07:02	07:34	09:02 (M03) 07:10	07:32
17:20	24 09:02 (M04)	19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	17:22	22 09:24 (M03) 16:42	16:47
30 07:21		06:44	06:56	06:09	05:40	05:40	06:02	06:32	07:03	07:36	09:04 (M03) 07:11	07:32
17:21	25 09:02 (M04)	19:29	20:02	20:31	20:44	20:27	19:46	18:55	18:09	17:23	23 09:27 (M04) 16:42	16:48
31 07:20		06:44	06:54		05:40		06:03	06:33		07:37	09:08 (M03)	07:32
17:22	26 09:03 (M04)	19:30		20:31		20:26	19:45	19:45		18:08	22 09:30 (M04)	16:49
Potential sun hours	298	297	369	398	448	451	458	428	375	346	299	288
Total, worst case	177	846	185							797	431	
Sun reduction	0.45	0.62	0.73							0.84	0.61	
Oper. time red.	1.00	1.00	1.00							1.00	1.00	
Wind dir. red.	0.39	0.40	0.41							0.41	0.39	
Total reduction	0.17	0.25	0.30							0.34	0.23	
Total, real	31	211	55							274	101	

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)

SHADOW - Calendar

Shadow receptor: 64 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (136)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January		February		March		April		May		June		July		August		September		October		November		December		
1	07:32		07:19		08:49 (M04)	06:43		08:47 (M03)	06:53	06:07	05:39	05:40	06:04	06:34	07:04		06:34	06:04	05:34	05:04	04:34	06:38		08:11 (M03)	07:12
	16:50		17:24	26	09:15 (M04)	17:58		09:08 (M03)	19:31	20:03	20:32	20:44	20:25	19:43	18:53		19:43	18:53	18:06	37	08:48 (M03)	16:42		08:48 (M03)	16:42
2	07:33		07:18		08:49 (M04)	06:42		08:49 (M03)	06:51	06:06	05:39	05:40	06:05	06:35	07:05		06:35	06:05	06:39		08:12 (M03)	07:13		08:12 (M03)	07:13
	16:51		17:25	26	09:15 (M04)	17:59		09:04 (M03)	19:32	20:04	20:33	20:43	20:24	19:41	18:51		19:41	18:51	17:05	35	08:47 (M03)	16:41		08:47 (M03)	16:41
3	07:33		07:17		08:50 (M04)	06:40			06:49	06:05	05:38	05:41	06:06	06:36	07:06		06:36	06:06	06:40		08:13 (M03)	07:14		08:13 (M03)	07:14
	16:52		17:26	24	09:14 (M04)	18:00			19:33	20:03	20:32	20:43	20:23	19:40	18:50		19:40	18:50	17:04	33	08:46 (M03)	16:41		08:46 (M03)	16:41
4	07:33		07:16		08:49 (M03)	06:38			06:48	06:04	05:38	05:42	06:07	06:37	07:07		06:37	06:07	06:41		08:15 (M03)	07:15		08:15 (M03)	07:15
	16:52		17:27	24	09:13 (M04)	18:01			19:34	20:06	20:34	20:43	20:22	19:38	18:48		19:38	18:48	17:03	31	08:46 (M03)	16:41		08:46 (M03)	16:41
5	07:33		07:15		08:47 (M03)	06:37			06:46	06:02	05:38	05:42	06:08	06:38	07:08		06:38	06:08	06:43		08:16 (M03)	07:16		08:16 (M03)	07:16
	16:53		17:29	26	09:13 (M03)	18:02			19:35	20:07	20:35	20:43	20:21	19:37	18:46		19:37	18:46	17:01	28	08:44 (M03)	16:41		08:44 (M03)	16:41
6	07:33		07:14		08:46 (M03)	06:35			06:44	06:01	05:37	05:43	06:09	06:39	07:09		06:39	06:09	06:44		08:17 (M03)	07:17		08:17 (M03)	07:17
	16:54		17:30	28	09:14 (M03)	18:03			19:37	20:08	20:36	20:43	20:20	19:35	18:45		19:35	18:45	17:00	25	08:42 (M03)	16:40		08:42 (M03)	16:40
7	07:33		07:13		08:45 (M03)	06:34			06:43	06:00	05:37	05:43	06:10	06:40	07:10		06:40	06:10	06:45		08:19 (M03)	07:18		08:19 (M03)	07:18
	16:55		17:31	31	09:16 (M03)	18:04			19:38	20:09	20:36	20:43	20:19	19:33	18:43		19:33	18:43	16:59	24	08:43 (M04)	16:40		08:43 (M04)	16:40
8	07:32		07:12		08:44 (M03)	07:32			06:41	05:59	05:37	05:44	06:11	06:41	07:11		06:41	07:11	06:46		08:21 (M04)	17:19		08:21 (M04)	17:19
	16:56		17:32	33	09:17 (M03)	18:05			19:39	20:10	20:05	20:42	20:17	19:32	18:41		19:32	18:41	17:04	24	08:45 (M04)	16:40		08:45 (M04)	16:40
9	07:32		07:10		08:42 (M03)	07:31			06:40	05:58	05:36	05:45	06:12	06:42	07:12		06:42	07:12	06:47		08:20 (M04)	07:20		08:20 (M04)	07:20
	16:57		17:34	35	09:17 (M03)	19:07			19:40	20:11	20:38	20:42	20:16	19:30	18:40		19:30	18:40	16:57	26	08:46 (M04)	16:40		08:46 (M04)	16:40
10	07:32		07:09		08:41 (M03)	07:29			06:38	05:57	05:36	05:45	06:13	06:43	07:13		06:43	07:13	06:49		08:20 (M04)	07:21		08:20 (M04)	07:21
	16:58		17:35	37	09:18 (M03)	19:08			19:41	20:12	20:38	20:42	20:15	19:28	18:38		19:28	18:38	16:56	26	08:46 (M04)	16:40		08:46 (M04)	16:40
11	07:32		07:08		08:41 (M03)	07:27			06:36	05:55	05:36	05:46	06:14	06:44	07:14		06:44	07:14			08:20 (M04)	07:22		08:20 (M04)	07:22
	16:59		17:36	38	09:19 (M03)	19:09			19:42	20:13	20:39	20:41	20:14	19:27	18:36	10	09:25 (M03)	06:50			08:20 (M04)	07:22		08:20 (M04)	07:22
12	07:32				08:41 (M03)	07:26			06:35	05:54	05:36	05:47	06:15	06:45	07:15		06:45	07:15			08:20 (M04)	07:23		08:20 (M04)	07:23
	17:00	6	08:54 (M04)	07:07	09:00 (M04)	17:37			19:43	20:14	20:39	20:41	20:12	19:25	18:35	18	09:29 (M03)	16:54	28		08:48 (M04)	16:40		08:48 (M04)	16:40
13	07:31		07:06		08:52 (M04)	07:06			06:33	05:53	05:36	05:47	06:16	06:46	07:16		06:46	07:16			08:21 (M04)	07:23		08:21 (M04)	07:23
	17:01	11	09:03 (M04)	17:39	09:03 (M04)	17:39	41		19:44	20:15	20:40	20:40	20:11	19:23	18:33	23	09:41 (M03)	16:53	29		08:48 (M04)	16:41		08:48 (M04)	16:41
14	07:31		07:04		08:51 (M04)	07:04			06:32	05:52	05:36	05:48	06:17	06:47	07:18		06:47	07:18			08:19 (M04)	07:24		08:19 (M04)	07:24
	17:02	13	09:04 (M04)	17:40	09:20 (M03)	19:12			19:45	20:16	20:40	20:40	20:10	19:22	18:32	27	09:43 (M03)	16:52	29		08:48 (M04)	16:41		08:48 (M04)	16:41
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	17:05	18	09:07 (M04)	17:42	09:20 (M03)	19:14			19:47	20:18	20:41	20:39	20:07	19:18	18:29	33	09:47 (M03)	16:50	29		08:49 (M04)	16:41		08:49 (M04)	16:41
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20	07:28		06:56		08:49 (M03)	07:13			06:23	05:47	05:36	05:53	06:22	06:53	07:24		06:53	07:24			08:22 (M04)	07:28		08:22 (M04)	07:28
	17:09	25	09:12 (M04)	17:47	09:20 (M03)	19:19			19:51	20:22	20:42	20:36	20:01	19:11	18:23	39	09:49 (M03)	16:47	27		08:49 (M04)	16:42		08:49 (M04)	16:42
21	07:28		06:55		08:48 (M04)	07:11			06:21	05:46	05:37	05:54	06:23	06:54	07:25		06:54	07:25			08:23 (M04)	07:29		08:23 (M04)	07:29
	17:10	25	09:13 (M04)	17:48	09:20 (M03)	19:20			19:52	20:23	20:43	20:35	20:00	19:10	18:21	40	09:50 (M03)	16:47	25		08:48 (M04)	16:43		08:48 (M04)	16:43
22	07:27		06:53		08:49 (M03)	07:09			06:20	05:45	05:37	05:55	06:24	06:55	07:26		06:55	07:26			08:23 (M04)	07:29		08:23 (M04)	07:29
	17:12	27	09:14 (M04)	17:49	09:18 (M03)	19:21			19:53	20:24	20:43	20:35	20:00	19:10	18:20	41	09:50 (M03)	16:46	25		08:48 (M04)	16:43		08:48 (M04)	16:43
23	07:26		06:52		08:40 (M03)	07:08			06:18	05:45	05:37	05:56	06:25	06:56	07:28		06:56	07:28			08:24 (M04)	07:30		08:24 (M04)	07:30
	17:13	27	09:14 (M04)	17:51	09:18 (M03)	19:22			19:54	20:25	20:43	20:34	20:00	19:10	18:20	42	09:51 (M03)	16:45	23		08:47 (M04)	16:44		08:47 (M04)	16:44
24	07:26		06:51		08:40 (M03)	07:06			06:17	05:44	05:37	05:56	06:26	06:57	07:29		06:57	07:29			08:25 (M04)	07:30		08:25 (M04)	07:30
	17:14	27	09:14 (M04)	17:52	09:16 (M03)	19:23			19:55	20:26	20:43	20:33	20:00	19:10	18:20	41	09:50 (M03)	16:45	22		08:48 (M04)	16:44		08:48 (M04)	16:44
25	07:25		06:49		08:41 (M03)	07:04			06:15	05:43	05:38	05:57	06:27	06:58	07:30		06:58	07:30							

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 65 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (137)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:32		07:19		08:45 (M03)	06:43	06:53	06:07	05:39	05:40	06:04	06:34	07:04		06:38		06:38		08:06 (M03)	07:12		08:06 (M03)	07:12	
	16:50		17:24	24	09:09 (M04)	17:58	19:31	20:03	20:32	20:44	20:25	19:43	18:53		18:06	36	18:06		08:42 (M03)	16:42		08:42 (M03)	16:42	
2	07:33		07:18		08:43 (M03)	06:42	06:51	06:06	05:39	05:40	06:05	06:35	07:05		06:39		06:39		08:06 (M03)	07:13		08:06 (M03)	07:13	
	16:51		17:25	25	09:08 (M04)	17:59	19:32	20:04	20:33	20:44	20:24	19:41	18:51		17:05	35	17:05		08:41 (M03)	16:41		08:41 (M03)	16:41	
3	07:33		07:17		08:42 (M03)	06:40	06:49	06:05	05:38	05:41	06:06	06:36	07:06		06:40		06:40		08:06 (M03)	07:14		08:06 (M03)	07:14	
	16:52		17:26	26	09:08 (M04)	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:50		17:04	34	17:04		08:40 (M03)	16:41		08:40 (M03)	16:41	
4	07:33		07:16		08:40 (M03)	06:38	06:48	06:04	05:38	05:42	06:07	06:37	07:07		06:41		06:41		08:08 (M03)	07:15		08:08 (M03)	07:15	
	16:52		17:27	27	09:07 (M03)	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48		17:03	32	17:03		08:40 (M03)	16:41		08:40 (M03)	16:41	
5	07:33		07:15		08:39 (M03)	06:37	06:46	06:02	05:38	05:42	06:08	06:38	07:08		06:43		06:43		08:09 (M03)	07:16		08:09 (M03)	07:16	
	16:53		17:29	29	09:08 (M03)	18:02	19:35	20:07	20:35	20:43	20:21	19:37	18:46		17:01	30	17:01		08:39 (M03)	16:41		08:39 (M03)	16:41	
6	07:33		07:14		08:39 (M03)	06:35	06:44	06:01	05:37	05:43	06:09	06:39	07:09		06:44		06:44		08:09 (M03)	07:17		08:09 (M03)	07:17	
	16:54		17:30	31	09:10 (M03)	18:03	19:37	20:08	20:36	20:43	20:20	19:35	18:45		17:00	29	17:00		08:38 (M03)	16:40		08:38 (M03)	16:40	
7	07:33		07:13		08:38 (M03)	06:34	06:43	06:00	05:37	05:43	06:10	06:40	07:10		06:45		06:45		08:10 (M03)	07:18		08:10 (M03)	07:18	
	16:55		17:31	33	09:11 (M03)	18:04	19:38	20:09	20:36	20:43	20:19	19:33	18:43		16:59	27	16:59		08:37 (M03)	16:40		08:37 (M03)	16:40	
8	07:32		07:12		08:38 (M03)	07:32	06:41	05:59	05:37	05:44	06:11	06:41	07:11		06:46		06:46		08:13 (M03)	07:19		08:13 (M03)	07:19	
	16:56		17:32	33	09:11 (M03)	19:05	19:39	20:10	20:37	20:42	20:17	19:32	18:41		16:58	26	16:58		08:39 (M04)	16:40		08:39 (M04)	16:40	
9	07:32		07:10		08:36 (M03)	07:31	06:40	05:58	05:36	05:45	06:12	06:42	07:12		06:47		06:47		08:14 (M03)	07:20		08:14 (M03)	07:20	
	16:57		17:34	35	09:11 (M03)	19:07	19:40	20:11	20:38	20:42	20:16	19:30	18:40		16:57	25	16:57		08:39 (M04)	16:40		08:39 (M04)	16:40	
10	07:32		07:09		08:36 (M03)	07:29	06:38	05:57	05:36	05:45	06:13	06:43	07:13		06:49		06:49		08:16 (M03)	07:21		08:16 (M03)	07:21	
	16:58		17:35	36	09:12 (M03)	19:08	19:41	20:12	20:38	20:42	20:15	19:28	18:38		16:56	24	16:56		08:40 (M04)	16:40		08:40 (M04)	16:40	
11	07:32		07:08		08:36 (M03)	07:27	06:36	05:55	05:36	05:46	06:14	06:44	07:14		06:50		06:50		08:17 (M04)	07:22		08:17 (M04)	07:22	
	16:59		17:36	37	09:13 (M03)	19:09	19:42	20:13	20:39	20:41	20:14	19:27	18:36		16:55	25	16:55		08:42 (M04)	16:40		08:42 (M04)	16:40	
12	07:32		07:07		08:36 (M03)	07:26	06:35	05:54	05:36	05:47	06:15	06:45	07:15		06:51		06:51		08:17 (M04)	07:23		08:17 (M04)	07:23	
	17:00	5	08:55 (M04)	17:37	37	09:13 (M03)	19:10	19:43	20:14	20:39	20:41	20:12	19:25		18:35		18:35		08:43 (M04)	16:40		08:43 (M04)	16:40	
13	07:31		08:48 (M04)	07:06		08:35 (M03)	07:24	06:33	05:53	05:36	05:47	06:16	07:17		06:52		06:52		08:16 (M04)	07:23		08:16 (M04)	07:23	
	17:01	10	08:58 (M04)	17:39	37	09:12 (M03)	19:11	19:44	20:15	20:40	20:40	20:11	19:23		18:33		18:33		08:42 (M04)	16:41		08:42 (M04)	16:41	
14	07:31		08:46 (M04)	07:04		08:35 (M03)	07:22	06:32	05:52	05:36	05:48	06:17	07:18		06:53		06:53		08:16 (M04)	07:24		08:16 (M04)	07:24	
	17:02	14	09:00 (M04)	17:40	38	09:13 (M03)	19:12	19:45	20:16	20:40	20:40	20:10	19:22		18:32		18:32		08:42 (M04)	16:41		08:42 (M04)	16:41	
15	07:31		08:46 (M04)	07:03		08:36 (M03)	07:21	06:30	05:51	05:36	05:49	06:18	07:19		06:54		06:54		08:17 (M04)	07:25		08:17 (M04)	07:25	
	17:04	16	09:02 (M04)	17:41	37	09:13 (M03)	19:13	19:46	20:17	20:41	20:39	20:08	19:20		18:30		18:30		08:43 (M04)	16:41		08:43 (M04)	16:41	
16	07:30		08:45 (M04)	07:02		08:36 (M03)	07:19	06:29	05:50	05:36	05:50	06:19	07:20		06:56		06:56		08:17 (M04)	07:26		08:17 (M04)	07:26	
	17:05	18	09:03 (M04)	17:42	37	09:13 (M03)	19:14	19:47	20:18	20:41	20:39	20:07	19:18		18:29	14	18:29		08:43 (M04)	16:41		08:43 (M04)	16:41	
17	07:30		08:45 (M04)	07:00		08:36 (M03)	07:18	06:27	05:49	05:36	05:50	06:20	07:21		06:57		06:57		08:17 (M04)	07:26		08:17 (M04)	07:26	
	17:06	19	09:04 (M04)	17:43	36	09:12 (M03)	19:15	19:48	20:19	20:41	20:38	20:06	19:16		18:27	20	18:27		08:43 (M04)	16:41		08:43 (M04)	16:41	
18	07:29		08:44 (M04)	06:59		08:36 (M03)	07:16	06:26	05:49	05:36	05:51	06:20	07:22		06:51		06:51		08:17 (M04)	07:27		08:17 (M04)	07:27	
	17:07	21	09:05 (M04)	17:45	35	09:11 (M03)	19:16	19:49	20:20	20:42	20:37	20:04	19:15		18:26	24	18:26		08:43 (M04)	16:42		08:43 (M04)	16:42	
19	07:29		08:44 (M04)	06:58		08:36 (M03)	07:14	06:24	05:48	05:36	05:52	06:21	07:23		06:52		06:52		08:18 (M04)	07:28		08:18 (M04)	07:28	
	17:08	22	09:06 (M04)	17:46	34	09:10 (M03)	19:17	19:50	20:21	20:42	20:37	20:03	19:13		18:24	27	18:24		08:44 (M04)	16:42		08:44 (M04)	16:42	
20	07:28		08:44 (M04)	06:56		08:37 (M03)	07:13	06:23	05:47	05:36	05:53	06:22	07:24		06:53		06:53		08:19 (M04)	07:28		08:19 (M04)	07:28	
	17:09	23	09:07 (M04)	17:47	33	09:10 (M03)	19:19	19:51	20:22	20:42	20:36	20:01	19:11		18:23	29	18:23		08:44 (M04)	16:42		08:44 (M04)	16:42	
21	07:28		08:44 (M04)	06:55		08:38 (M03)	07:11	06:21	05:46	05:37	05:54	06:23	07:25		06:54		06:54		08:19 (M04)	07:29		08:19 (M04)	07:29	
	17:10	24	09:08 (M04)	17:48	31	09:09 (M03)	19:20	19:52	20:23	20:43	20:35	20:00	19:10		18:21	32	18:21		08:43 (M04)	16:43		08:43 (M04)	16:43	
22	07:27		08:44 (M04)	06:53		08:39 (M03)	07:09	06:20	05:45	05:37	05:55	06:24	07:26		06:55		06:55		08:20 (M04)	07:29		08:20 (M04)	07:29	
	17:12	25	09:09 (M04)	17:49	28	09:07 (M03)	19:21	19:53	20:24	20:43	20:35	19:58	19:08		18:20	33	18:20		08:43 (M04)	16:43		08:43 (M04)	16:43	
23	07:26		08:43 (M04)	06:52		08:40 (M03)	07:08	06:18	05:45	05:37	05:56	06:25	07:28		06:56		06:56		08:20 (M04)	07:30		08:20 (M04)	07:30	
	17:13	26	09:09 (M04)	17:51	26	09:06 (M03)	19:22	19:54	20:25	20:43	20:34	19:57	19:06		18:18	34	18:18		08:42 (M04)	16:44		08:42 (M04)	16:44	
24	07:26		08:43 (M04)	06:51		08:41 (M03)	07:06	06:17	05:44	05:37	05:56	06:26	07:29		06:57		06:57		08:22 (M04)	07:30		08:22 (M04)	07:30	
	17:14	26	09:09 (M04)	17:52	22	09:03 (M03)	19:23	19:55	20:26	20:43	20:33	19:55	19:05		18:17	35	18:17		08:43 (M04)	16:44		08:43 (M04)	16:44	
25	07:25		08:44 (M04)	06:49		08:44 (M03)	07:04	06:15	05:43	05:38	05:57	06:27	07:30		06:58		06:58		08:23 (M04)	07:31		08:23 (M04)	07:31	
	17:15	26	09:10 (M04)	17:53	17	09:01 (M03)	19:24	19:56	20:26	20:43	20:32	19:54	19:03		18:15	36	18:15		08:42 (M04)	16:45		08:42 (M04)	16:45	
26	07:24		08:44 (M04)	06:48		08:46 (M03)	07:03	06:14	05:42	05:38	05:58	06:28	07:31		06:59		06:59		08:24 (M04)	07:31		08:24 (M04)	07:31	
	17:16	26	09:10 (M04)	17:54	11	08:57 (M03)	19:25	19:58	20:27	20:44	20:31	19:52	19:01		18:14	37	18:14		08:43 (M04)	16:44		08:43 (M04)	16:44	
27	07:23		08:44 (M04)	06:46			07:01	06:13	05:42	05:38	05:59	06:29	07:00		07:32		07:32		08:25 (M04)	07:31		08:25 (M04)	07:31	
	17:18																							

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 66 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (138)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33 16:50	07:19 17:24	06:43 17:58	06:53 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	08:16 (M03) 18:06 (M03)	06:38 16:42
2	07:33 16:51	07:18 17:25	06:42 17:59	06:51 19:32	06:06 20:04	05:39 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	08:15 (M03) 17:05 (M03)	06:39 16:41
3	07:33 16:52	07:17 17:26	06:40 18:00	07:47 (M03) 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:06 20:23	06:36 19:40	07:06 18:50	08:15 (M03) 17:04 (M03)	06:40 16:41
4	07:33 16:53	07:16 17:27	06:39 18:01	07:43 (M03) 19:34	06:04 20:06	05:38 20:34	05:42 20:43	06:07 20:22	06:37 19:38	07:07 18:48	08:14 (M03) 17:03 (M03)	06:41 16:41
5	07:33 16:53	07:15 17:29	06:37 18:02	07:41 (M03) 19:35	06:02 20:07	05:38 20:35	05:42 20:43	06:08 20:21	06:38 19:37	07:08 18:46	08:14 (M03) 17:01 (M03)	06:43 16:41
6	07:33 16:54	07:14 17:30	06:35 18:03	07:40 (M03) 19:37	06:01 20:08	05:37 20:36	05:43 20:43	06:09 20:20	06:39 19:35	07:09 18:45	08:15 (M03) 17:00 (M03)	06:44 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	07:38 (M03) 19:38	06:00 20:09	05:37 20:36	05:43 20:43	06:10 20:19	06:40 19:33	07:10 18:43	08:15 (M03) 16:59 (M03)	06:45 16:40
8	07:33 16:56	07:12 17:32	07:32 19:05	08:38 (M03) 19:39	06:41 20:10	05:59 20:37	05:44 20:42	06:11 20:18	06:41 19:32	07:11 18:41	08:16 (M03) 16:58 (M03)	06:46 16:40
9	07:32 16:57	07:10 17:34	07:31 19:07	08:37 (M03) 19:40	05:58 20:11	05:37 20:38	05:45 20:42	06:12 20:16	06:42 19:30	07:12 18:40	08:17 (M03) 16:57 (M03)	06:47 16:40
10	07:32 16:58	07:09 17:35	07:29 19:08	08:36 (M03) 19:41	05:57 20:12	05:36 20:38	05:45 20:42	06:13 20:15	06:43 19:28	07:13 18:38	08:19 (M03) 16:56 (M03)	06:49 16:40
11	07:32 16:59	07:08 17:36	07:27 19:09	08:36 (M03) 19:42	05:56 20:13	05:36 20:39	05:46 20:41	06:14 20:14	06:44 19:27	07:14 18:37	08:23 (M03) 16:55 (M03)	06:50 16:40
12	07:32 17:00	07:07 17:37	07:26 19:10	08:36 (M03) 19:43	05:54 20:14	05:36 20:39	05:47 20:41	06:15 20:12	06:45 19:25	07:15 18:35	08:27 (M03) 16:51 (M03)	06:51 16:40
13	07:31 17:01	07:06 17:39	07:24 19:11	08:36 (M03) 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:16 20:11	06:46 19:23	07:17 18:33	08:27 (M03) 16:53 (M03)	06:52 16:41
14	07:31 17:02	07:04 17:40	07:23 19:12	08:36 (M03) 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:17 20:10	06:47 19:22	07:18 18:32	08:27 (M03) 16:53 (M03)	06:53 16:41
15	07:31 17:04	07:03 17:41	07:21 19:13	08:37 (M03) 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:18 20:08	06:48 19:20	07:19 18:30	08:27 (M03) 16:54 (M03)	06:54 16:41
16	07:30 17:05	07:02 17:42	07:19 19:14	08:37 (M03) 19:47	05:50 20:18	05:36 20:41	05:50 20:39	06:19 20:07	06:49 19:18	07:20 18:29	08:27 (M03) 16:56 (M03)	06:56 16:41
17	07:30 17:06	07:00 17:43	07:18 19:15	08:39 (M03) 19:48	05:50 20:19	05:36 20:41	05:51 20:38	06:20 20:06	06:50 19:17	07:21 18:27	08:27 (M03) 16:57 (M03)	06:57 16:41
18	07:29 17:07	06:59 17:45	07:16 19:16	08:41 (M03) 19:49	05:49 20:20	05:36 20:42	05:51 20:37	06:21 20:04	06:51 19:15	07:22 18:26	08:27 (M03) 16:58 (M03)	06:58 16:42
19	07:29 17:08	06:58 17:46	07:14 19:18	08:52 (M03) 19:50	05:48 20:21	05:36 20:42	05:52 20:37	06:22 20:03	06:52 19:13	07:23 18:24	08:27 (M03) 16:59 (M03)	06:59 16:42
20	07:28 17:09	06:56 17:47	07:13 19:19	06:23 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:23 20:01	06:53 19:11	07:24 18:23	08:27 (M03) 16:57 (M03)	07:00 16:42
21	07:28 17:10	06:55 17:48	07:11 19:20	06:21 19:52	05:46 20:23	05:37 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	08:27 (M03) 16:58 (M03)	07:01 16:43
22	07:27 17:12	06:53 17:49	07:09 19:21	06:20 19:53	05:45 20:24	05:37 20:43	05:55 20:35	06:24 19:58	06:55 19:08	07:26 18:20	08:27 (M03) 16:59 (M03)	07:03 16:43
23	07:26 17:13	06:52 17:51	07:08 19:22	06:18 19:54	05:45 20:25	05:37 20:43	05:56 20:34	06:25 19:57	06:56 19:06	07:28 18:18	08:27 (M03) 16:59 (M03)	07:04 16:44
24	07:26 17:14	06:51 17:52	07:06 19:23	06:17 19:55	05:44 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:05	07:29 18:17	08:27 (M03) 16:59 (M03)	07:05 16:44
25	07:25 17:15	06:49 17:53	07:04 19:24	06:15 19:57	05:43 20:26	05:38 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:16	08:27 (M03) 16:59 (M03)	07:06 16:45
26	07:24 17:16	06:48 17:54	07:03 19:25	06:14 19:58	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	08:27 (M03) 16:59 (M03)	07:07 16:46
27	07:23 17:18	06:46 17:55	07:01 19:26	06:13 19:59	05:42 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 19:00	07:32 18:13	08:27 (M03) 16:59 (M03)	07:08 16:46
28	07:23 17:19	06:45 17:56	06:59 19:27	06:11 20:00	05:41 20:29	05:39 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	08:27 (M03) 16:59 (M03)	07:09 16:47
29	07:22 17:20	06:58 17:20	06:58 19:28	06:10 20:01	05:41 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	08:27 (M03) 16:59 (M03)	07:10 16:47
30	07:21 17:21	06:56 17:21	06:56 19:29	06:09 20:02	05:40 20:31	05:40 20:44	06:02 20:28	06:32 19:46	07:03 18:55	07:36 18:09	08:27 (M03) 16:59 (M03)	07:11 16:48
31	07:20 17:22	06:54 17:22	06:54 19:30	06:03 20:03	05:40 20:31	05:40 20:44	06:03 20:26	06:33 19:45	07:03 18:08	07:37 18:08	08:27 (M03) 16:59 (M03)	07:12 16:49
Potential sun hours	298	297	369	398	448	451	458	428	375	346	299	288
Total, worst case			327						108		223	
Sun reduction			0.73						0.93		0.84	
Oper. time red.			1.00						1.00		1.00	
Wind dir. red.			0.51						0.51		0.51	
Total reduction			0.37						0.48		0.43	
Total, real			122						51		96	

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 67 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (139)

Assumptions for shadow calculations

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January			February			March			April			May			June			July			August			September			October			November			December		
1	07:33	07:19	06:43						06:53	06:07	05:39	05:40	06:04	06:34					07:04									08:10 (M03)	06:38	07:12						
	16:50	17:24	17:58						19:31	20:03	20:32	20:44	20:25	19:43					18:53	18								08:28 (M03)	18:06	16:42						
2	07:33	07:18	06:42						06:51	06:06	05:39	05:40	06:05	06:35					07:05									08:12 (M03)	06:39	07:13						
	16:51	17:25	17:59						19:32	20:04	20:33	20:44	20:24	19:41					18:51	13								08:25 (M03)	17:05	16:41						
3	07:33	07:17	06:40						06:49	06:05	05:38	05:41	06:06	06:36					07:06									08:16 (M03)	06:40	07:14						
	16:52	17:26	18:00						19:33	20:05	20:34	20:43	20:23	19:40					18:50	5								08:21 (M03)	17:04	16:41						
4	07:33	07:16	06:39						06:48	06:04	05:38	05:42	06:07	06:37					07:07											06:41	07:15					
	16:53	17:27	18:01						19:34	20:06	20:34	20:43	20:22	19:38					18:48											17:03	16:41					
5	07:33	07:15	06:37						06:46	06:02	05:38	05:42	06:08	06:38					07:08											06:43	07:16					
	16:53	17:29	18:02						19:35	20:07	20:35	20:43	20:21	19:37					18:46											17:01	16:41					
6	07:33	07:14	06:35						06:45	06:01	05:37	05:43	06:09	06:39					07:09											06:44	07:17					
	16:54	17:30	18:03						19:37	20:08	20:36	20:43	20:20	19:35					18:45											17:00	16:40					
7	07:33	07:13	06:34						06:43	06:00	05:37	05:43	06:10	06:40					07:10											06:45	07:18					
	16:55	17:31	18:04						19:38	20:09	20:36	20:43	20:19	19:33					18:43											16:59	16:40					
8	07:33	07:12	07:32						06:41	05:59	05:37	05:44	06:11	06:41					07:11											06:46	07:19					
	16:56	17:32	19:05						19:39	20:10	20:37	20:42	20:18	19:32					18:41											16:58	16:40					
9	07:32	07:10	07:31						06:40	05:58	05:37	05:45	06:12	06:42					07:12											06:47	07:20					
	16:57	17:34	19:07						19:40	20:11	20:38	20:42	20:16	19:30					18:40											16:57	16:40					
10	07:32	07:09	07:29						06:38	05:57	05:36	05:45	06:13	06:43					07:13											06:49	07:21					
	16:58	17:35	19:08						19:41	20:12	20:38	20:42	20:15	19:28					18:38											16:56	16:40					
11	07:32	07:08	07:27					08:35 (M03)	06:37	05:56	05:36	05:46	06:14	06:44					07:14											06:50	07:22					
	16:59	17:36	19:09	10				08:45 (M03)	19:42	20:13	20:39	20:41	20:14	19:27					18:37											16:55	16:40					
12	07:32	07:07	07:26					08:32 (M03)	06:35	05:54	05:36	05:47	06:15	06:45					07:15											06:51	07:23					
	17:00	17:37	19:10	15				08:47 (M03)	19:43	20:14	20:39	20:41	20:12	19:25					18:35											16:54	16:40					
13	07:31	07:06	07:24					08:29 (M03)	06:33	05:53	05:36	05:47	06:16	06:46					07:17											06:52	07:23					
	17:01	17:39	19:11	20				08:49 (M03)	19:44	20:15	20:40	20:40	20:11	19:23					18:33											16:53	16:41					
14	07:31	07:04	07:23					08:28 (M03)	06:32	05:52	05:36	05:48	06:17	06:47					07:18											06:53	07:24					
	17:02	17:40	19:12	22				08:50 (M03)	19:45	20:16	20:40	20:40	20:10	19:22					18:32											16:52	16:41					
15	07:31	07:03	07:21					08:27 (M03)	06:30	05:51	05:36	05:49	06:18	06:48					07:19											06:54	07:25					
	17:04	17:41	19:13	23				08:50 (M03)	19:46	20:17	20:41	20:39	20:08	19:20					18:30											16:51	16:41					
16	07:30	07:02	07:19					08:25 (M03)	06:29	05:50	05:36	05:50	06:19	06:49					07:20											06:56	07:26					
	17:05	17:42	19:14	25				08:50 (M03)	19:47	20:18	20:41	20:39	20:07	19:18					18:29											16:50	16:41					
17	07:30	07:00	07:18					08:25 (M03)	06:27	05:50	05:36	05:51	06:20	06:50					07:21											06:57	07:26					
	17:06	17:43	19:15	26				08:51 (M03)	19:48	20:19	20:41	20:38	20:06	19:17	12				08:29 (M03)	18:27										16:50	16:41					
18	07:29	06:59	07:16					08:24 (M03)	06:26	05:49	05:36	05:51	06:21	06:51					08:15 (M03)	07:22										06:58	07:27					
	17:07	17:45	19:16	27				08:51 (M03)	19:49	20:20	20:42	20:37	20:04	19:15	16				08:31 (M03)	18:26										16:49	16:42					
19	07:29	06:58	07:14					08:24 (M03)	06:24	05:48	05:36	05:52	06:22	06:52					08:13 (M03)	07:23										06:59	07:28					
	17:08	17:46	19:18	26				08:50 (M03)	19:50	20:21	20:42	20:37	20:03	19:13	19				08:32 (M03)	18:24										16:48	16:42					
20	07:28	06:56	07:13					08:24 (M03)	06:23	05:47	05:36	05:53	06:23	06:53					08:11 (M03)	07:24										07:00	07:28					
	17:09	17:47	19:19	26				08:50 (M03)	19:51	20:22	20:42	20:36	20:01	19:11	22				08:33 (M03)	18:23										16:47	16:42					
21	07:28	06:55	07:11					08:24 (M03)	06:21	05:46	05:37	05:54	06:23	06:54					08:10 (M03)	07:25										07:01	07:29					
	17:10	17:48	19:20	25				08:49 (M03)	19:52	20:23	20:43	20:35	20:00	19:10	24				08:34 (M03)	18:21										16:47	16:43					
22	07:27	06:53	07:09					08:24 (M03)	06:20	05:45	05:37	05:55	06:24	06:55					08:09 (M03)	07:26										07:03	07:29					
	17:12	17:49	19:21	24				08:48 (M03)	19:53	20:24	20:43	20:35	19:58	19:08	25				08:34 (M03)	18:20										16:46	16:43					
23	07:26	06:52	07:08					08:25 (M03)	06:18	05:45	05:37	05:56	06:25	06:56					08:09 (M03)	07:28										07:04	07:30					
	17:13	17:51	19:22	22				08:47 (M03)	19:54	20:25	20:43	20:34	19:57	19:06	25				08:34 (M03)	18:18										16:45	16:44					
24	07:26	06:51	07:06					08:25 (M03)	06:17	05:44	05:37	05:56	06:26	06:57					08:08 (M03)	07:29										07:05	07:30					
	17:14	17:52	19:23	20				08:45 (M03)	19:55	20:26	20:43	20:33	19:55	19:05	26				08:34 (M03)	18:17										16:45	16:44					
25	07:25	06:49	07:04					08:26 (M03)	06:15	05:43	05:38	05:57	06:27	06:58					08:08 (M03)	07:30										07:06	07:31					
	17:15	17:53	19:24	17				08:43 (M03)	19:56	20:26	20:43	20:32	19:54	19:03	26				08:34 (M03)	18:16										16:44	16:45					
26	07:24	06:48	07:03					08:29 (M03)	06:14	05:42	05:38	05:58	06:28	06:59					08:08 (M03)	07:31										07:07	07:31					
	17:16	17:54	19:25	12				08:41 (M03)	19:58	20:27	20:44	20:31	19:52	19:01	26				08:34 (M03)	18:14										16:44	16:46					
27	07:23	06:46	07:01					08:33 (M03)	06:13	05:42	05:38	05:59	06:29	07:00					08:08 (M03)	07:32										07:08	07:31					
	17:18	17:55	19:26	3				08:36 (M03)	19:59	20:28	20:44	20:30	19:51	19:00	25				08:33 (M03)	18:13																

Project:

Fountain Wind

Licensed user:

EDR

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

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 68 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (140)

Assumptions for shadow calculations

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

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

		January	February	March		April		May		June		July		August		September		October		November		December
1	07:32 16:50	07:19 17:23	06:43 17:57		06:52 19:31	31	18:32 (D03) 19:03 (D03)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43					07:04 18:53	06:38 18:06	07:12 16:41			
2	07:33 16:50	07:18 17:25	06:41 17:58		06:51 19:32	30	18:33 (D03) 19:03 (D03)	06:06 20:04	05:38 20:33	05:40 20:43	06:05 20:24	06:35 19:41	9	18:39 (D03)			07:05 18:51	06:39 17:05	07:13 16:41			
3	07:33 16:51	07:17 17:26	06:40 18:00		06:49 19:33	30	18:32 (D03) 19:02 (D03)	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	15	18:51 (D03)			07:06 18:49	06:40 17:04	07:14 16:41			
4	07:33 16:52	07:16 17:27	06:38 18:01		06:48 19:34	29	18:33 (D03) 19:02 (D03)	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	20	18:33 (D03) 18:53 (D03)			07:07 18:48	06:41 17:02	07:15 16:40			
5	07:33 16:53	07:15 17:28	06:37 18:02		06:46 19:35	28	18:33 (D03) 19:01 (D03)	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	23	18:31 (D03) 18:54 (D03)			07:08 18:46	06:43 17:01	07:16 16:40			
6	07:33 16:54	07:14 17:30	06:35 18:03		06:44 19:36	25	18:34 (D03) 18:59 (D03)	06:01 20:08	05:35 20:36	05:42 20:43	06:08 20:20	06:39 19:35	25	18:30 (D03) 18:55 (D03)			07:09 18:44	06:44 17:00	07:17 16:40			
7	07:33 16:55	07:13 17:31	06:34 18:04		06:43 19:37	23	18:35 (D03) 18:58 (D03)	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	27	18:29 (D03) 18:56 (D03)			07:10 18:43	06:45 16:59	07:18 16:40			
8	07:32 16:56	07:12 17:32	07:32 19:05		06:41 19:38	20	18:36 (D03) 18:56 (D03)	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	28	18:28 (D03) 18:56 (D03)			07:11 18:41	06:46 16:58	07:19 16:40			
9	07:32 16:57	07:10 17:33	07:30 19:06		06:39 19:40	15	18:38 (D03) 18:53 (D03)	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	29	18:27 (D03) 18:56 (D03)			07:12 18:39	06:47 16:57	07:20 16:40			
10	07:32 16:58	07:09 17:35	07:29 19:07		06:38 19:41	9	18:41 (D03) 18:50 (D03)	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	30	18:26 (D03) 18:56 (D03)			07:13 18:38	06:48 16:56	07:21 16:40			
11	07:32 16:59	07:08 17:36	07:27 19:09		06:36 19:42			05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	31	18:25 (D03) 18:55 (D03)			07:14 18:36	06:50 16:55	07:22 16:40			
12	07:32 17:00	07:07 17:37	07:26 19:10		06:35 19:43			05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	31	18:25 (D03) 18:56 (D03)			07:15 18:35	06:51 16:54	07:23 16:40			
13	07:31 17:01	07:05 17:38	07:24 19:11		06:33 19:44			05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	30	18:25 (D03) 18:55 (D03)			07:16 18:33	06:52 16:53	07:23 16:40			
14	07:31 17:02	07:04 17:39	07:22 19:12		06:32 19:45			05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	30	18:25 (D03) 18:55 (D03)			07:17 18:32	06:53 16:52	07:24 16:40			
15	07:31 17:03	07:03 17:41	07:21 19:13		06:30 19:46			05:51 20:17	05:36 20:41	05:49 20:39	06:17 19:20	06:48 19:20	29	18:25 (D03) 18:54 (D03)			07:19 18:30	06:54 16:51	07:25 16:41			
16	07:30 17:04	07:02 17:42	07:19 19:14		06:28 19:47			05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	28	18:25 (D03) 18:53 (D03)			07:20 18:28	06:56 16:50	07:26 16:41			
17	07:30 17:05	07:00 17:43	07:17 19:15		06:27 19:48			05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	26	18:26 (D03) 18:52 (D03)			07:21 18:27	06:57 16:49	07:26 16:41			
18	07:29 17:07	06:59 17:44	07:16 19:16		06:25 19:49			05:48 20:20	05:36 20:42	05:51 20:37	06:20 19:15	06:51 19:15	24	18:26 (D03) 18:50 (D03)			07:22 18:25	06:58 16:48	07:27 16:41			
19	07:29 17:08	06:58 17:46	07:14 19:17		06:24 19:50			05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	22	18:26 (D03) 18:48 (D03)			07:23 18:24	06:59 16:48	07:27 16:42			
20	07:28 17:09	06:56 17:47	07:12 19:18		06:22 19:51			05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	18	18:28 (D03) 18:46 (D03)			07:24 18:22	07:00 16:47	07:28 16:42			
21	07:28 17:10	06:55 17:48	07:11 19:19		06:21 19:52			05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	06:54 19:10	12	18:28 (D03) 18:42 (D03)			07:25 18:21	07:01 16:46	07:29 16:42			
22	07:27 17:11	06:53 17:49	07:09 19:21	10	18:46 (D03) 19:53			05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08					07:26 18:19	07:03 16:46	07:29 16:43			
23	07:26 17:12	06:52 17:50	07:07 19:22	17	18:43 (D03) 19:54			05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06					07:27 18:18	07:04 16:45	07:30 16:43			
24	07:26 17:14	06:50 17:51	07:06 19:23	21	18:40 (D03) 19:55			05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04					07:29 18:17	07:05 16:44	07:30 16:44			
25	07:25 17:15	06:49 17:53	07:04 19:24	24	18:38 (D03) 19:56			05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03					07:30 18:15	07:06 16:44	07:30 16:45			
26	07:24 17:16	06:48 17:54	07:02 19:25	26	18:36 (D03) 19:57			05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01					07:31 18:14	07:07 16:43	07:31 16:45			
27	07:23 17:17	06:46 17:55	07:01 19:26	28	18:36 (D03) 19:58			05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59					07:32 18:12	07:08 16:43	07:31 16:46			
28	07:22 17:18	06:45 17:56	06:59 19:27	29	18:35 (D03) 20:00			05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58					07:33 18:11	07:09 16:42	07:32 16:46			
29	07:22 17:20		06:57 19:28	29	18:34 (D03) 19:03 (D03)			05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56					07:34 18:10	07:10 16:42	07:32 16:47			
30	07:21 17:21		06:56 19:29	30	18:34 (D03) 19:04 (D03)			05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54					07:35 18:09	07:11 16:42	07:32 16:48			
31	07:20 17:22		06:54 19:30	31	18:33 (D03) 19:04 (D03)			05:39 20:31		06:03 20:26	06:33 19:44						07:37 18:07	07:32 16:49				
Potential sun hours	298	297	369		398			448		452		458		428		375		346		298		288
Total, worst case			245		240											487						
Sun reduction			0.73		0.82											0.93						
Oper. time red.			1.00		1.00											1.00						
Wind dir. red.			0.68		0.68											0.68						
Total reduction			0.49		0.55											0.63						
Total, real			121		133											307						

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor:** 69 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (141)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	[January	[February	[March		[April		[May	[June	[July	[August		[September		[October	[November	[December		
1	07:32	07:19	06:43		06:52	18:22 (D03)	06:07	05:39	05:40	06:04		06:34	10	19:09 (D02)	07:04	06:38	07:12	
	16:50	17:23	17:57		19:31	30	18:52 (D03)	20:03	20:32	20:44		19:43		19:19 (D02)	18:53	18:06	16:41	
2	07:33	07:18	06:41		06:51	18:23 (D03)	06:06	05:38	05:40	06:05		06:35			07:05	06:39	07:13	
	16:50	17:25	17:58		19:32	29	18:52 (D03)	20:04	20:33	20:44		19:41			18:51	17:05	16:41	
3	07:33	07:17	06:40		06:49	18:24 (D03)	06:05	05:38	05:41	06:05		06:36			07:06	06:40	07:14	
	16:51	17:26	18:00		19:33	26	18:50 (D03)	20:05	20:34	20:43		19:40			18:49	17:04	16:41	
4	07:33	07:16	06:38		06:48	18:25 (D03)	06:03	05:38	05:41	06:06		06:37			07:07	06:41	07:15	
	16:52	17:27	18:01		19:34	24	18:49 (D03)	20:06	20:34	20:43		19:38			18:48	17:02	16:40	
5	07:33	07:15	06:37		06:46	18:26 (D03)	06:02	05:37	05:42	06:07		06:38		18:28 (D03)	07:08	06:43	07:16	
	16:53	17:28	18:02		19:35	21	18:47 (D03)	20:07	20:35	20:43		19:36	8	18:36 (D03)	18:46	17:01	16:40	
6	07:33	07:14	06:35		06:44	18:28 (D03)	06:01	05:37	05:42	06:08		06:39		18:24 (D03)	07:09	06:44	07:17	
	16:54	17:30	18:03		19:36	16	18:44 (D03)	20:08	20:36	20:43		19:35	16	18:40 (D03)	18:44	17:00	16:40	
7	07:33	07:13	06:34		06:43	18:32 (D03)	06:00	05:37	05:43	06:09		06:40		18:21 (D03)	07:10	06:45	07:18	
	16:55	17:31	18:04		19:37	9	18:41 (D03)	20:09	20:36	20:43		19:33	21	18:42 (D03)	18:43	16:59	16:40	
8	07:32	07:12	07:32		06:41		05:59	05:36	05:44	06:10		06:41		18:19 (D03)	07:11	06:46	07:19	
	16:56	17:32	19:05		19:38		20:10	20:37	20:42	20:17		19:31	24	18:43 (D03)	18:41	16:58	16:40	
9	07:32	07:10	07:30		06:39		05:57	05:36	05:44	06:11		06:42		18:18 (D03)	07:12	06:47	07:20	
	16:57	17:33	19:06		19:40		20:11	20:38	20:42	20:16		19:30	26	18:44 (D03)	18:39	16:57	16:40	
10	07:32	07:09	07:29		06:38		05:56	05:36	05:45	06:12		06:43		18:16 (D03)	07:13	06:48	07:21	
	16:58	17:35	19:07		19:41		20:12	20:38	20:42	20:15		19:28	29	18:45 (D03)	18:38	16:56	16:40	
11	07:32	07:08	07:27		06:36		05:55	05:36	05:46	06:13		06:44		18:15 (D03)	07:14	06:50	07:22	
	16:59	17:36	19:09		19:42	10	19:20 (D02)	20:13	20:39	20:41		19:26	30	18:45 (D03)	18:36	16:55	16:40	
12	07:32	07:07	07:26		06:35		05:54	05:36	05:46	06:14		06:45		18:14 (D03)	07:15	06:51	07:23	
	17:00	17:37	19:10		19:43	14	19:22 (D02)	20:14	20:39	20:41		19:25	31	18:45 (D03)	18:35	16:54	16:40	
13	07:31	07:05	07:24		06:33		05:53	05:36	05:47	06:15		06:46		18:14 (D03)	07:16	06:52	07:23	
	17:01	17:38	19:11		19:44	16	19:22 (D02)	20:15	20:40	20:40		19:23	31	18:45 (D03)	18:33	16:53	16:40	
14	07:31	07:04	07:22		06:32		05:52	05:36	05:48	06:16		06:47		18:13 (D03)	07:17	06:53	07:24	
	17:02	17:39	19:12		19:45	19	19:24 (D02)	20:16	20:40	20:40		19:21	32	18:45 (D03)	18:32	16:52	16:40	
15	07:31	07:03	07:21		06:30		05:51	05:36	05:49	06:17		06:48		18:12 (D03)	07:19	06:54	07:25	
	17:03	17:41	19:13		19:46	22	19:25 (D02)	20:17	20:41	20:39	3	19:20 (D02)	19:20	33	18:45 (D03)	18:30	16:51	16:41
16	07:30	07:02	07:19		06:28		05:50	05:36	05:49	06:18		06:49		18:13 (D02)	07:20	06:56	07:26	
	17:04	17:42	19:14		19:47	23	19:26 (D02)	20:18	20:41	20:39	11	19:24 (D02)	19:18	33	18:45 (D03)	18:28	16:50	16:41
17	07:30	07:00	07:17		06:27		05:49	05:36	05:50	06:19		06:50		19:11 (D02)	07:21	06:57	07:26	
	17:05	17:43	19:15		19:48	24	19:26 (D02)	20:19	20:41	20:38	15	19:26 (D02)	19:16	32	18:44 (D03)	18:27	16:49	16:41
18	07:29	06:59	07:16		06:25		05:48	05:36	05:51	06:20		06:51		19:09 (D02)	07:22	06:58	07:27	
	17:07	17:44	19:16	11	18:47 (D03)	24	19:26 (D02)	20:20	20:42	20:37	18	19:27 (D02)	19:15	32	18:44 (D03)	18:25	16:48	16:41
19	07:29	06:58	07:14		06:24		05:47	05:36	05:52	06:21		06:52		19:08 (D02)	07:23	06:59	07:28	
	17:08	17:46	19:17	18	18:50 (D03)	24	19:25 (D02)	20:21	20:42	20:37	20	19:28 (D02)	19:13	31	18:42 (D03)	18:24	16:48	16:42
20	07:28	06:56	07:12		06:22		05:47	05:36	05:53	06:22		06:53		19:07 (D02)	07:24	07:00	07:28	
	17:09	17:47	19:18	21	18:52 (D03)	25	19:26 (D02)	20:22	20:42	20:36	22	19:29 (D02)	19:11	30	18:41 (D03)	18:22	16:47	16:42
21	07:28	06:55	07:11		06:21		05:46	05:36	05:53	06:23		06:54		19:06 (D02)	07:25	07:01	07:29	
	17:10	17:48	19:19	25	18:53 (D03)	24	19:25 (D02)	20:23	20:43	20:35	23	19:29 (D02)	19:10	28	18:40 (D03)	18:21	16:46	16:42
22	07:27	06:53	07:09		06:19		05:45	05:36	05:54	06:24		06:55		19:06 (D02)	07:26	07:03	07:29	
	17:11	17:49	19:21	27	18:54 (D03)	22	19:24 (D02)	20:24	20:43	20:35	23	19:29 (D02)	19:08	26	18:38 (D03)	18:07	16:46	16:43
23	07:26	06:52	07:07		06:18		05:44	05:37	05:55	06:25		06:56		19:05 (D02)	07:27	07:04	07:30	
	17:12	17:50	19:22	29	18:55 (D03)	22	19:23 (D02)	20:25	20:43	20:34	24	19:29 (D02)	19:06	22	18:36 (D03)	18:18	16:45	16:43
24	07:26	06:50	07:06		06:17		05:43	05:37	05:56	06:26		06:57		19:05 (D02)	07:29	07:05	07:30	
	17:14	17:51	19:23	30	18:55 (D03)	20	19:22 (D02)	20:26	20:43	20:33	24	19:29 (D02)	19:04	19	18:34 (D03)	18:17	16:44	16:44
25	07:25	06:49	07:04		06:15		05:43	05:37	05:57	06:27		06:58		19:05 (D02)	07:30	07:06	07:31	
	17:15	17:53	19:24	31	18:55 (D03)	17	19:21 (D02)	20:26	20:43	20:32	24	19:29 (D02)	19:03	14	18:31 (D03)	18:15	16:44	16:45
26	07:24	06:48	07:02		06:14		05:42	05:38	05:58	06:28		06:59		19:05 (D02)	07:31	07:07	07:31	
	17:16	17:54	19:25	32	18:55 (D03)	15	19:19 (D02)	20:27	20:44	20:31	24	19:29 (D02)	19:01		18:14	16:43	16:45	
27	07:23	06:46	07:01		06:12		05:41	05:38	05:59	06:29		06:59		19:05 (D02)	07:32	07:08	07:31	
	17:17	17:55	19:26	33	18:56 (D03)	10	19:17 (D02)	20:28	20:44	20:30	23	19:28 (D02)	18:59		18:12	16:43	16:46	
28	07:22	06:45	06:59		06:11		05:41	05:38	06:00	06:30		06:59		19:05 (D02)	07:33	07:09	07:32	
	17:18	17:56	19:27	33	18:55 (D03)		20:29	20:44	20:29	19:49	21	19:26 (D02)	18:58		18:11	16:42	16:46	
29	07:22		06:57		06:10		05:40	05:39	06:01	06:31		06:59		19:06 (D02)	07:34	07:10	07:32	
	17:20		19:28	32	18:54 (D03)		20:30	20:44	20:28	19:48	19	19:25 (D02)	18:56		18:10	16:42	16:47	
30	07:21		06:56		06:08		05:40	05:39	06:02	06:32		06:59		19:07 (D02)	07:35	07:11	07:32	
	17:21		19:29	32	18:54 (D03)		20:31	20:44	20:27	19:46	16	19:23 (D02)	18:54		18:09	16:42	16:48	
31	07:20		06:54		06:07		05:39		06:03	06:33		06:59		19:07 (D02)	07:37	07:12	07:32	
	17:22		19:30	31	18:53 (D03)		20:31	20:26	20:26	19:44	14	19:21 (D02)			18:07	16:49	16:49	
Potential sun hours	298	297	369		398		448	452	458	428		375			346	298	288	
Total, worst case			385		486					324		558						
Sun reduction			0.73		0.82					0.96		0.93						
Oper. time red.			1.00		1.00					1.00		1.00						
Wind dir. red.			0.70		0.62					0.58		0.70						
Total reduction			0.51		0.51					0.55		0.65						
Total, real			198		246					179		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)
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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 70 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (142)**

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

Assumptions for shadow calculationsJan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
0.45 0.62 0.73 0.82 0.92 0.94 0.97 0.96 0.93 0.84 0.61 0.47

Operational time

N NNE NE ENE E ESE SE SSE S SSW SW WSW W WNW NW NNW Sum
23 65 319 1,935 1,830 119 5 24 340 1,432 1,766 761 99 19 10 13 8,760

	[January	[February	[March		[April		[May	[June	[July	[August	[September		[October	[November	[December
1	07:32 16:50	07:19 17:23	06:43 17:57		06:52 19:31	29	18:30 (D03) 18:59 (D03)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58		06:51 19:32	27	18:31 (D03) 18:58 (D03)	06:06 20:04	05:38 20:33	05:40 20:43	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00		06:49 19:33	26	18:31 (D03) 18:57 (D03)	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01		06:48 19:34	23	18:33 (D03) 18:56 (D03)	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02		06:46 19:35	20	18:34 (D03) 18:35 (D03)	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	18:34 (D03) 18:45 (D03)	07:08 18:46	06:43 17:01
6	07:33 16:54	07:14 17:30	06:35 18:03		06:44 19:36	16	18:35 (D03) 18:51 (D03)	06:01 20:08	05:37 20:36	05:43 20:43	06:08 20:20	06:39 19:35	18:31 (D03) 18:47 (D03)	07:09 18:44	06:44 17:00
7	07:33 16:55	07:13 17:31	06:34 18:04		06:43 19:37	11	18:38 (D03) 18:49 (D03)	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	18:29 (D03) 18:49 (D03)	07:10 18:43	06:45 16:59
8	07:32 16:56	07:12 17:32	07:32 19:05		06:41 19:38			05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	18:27 (D03) 18:50 (D03)	07:11 18:41	06:46 16:58
9	07:32 16:57	07:10 17:33	07:30 19:06		06:39 19:40			05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	18:26 (D03) 18:51 (D03)	07:12 18:39	06:47 16:57
10	07:32 16:58	07:09 17:35	07:29 19:07		06:38 19:41			05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	18:24 (D03) 18:52 (D03)	07:13 18:38	06:48 16:56
11	07:32 16:59	07:08 17:36	07:27 19:09		06:36 19:42			05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	18:23 (D03) 18:52 (D03)	07:14 18:36	06:50 16:55
12	07:32 17:00	07:07 17:37	07:26 19:10		06:35 19:43			05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	18:22 (D03) 18:52 (D03)	07:15 18:35	06:51 16:54
13	07:31 17:01	07:05 17:38	07:24 19:11		06:33 19:44			05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	18:22 (D03) 18:52 (D03)	07:16 18:33	06:52 16:53
14	07:31 17:02	07:04 17:39	07:22 19:12		06:32 19:45			05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	18:21 (D03) 18:52 (D03)	07:17 18:32	06:53 16:52
15	07:31 17:03	07:03 17:41	07:21 19:13		06:30 19:46			05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	18:21 (D03) 18:52 (D03)	07:19 18:30	06:54 16:51
16	07:30 17:04	07:02 17:42	07:19 19:14		06:28 19:47			05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	18:21 (D03) 18:51 (D03)	07:20 18:28	06:56 16:50
17	07:30 17:05	07:00 17:43	07:17 19:15		06:27 19:48			05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	18:21 (D03) 18:50 (D03)	07:21 18:27	06:57 16:49
18	07:29 17:07	06:59 17:44	07:16 19:16		06:25 19:49			05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	18:21 (D03) 18:50 (D03)	07:22 18:25	06:58 16:48
19	07:29 17:08	06:58 17:46	07:14 19:17	5	18:46 (D03) 18:51 (D03)			05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	18:20 (D03) 18:48 (D03)	07:23 18:24	06:59 16:48
20	07:28 17:09	06:56 17:47	07:12 19:18	14	18:42 (D03) 18:56 (D03)			05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	18:21 (D03) 18:46 (D03)	07:24 18:22	07:00 16:47
21	07:28 17:10	06:55 17:48	07:11 19:19	19	18:39 (D03) 18:58 (D03)			05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	06:54 19:10	18:21 (D03) 18:45 (D03)	07:25 18:21	07:01 16:46
22	07:27 17:11	06:53 17:49	07:09 19:21	23	18:36 (D03) 18:59 (D03)			05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	18:23 (D03) 18:43 (D03)	07:26 18:19	07:03 16:46
23	07:26 17:12	06:52 17:50	07:07 19:22	25	18:36 (D03) 19:01 (D03)			05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	18:24 (D03) 18:40 (D03)	07:27 18:18	07:04 16:45
24	07:26 17:14	06:50 17:51	07:06 19:23	27	18:34 (D03) 19:01 (D03)			05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	18:27 (D03) 18:37 (D03)	07:29 18:17	07:05 16:44
25	07:25 17:15	06:49 17:53	07:04 19:24	28	18:33 (D03) 19:01 (D03)			05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	18:30 18:15	07:30 16:44	07:06 16:45
26	07:24 17:16	06:48 17:54	07:02 19:25	30	18:31 (D03) 19:01 (D03)			05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	18:28 18:14	07:31 16:43	07:07 16:45
27	07:23 17:17	06:46 17:55	07:01 19:26	31	18:31 (D03) 19:02 (D03)			05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	18:27 18:12	07:32 16:43	07:08 16:46
28	07:22 17:18	06:45 17:56	06:59 19:27	30	18:31 (D03) 19:01 (D03)			05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	18:26 18:11	07:33 16:42	07:09 16:46
29	07:22 17:20	06:57 19:28	06:57 19:28	31	18:30 (D03) 19:01 (D03)			05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	18:25 18:10	07:34 16:42	07:10 16:47
30	07:21 17:21	06:56 19:29	06:56 19:29	31	18:30 (D03) 19:01 (D03)			05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	18:26 18:09	07:35 16:42	07:11 16:48
31	07:20 17:22	06:54 19:30	06:54 19:30	30	18:30 (D03) 19:00 (D03)			05:39 20:31	06:03 20:26	06:33 19:44	07:04 19:44	18:54 18:07	18:27 18:07	07:36 16:43	07:12 16:49
Potential sun hours	298	297	369		398			448	452	458	428	375	485	346	298
Total, worst case			324		152								485		
Sun reduction			0.73		0.82								0.93		
Oper. time red.			1.00		1.00								1.00		
Wind dir. red.			0.69		0.69								0.69		
Total reduction			0.50		0.56								0.64		
Total, real			163		86								311		

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)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar

Shadow receptor: 71 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (143)**Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	18:21 (D03) 18:35 (D03)	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	18:57 (D02) 19:19 (D02)	07:04 18:53
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	18:27 (D03) 18:30 (D03)	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	18:58 (D02) 19:18 (D02)	07:05 18:51
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:06 19:40	06:36 19:41	18:59 (D02) 19:16 (D02)	07:06 18:49
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:07 19:38	06:37 19:38	19:00 (D02) 19:14 (D02)	07:07 18:48
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:07 19:36	06:38 19:36	19:03 (D02) 19:11 (D02)	07:08 18:46
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:08 19:35	06:39 19:35	07:09 18:44	07:09 17:00
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	19:07 (D02) 19:15 (D02)	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	07:10 16:59
8	07:32 16:56	07:12 17:32	06:32 19:05	06:41 19:38	19:03 (D02) 19:17 (D02)	05:59 20:10	05:36 20:37	05:44 20:42	06:10 19:31	06:41 19:31	07:11 18:41	07:11 16:58
9	07:32 16:57	07:10 17:33	06:30 19:06	06:39 19:40	19:01 (D02) 19:18 (D02)	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	07:12 16:57
10	07:32 16:58	07:09 17:35	06:29 19:07	06:38 19:41	19:00 (D02) 19:20 (D02)	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	07:13 16:56
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	18:58 (D02) 19:20 (D02)	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	18:15 (D03) 18:28 (D03)	07:14 18:36
12	07:32 17:00	07:07 17:37	06:26 19:10	18:32 (D03) 18:38 (D03)	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	18:12 (D03) 18:30 (D03)	07:15 18:35
13	07:31 17:01	07:05 17:38	06:24 19:11	18:24 (D03) 18:42 (D03)	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:41	06:15 20:11	06:46 19:23	18:10 (D03) 18:32 (D03)	07:16 18:33
14	07:31 17:02	07:04 17:39	06:22 19:12	18:24 (D03) 18:45 (D03)	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	18:08 (D03) 18:33 (D03)	07:17 18:32
15	07:31 17:03	07:03 17:41	06:21 19:13	18:22 (D03) 18:46 (D03)	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	18:06 (D03) 18:34 (D03)	07:19 18:30
16	07:30 17:04	07:02 17:42	06:19 19:14	18:20 (D03) 18:46 (D03)	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	18:05 (D03) 18:34 (D03)	07:20 18:28
17	07:30 17:05	07:00 17:43	06:17 19:15	18:19 (D03) 18:48 (D03)	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	18:04 (D03) 18:35 (D03)	07:21 18:27
18	07:29 17:07	06:59 17:44	06:16 19:16	18:18 (D03) 18:48 (D03)	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	18:03 (D03) 18:35 (D03)	07:22 18:25
19	07:29 17:08	06:58 17:46	06:14 19:17	18:17 (D03) 18:48 (D03)	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	18:01 (D03) 18:34 (D03)	07:23 18:24
20	07:28 17:09	06:56 17:47	06:12 19:18	18:16 (D03) 18:49 (D03)	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	19:06 (D02) 19:17 (D02)	06:53 19:11	07:24 18:22
21	07:28 17:10	06:55 17:48	06:11 19:19	18:16 (D03) 18:49 (D03)	06:21 19:52	05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	19:04 (D02) 19:19 (D02)	06:54 19:10	07:25 18:21
22	07:27 17:11	06:53 17:49	06:09 19:21	18:15 (D03) 18:48 (D03)	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	19:02 (D02) 19:21 (D02)	06:55 19:08	07:26 18:33
23	07:26 17:12	06:52 17:50	06:07 19:22	18:15 (D03) 18:48 (D03)	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	19:01 (D02) 19:22 (D02)	06:56 19:06	07:27 18:32
24	07:26 17:14	06:50 17:51	06:06 19:23	18:15 (D03) 18:48 (D03)	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	19:00 (D02) 19:22 (D02)	06:57 19:04	07:29 18:32
25	07:25 17:15	06:49 17:53	06:04 19:24	18:15 (D03) 18:47 (D03)	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	18:59 (D02) 19:23 (D02)	06:58 19:03	07:30 18:15
26	07:24 17:16	06:48 17:54	06:02 19:25	18:14 (D03) 18:46 (D03)	06:14 19:57	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	18:59 (D02) 19:23 (D02)	06:59 19:01	07:31 18:14
27	07:23 17:17	06:46 17:55	06:01 19:26	18:16 (D03) 18:45 (D03)	06:12 19:58	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	18:58 (D02) 19:23 (D02)	07:00 18:59	07:32 18:12
28	07:22 17:18	06:45 17:56	06:59 19:27	18:16 (D03) 18:44 (D03)	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	18:58 (D02) 19:23 (D02)	07:01 18:58	07:33 18:11
29	07:22 17:20		06:57	18:16 (D03)	06:10	05:40	05:39	06:01	06:31	18:58 (D02)	07:02	07:34
30	07:21 17:21		06:56	18:42 (D03)	20:01	05:40	05:39	06:02	06:32	19:22 (D02)	18:56	07:35
31	07:20 17:22		06:54	18:18 (D03)	20:02	05:40	05:39	06:02	06:32	18:57 (D02)	07:03	07:36
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case			538	352				258	628	11		
Sun reduction			0.73	0.82				0.96	0.93	0.84		
Oper. time red.			1.00	1.00				1.00	1.00	1.00		
Wind dir. red.			0.73	0.60				0.60	0.71	0.73		
Total reduction			0.53	0.50				0.57	0.66	0.61		
Total, real			286	175				148	416	7		

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 72 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (144)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	18:18 (D03)	06:07	05:39	05:40	06:04	06:34	18:56 (D02)	07:04
	16:50	17:23	17:57	19:31	18:30 (D03)	20:03	20:32	20:44	20:25	19:43	19:19 (D02)	18:53
2	07:33	07:18	06:41	06:51		06:06	05:38	05:40	06:05	06:35	18:57 (D02)	07:05
	16:50	17:25	17:58	19:32		20:04	20:33	20:44	20:24	19:41	19:18 (D02)	18:51
3	07:33	07:17	06:40	06:49		06:05	05:38	05:41	06:05	06:36	18:58 (D02)	07:06
	16:51	17:26	18:00	19:33		20:05	20:34	20:43	20:23	19:40	19:16 (D02)	18:49
4	07:33	07:16	06:38	06:48		06:03	05:38	05:41	06:06	06:37	18:59 (D02)	07:07
	16:52	17:27	18:01	19:34		20:06	20:34	20:43	20:22	19:38	19:14 (D02)	18:48
5	07:33	07:15	06:37	06:46		06:02	05:37	05:42	06:07	06:38	19:02 (D02)	07:08
	16:53	17:28	18:02	19:35		20:07	20:35	20:43	20:21	19:36	19:11 (D02)	18:46
6	07:33	07:14	06:35	06:44		06:01	05:37	05:42	06:08	06:39		07:09
	16:54	17:30	18:03	19:36		20:08	20:36	20:43	20:20	19:35		18:44
7	07:33	07:13	06:34	06:43			19:06 (D02)	06:00	05:37	05:43	06:09	
	16:55	17:31	18:04	19:37		8	19:14 (D02)	20:09	20:36	20:43	20:19	
8	07:32	07:12	07:32	06:41			19:02 (D02)	05:59	05:36	05:44	06:10	
	16:56	17:32	19:05	19:38		15	19:17 (D02)	20:10	20:37	20:42	19:31	
9	07:32	07:10	07:30	06:39			19:00 (D02)	05:57	05:36	05:44	06:11	
	16:57	17:33	19:06	19:40		18	19:18 (D02)	20:11	20:38	20:42	20:16	
10	07:32	07:09	07:29	18:23 (D03)	06:38		18:59 (D02)	05:56	05:36	05:45	06:12	
	16:58	17:35	19:07	13	18:36 (D03)	19:41	21	19:20 (D02)	20:12	20:38	20:42	20:15
11	07:32	07:08	07:27	18:20 (D03)	06:36		18:57 (D02)	05:55	05:36	05:46	06:13	
	16:59	17:36	19:09	20	18:40 (D03)	19:42	23	19:20 (D02)	20:13	20:39	20:41	20:14
12	07:32	07:07	07:26	18:17 (D03)	06:35		18:57 (D02)	05:54	05:36	05:46	06:14	
	17:00	17:37	19:10	24	18:41 (D03)	19:43	24	19:21 (D02)	20:14	20:39	20:41	20:12
13	07:31	07:06	07:24	18:15 (D03)	06:33		18:55 (D02)	05:53	05:36	05:47	06:15	
	17:01	17:38	19:11	27	18:42 (D03)	19:44	26	19:21 (D02)	20:15	20:40	20:40	20:11
14	07:31	07:04	07:22	18:14 (D03)	06:32		18:55 (D02)	05:52	05:36	05:48	06:16	
	17:02	17:39	19:12	30	18:44 (D03)	19:45	27	19:22 (D02)	20:16	20:40	20:40	20:10
15	07:31	07:03	07:21	18:12 (D03)	06:30		18:54 (D02)	05:51	05:36	05:49	06:17	
	17:03	17:41	19:13	32	18:44 (D03)	19:46	27	19:21 (D02)	20:17	20:41	20:39	20:08
16	07:30	07:02	07:19	18:11 (D03)	06:28		18:55 (D02)	05:50	05:36	05:49	06:18	
	17:04	17:42	19:14	33	18:44 (D03)	19:47	26	19:21 (D02)	20:18	20:41	20:39	20:07
17	07:30	07:00	07:17	18:11 (D03)	06:27		18:54 (D02)	05:49	05:36	05:50	06:19	
	17:05	17:43	19:15	34	18:45 (D03)	19:48	27	19:21 (D02)	20:19	20:41	20:38	20:06
18	07:29	06:59	07:16	18:10 (D03)	06:25		18:54 (D02)	05:48	05:36	05:51	06:20	
	17:07	17:44	19:16	35	18:45 (D03)	19:49	27	19:21 (D02)	20:20	20:42	20:37	20:04
19	07:29	06:58	07:14	18:09 (D03)	06:24		18:54 (D02)	05:47	05:36	05:52	06:21	
	17:08	17:46	19:17	36	18:45 (D03)	19:50	25	19:19 (D02)	20:21	20:42	20:37	20:03
20	07:28	06:56	07:12	18:09 (D03)	06:22		18:55 (D02)	05:47	05:36	05:53	06:22	
	17:09	17:47	19:18	37	18:46 (D03)	19:51	24	19:19 (D02)	20:22	20:42	20:36	20:01
21	07:28	06:55	07:11	18:08 (D03)	06:21		18:55 (D02)	05:46	05:36	05:54	06:23	
	17:10	17:48	19:19	37	18:45 (D03)	19:52	22	19:17 (D02)	20:23	20:43	20:35	20:00
22	07:27	06:53	07:09	18:08 (D03)	06:19		18:56 (D02)	05:45	05:36	05:54	06:24	
	17:11	17:49	19:21	36	18:44 (D03)	19:53	20	19:16 (D02)	20:24	20:43	20:35	19:58
23	07:26	06:52	07:07	18:08 (D03)	06:18		18:57 (D02)	05:44	05:37	05:55	06:25	
	17:12	17:50	19:22	36	18:44 (D03)	19:54	17	19:14 (D02)	20:25	20:43	20:34	19:57
24	07:26	06:50	07:06	18:08 (D03)	06:17		18:59 (D02)	05:43	05:37	05:56	06:26	
	17:14	17:51	19:23	35	18:43 (D03)	19:55	14	19:13 (D02)	20:26	20:43	20:33	19:55
25	07:25	06:49	07:04	18:08 (D03)	06:15		19:02 (D02)	05:43	05:37	05:57	06:27	
	17:15	17:53	19:24	34	18:42 (D03)	19:56	8	19:10 (D02)	20:26	20:43	20:32	19:54
26	07:24	06:48	07:02	18:08 (D03)	06:14			05:42	05:38	05:58	06:28	
	17:16	17:54	19:25	33	18:41 (D03)	19:57		20:27	20:44	20:31	19:52	26
27	07:23	06:46	07:01	18:09 (D03)	06:12			05:41	05:38	05:59	06:29	
	17:17	17:55	19:26	32	18:41 (D03)	19:59		20:28	20:44	20:30	19:51	27
28	07:22	06:45	06:59	18:10 (D03)	06:11			05:41	05:38	06:00	06:30	
	17:18	17:56	19:27	29	18:39 (D03)	20:00		20:29	20:44	20:29	19:49	27
29	07:22		06:57	18:11 (D03)	06:10			05:40	05:39	06:01	06:31	
	17:20		19:28	26	18:37 (D03)	20:01		20:30	20:44	20:28	19:48	27
30	07:21		06:56	18:13 (D03)	06:08			05:40	05:39	06:02	06:32	
	17:21		19:29	23	18:36 (D03)	20:02		20:31	20:44	20:27	19:46	26
31	07:20		06:54	18:14 (D03)				05:39		06:03	06:33	
	17:22		19:30	19	18:33 (D03)			20:31		20:26	19:45	25
Potential sun hours	298	297	369	398		448	452	458	428	375		346
Total, worst case				661		411			317		703	70
Sun reduction				0.73		0.82			0.96		0.93	0.84
Oper. time red.				1.00		1.00			1.00		1.00	1.00
Wind dir. red.				0.74		0.60			0.60		0.72	0.74
Total reduction				0.54		0.49			0.57		0.67	0.62
Total, real				357		203			182		472	43

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:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 73 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (145)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32	07:19	06:43	06:52	06:07	05:39	05:40	06:03	06:34	07:04	06:38	07:12
	16:50	17:23	17:57	19:31	20:03	20:32	20:44	20:25	19:43	18:53	18:06	16:41
2	07:33	07:18	06:41	06:51	06:06	05:38	05:40	06:04	06:35	07:05	06:39	07:13
	16:50	17:25	17:58	19:32	20:04	20:33	20:43	20:24	19:41	18:51	17:05	16:41
3	07:33	07:17	06:40	06:49	06:04	05:38	05:41	06:05	06:36	07:06	06:40	07:14
	16:51	17:26	18:00	19:33	20:05	20:34	20:43	20:23	19:40	18:49	17:03	16:41
4	07:33	07:16	06:38	06:47	06:03	05:37	05:41	06:06	06:37	07:07	06:41	07:15
	16:52	17:27	18:01	19:34	20:06	20:34	20:43	20:22	19:38	18:48	17:02	16:40
5	07:33	07:15	06:37	06:46	06:02	05:37	05:42	06:07	06:38	07:08	06:43	07:16
	16:53	17:28	18:02	19:35	20:07	20:35	20:43	20:21	19:36	18:46	17:01	16:40
6	07:33	07:14	06:35	06:44	06:01	05:37	05:42	06:08	06:39	07:09	06:44	07:17
	16:54	17:30	18:03	19:36	20:08	20:36	20:43	20:20	19:35	18:44	17:00	16:40
7	07:33	07:13	06:34	06:43	06:00	05:37	05:43	06:09	06:40	07:10	06:45	07:18
	16:55	17:31	18:04	19:37	20:09	20:36	20:43	20:19	19:33	18:43	16:59	16:40
8	07:32	07:11	07:32	06:41	05:58	05:36	05:44	06:10	06:41	07:11	06:46	07:19
	16:56	17:32	19:05	19:38	20:10	20:37	20:42	20:17	19:31	18:41	16:58	16:40
9	07:32	07:10	07:30	06:39	05:57	05:36	05:44	06:11	06:42	07:12	06:47	07:20
	16:57	17:33	19:06	19:40	20:11	20:38	20:42	20:16	19:30	18:39	16:57	16:40
10	07:32	07:09	07:29	06:38	05:56	05:36	05:45	06:12	06:43	07:13	06:48	07:21
	16:58	17:35	19:07	19:41	20:12	20:38	20:42	20:15	19:28	18:38	16:56	16:40
11	07:32	07:08	07:27	06:36	05:55	05:36	05:46	06:13	06:44	07:14	06:50	07:22
	16:59	17:36	19:09	19:42	20:13	20:39	20:41	20:14	19:26	18:36	16:55	16:40
12	07:32	07:07	07:26	06:35	05:54	05:36	05:46	06:14	06:45	07:15	06:51	07:23
	17:00	17:37	19:10	19:43	20:14	20:39	20:41	20:12	19:25	18:35	16:54	16:40
13	07:31	07:05	07:24	06:33	05:53	05:36	05:47	06:15	06:46	07:16	06:52	07:23
	17:01	17:38	19:11	19:44	20:15	20:40	20:40	20:11	19:23	18:33	16:53	16:40
14	07:31	07:04	07:22	06:31	05:52	05:36	05:48	06:16	06:47	07:17	06:53	07:24
	17:02	17:39	19:12	19:45	20:16	20:40	20:40	20:10	19:21	18:32	16:52	16:40
15	07:31	07:03	07:21	06:30	05:51	05:36	05:49	06:17	06:48	07:19	06:54	07:25
	17:03	17:41	19:13	19:46	20:17	20:41	20:39	20:08	19:20	18:30	16:51	16:40
16	07:30	07:02	07:19	06:28	05:50	05:36	05:49	06:18	06:49	07:20	06:56	07:26
	17:04	17:42	19:14	19:47	20:18	20:41	20:39	20:07	19:18	18:28	16:50	16:41
17	07:30	07:00	07:17	06:27	05:49	05:36	05:50	06:19	06:50	07:21	06:57	07:26
	17:05	17:43	19:15	19:48	20:19	20:41	20:38	20:06	19:16	18:27	16:49	16:41
18	07:29	06:59	07:16	06:25	05:48	05:36	05:51	06:20	06:51	07:22	06:58	07:27
	17:06	17:44	19:16	19:49	20:20	20:42	20:37	20:04	19:15	18:25	16:48	16:41
19	07:29	06:58	07:14	06:24	05:47	05:36	05:52	06:21	06:52	07:23	06:59	07:27
	17:08	17:45	19:17	19:50	20:21	20:42	20:37	20:03	19:13	18:24	16:48	16:42
20	07:28	06:56	07:12	06:22	05:46	05:36	05:53	06:22	06:53	07:24	07:00	07:28
	17:09	17:47	19:18	19:51	20:22	20:42	20:36	20:01	19:11	18:22	16:47	16:42
21	07:28	06:55	07:11	06:21	05:46	05:36	05:53	06:23	06:54	07:25	07:01	07:29
	17:10	17:48	19:19	19:52	20:23	20:43	20:35	20:00	19:09	18:21	16:46	16:42
22	07:27	06:53	07:09	06:19	05:45	05:36	05:54	06:24	06:55	07:26	07:03	07:29
	17:11	17:49	19:20	19:53	20:24	20:43	20:35	19:58	19:08	18:19	16:46	16:43
23	07:26	06:52	07:07	06:18	05:44	05:37	05:55	06:25	06:56	07:27	07:04	07:30
	17:12	17:50	19:22	19:54	20:25	20:43	20:34	19:57	19:06	18:18	16:45	16:43
24	07:26	06:50	07:06	06:17	05:43	05:37	05:56	06:26	06:57	07:29	07:05	07:30
	17:14	17:51	19:23	19:55	20:26	20:43	20:33	19:55	19:04	18:17	16:44	16:44
25	07:25	06:49	07:04	06:15	05:43	05:37	05:57	06:27	06:58	07:30	07:06	07:30
	17:15	17:53	19:24	19:56	20:26	20:43	20:32	19:54	19:03	18:15	16:44	16:44
26	07:24	06:47	07:02	06:14	05:42	05:37	05:58	06:28	06:59	07:31	07:07	07:31
	17:16	17:54	19:25	19:57	20:27	20:44	20:31	19:52	19:01	18:14	16:43	16:45
27	07:23	06:46	07:01	06:12	05:41	05:38	05:59	06:29	07:00	07:32	07:08	07:31
	17:17	17:55	19:26	19:58	20:28	20:44	20:30	19:51	18:59	18:12	16:43	16:46
28	07:22	06:44	06:59	06:11	05:41	05:38	06:00	06:30	07:01	07:33	07:09	07:32
	17:18	17:56	19:27	20:00	20:29	20:44	20:29	19:49	18:58	18:11	16:42	16:46
29	07:22		06:57	06:10	05:40	05:39	06:01	06:31	07:02	07:34	07:10	07:32
	17:20		19:28	20:01	20:30	20:44	20:28	19:48	18:56	18:10	16:42	16:47
30	07:21		06:56	06:08	05:40	05:39	06:02	06:32	07:03	07:35	07:11	07:32
	17:21		19:29	20:02	20:31	20:44	20:27	19:46	18:54	18:08	16:42	16:48
31	07:20		06:54		05:39		06:03	06:33		07:37		07:32
	17:22		19:30		20:31		20:26	19:44		18:07		16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 74 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (146)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:32 16:50	07:19 17:23	06:43 17:57	06:52 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:12 16:41
2	07:33 16:50	07:18 17:25	06:41 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:04 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:13 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:04 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:03	07:14 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:47 19:34	06:03 20:06	05:37 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:15 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:16 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:37	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:32 16:56	07:11 17:32	06:32 18:05	06:41 19:38	05:58 20:10	05:36 20:37	05:44 20:42	06:10 20:17	06:41 19:31	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:30 18:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:39	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 18:07	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:48 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 18:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:26	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 18:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:05 17:38	06:24 18:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:39	06:22 18:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:17 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 18:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:40
16	07:30 17:04	07:02 17:42	06:19 18:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 18:15	06:27 19:48	05:49 20:19	05:36 20:41	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 18:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:37	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:45	06:14 18:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 18:18	06:22 19:51	05:47 20:22	05:36 20:42	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 18:19	06:21 19:52	05:46 20:23	05:36 20:43	05:53 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:42
22	07:27 17:11	06:53 17:49	06:09 18:20	06:19 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:19	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 18:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:50 17:51	06:06 18:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 18:24	06:15 19:56	05:43 20:26	05:37 20:43	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:30 16:44
26	07:24 17:16	06:47 17:54	06:02 18:25	06:14 19:57	05:42 20:27	05:37 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 18:26	06:12 19:58	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:12	07:08 16:43	07:31 16:46
28	07:22 17:18	06:44 17:56	06:59 18:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20		06:57 18:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:28	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 18:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:27	06:32 19:46	07:03 18:54	07:35 18:08	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:31		06:03 20:26	06:33 19:44		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	458	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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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Project:

Fountain Wind

Licensed user:

EDR217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar**Shadow receptor: 75 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (147)****Assumptions for shadow calculations**

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.62	0.73	0.82	0.92	0.94	0.97	0.96	0.93	0.84	0.61	0.47

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
23	65	319	1,935	1,830	119	5	24	340	1,432	1,766	761	99	19	10	13	8,760

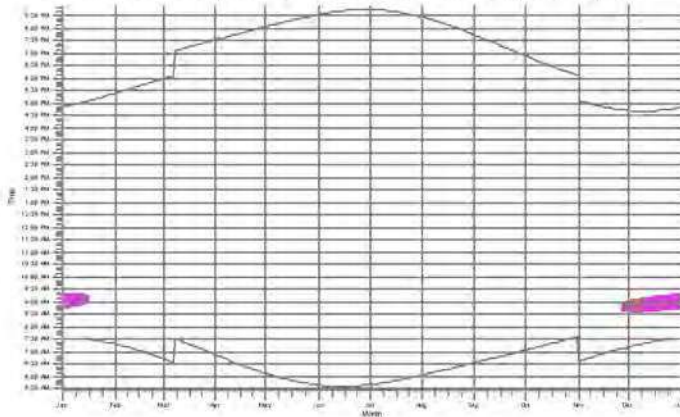
	January	February	March	April	May	June	July	August	September	October	November	December
1	07:33 16:50	07:19 17:23	06:43 17:57	06:53 19:31	06:07 20:03	05:39 20:32	05:40 20:44	06:04 20:25	06:34 19:43	07:04 18:53	06:38 18:06	07:13 16:41
2	07:33 16:50	07:18 17:25	06:42 17:58	06:51 19:32	06:06 20:04	05:38 20:33	05:40 20:44	06:05 20:24	06:35 19:41	07:05 18:51	06:39 17:05	07:14 16:41
3	07:33 16:51	07:17 17:26	06:40 18:00	06:49 19:33	06:05 20:05	05:38 20:34	05:41 20:43	06:05 20:23	06:36 19:40	07:06 18:49	06:40 17:04	07:15 16:41
4	07:33 16:52	07:16 17:27	06:38 18:01	06:48 19:34	06:03 20:06	05:38 20:34	05:41 20:43	06:06 20:22	06:37 19:38	07:07 18:48	06:41 17:02	07:16 16:40
5	07:33 16:53	07:15 17:28	06:37 18:02	06:46 19:35	06:02 20:07	05:37 20:35	05:42 20:43	06:07 20:21	06:38 19:36	07:08 18:46	06:43 17:01	07:17 16:40
6	07:33 16:54	07:14 17:30	06:35 18:03	06:44 19:36	06:01 20:08	05:37 20:36	05:42 20:43	06:08 20:20	06:39 19:35	07:09 18:44	06:44 17:00	07:17 16:40
7	07:33 16:55	07:13 17:31	06:34 18:04	06:43 19:38	06:00 20:09	05:37 20:36	05:43 20:43	06:09 20:19	06:40 19:33	07:10 18:43	06:45 16:59	07:18 16:40
8	07:33 16:56	07:12 17:32	06:32 19:05	06:41 19:39	05:59 20:10	05:36 20:37	05:44 20:42	06:10 20:18	06:41 19:32	07:11 18:41	06:46 16:58	07:19 16:40
9	07:32 16:57	07:10 17:33	06:31 19:06	06:39 19:40	05:57 20:11	05:36 20:38	05:44 20:42	06:11 20:16	06:42 19:30	07:12 18:40	06:47 16:57	07:20 16:40
10	07:32 16:58	07:09 17:35	06:29 19:08	06:38 19:41	05:56 20:12	05:36 20:38	05:45 20:42	06:12 20:15	06:43 19:28	07:13 18:38	06:49 16:56	07:21 16:40
11	07:32 16:59	07:08 17:36	06:27 19:09	06:36 19:42	05:55 20:13	05:36 20:39	05:46 20:41	06:13 20:14	06:44 19:27	07:14 18:36	06:50 16:55	07:22 16:40
12	07:32 17:00	07:07 17:37	06:26 19:10	06:35 19:43	05:54 20:14	05:36 20:39	05:46 20:41	06:14 20:12	06:45 19:25	07:15 18:35	06:51 16:54	07:23 16:40
13	07:31 17:01	07:06 17:38	06:24 19:11	06:33 19:44	05:53 20:15	05:36 20:40	05:47 20:40	06:15 20:11	06:46 19:23	07:16 18:33	06:52 16:53	07:23 16:40
14	07:31 17:02	07:04 17:40	06:22 19:12	06:32 19:45	05:52 20:16	05:36 20:40	05:48 20:40	06:16 20:10	06:47 19:21	07:18 18:32	06:53 16:52	07:24 16:40
15	07:31 17:03	07:03 17:41	06:21 19:13	06:30 19:46	05:51 20:17	05:36 20:41	05:49 20:39	06:17 20:08	06:48 19:20	07:19 18:30	06:54 16:51	07:25 16:41
16	07:30 17:04	07:02 17:42	06:19 19:14	06:28 19:47	05:50 20:18	05:36 20:41	05:49 20:39	06:18 20:07	06:49 19:18	07:20 18:28	06:56 16:50	07:26 16:41
17	07:30 17:05	07:00 17:43	06:17 19:15	06:27 19:48	05:49 20:19	05:36 20:42	05:50 20:38	06:19 20:06	06:50 19:16	07:21 18:27	06:57 16:49	07:26 16:41
18	07:29 17:07	06:59 17:44	06:16 19:16	06:25 19:49	05:48 20:20	05:36 20:42	05:51 20:38	06:20 20:04	06:51 19:15	07:22 18:25	06:58 16:48	07:27 16:41
19	07:29 17:08	06:58 17:46	06:14 19:17	06:24 19:50	05:47 20:21	05:36 20:42	05:52 20:37	06:21 20:03	06:52 19:13	07:23 18:24	06:59 16:48	07:28 16:42
20	07:28 17:09	06:56 17:47	06:12 19:18	06:22 19:51	05:47 20:22	05:36 20:43	05:53 20:36	06:22 20:01	06:53 19:11	07:24 18:22	07:00 16:47	07:28 16:42
21	07:28 17:10	06:55 17:48	06:11 19:20	06:21 19:52	05:46 20:23	05:36 20:43	05:54 20:35	06:23 20:00	06:54 19:10	07:25 18:21	07:01 16:46	07:29 16:42
22	07:27 17:11	06:53 17:49	06:09 19:21	06:20 19:53	05:45 20:24	05:36 20:43	05:54 20:35	06:24 19:58	06:55 19:08	07:26 18:20	07:03 16:46	07:29 16:43
23	07:26 17:12	06:52 17:50	06:07 19:22	06:18 19:54	05:44 20:25	05:37 20:43	05:55 20:34	06:25 19:57	06:56 19:06	07:27 18:18	07:04 16:45	07:30 16:43
24	07:26 17:14	06:51 17:52	06:06 19:23	06:17 19:55	05:43 20:26	05:37 20:43	05:56 20:33	06:26 19:55	06:57 19:04	07:29 18:17	07:05 16:44	07:30 16:44
25	07:25 17:15	06:49 17:53	06:04 19:24	06:15 19:56	05:43 20:27	05:37 20:44	05:57 20:32	06:27 19:54	06:58 19:03	07:30 18:15	07:06 16:44	07:31 16:45
26	07:24 17:16	06:48 17:54	06:02 19:25	06:14 19:58	05:42 20:27	05:38 20:44	05:58 20:31	06:28 19:52	06:59 19:01	07:31 18:14	07:07 16:43	07:31 16:45
27	07:23 17:17	06:46 17:55	06:01 19:26	06:12 19:59	05:41 20:28	05:38 20:44	05:59 20:30	06:29 19:51	07:00 18:59	07:32 18:13	07:08 16:43	07:31 16:46
28	07:23 17:18	06:45 17:56	06:00 19:27	06:11 20:00	05:41 20:29	05:38 20:44	06:00 20:29	06:30 19:49	07:01 18:58	07:33 18:11	07:09 16:42	07:32 16:46
29	07:22 17:20		06:57 19:28	06:10 20:01	05:40 20:30	05:39 20:44	06:01 20:29	06:31 19:48	07:02 18:56	07:34 18:10	07:10 16:42	07:32 16:47
30	07:21 17:21		06:56 19:29	06:08 20:02	05:40 20:31	05:39 20:44	06:02 20:28	06:32 19:46	07:03 18:54	07:36 18:09	07:11 16:42	07:32 16:48
31	07:20 17:22		06:54 19:30		05:39 20:32		06:03 20:27	06:33 19:45		07:37 18:07		07:32 16:49
Potential sun hours	298	297	369	398	448	452	459	428	375	346	298	288
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

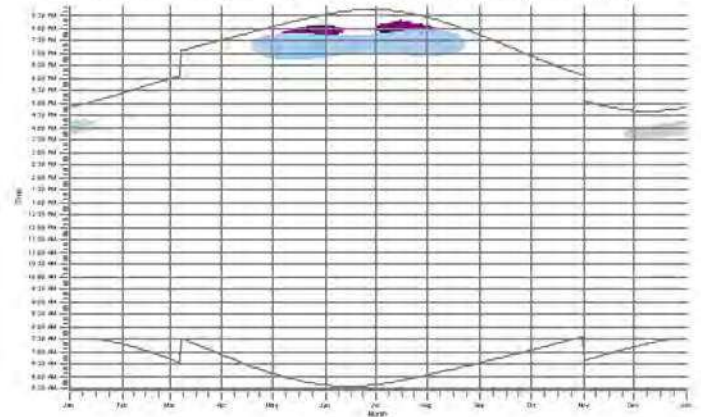
Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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SHADOW - Calendar, graphical

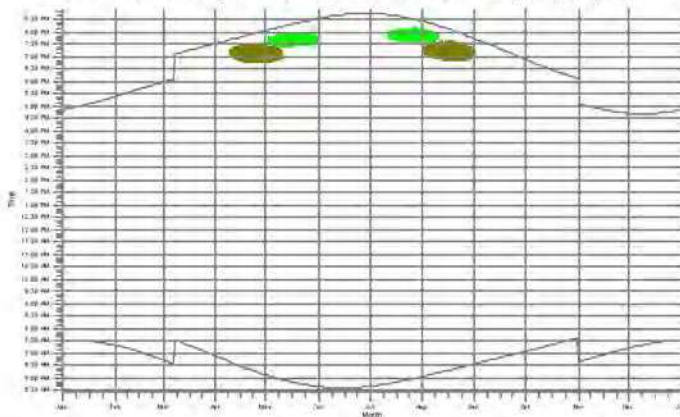
1: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (76)



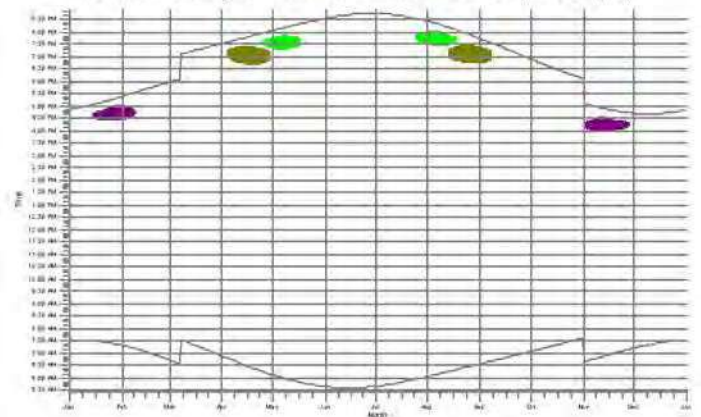
2: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)



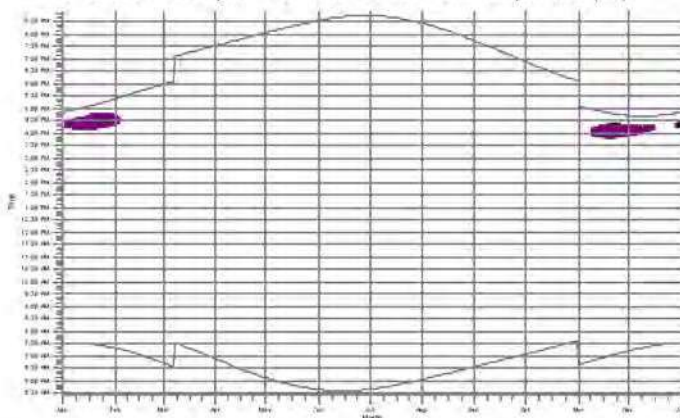
3: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (78)



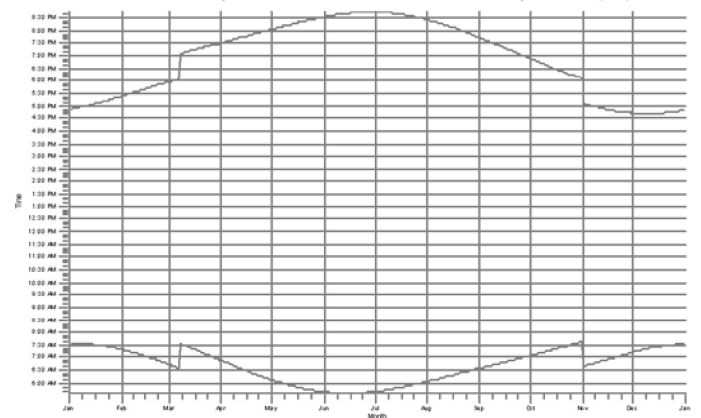
4: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)



5: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (80)



6: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (81)

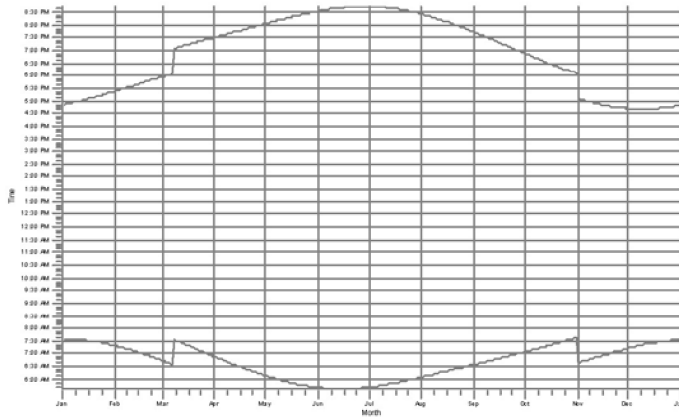


WTG:

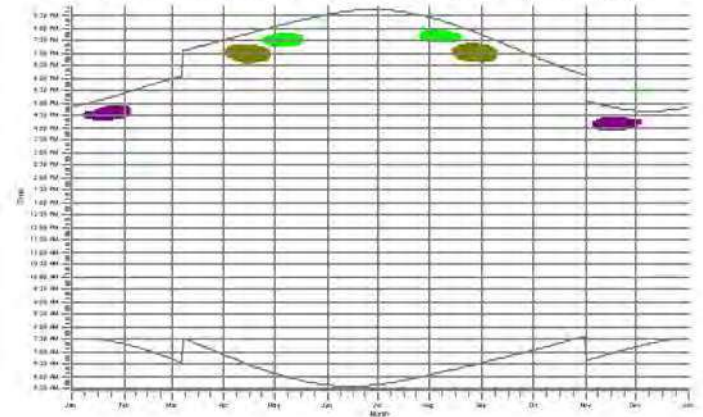
D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) D04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (78)
D03: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77) E01: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (81)
D05: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (82)
L04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (102)

SHADOW - Calendar, graphical

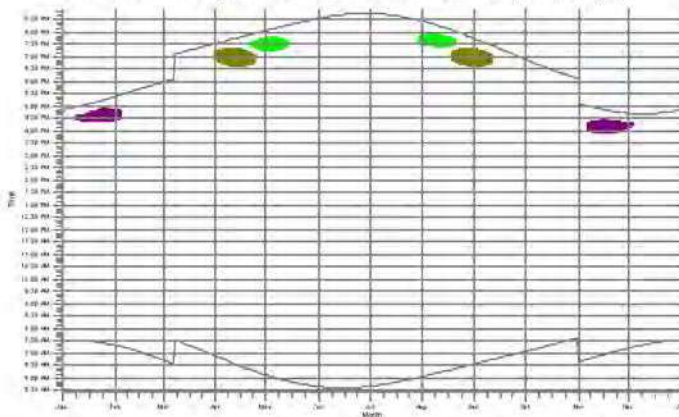
7: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (82)



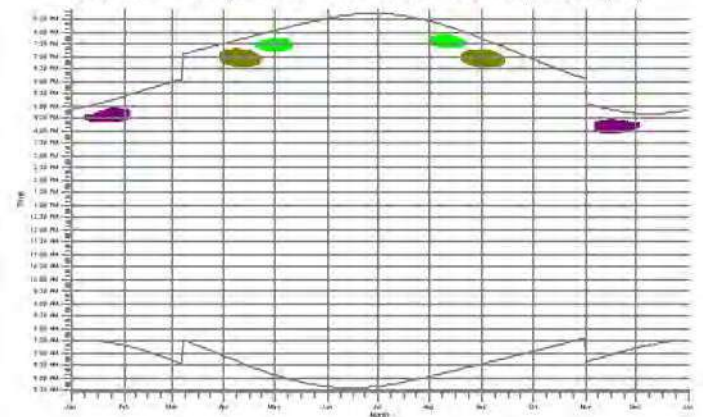
8: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)



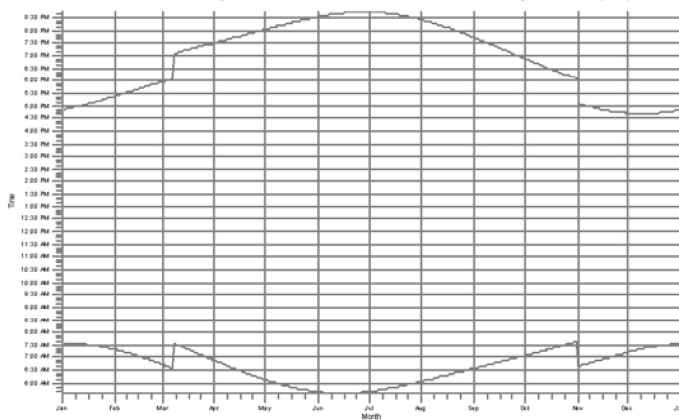
9: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)



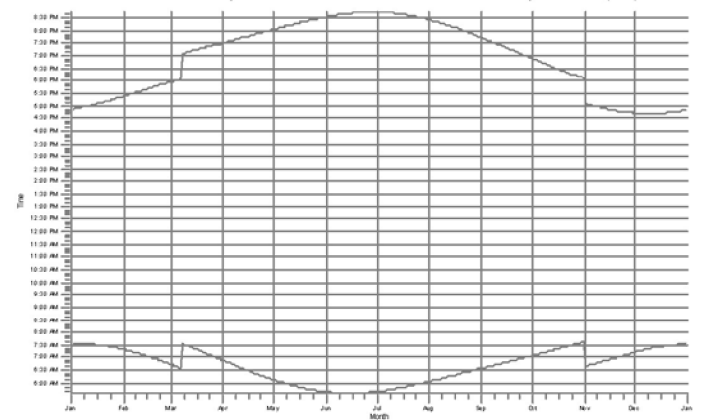
10: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)



11: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (86)



12: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (87)

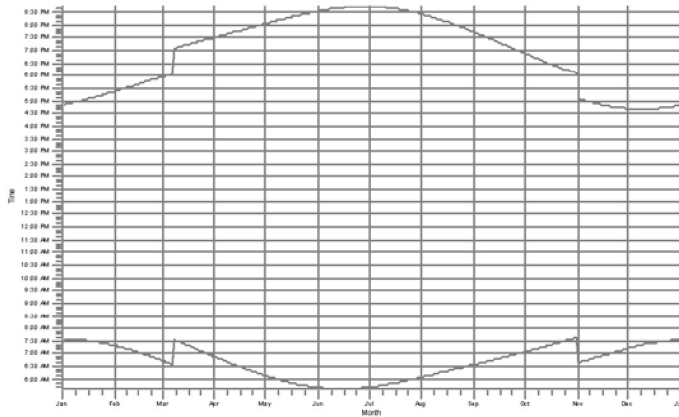


WTGs

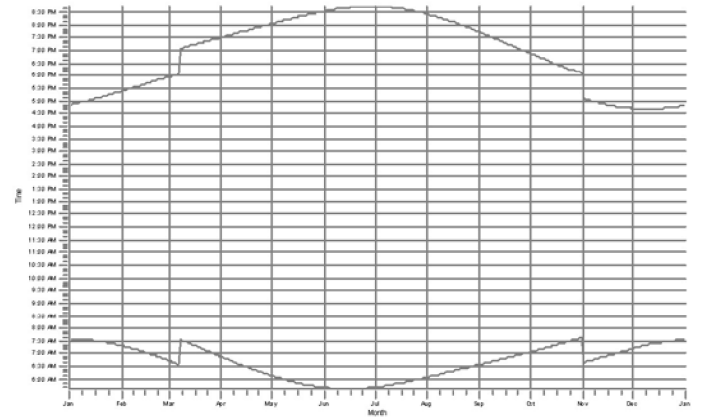
D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) D03: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77) D04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (78)

SHADOW - Calendar, graphical

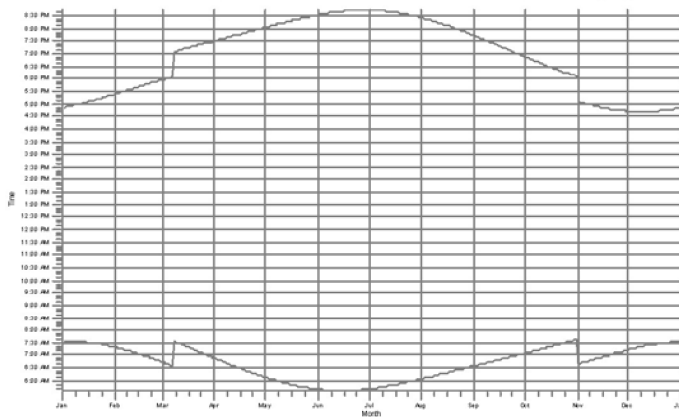
13: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (88)



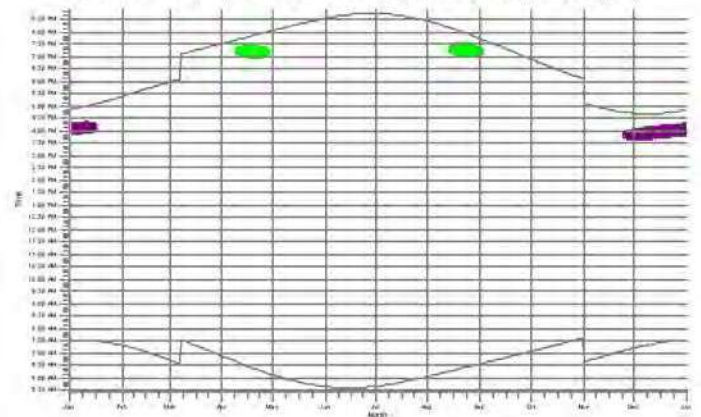
14: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (89)



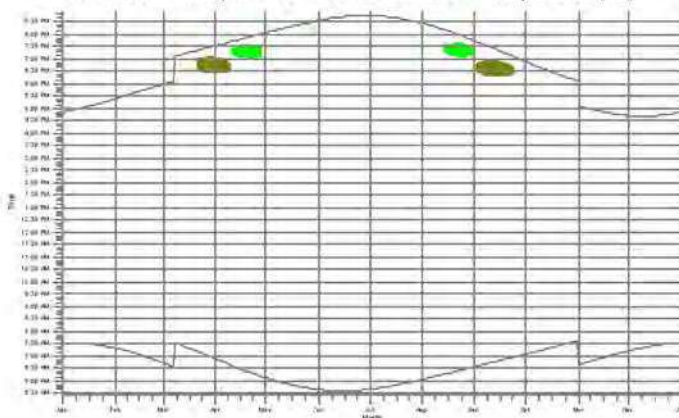
15: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (90)



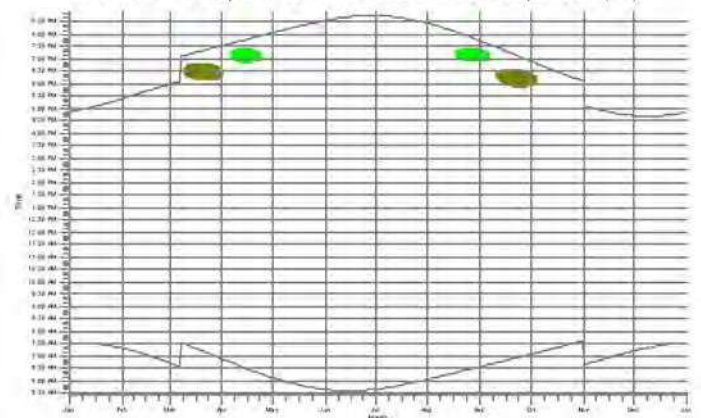
16: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)



17: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (92)



18: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (93)



WTGs

D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) D03: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77) D04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (78)

Project:

Fountain Wind

Licensed user:

EDR

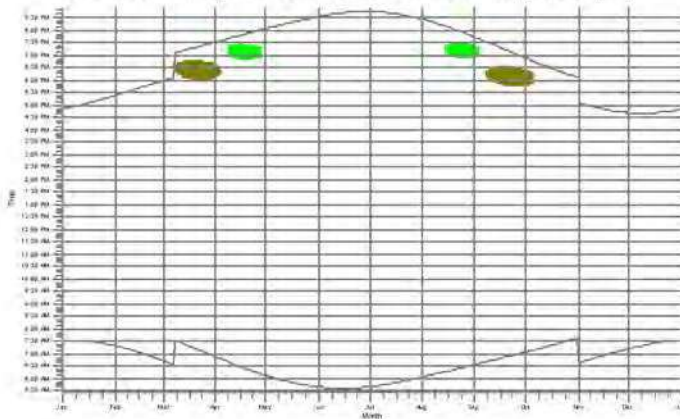
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

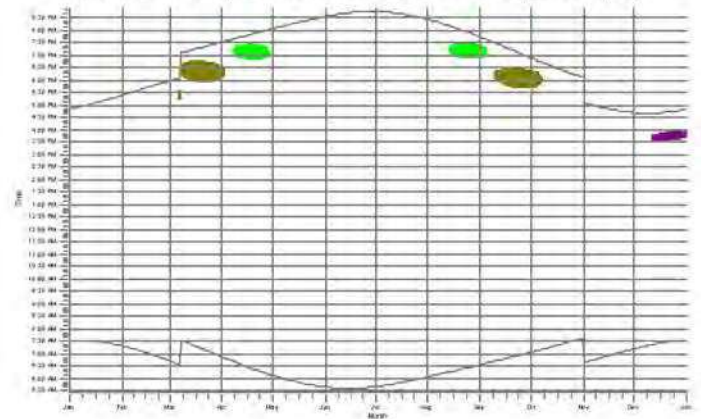
9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar, graphical

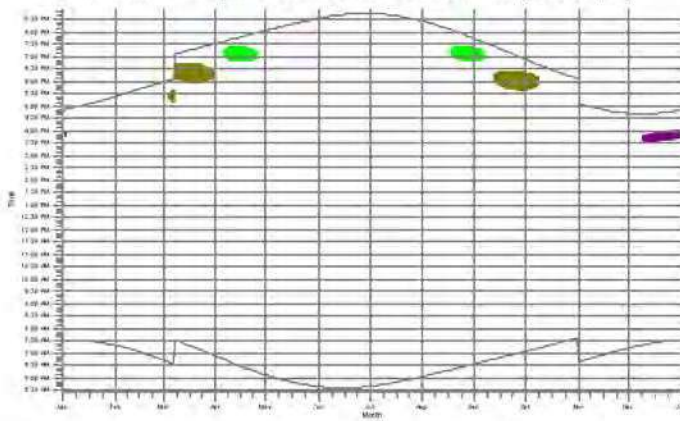
19: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (94)



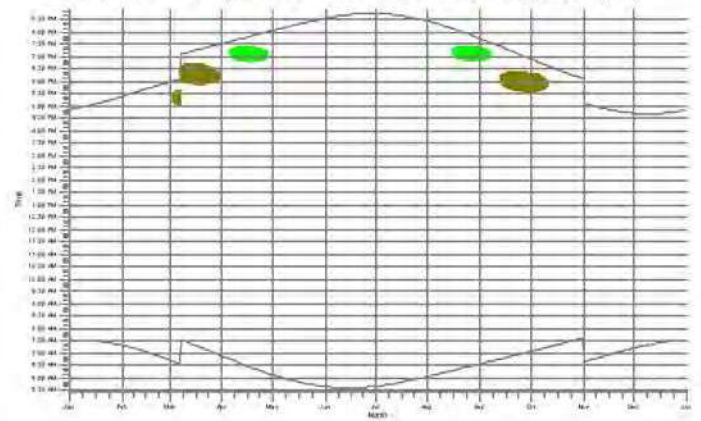
20: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)



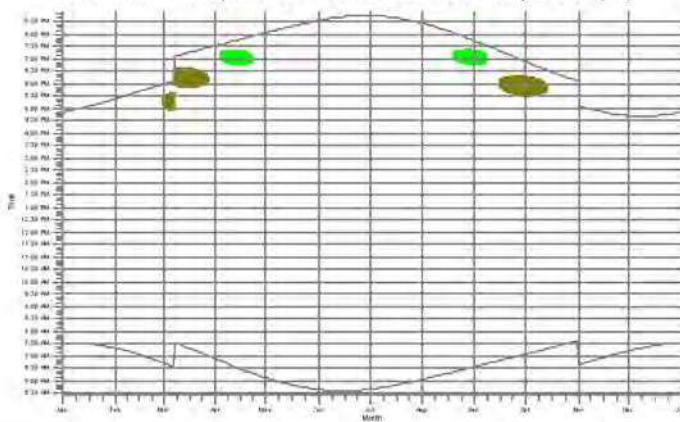
21: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)



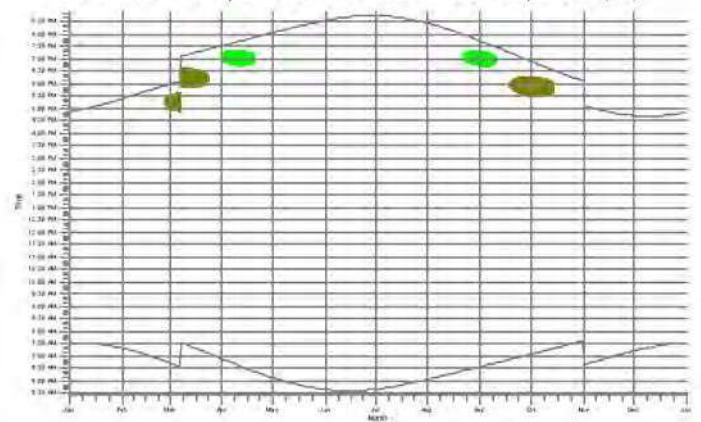
22: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (97)



23: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (98)



24: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)

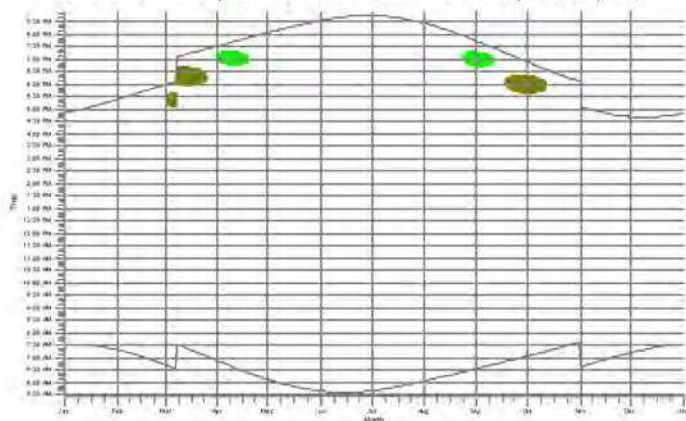


WTG:

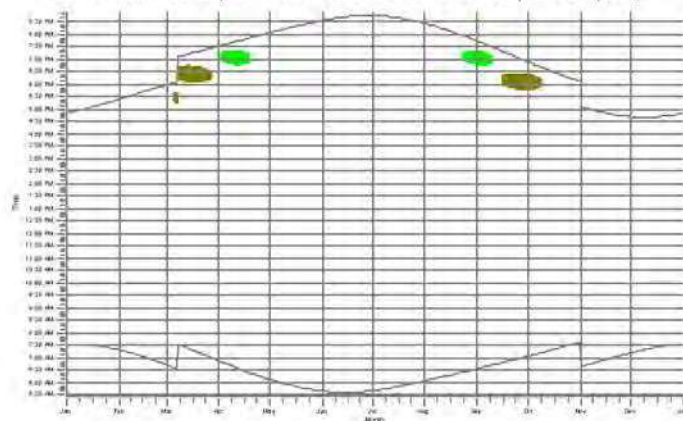
D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) D03: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77) D04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (78)

SHADOW - Calendar, graphical

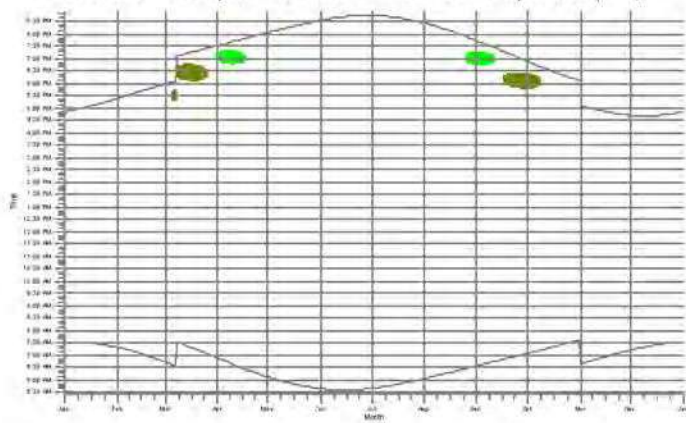
25: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (100)



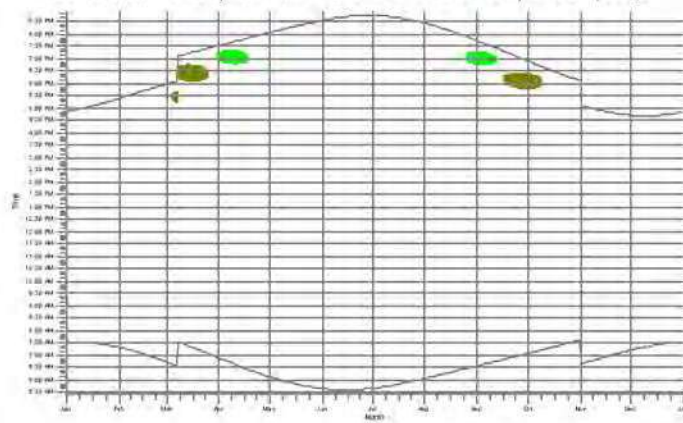
26: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (101)



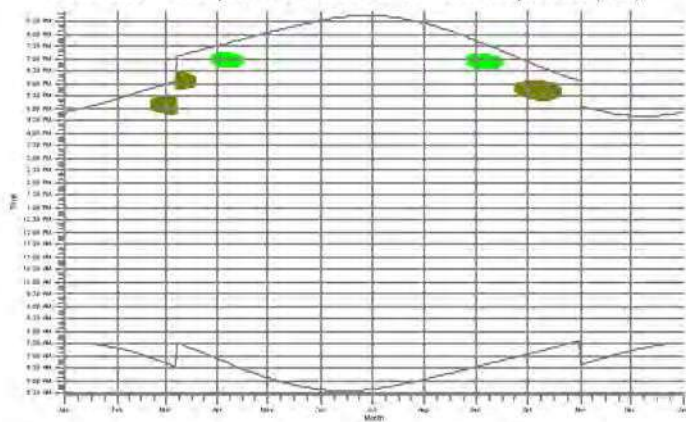
28: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (102)



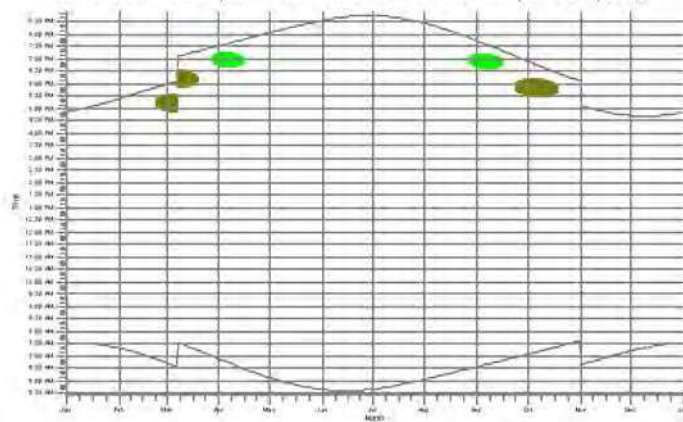
29: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (103)



30: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)



31: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)



WTG:

002: Siemens Gamesa SG 6.0-170 G200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) 003: Siemens Gamesa SG 6.0-170 G200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77)

Project:

Fountain Wind

Licensed user:

EDR

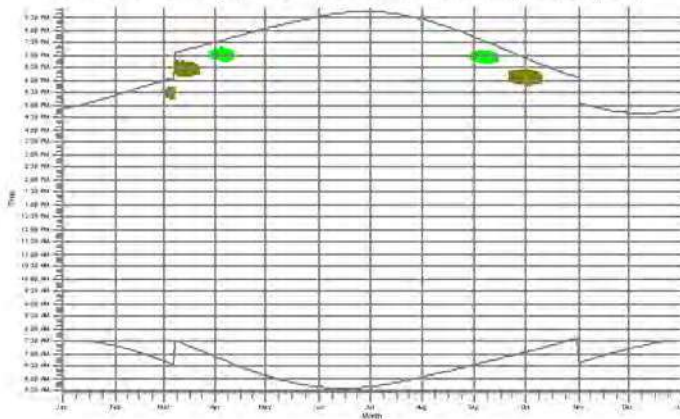
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

Calculated:

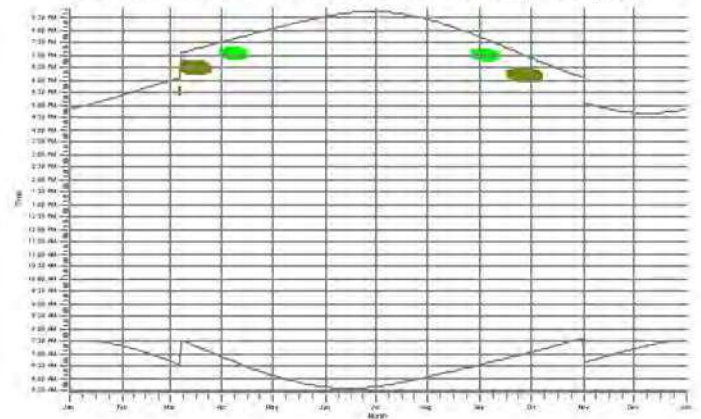
9/3/2020 8:59 AM/3.3.274

SHADOW - Calendar, graphical

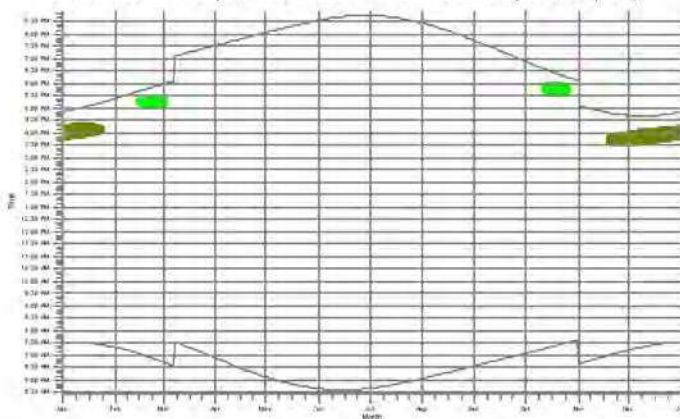
32: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (106)



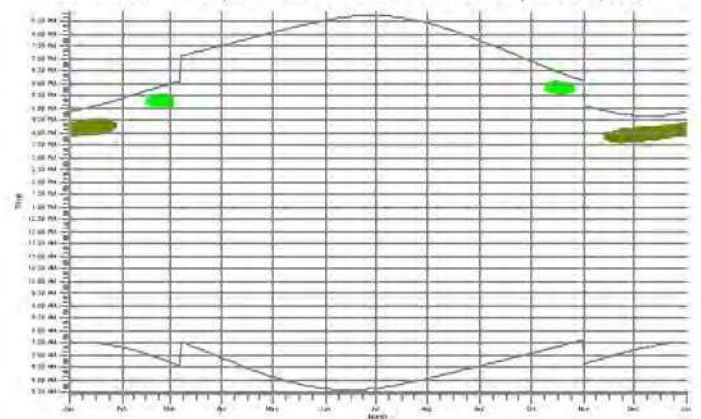
33: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (107)



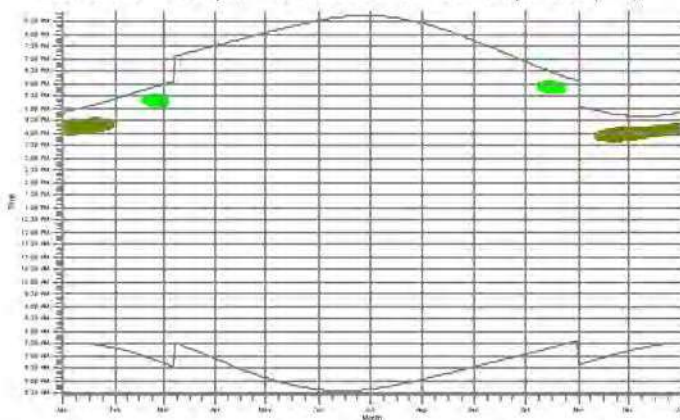
34: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)



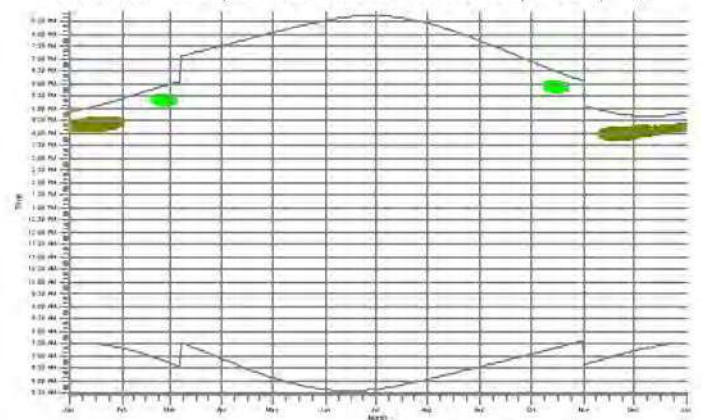
35: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)



36: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)



37: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)



WTGs

D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76)

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Project:

Fountain Wind

Licensed user:

EDR

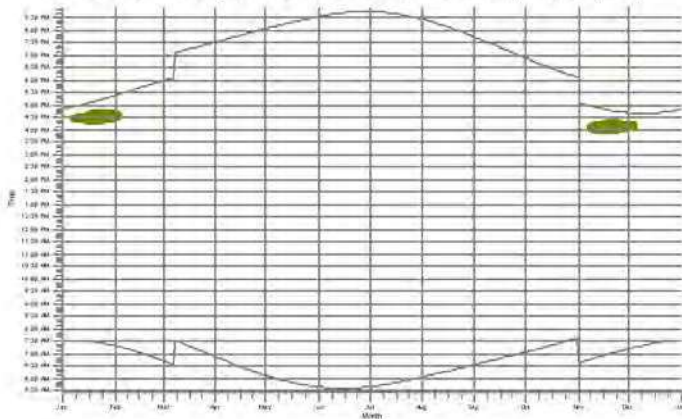
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US-SYRACUSE, NY 13202
(315) 471 0688

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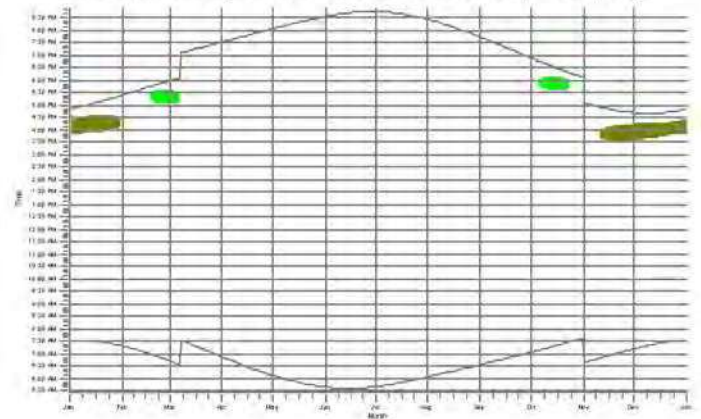
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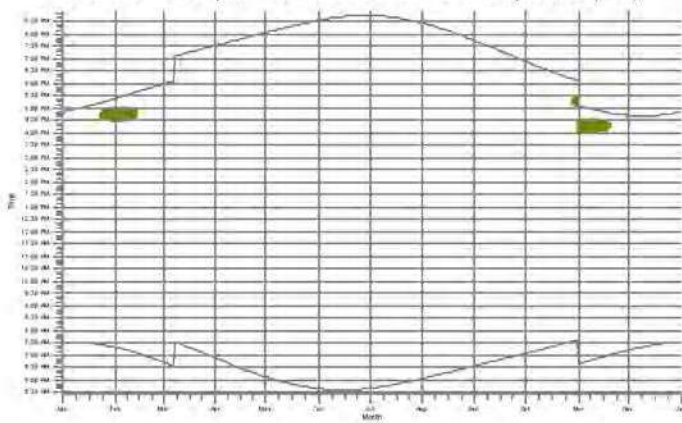
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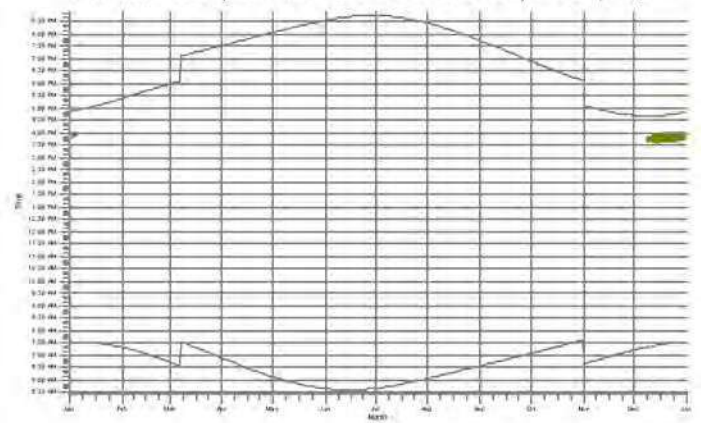
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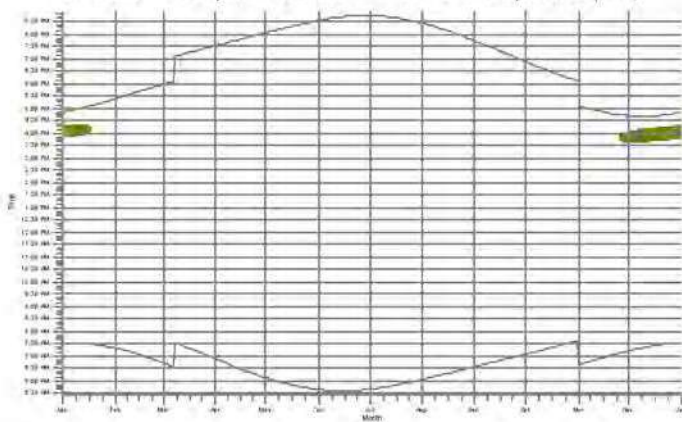
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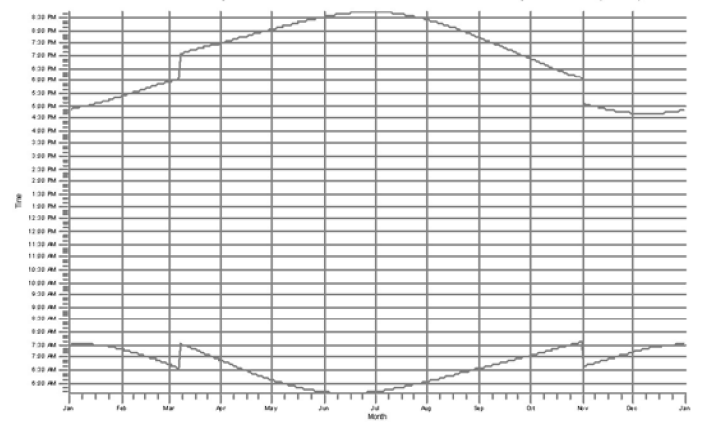
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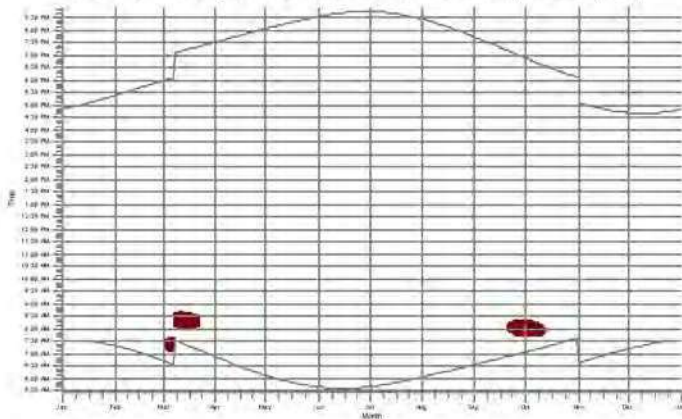
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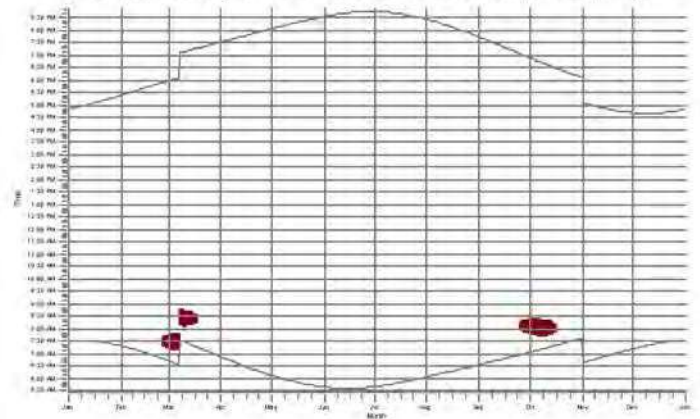
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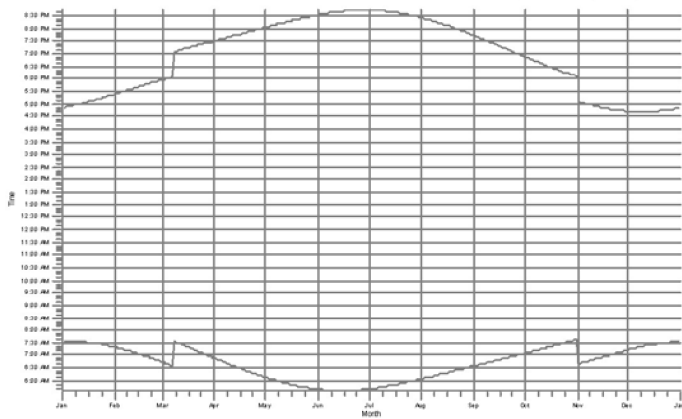
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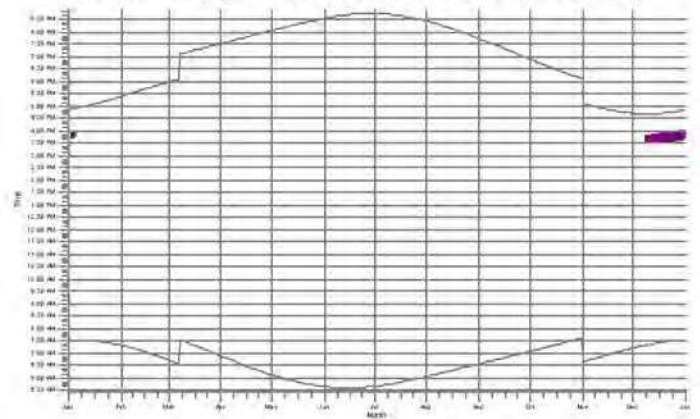
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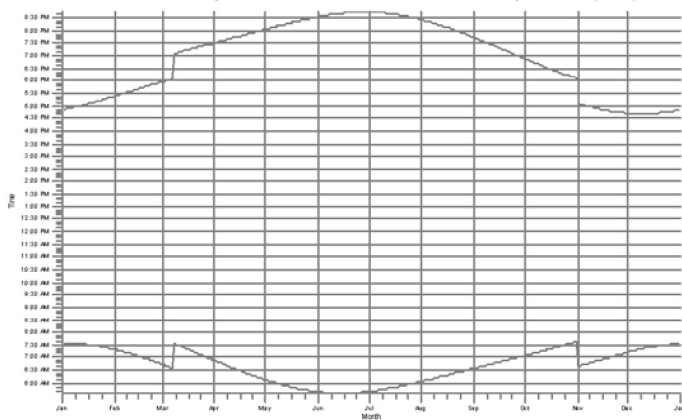
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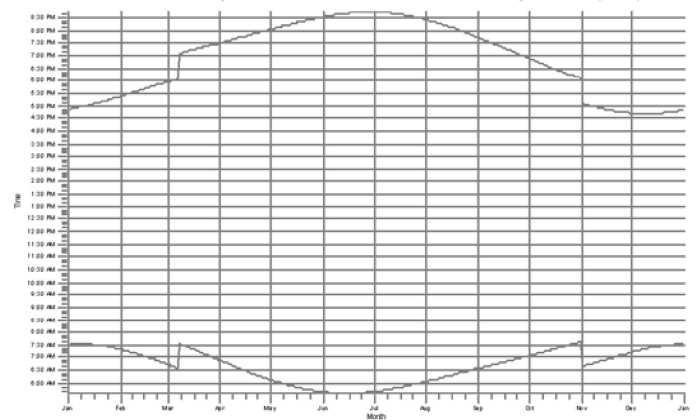
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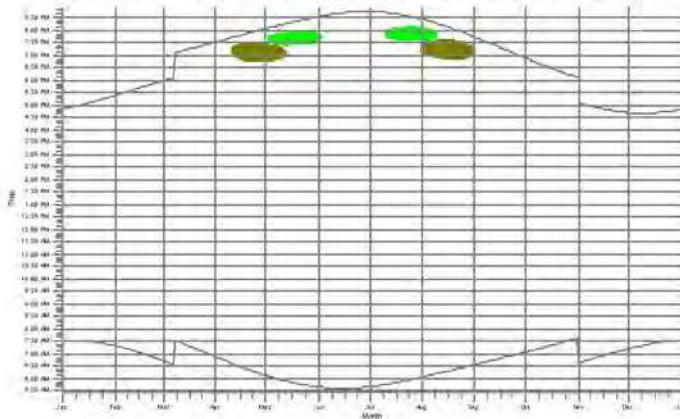


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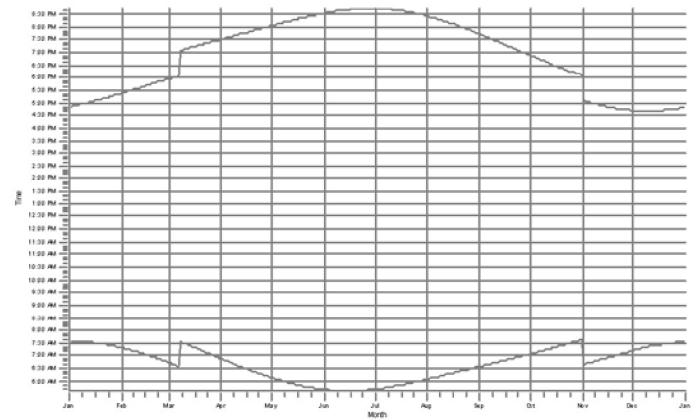
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SHADOW - Calendar, graphical

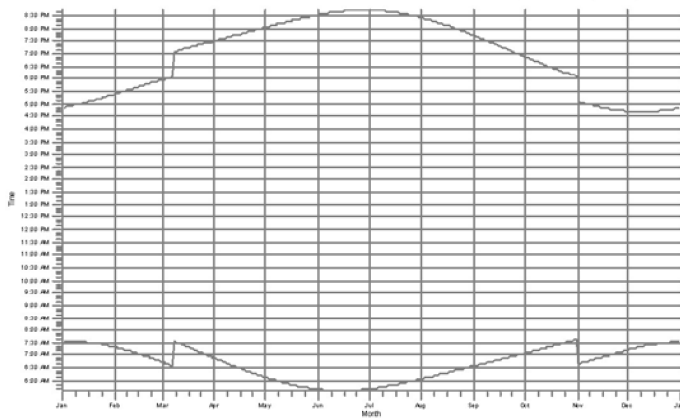
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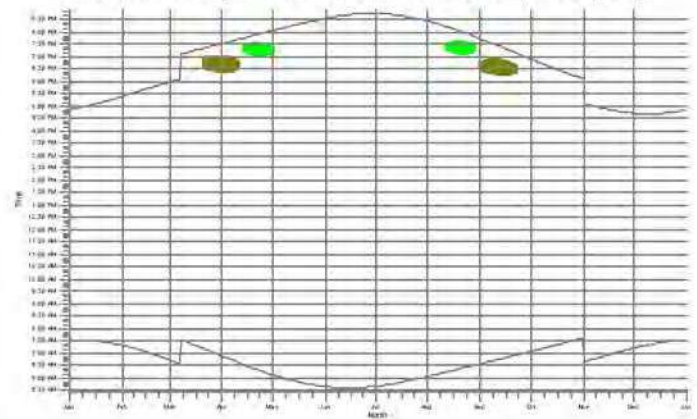
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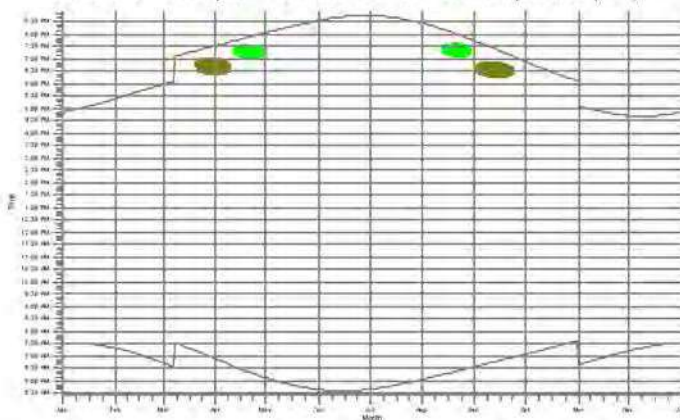
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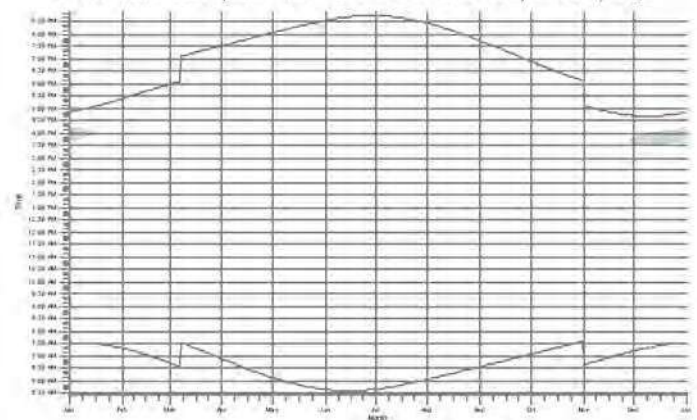
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57: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (129)



WTG:

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Project:

Fountain Wind

Licensed user:

EDR

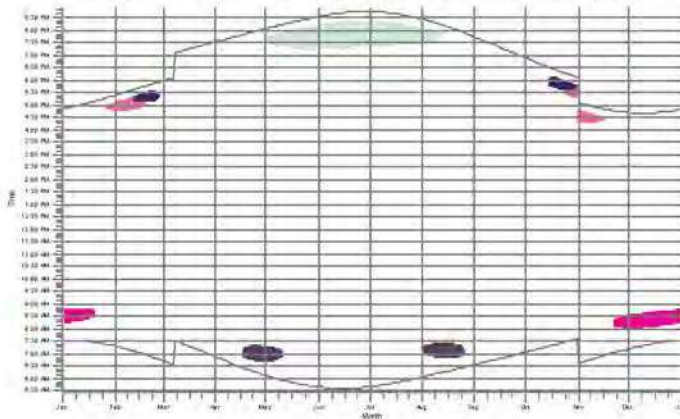
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

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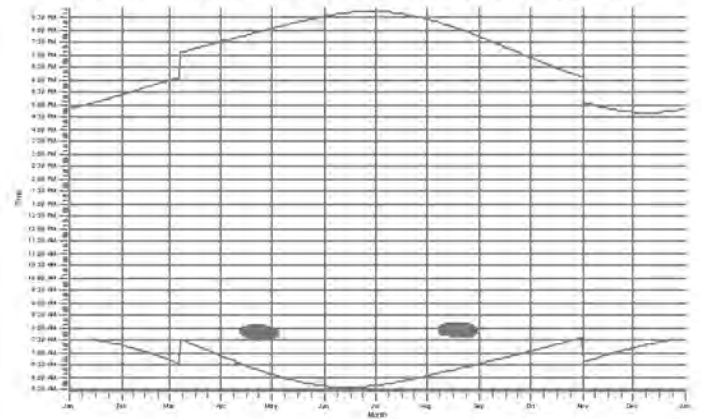
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SHADOW - Calendar, graphical

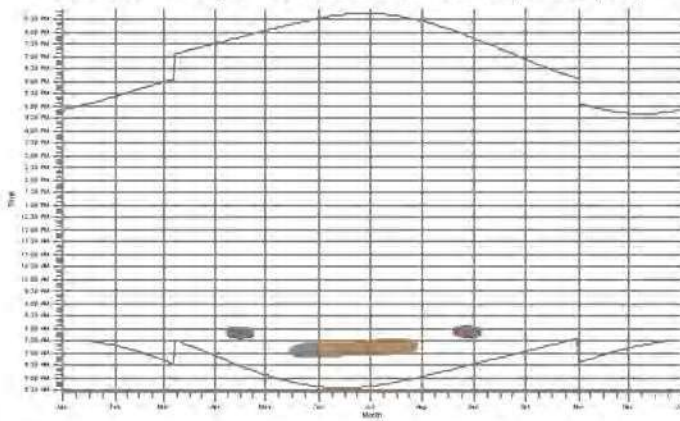
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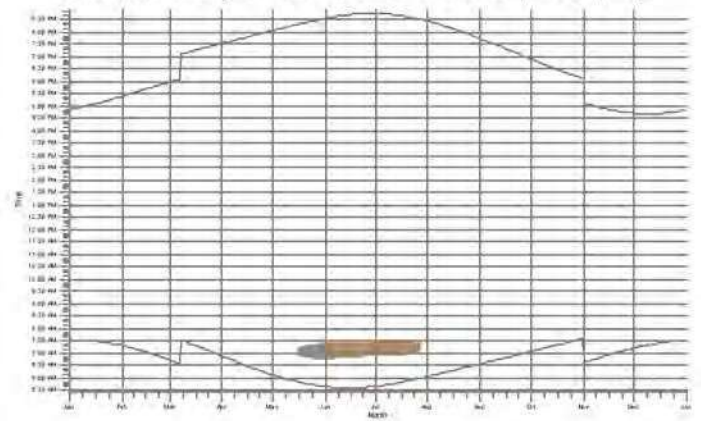
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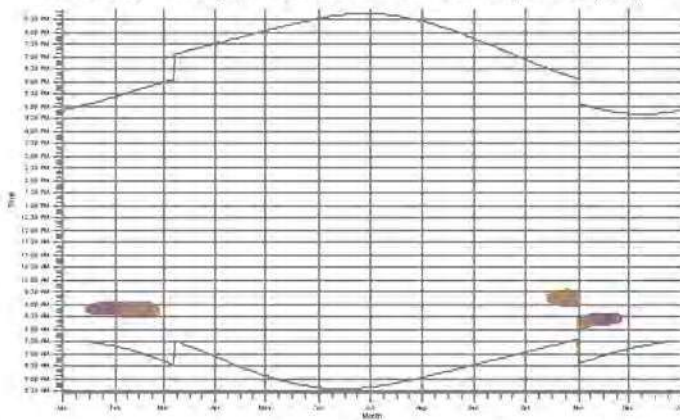
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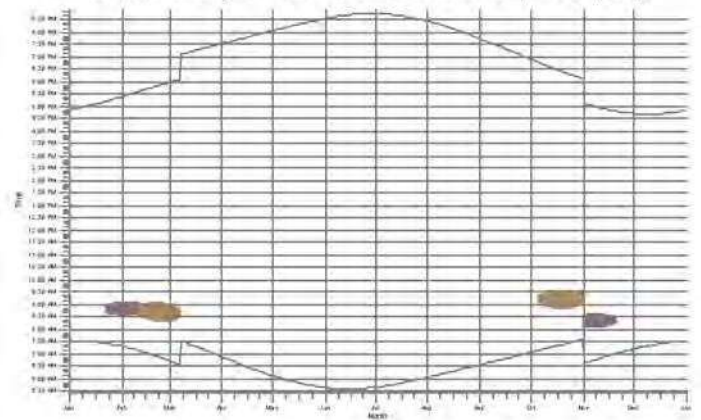
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63: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (135)



WTG:

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 N04: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (135)
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Project:

Fountain Wind

Licensed user:

EDR

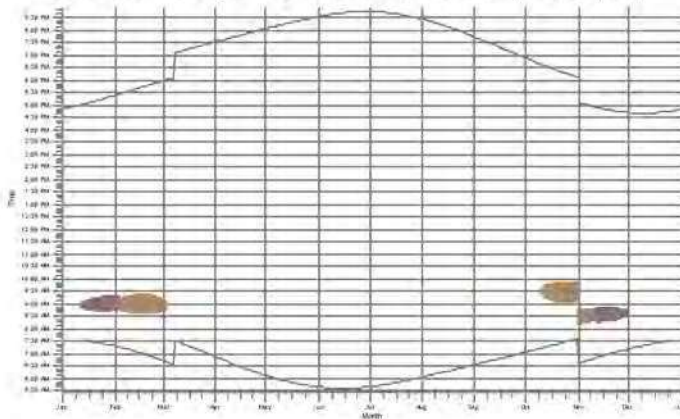
217 Montgomery St., Suite 1000
US-SYRACUSE, NY 13202
(315) 471 0688

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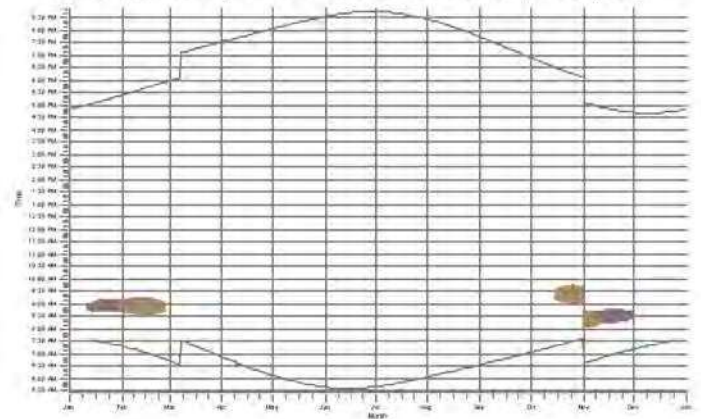
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SHADOW - Calendar, graphical

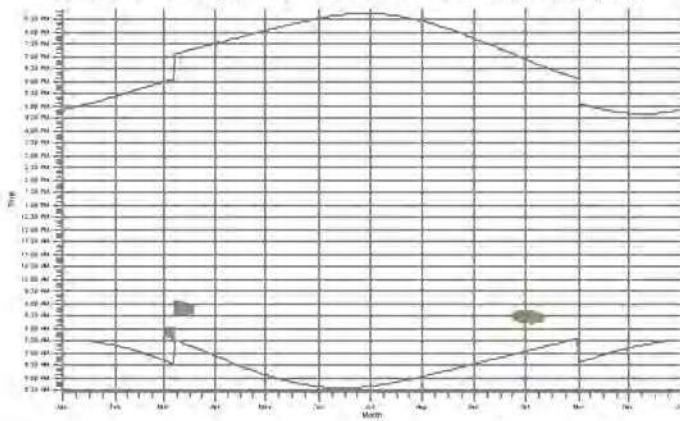
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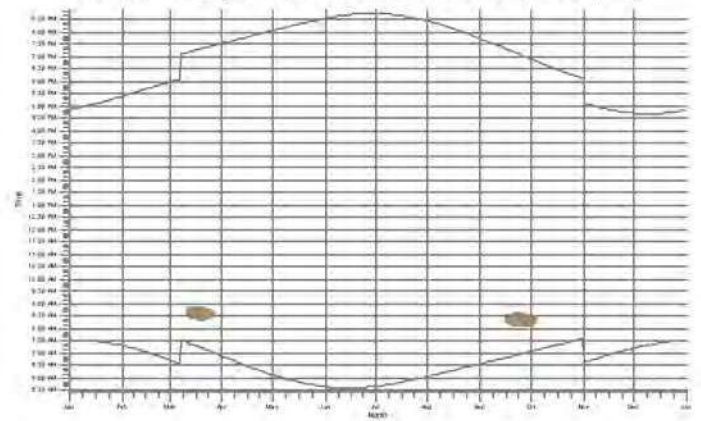
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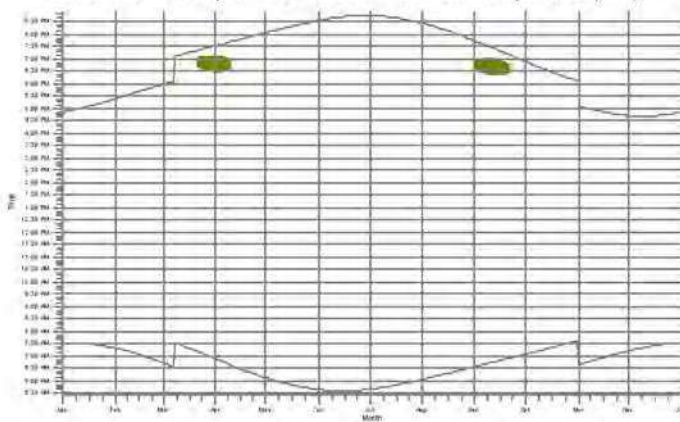
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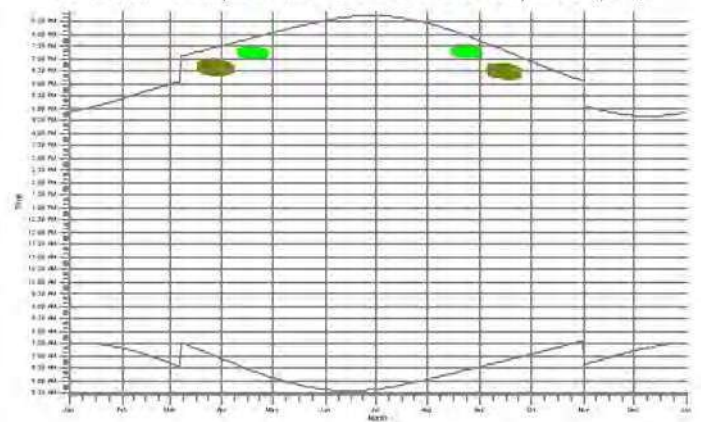
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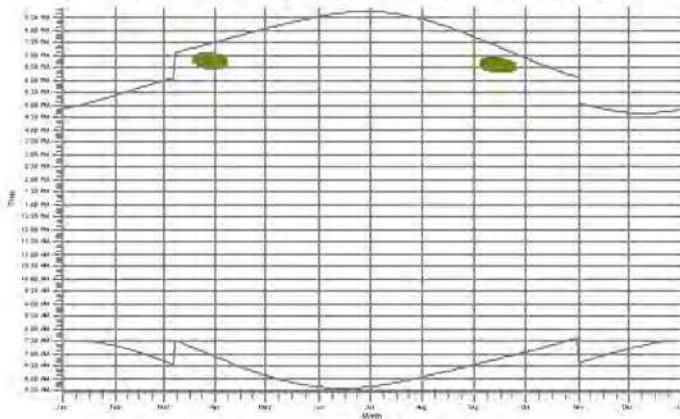


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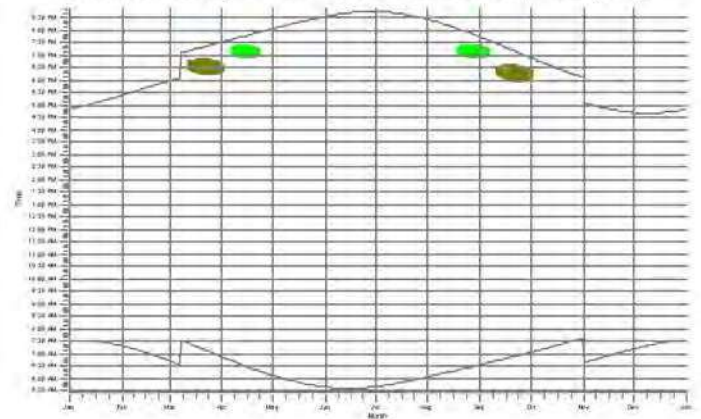
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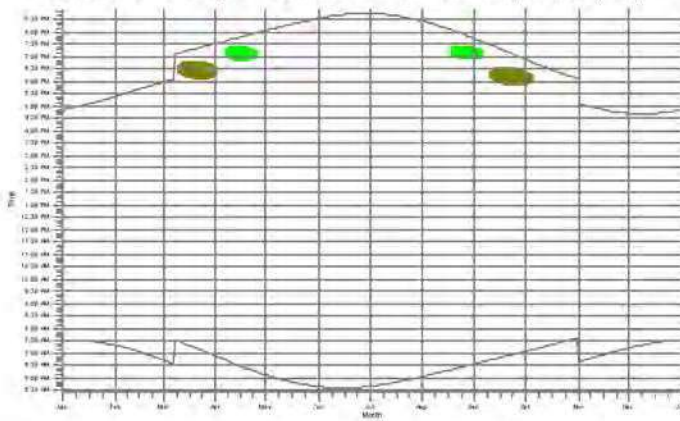
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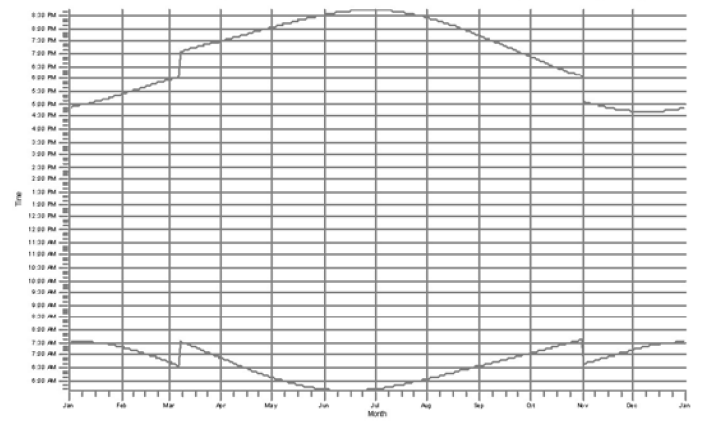
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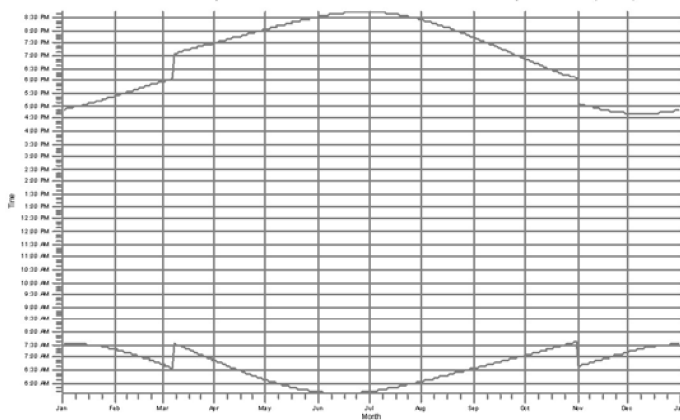
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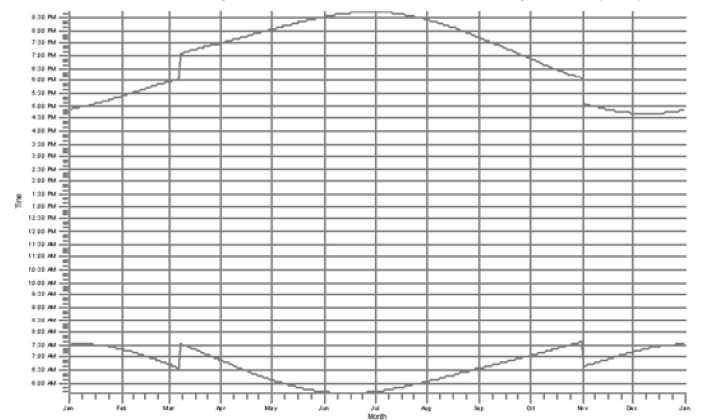
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75: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (147)



WTG:

D02: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (76) D03: Siemens Gamesa SG 6.0-170 6200 170.0 IOW hub: 115.0 m (TOT: 200.0 m) (77)

A4. Stantec: Visual Resources Technical Report



TECHNICAL MEMORANDUM

DATE: January 16, 2020

TO: John Kuba, ConnectGen Operating LLC

FROM: Kori Hutchison and Andrea Chatfield, WEST, Inc.

RE: 2019 eDNA Surveys for Foothill Yellow-legged Frog at the Fountain Wind Project, Shasta County, California

INTRODUCTION

In September 2019, Western EcoSystems Technology, Inc. (WEST) performed aquatic environmental DNA (eDNA) surveys to assess presence/absence of foothill yellow-legged frog (FYLF; *Rana boylei*) at the proposed Fountain Wind Project (Project) in Shasta County, California. The eDNA surveys at the Project build upon the previous FYLF habitat assessment and visual encounter surveys (VES) conducted in 2018 and 2019, the methods and results of which are presented in Chatfield and Hutchison 2019. VES conducted at the Project in 2018 and 2019 yielded no detections of FYLF. Nonetheless, California Department of Fish and Wildlife (CDFW) biologists recommended presence/absence surveys using eDNA methodology to supplement the previous VES efforts at the Project. The eDNA survey results for FYLF were negative. The following memorandum summarizes the methods and results of eDNA surveys conducted at the Project in September 2019.

eDNA BACKGROUND

Environmental DNA is genetic material that has been released by an organism into its environment in the form of sloughed cells, feces, or other exogenous processes, and can be detected in air, water, or soil (Laramie et al. 2015; Carim et al. 2016). The collection and analysis of eDNA can be an efficient method of determining presence of aquatic organisms, and is an effective alternative to standard survey methods that are logistically difficult or have low probabilities of detection (Laramie et al. 2015; Carim et al. 2016; Goldberg et al. 2016; 2017). Environmental DNA methodology can be especially useful in determining presence of rare and sensitive species, as it is capable of detecting species presence at very low densities (Goldberg et al. 2013; 2016; 2017). Avoidance of contamination during sample collection, transportation, and analysis is of utmost importance, given the high sensitivity of eDNA methods and generally very low concentrations of aqueous DNA (Goldberg et al. 2016).

PROJECT AND SURVEY AREA

The Project is located on privately-owned, commercial timberlands in central Shasta County, California. The dominant vegetation type in and around the Project is mixed coniferous forest (post-fire and unburned), with smaller amounts of mixed montane chaparral and mixed montane riparian forest/scrub. The primary land use in this area is commercial timber production, which has resulted in a highly fragmented landscape across much of the area. Dominant overstory species include a combination of white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), and California black oak (*Quercus kelloggii*).

For the purpose of determining eDNA sampling locations, an updated Project Site (i.e., the area in which Project facilities could be sited) was provided in a Geographic Information System (GIS) format by the Project proponent in September 2019 (Figure 1). The Project Site consists of approximately 4,463 acres (ac; 1,806 hectares [ha]) including all facilities included in the site plan and an appropriate buffer to capture areas where permanent and temporary disturbance could occur (e.g., newly proposed roads, roads that may be expanded, turbine pads, and underground collection lines) to provide for some flexibility in final project micrositeing. For comparison purposes, previous development corridors (dated May 2018 and May 2019) used for the 2018 and 2019 FYLF habitat assessment and VES (see Chatfield and Hutchison 2019) are also depicted in Figure 1. The current (dated September 2019) Project Site largely overlaps the previous 2018 and 2019 development corridors, with the exception that the survey corridor around each turbine was increased from 500 feet to 700 feet resulting in approximately an additional 800 ac (324 ha). The additional 800 ac consists of mostly upland environments. The previous FYLF habitat assessment and VES, therefore, included the majority of the current Project Site. In combination with the 2019 eDNA surveys, which included the entirety of the Project Site, the FYLF studies conducted to date provide comprehensive coverage of all potential FYLF habitats within the current Project Site.

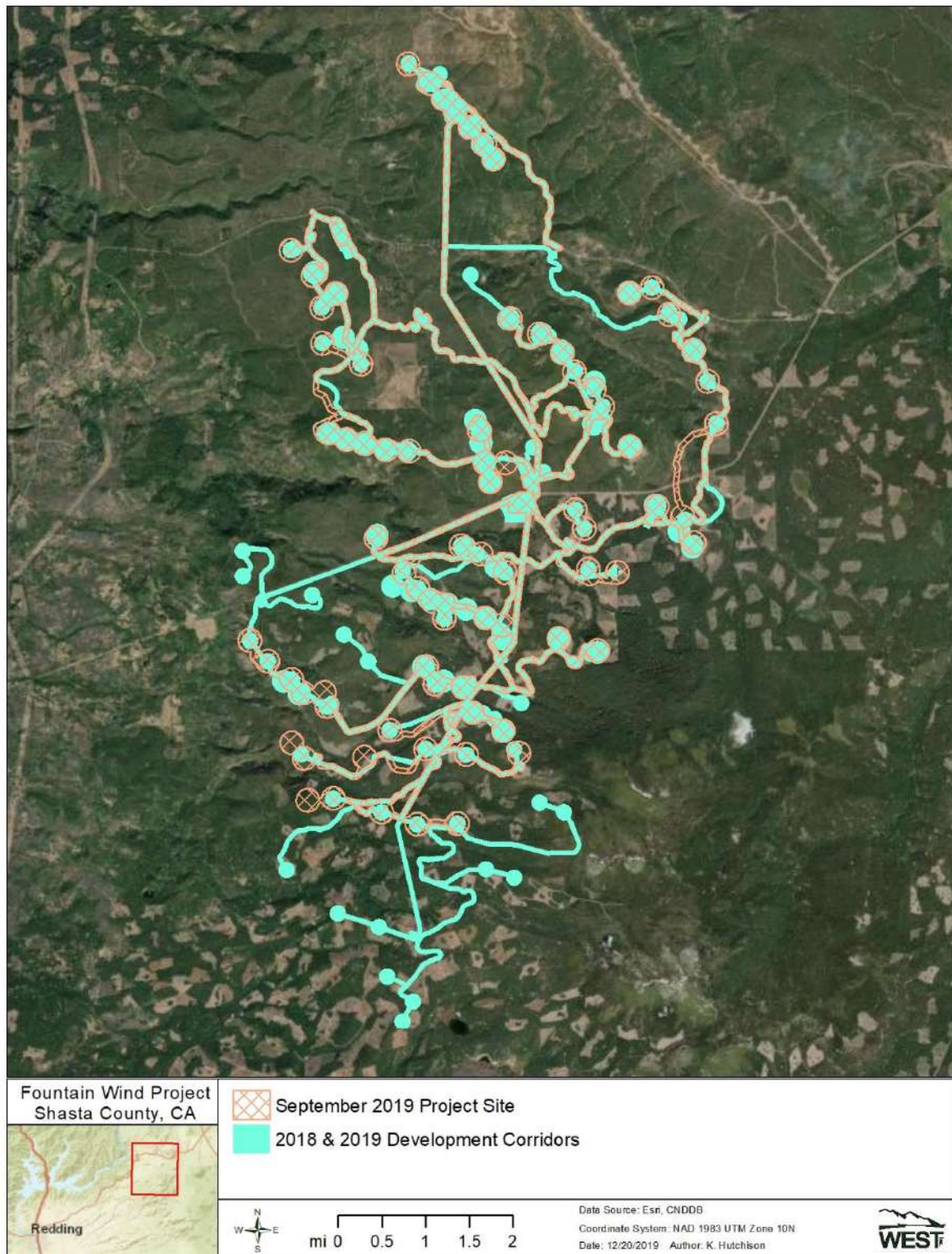


Figure 1. Current (September 2019) Project Site evaluated during the 2019 environmental DNA survey effort, in relation to the previously proposed development corridors evaluated during the 2018 and 2019 FYLF habitat assessment and visual encounter surveys (VES).

METHODS

Determining Sampling Locations

Geographic information system (GIS) data from the United States Geological Survey (USGS) National Hydrography Dataset (NHD; USGS 2019) and examination of aerial imagery were used to conduct a desktop assessment of potentially suitable stream crossings within the Project Site. Following the desktop assessment, a WEST biologist with training in FYLF survey methods conducted a field verification to determine the suitability of identified stream crossings for conducting eDNA surveys. Criteria considered during the field verification included whether stream crossings had sufficient surface water to conduct sampling (i.e., >3 liters [L]), and whether stream crossings would be directly affected by temporary or permanent ground disturbance (i.e., roads, turbine pads, underground collection lines). Streams that crossed below long spans of overhead collection lines were not surveyed. Additional crossings identified during the field verification were also evaluated for inclusion.

Sampling Equipment

In order to simplify sample collection and reduce the possibility of contamination and DNA degradation, eDNA surveys were conducted using Smith-Root's eDNA Sampler Backpack, a fully-integrated, purpose-built aquatic eDNA sampling system (Thomas et al. 2018; Smith-Root 2019a). This system was designed to minimize the risk of sample contamination in the field, using single-use, self-preserving filters so that the sample is never handled until it is received by the lab (Smith-Root 2019b). The eDNA Sampler Backpack uses a smart pump system that monitors the rate at which water is pumped to minimize clogging from suspended sediments, standardizing flow and pressure, and making it easy to accurately reach target volume (Smith-Root 2019a).

eDNA Field Surveys

Environmental DNA field surveys were conducted on September 25-27, 2019, consistent with recommendations and guidelines described in Goldberg et al. (2016; 2017) and methodology used in Carim et al. (2016). Surveys were conducted in all suitable stream crossings within the Project Site, targeting the potential fall distribution of FYLF. Samples were taken on the downstream side of each stream crossing, or on both sides when there was little to no connectivity between water on each side of the crossing (i.e., rocks, woody debris, or other materials interrupting stream flow). Three replicate samples were taken at each sampling station to safeguard against collection error and to detect any potential contamination (Goldberg et al. 2016). A new single-use filter was used for each of the three samples at each station. Given that each sample station was relatively clear of debris, the target volume of 1 L of water was filtered for each individual sample (Goldberg et al. 2017; J. Ponce, Technical Sales Associate and Biologist, Smith-Root, Inc., personal communication). Filters were placed at the end of a telescoping pole, and submerged just below the surface of the water without surveyors having to enter the stream. When the pump reached 1 L, the filter was removed and returned to its original re-sealable bag for transport to the laboratory. Time, water temperature, and geographic location of each sample were recorded, along with an identifying sample number.

Positive control samples were taken at a site known to have recent FYLF detections along the Trinity River, north of the junction with Ramshorn Creek in Trinity County, California (41.181002, -122.658809). Adult and subadult life stages of FYLF were observed when collecting positive control samples. Negative control samples were taken outside of the FYLF range on the Willamette River in Benton County, Oregon.

Sample Analysis

Laboratory-based qPCR analysis of the eDNA samples was performed by Precision Biomonitoring Inc. in Guelph, Ontario, using a qPCR assay adapted from Goldberg et al. (2016) and validated on a BioRad CFX96 PCR thermocycler to detect FYLF eDNA. The methods of this analysis are described in detail in the Environmental DNA Analysis Report prepared by Precision Biomonitoring Inc. (2019) and included as Appendix A.

RESULTS AND CONCLUSIONS

Results from the desktop assessment yielded 47 potential stream crossings within the Project Site suitable for eDNA sampling (Figure 2). During field verification of these locations, 29 crossings were determined to be unsuitable for sampling; 23 crossings were dry streambeds with no surface water present and six crossings did not cross the Project Site in areas that would be subject to ground disturbance (e.g., long spans of overhead distribution lines). An additional six crossings were identified as suitable during field verification, including one crossing that necessitated two sampling stations due to a lack of surface water connectivity between upstream and downstream flows. Together, the desktop assessment and field verification resulted in a total of 24 stream crossings determined to be suitable for eDNA sampling and a total of 25 sampling stations.

Environmental DNA samples were taken at each of the 25 sampling stations on September 25-27, 2019, with three water samples taken at each station. Twenty-one (21) of the 25 samples yielded quantifiable levels ($>0.5 \text{ ng mL}^{-1}$; Crookes 2019) of DNA isolated from filters. Each of the five samples without quantifiable levels of DNA had corresponding replicates that did contain quantifiable levels of DNA. There were no positive detections of FYLF eDNA identified in the analysis. A detailed description of analysis results is provided in Crookes (2019; Appendix A).

The results of the 2019 eDNA surveys for FYLF are consistent with previous VES conducted at the Project in 2018 and 2019 (Chatfield and Hutchison 2019) which have found no evidence of FYLF presence within the Project Site. Results of the studies conducted at the Project to date indicate no impacts to FYLF resulting from Project development.

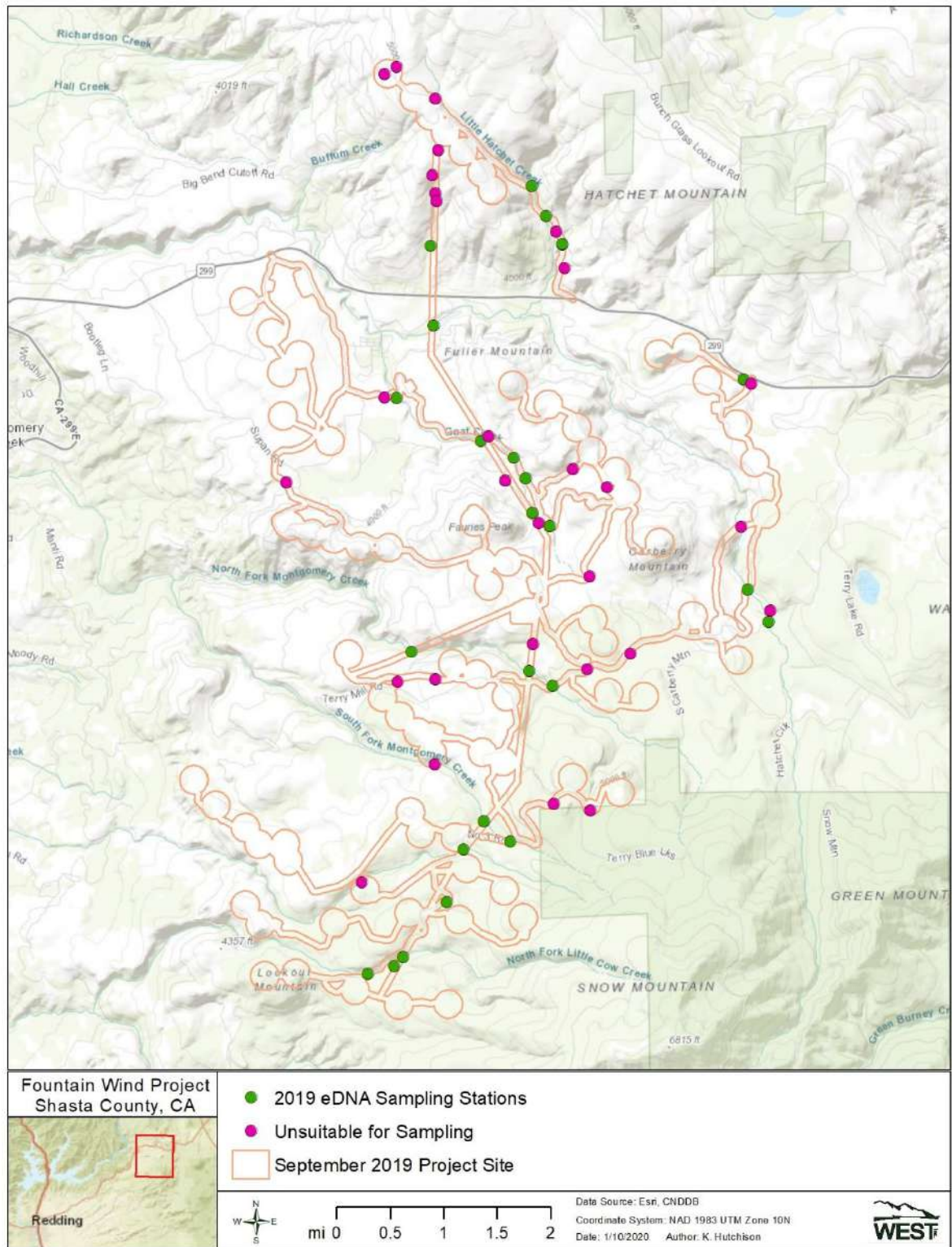


Figure 2. 2019 environmental DNA (eDNA) sampling stations with the Fountain Wind Project. Also shown are locations determined to be unsuitable for sampling based on field evaluation.

LITERATURE CITED

- Carim, K.J., K.S. McKelvey, M.K. Young, T.M. Wilcox, M.K. Schwartz. 2016. A protocol for collecting environmental DNA samples from streams. Gen. Tech. Rep. RMRS-GTR-355. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 18 p.
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- Goldberg, C.S., A. Sepulveda, J. Baumgardt, and L.P. Waits. 2013. Environmental DNA as a new method for early detection of New Zealand mudsnails (*Potamopyrgus antipodarum*): *Freshwater Science*, v. 32, p. 792-800.
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APPENDIX A – ENVIRONMENTAL DNA ANALYSIS REPORT

Environmental DNA Analysis Report

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Report Issued: 08/11/2019

Prepared By: Steve Crookes	Date: 08/11/2019	Email: steve.crookes@precisionbiomonitoring.com
Approved By: Mario Thomas	Date: 08/11/2019	Email: mario.thomas@precisionbiomonitoring.com

1. REPORT INFORMATION

Prepared for

Smith-Root, Inc.,
16603 NE 50th Avenue, Vancouver,
Washington 98686

Contact Name	Email Address	Phone
Austen Thomas	a.thomas@smithroot.com	360 573 0202 x 2143

Sample Information (For additional sample information see Sample Information Table below.)

Project Reference: Unknown

Sample Collection Conducted by: West Inc.

Date Shipped: 10/2019

Sample Shipment Format: Filters (pore size = 5 µm), self-preserving .

Date Received: 10/2019

Samples Received By: Steve Crookes

Condition of Samples Upon Receipt: Intact, ambient temperature.

Sample Extraction: Qiagen DNeasy Blood and Tissue Kit and Qiashredder

Analysis

Analysis applied: qPCR to detect foothills yellow-legged frogs (*Rana boylei*) eDNA, fluorometric quantification of eDNA yield.

Analysis Conducted By: Steve Crookes

Analysis Location: Precision Biomonitoring Laboratories

Date(s) of Analysis: 22/10/2019 – 07/11/2019

2. SAMPLE INFORMATION TABLE

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
003	25/09/2019	22/10/2019	22/10/2019	07/11/2019
004	25/09/2019	22/10/2019	22/10/2019	07/11/2019
005	25/09/2019	22/10/2019	22/10/2019	07/11/2019
006	25/09/2019	22/10/2019	22/10/2019	07/11/2019
007	25/09/2019	22/10/2019	22/10/2019	07/11/2019
008	25/09/2019	22/10/2019	22/10/2019	07/11/2019
013	25/09/2019	22/10/2019	22/10/2019	07/11/2019
015	25/09/2019	22/10/2019	22/10/2019	07/11/2019
016	25/09/2019	22/10/2019	22/10/2019	07/11/2019
017	25/09/2019	22/10/2019	22/10/2019	07/11/2019
018	25/09/2019	22/10/2019	22/10/2019	07/11/2019
020	25/09/2019	22/10/2019	22/10/2019	07/11/2019
021	25/09/2019	22/10/2019	22/10/2019	07/11/2019
022	25/09/2019	22/10/2019	22/10/2019	07/11/2019
023	25/09/2019	22/10/2019	22/10/2019	07/11/2019
024	25/09/2019	22/10/2019	22/10/2019	07/11/2019
025	25/09/2019	22/10/2019	22/10/2019	07/11/2019
026	25/09/2019	22/10/2019	22/10/2019	07/11/2019
027	25/09/2019	22/10/2019	22/10/2019	07/11/2019
028	25/09/2019	22/10/2019	22/10/2019	07/11/2019
029	25/09/2019	22/10/2019	22/10/2019	07/11/2019
030	25/09/2019	24/10/2019	24/10/2019	07/11/2019
031	25/09/2019	24/10/2019	24/10/2019	07/11/2019
032	25/09/2019	24/10/2019	24/10/2019	07/11/2019
033	26/09/2019	24/10/2019	24/10/2019	07/11/2019
034	26/09/2019	24/10/2019	24/10/2019	07/11/2019
035	26/09/2019	24/10/2019	24/10/2019	07/11/2019
036	26/09/2019	24/10/2019	24/10/2019	07/11/2019
037	26/09/2019	24/10/2019	24/10/2019	07/11/2019
038	26/09/2019	24/10/2019	24/10/2019	07/11/2019

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
039	26/09/2019	24/10/2019	24/10/2019	07/11/2019
040	26/09/2019	24/10/2019	24/10/2019	07/11/2019
041	26/09/2019	24/10/2019	24/10/2019	07/11/2019
042	26/09/2019	24/10/2019	24/10/2019	07/11/2019
043	26/09/2019	24/10/2019	24/10/2019	07/11/2019
044	26/09/2019	24/10/2019	24/10/2019	07/11/2019
045	26/09/2019	24/10/2019	24/10/2019	07/11/2019
046	26/09/2019	24/10/2019	24/10/2019	07/11/2019
047	26/09/2019	24/10/2019	24/10/2019	07/11/2019
048	26/09/2019	24/10/2019	24/10/2019	07/11/2019
049	26/09/2019	28/10/2019	28/10/2019	07/11/2019
050	26/09/2019	28/10/2019	28/10/2019	07/11/2019
051	26/09/2019	28/10/2019	28/10/2019	07/11/2019
052	26/09/2019	28/10/2019	28/10/2019	07/11/2019
053	26/09/2019	28/10/2019	28/10/2019	07/11/2019
054	26/09/2019	28/10/2019	28/10/2019	07/11/2019
055	26/09/2019	28/10/2019	28/10/2019	07/11/2019
056	26/09/2019	28/10/2019	28/10/2019	07/11/2019
057	26/09/2019	28/10/2019	28/10/2019	07/11/2019
058	26/09/2019	28/10/2019	28/10/2019	07/11/2019
059	26/09/2019	28/10/2019	28/10/2019	07/11/2019
060	26/09/2019	28/10/2019	28/10/2019	07/11/2019
061	26/09/2019	28/10/2019	28/10/2019	07/11/2019
062	26/09/2019	28/10/2019	28/10/2019	07/11/2019
063	27/09/2019	28/10/2019	28/10/2019	07/11/2019
064	27/09/2019	28/10/2019	28/10/2019	07/11/2019
065	27/09/2019	28/10/2019	28/10/2019	07/11/2019
066	27/09/2019	28/10/2019	28/10/2019	07/11/2019
067	27/09/2019	28/10/2019	28/10/2019	07/11/2019
068	27/09/2019	28/10/2019	28/10/2019	07/11/2019
069	27/09/2019	29/10/2019	29/10/2019	07/11/2019

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
070	27/09/2019	29/10/2019	29/10/2019	07/11/2019
071	27/09/2019	29/10/2019	29/10/2019	07/11/2019
072	27/09/2019	29/10/2019	29/10/2019	07/11/2019
074	27/09/2019	29/10/2019	29/10/2019	07/11/2019
075	27/09/2019	29/10/2019	29/10/2019	07/11/2019
076	27/09/2019	29/10/2019	29/10/2019	07/11/2019
077	27/09/2019	29/10/2019	29/10/2019	07/11/2019
078	27/09/2019	29/10/2019	29/10/2019	07/11/2019
079	27/09/2019	29/10/2019	29/10/2019	07/11/2019
080	27/09/2019	29/10/2019	29/10/2019	07/11/2019
081	27/09/2019	29/10/2019	29/10/2019	07/11/2019
082	27/09/2019	29/10/2019	29/10/2019	07/11/2019
083	27/09/2019	29/10/2019	29/10/2019	07/11/2019
084	27/09/2019	29/10/2019	29/10/2019	07/11/2019
085	27/09/2019	29/10/2019	29/10/2019	07/11/2019
086	27/09/2019	29/10/2019	29/10/2019	07/11/2019
087	27/09/2019	29/10/2019	29/10/2019	07/11/2019
088	27/09/2019	29/10/2019	29/10/2019	07/11/2019
089	27/09/2019	29/10/2019	29/10/2019	07/11/2019
090	27/09/2019	30/10/2019	30/10/2019	07/11/2019
091	28/09/2019	30/10/2019	30/10/2019	07/11/2019
092	28/09/2019	30/10/2019	30/10/2019	07/11/2019
093	28/09/2019	30/10/2019	30/10/2019	07/11/2019
095	2/10/2019	30/10/2019	30/10/2019	07/11/2019
096	2/10/2019	30/10/2019	30/10/2019	07/11/2019
097	2/10/2019	30/10/2019	30/10/2019	07/11/2019

N/A: Not Applicable

3. METHODS

3.1 qPCR Assay Design

A qPCR assay was adapted from Goldberg et al. and validated on a BioRad CFX96 PCR thermocycler to detect *Rana boylei* eDNA. For assay details and validation methodology see [Appendix i](#).

3.2 Sample preservation and transport

Filters were preserved using SRI's self-preserving filter cartridges during transport..

3.3 eDNA Extraction from Filters

eDNA was extracted from filters using a validated protocol for eDNA. eDNA was extracted using the DNeasy Blood and Tissue Kit and the Qia-shredder kit (Qiagen). eDNA extracts were aliquoted and those aliquots assigned for downstream qPCR were immediately stored at 4° C, otherwise aliquots were stored at – 20 ° C.

3.4 Fluorometric Quantification of DNA Yield

DNA yields per sample were measured by fluorometric quantification on a Qubit 2.0™ Spectrophotometer (ThermoFisher). This measure quantifies total eDNA (including non-target DNA) captured on the filter papers and extracted into the final elution solution during DNA extraction. This quality control step is used to control against filter and extraction malfunctions to ensure that sufficient DNA was extracted for qPCR analyses.

3.5 qPCR Detection of *R. boylei* eDNA

qPCR was conducted using a CFX96 Real-Time Detection System (BioRad) with optimized thermal cycling conditions (see [Appendix i](#)). All qPCRs performed in triplicate per sample. Positive amplification controls (PAC) consisting of reactions containing the target DNA fragment were included in each qPCR run to verify qPCR assay performance. In this case, the PAC consisted of *R. boylei* synthetic gBlock of the target locus (ND2), loaded at 162,000 copies per PCR reaction. No-template controls (NTC) were included in each qPCR run to detect the potential presence of sample or reagent contamination during analysis. In the final run, two replicates of an extraction blank were also run to determine if there was contamination during the DNA extraction phase. Each qPCR reaction was 20 µL, consisting of 11.2 µL of customized 2 x master mix and 8.8 µL of eDNA extract. All qPCR reactions included an internal positive control (IPC), which is used to test for the presence of PCR inhibition. The presence of PCR inhibition stemming from environmental samples must be tested for, which when not identified can lead to false negatives. The IPC is set up such that a delay in the mean quantification cycle (Cq) value, of 1 or more, for a reaction containing eDNA extract, relative to NTC reactions containing pure water is indicative of PCR inhibition.

4. RESULTS

4.1 DNA Extraction Yield

All but five samples (samples: 003, 004, 006, 007 and 008) yielded quantifiable levels of DNA isolated from filters indicating effective extraction performance (Table 1). The concentration of DNA in the five low-DNA samples fell below the lower limit of detection of the Qubit 2.0™ Spectrophotometer. DNA yields across samples were highly variable (mean yield = 339.83 ng mL⁻¹; standard deviation = 843.58 ng mL⁻¹).

4.2 Results of qPCR Analysis

Of the 261 total qPCR tests for the filter-extracted eDNA samples, only nine amplified to detectable levels during the 50 cycles of the *R. boylii* assay thermocycle (Table 1). However, these tests represent three contiguous samples (samples 91 through 93) and each technical replicate amplified. Of these nine reactions, five were above or just below the LOD. Per reaction copy numbers ranged between 1.628 – 16.28 copies per reaction.

All NTC reactions were negative for *R. boylii* DNA indicating no contamination during qPCR analysis (Table 1), as were the extraction blank qPCR reactions. Further, no IPC Cq values were delayed relative to the mean IPC Cq value of the NTC (mean NTC IPC = 30.212), indicating the absence of qPCR inhibition (Table 1). The PAC reactions were positive with Cq values consonant with the number of target copies of the frog's gBlock, indicating optimal assay performance.

Table 1: Results of qPCR and DNA yield analysis. Results for qPCR are reported as Cq, and where calculable, copy number of frog target DNA per PCR reaction. Copy number is reported by reference to the standard curve used to validate the assay. A lower Cq value is indicative of higher levels of target DNA. Mean IPC Cq is reported across technical replicates for each sample. DNA yields are reported within the capable range of the Qubit 2.0™ Fluorometer, 10 – 12000 ng mL⁻¹.

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
003	0	0	0	0	0	0	29.128	< 0.5
004	0	0	0	0	0	0	29.488	< 0.5
005	0	0	0	0	0	0	28.951	14.2
006	0	0	0	0	0	0	29.838	< 0.5
007	0	0	0	0	0	0	29.404	< 0.5
008	0	0	0	0	0	0	28.935	< 0.5
013	0	0	0	0	0	0	29.162	20
015	0	0	0	0	0	0	29.175	25
016	0	0	0	0	0	0	29.527	53
017	0	0	0	0	0	0	29.109	24.4

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
018	0	0	0	0	0	0	29.189	107
020	0	0	0	0	0	0	29.213	478
021	0	0	0	0	0	0	29.111	22.4
022	0	0	0	0	0	0	28.919	45.2
023	0	0	0	0	0	0	29.184	36
024	0	0	0	0	0	0	29.335	22.6
025	0	0	0	0	0	0	29.381	90.4
026	0	0	0	0	0	0	28.796	51.6
027	0	0	0	0	0	0	28.617	196
028	0	0	0	0	0	0	29.238	96
029	0	0	0	0	0	0	28.458	280
030	0	0	0	0	0	0	28.506	382
031	0	0	0	0	0	0	28.631	230
032	0	0	0	0	0	0	29.044	318
033	0	0	0	0	0	0	28.874	33.2
034	0	0	0	0	0	0	28.469	28
035	0	0	0	0	0	0	28.814	91.6
036	0	0	0	0	0	0	29.067	26.2
037	0	0	0	0	0	0	29.463	81
038	0	0	0	0	0	0	29.339	36.6
039	0	0	0	0	0	0	29.173	40.4
040	0	0	0	0	0	0	29.610	27.2
041	0	0	0	0	0	0	39.776	55.8
042	0	0	0	0	0	0	29.659	169
043	0	0	0	0	0	0	29.719	77.6
044	0	0	0	0	0	0	29.659	28.4
045	0	0	0	0	0	0	29.036	27.4
046	0	0	0	0	0	0	29.035	29.6

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
047	0	0	0	0	0	0	29.357	33.4
048	0	0	0	0	0	0	29.146	123
049	0	0	0	0	0	0	28.491	202
050	0	0	0	0	0	0	29.234	194
051	0	0	0	0	0	0	29.467	240
052	0	0	0	0	0	0	29.269	120
053	0	0	0	0	0	0	29.247	167
054	0	0	0	0	0	0	29.228	100
055	0	0	0	0	0	0	29.385	168
056	0	0	0	0	0	0	29.030	115
057	0	0	0	0	0	0	28.955	226
058	0	0	0	0	0	0	28.538	117
059	0	0	0	0	0	0	29.189	284
060	0	0	0	0	0	0	29.140	185
061	0	0	0	0	0	0	28.587	165
062	0	0	0	0	0	0	28.617	86
063	0	0	0	0	0	0	29.985	64.2
064	0	0	0	0	0	0	29.324	137
065	0	0	0	0	0	0	28.917	154
066	0	0	0	0	0	0	28.881	45.6
067	0	0	0	0	0	0	28.996	91
068	0	0	0	0	0	0	29.650	216
069	0	0	0	0	0	0	28.911	5660
070	0	0	0	0	0	0	29.077	230
071	0	0	0	0	0	0	30.046	292
072	0	0	0	0	0	0	29.712	175
074	0	0	0	0	0	0	29.801	216
075	0	0	0	0	0	0	30.010	324

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
076	0	0	0	0	0	0	29.622	105
077	0	0	0	0	0	0	29.504	54.6
078	0	0	0	0	0	0	29.505	96.8
079	0	0	0	0	0	0	29.700	212
080	0	0	0	0	0	0	29.806	16.6
081	0	0	0	0	0	0	29.436	142
082	0	0	0	0	0	0	29.286	106
083	0	0	0	0	0	0	29.600	128
084	0	0	0	0	0	0	29.400	55.4
085	0	0	0	0	0	0	29.231	56.4
086	0	0	0	0	0	0	29.611	94.6
087	0	0	0	0	0	0	29.042	64.4
088	0	0	0	0	0	0	29.366	576
089	0	0	0	0	0	0	29.059	586
090	0	0	0	0	0	0	29.277	584
091	45.75	48.72	40.47	*	*	1.628	29.185	3580
092	42.35	41.51	38.24	*	1.628	16.28	29.287	1630
093	38.74	38.09	37.52	16.28	16.28	16.28	29.219	3860
095	0	0	0	0	0	0	29.511	1290
096	0	0	0	0	0	0	28.917	1353
097	0	0	0	0	0	0	29.079	1600
Blank	0	0	0	0	0	0	29.342	< 0.5

0: No Cq observed. *: Uncalculable – Cq value is > intercept of standard curve (Appendix i; essentially, there are inferred to be fewer than one copy of target DNA per reaction as calculated by standard curve) and below LOD.

5. APPENDIX I: *R. BOYLI* qPCR ASSAY

The Precision Biomonitoring foothills yellow-legged frog (*Rana boylei*) qPCR assay for eDNA is a quantitative real-time PCR (qPCR) assay designed by Bedwell (2018), but validated and optimized for the detection of *R. boylei* environmental DNA (eDNA) obtained from filtered water samples.

Technical Specifications

The *R. boylei* qPCR assay was validated in accordance with parameters outlined in the *Minimum Information for Publication of Quantitative Real-Time PCR Experiments* (MIQE) guidelines (Bustin et al., 2009). The *R. boylei* assay thermocycler conditions and reagent concentrations were derived from Bedwell (2008), and optimized to a BioRad CFX96 Real-Time Detection System (see Table A1).

Table A1: Optimized Thermal Cycling Conditions of the *R. boylei* Assay.

Step	Time (s)	Temperature (°C)
1. Initial Denature	120	95
<i>Followed by 50x cycles of steps 2 and 3</i>		
2. Denature	15	95
3. Anneal	60	60

The performance of the *R. boylei* assay on this system was verified by constructing a standard curve using serial 10-fold dilutions of synthetic target fragment (gBlock) of which the copy number is known. The qPCR efficiency, limit of detection (LOD), and limit of quantification (LOQ) were interpreted from the results of the standard curve (see Table A2). The LOD is the lowest concentration of target for which positive amplification is observed in 95% of the replicates. The LOQ is defined as the lowest concentration of target for which 100% of replicates amplify and that can be accurately quantified with a coefficient of variance below a threshold of ≤35% obtained from back-calculated copy number for replicates in a standard curve (Forootan et al., 2017). The Standard curve was run on a MIC thermal cycler (Biomolecular systems).

Table A2: Validated *R. boylei* Assay Parameters.

Parameter	Validated Result
qPCR Efficiency	96.5%
LOD	1.85 copies/μL
LOQ	1.85 copies/μL
R ²	0.993
Equation	y = -3.408x + 41.30

Specificity Testing

The specificity of the *R. boylei* assay was assessed by Bedwell (2018). Based on these results the assay was determined to be species specific.

Table A3: *R. boylei* Assay Specificity

Species	No. of samples	Detection Result
Foothills yellow-legged frog (<i>Rana boylei</i>)	10	Positive
Cascades frog (<i>Rana cascadae</i>)	5	Negative
Bullfrog (<i>Lithobates catesbeianus</i>)	5	Negative
Western toad (<i>Anaxyrus boreas</i>)	5	Negative
California red-legged frog (<i>Rana draytonii</i>)	5	Negative
Sierran treefrog (<i>Pseudacris sierrae</i>)	5	Negative

References

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6. APPENDIX II: GLOSSARY

C_q: quantification cycle; the PCR cycle at which the target is considered positively amplified in a given sample.

Internal positive control (IPC): used to detect PCR inhibition in a reaction that may result from inhibitory substances carried through the sampling and extraction process.

Limit of detection (LOD): the lowest concentration of DNA that can be detected by a given qPCR assay 95% of the time, typically expressed as target copies/μL (Bustin *et al.* 2009).

Limit of quantification (LOQ): the lowest concentration of target that can be accurately quantified with a coefficient of variance below a threshold of ≤35% obtained from replicates in an assay specific standard curve (Forootan *et al.* 2017). Typically expressed as target copies/μL.

No template control (NTC): omits any DNA template from a reaction and serves as a control for extraneous nucleic acid contamination.

Positive Amplification Control (PAC): used to verify that a qPCR assay is performing properly during analysis. Amplification controls consist of the target DNA and should always return a positive amplification with an expected C_q value for a given assay.

Quantitative Real-time PCR (qPCR): a highly sensitive polymerase chain reaction procedure which monitors the amplification and detection of a targeted DNA molecule in real time.

qPCR Assay: the collection of primers, hydrolysis probe, IPC, master mix, and cycling conditions on a specific thermal cycler designed and optimized to amplify and detect target DNA.

qPCR efficiency: determined from the slope of the log-linear portion of the standard curve. High qPCR efficiency is indicative of precise and robust qPCR assay performance.

TaqMan™: a type of qPCR assay which employs fluorescent DNA probes to increase specificity.

Target: universal term for the nucleic acid sequence to be amplified.

Technical replicate: replicates used to perform the same test multiple times on a single sample.

7. APPENDIX III: REFERENCES

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A5. West: eDNA Foothill Yellow-legged Frog Report



TECHNICAL MEMORANDUM

DATE: January 16, 2020

TO: John Kuba, ConnectGen Operating LLC

FROM: Kori Hutchison and Andrea Chatfield, WEST, Inc.

RE: 2019 eDNA Surveys for Foothill Yellow-legged Frog at the Fountain Wind Project, Shasta County, California

INTRODUCTION

In September 2019, Western EcoSystems Technology, Inc. (WEST) performed aquatic environmental DNA (eDNA) surveys to assess presence/absence of foothill yellow-legged frog (FYLF; *Rana boylei*) at the proposed Fountain Wind Project (Project) in Shasta County, California. The eDNA surveys at the Project build upon the previous FYLF habitat assessment and visual encounter surveys (VES) conducted in 2018 and 2019, the methods and results of which are presented in Chatfield and Hutchison 2019. VES conducted at the Project in 2018 and 2019 yielded no detections of FYLF. Nonetheless, California Department of Fish and Wildlife (CDFW) biologists recommended presence/absence surveys using eDNA methodology to supplement the previous VES efforts at the Project. The eDNA survey results for FYLF were negative. The following memorandum summarizes the methods and results of eDNA surveys conducted at the Project in September 2019.

eDNA BACKGROUND

Environmental DNA is genetic material that has been released by an organism into its environment in the form of sloughed cells, feces, or other exogenous processes, and can be detected in air, water, or soil (Laramie et al. 2015; Carim et al. 2016). The collection and analysis of eDNA can be an efficient method of determining presence of aquatic organisms, and is an effective alternative to standard survey methods that are logistically difficult or have low probabilities of detection (Laramie et al. 2015; Carim et al. 2016; Goldberg et al. 2016; 2017). Environmental DNA methodology can be especially useful in determining presence of rare and sensitive species, as it is capable of detecting species presence at very low densities (Goldberg et al. 2013; 2016; 2017). Avoidance of contamination during sample collection, transportation, and analysis is of utmost importance, given the high sensitivity of eDNA methods and generally very low concentrations of aqueous DNA (Goldberg et al. 2016).

PROJECT AND SURVEY AREA

The Project is located on privately-owned, commercial timberlands in central Shasta County, California. The dominant vegetation type in and around the Project is mixed coniferous forest (post-fire and unburned), with smaller amounts of mixed montane chaparral and mixed montane riparian forest/scrub. The primary land use in this area is commercial timber production, which has resulted in a highly fragmented landscape across much of the area. Dominant overstory species include a combination of white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), and California black oak (*Quercus kelloggii*).

For the purpose of determining eDNA sampling locations, an updated Project Site (i.e., the area in which Project facilities could be sited) was provided in a Geographic Information System (GIS) format by the Project proponent in September 2019 (Figure 1). The Project Site consists of approximately 4,463 acres (ac; 1,806 hectares [ha]) including all facilities included in the site plan and an appropriate buffer to capture areas where permanent and temporary disturbance could occur (e.g., newly proposed roads, roads that may be expanded, turbine pads, and underground collection lines) to provide for some flexibility in final project micrositeing. For comparison purposes, previous development corridors (dated May 2018 and May 2019) used for the 2018 and 2019 FYLF habitat assessment and VES (see Chatfield and Hutchison 2019) are also depicted in Figure 1. The current (dated September 2019) Project Site largely overlaps the previous 2018 and 2019 development corridors, with the exception that the survey corridor around each turbine was increased from 500 feet to 700 feet resulting in approximately an additional 800 ac (324 ha). The additional 800 ac consists of mostly upland environments. The previous FYLF habitat assessment and VES, therefore, included the majority of the current Project Site. In combination with the 2019 eDNA surveys, which included the entirety of the Project Site, the FYLF studies conducted to date provide comprehensive coverage of all potential FYLF habitats within the current Project Site.

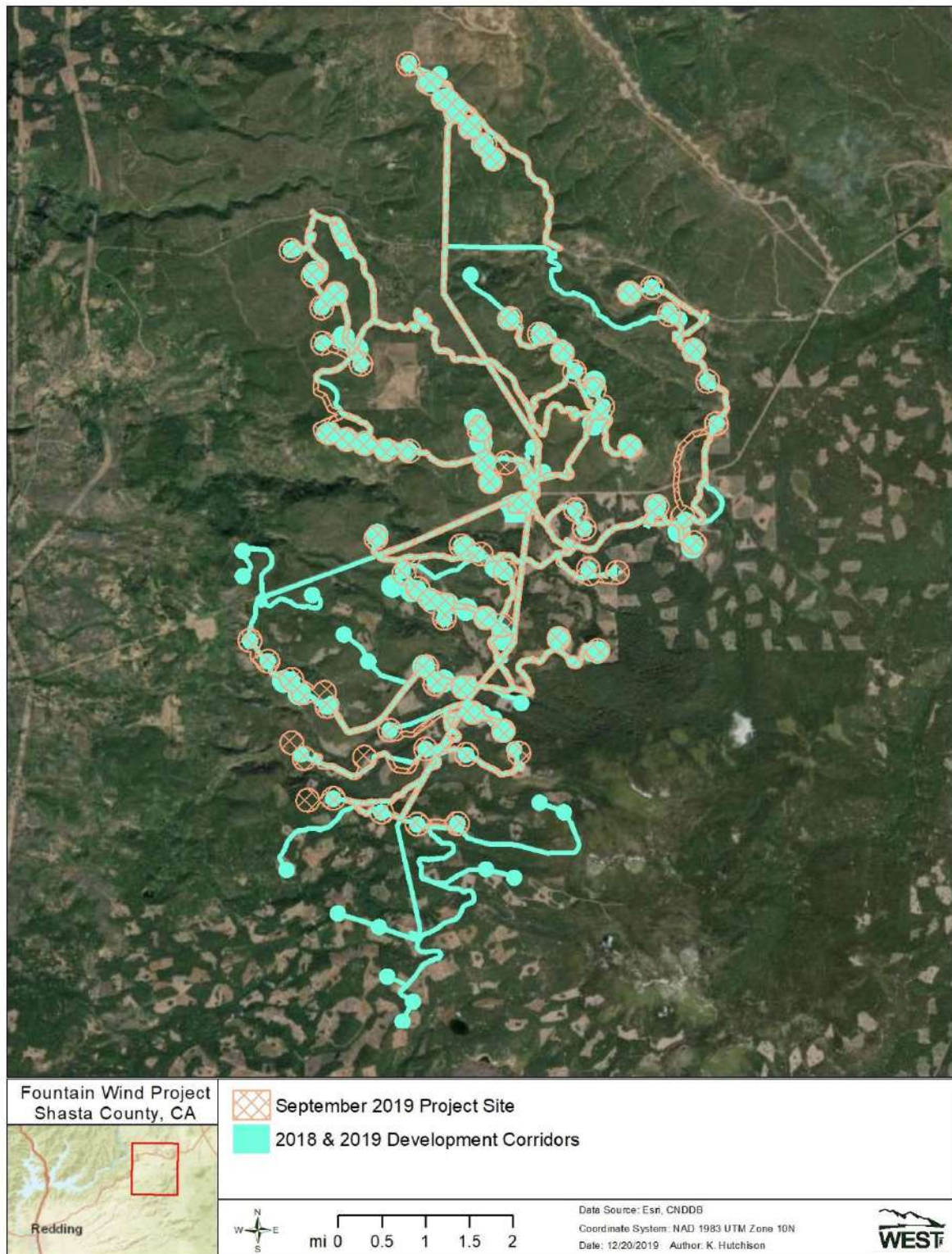


Figure 1. Current (September 2019) Project Site evaluated during the 2019 environmental DNA survey effort, in relation to the previously proposed development corridors evaluated during the 2018 and 2019 FYLF habitat assessment and visual encounter surveys (VES).

METHODS

Determining Sampling Locations

Geographic information system (GIS) data from the United States Geological Survey (USGS) National Hydrography Dataset (NHD; USGS 2019) and examination of aerial imagery were used to conduct a desktop assessment of potentially suitable stream crossings within the Project Site. Following the desktop assessment, a WEST biologist with training in FYLF survey methods conducted a field verification to determine the suitability of identified stream crossings for conducting eDNA surveys. Criteria considered during the field verification included whether stream crossings had sufficient surface water to conduct sampling (i.e., >3 liters [L]), and whether stream crossings would be directly affected by temporary or permanent ground disturbance (i.e., roads, turbine pads, underground collection lines). Streams that crossed below long spans of overhead collection lines were not surveyed. Additional crossings identified during the field verification were also evaluated for inclusion.

Sampling Equipment

In order to simplify sample collection and reduce the possibility of contamination and DNA degradation, eDNA surveys were conducted using Smith-Root's eDNA Sampler Backpack, a fully-integrated, purpose-built aquatic eDNA sampling system (Thomas et al. 2018; Smith-Root 2019a). This system was designed to minimize the risk of sample contamination in the field, using single-use, self-preserving filters so that the sample is never handled until it is received by the lab (Smith-Root 2019b). The eDNA Sampler Backpack uses a smart pump system that monitors the rate at which water is pumped to minimize clogging from suspended sediments, standardizing flow and pressure, and making it easy to accurately reach target volume (Smith-Root 2019a).

eDNA Field Surveys

Environmental DNA field surveys were conducted on September 25-27, 2019, consistent with recommendations and guidelines described in Goldberg et al. (2016; 2017) and methodology used in Carim et al. (2016). Surveys were conducted in all suitable stream crossings within the Project Site, targeting the potential fall distribution of FYLF. Samples were taken on the downstream side of each stream crossing, or on both sides when there was little to no connectivity between water on each side of the crossing (i.e., rocks, woody debris, or other materials interrupting stream flow). Three replicate samples were taken at each sampling station to safeguard against collection error and to detect any potential contamination (Goldberg et al. 2016). A new single-use filter was used for each of the three samples at each station. Given that each sample station was relatively clear of debris, the target volume of 1 L of water was filtered for each individual sample (Goldberg et al. 2017; J. Ponce, Technical Sales Associate and Biologist, Smith-Root, Inc., personal communication). Filters were placed at the end of a telescoping pole, and submerged just below the surface of the water without surveyors having to enter the stream. When the pump reached 1 L, the filter was removed and returned to its original re-sealable bag for transport to the laboratory. Time, water temperature, and geographic location of each sample were recorded, along with an identifying sample number.

Positive control samples were taken at a site known to have recent FYLF detections along the Trinity River, north of the junction with Ramshorn Creek in Trinity County, California (41.181002, -122.658809). Adult and subadult life stages of FYLF were observed when collecting positive control samples. Negative control samples were taken outside of the FYLF range on the Willamette River in Benton County, Oregon.

Sample Analysis

Laboratory-based qPCR analysis of the eDNA samples was performed by Precision Biomonitoring Inc. in Guelph, Ontario, using a qPCR assay adapted from Goldberg et al. (2016) and validated on a BioRad CFX96 PCR thermocycler to detect FYLF eDNA. The methods of this analysis are described in detail in the Environmental DNA Analysis Report prepared by Precision Biomonitoring Inc. (2019) and included as Appendix A.

RESULTS AND CONCLUSIONS

Results from the desktop assessment yielded 47 potential stream crossings within the Project Site suitable for eDNA sampling (Figure 2). During field verification of these locations, 29 crossings were determined to be unsuitable for sampling; 23 crossings were dry streambeds with no surface water present and six crossings did not cross the Project Site in areas that would be subject to ground disturbance (e.g., long spans of overhead distribution lines). An additional six crossings were identified as suitable during field verification, including one crossing that necessitated two sampling stations due to a lack of surface water connectivity between upstream and downstream flows. Together, the desktop assessment and field verification resulted in a total of 24 stream crossings determined to be suitable for eDNA sampling and a total of 25 sampling stations.

Environmental DNA samples were taken at each of the 25 sampling stations on September 25-27, 2019, with three water samples taken at each station. Twenty-one (21) of the 25 samples yielded quantifiable levels ($>0.5 \text{ ng mL}^{-1}$; Crookes 2019) of DNA isolated from filters. Each of the five samples without quantifiable levels of DNA had corresponding replicates that did contain quantifiable levels of DNA. There were no positive detections of FYLF eDNA identified in the analysis. A detailed description of analysis results is provided in Crookes (2019; Appendix A).

The results of the 2019 eDNA surveys for FYLF are consistent with previous VES conducted at the Project in 2018 and 2019 (Chatfield and Hutchison 2019) which have found no evidence of FYLF presence within the Project Site. Results of the studies conducted at the Project to date indicate no impacts to FYLF resulting from Project development.

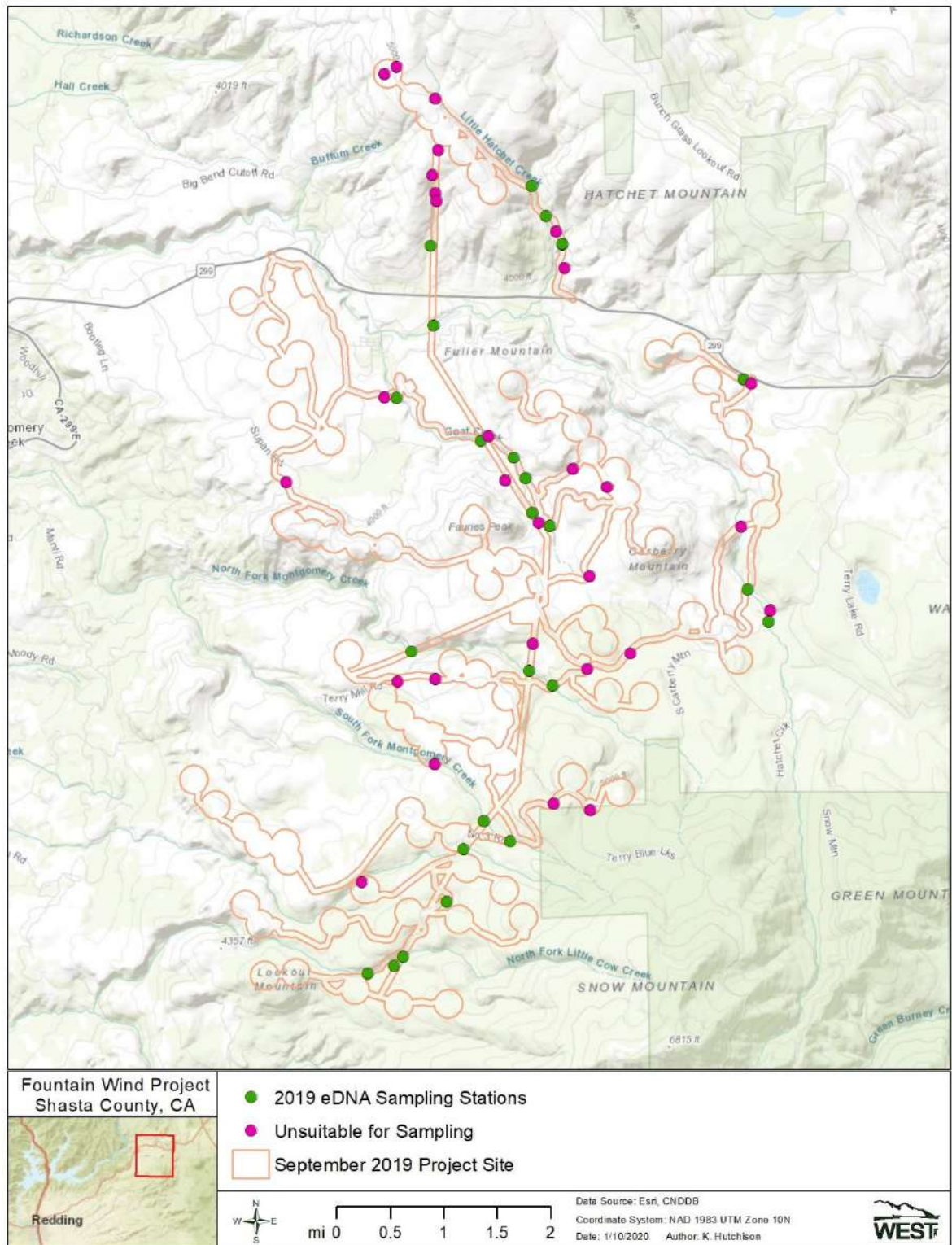


Figure 2. 2019 environmental DNA (eDNA) sampling stations with the Fountain Wind Project. Also shown are locations determined to be unsuitable for sampling based on field evaluation.

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APPENDIX A – ENVIRONMENTAL DNA ANALYSIS REPORT

Environmental DNA Analysis Report

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Report Issued: 08/11/2019

Prepared By: Steve Crookes	Date: 08/11/2019	Email: steve.crookes@precisionbiomonitoring.com
Approved By: Mario Thomas	Date: 08/11/2019	Email: mario.thomas@precisionbiomonitoring.com

1. REPORT INFORMATION

Prepared for

Smith-Root, Inc.,
16603 NE 50th Avenue, Vancouver,
Washington 98686

Contact Name	Email Address	Phone
Austen Thomas	a.thomas@smithroot.com	360 573 0202 x 2143

Sample Information (For additional sample information see Sample Information Table below.)

Project Reference: Unknown

Sample Collection Conducted by: West Inc.

Date Shipped: 10/2019

Sample Shipment Format: Filters (pore size = 5 µm), self-preserving .

Date Received: 10/2019

Samples Received By: Steve Crookes

Condition of Samples Upon Receipt: Intact, ambient temperature.

Sample Extraction: Qiagen DNeasy Blood and Tissue Kit and Qiashredder

Analysis

Analysis applied: qPCR to detect foothills yellow-legged frogs (*Rana boylei*) eDNA, fluorometric quantification of eDNA yield.

Analysis Conducted By: Steve Crookes

Analysis Location: Precision Biomonitoring Laboratories

Date(s) of Analysis: 22/10/2019 – 07/11/2019

2. SAMPLE INFORMATION TABLE

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
003	25/09/2019	22/10/2019	22/10/2019	07/11/2019
004	25/09/2019	22/10/2019	22/10/2019	07/11/2019
005	25/09/2019	22/10/2019	22/10/2019	07/11/2019
006	25/09/2019	22/10/2019	22/10/2019	07/11/2019
007	25/09/2019	22/10/2019	22/10/2019	07/11/2019
008	25/09/2019	22/10/2019	22/10/2019	07/11/2019
013	25/09/2019	22/10/2019	22/10/2019	07/11/2019
015	25/09/2019	22/10/2019	22/10/2019	07/11/2019
016	25/09/2019	22/10/2019	22/10/2019	07/11/2019
017	25/09/2019	22/10/2019	22/10/2019	07/11/2019
018	25/09/2019	22/10/2019	22/10/2019	07/11/2019
020	25/09/2019	22/10/2019	22/10/2019	07/11/2019
021	25/09/2019	22/10/2019	22/10/2019	07/11/2019
022	25/09/2019	22/10/2019	22/10/2019	07/11/2019
023	25/09/2019	22/10/2019	22/10/2019	07/11/2019
024	25/09/2019	22/10/2019	22/10/2019	07/11/2019
025	25/09/2019	22/10/2019	22/10/2019	07/11/2019
026	25/09/2019	22/10/2019	22/10/2019	07/11/2019
027	25/09/2019	22/10/2019	22/10/2019	07/11/2019
028	25/09/2019	22/10/2019	22/10/2019	07/11/2019
029	25/09/2019	22/10/2019	22/10/2019	07/11/2019
030	25/09/2019	24/10/2019	24/10/2019	07/11/2019
031	25/09/2019	24/10/2019	24/10/2019	07/11/2019
032	25/09/2019	24/10/2019	24/10/2019	07/11/2019
033	26/09/2019	24/10/2019	24/10/2019	07/11/2019
034	26/09/2019	24/10/2019	24/10/2019	07/11/2019
035	26/09/2019	24/10/2019	24/10/2019	07/11/2019
036	26/09/2019	24/10/2019	24/10/2019	07/11/2019
037	26/09/2019	24/10/2019	24/10/2019	07/11/2019
038	26/09/2019	24/10/2019	24/10/2019	07/11/2019

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
039	26/09/2019	24/10/2019	24/10/2019	07/11/2019
040	26/09/2019	24/10/2019	24/10/2019	07/11/2019
041	26/09/2019	24/10/2019	24/10/2019	07/11/2019
042	26/09/2019	24/10/2019	24/10/2019	07/11/2019
043	26/09/2019	24/10/2019	24/10/2019	07/11/2019
044	26/09/2019	24/10/2019	24/10/2019	07/11/2019
045	26/09/2019	24/10/2019	24/10/2019	07/11/2019
046	26/09/2019	24/10/2019	24/10/2019	07/11/2019
047	26/09/2019	24/10/2019	24/10/2019	07/11/2019
048	26/09/2019	24/10/2019	24/10/2019	07/11/2019
049	26/09/2019	28/10/2019	28/10/2019	07/11/2019
050	26/09/2019	28/10/2019	28/10/2019	07/11/2019
051	26/09/2019	28/10/2019	28/10/2019	07/11/2019
052	26/09/2019	28/10/2019	28/10/2019	07/11/2019
053	26/09/2019	28/10/2019	28/10/2019	07/11/2019
054	26/09/2019	28/10/2019	28/10/2019	07/11/2019
055	26/09/2019	28/10/2019	28/10/2019	07/11/2019
056	26/09/2019	28/10/2019	28/10/2019	07/11/2019
057	26/09/2019	28/10/2019	28/10/2019	07/11/2019
058	26/09/2019	28/10/2019	28/10/2019	07/11/2019
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061	26/09/2019	28/10/2019	28/10/2019	07/11/2019
062	26/09/2019	28/10/2019	28/10/2019	07/11/2019
063	27/09/2019	28/10/2019	28/10/2019	07/11/2019
064	27/09/2019	28/10/2019	28/10/2019	07/11/2019
065	27/09/2019	28/10/2019	28/10/2019	07/11/2019
066	27/09/2019	28/10/2019	28/10/2019	07/11/2019
067	27/09/2019	28/10/2019	28/10/2019	07/11/2019
068	27/09/2019	28/10/2019	28/10/2019	07/11/2019
069	27/09/2019	29/10/2019	29/10/2019	07/11/2019

Sample	Date of Filtration	Date of Sample Extraction	Date of DNA Yield Analysis	Date of qPCR Analysis
070	27/09/2019	29/10/2019	29/10/2019	07/11/2019
071	27/09/2019	29/10/2019	29/10/2019	07/11/2019
072	27/09/2019	29/10/2019	29/10/2019	07/11/2019
074	27/09/2019	29/10/2019	29/10/2019	07/11/2019
075	27/09/2019	29/10/2019	29/10/2019	07/11/2019
076	27/09/2019	29/10/2019	29/10/2019	07/11/2019
077	27/09/2019	29/10/2019	29/10/2019	07/11/2019
078	27/09/2019	29/10/2019	29/10/2019	07/11/2019
079	27/09/2019	29/10/2019	29/10/2019	07/11/2019
080	27/09/2019	29/10/2019	29/10/2019	07/11/2019
081	27/09/2019	29/10/2019	29/10/2019	07/11/2019
082	27/09/2019	29/10/2019	29/10/2019	07/11/2019
083	27/09/2019	29/10/2019	29/10/2019	07/11/2019
084	27/09/2019	29/10/2019	29/10/2019	07/11/2019
085	27/09/2019	29/10/2019	29/10/2019	07/11/2019
086	27/09/2019	29/10/2019	29/10/2019	07/11/2019
087	27/09/2019	29/10/2019	29/10/2019	07/11/2019
088	27/09/2019	29/10/2019	29/10/2019	07/11/2019
089	27/09/2019	29/10/2019	29/10/2019	07/11/2019
090	27/09/2019	30/10/2019	30/10/2019	07/11/2019
091	28/09/2019	30/10/2019	30/10/2019	07/11/2019
092	28/09/2019	30/10/2019	30/10/2019	07/11/2019
093	28/09/2019	30/10/2019	30/10/2019	07/11/2019
095	2/10/2019	30/10/2019	30/10/2019	07/11/2019
096	2/10/2019	30/10/2019	30/10/2019	07/11/2019
097	2/10/2019	30/10/2019	30/10/2019	07/11/2019

N/A: Not Applicable

3. METHODS

3.1 qPCR Assay Design

A qPCR assay was adapted from Goldberg et al. and validated on a BioRad CFX96 PCR thermocycler to detect *Rana boylei* eDNA. For assay details and validation methodology see [Appendix i](#).

3.2 Sample preservation and transport

Filters were preserved using SRI's self-preserving filter cartridges during transport..

3.3 eDNA Extraction from Filters

eDNA was extracted from filters using a validated protocol for eDNA. eDNA was extracted using the DNeasy Blood and Tissue Kit and the Qia-shredder kit (Qiagen). eDNA extracts were aliquoted and those aliquots assigned for downstream qPCR were immediately stored at 4° C, otherwise aliquots were stored at – 20 ° C.

3.4 Fluorometric Quantification of DNA Yield

DNA yields per sample were measured by fluorometric quantification on a Qubit 2.0™ Spectrophotometer (ThermoFisher). This measure quantifies total eDNA (including non-target DNA) captured on the filter papers and extracted into the final elution solution during DNA extraction. This quality control step is used to control against filter and extraction malfunctions to ensure that sufficient DNA was extracted for qPCR analyses.

3.5 qPCR Detection of *R. boylei* eDNA

qPCR was conducted using a CFX96 Real-Time Detection System (BioRad) with optimized thermal cycling conditions (see [Appendix i](#)). All qPCRs performed in triplicate per sample. Positive amplification controls (PAC) consisting of reactions containing the target DNA fragment were included in each qPCR run to verify qPCR assay performance. In this case, the PAC consisted of *R. boylei* synthetic gBlock of the target locus (ND2), loaded at 162,000 copies per PCR reaction. No-template controls (NTC) were included in each qPCR run to detect the potential presence of sample or reagent contamination during analysis. In the final run, two replicates of an extraction blank were also run to determine if there was contamination during the DNA extraction phase. Each qPCR reaction was 20 µL, consisting of 11.2 µL of customized 2 x master mix and 8.8 µL of eDNA extract. All qPCR reactions included an internal positive control (IPC), which is used to test for the presence of PCR inhibition. The presence of PCR inhibition stemming from environmental samples must be tested for, which when not identified can lead to false negatives. The IPC is set up such that a delay in the mean quantification cycle (Cq) value, of 1 or more, for a reaction containing eDNA extract, relative to NTC reactions containing pure water is indicative of PCR inhibition.

4. RESULTS

4.1 DNA Extraction Yield

All but five samples (samples: 003, 004, 006, 007 and 008) yielded quantifiable levels of DNA isolated from filters indicating effective extraction performance (Table 1). The concentration of DNA in the five low-DNA samples fell below the lower limit of detection of the Qubit 2.0™ Spectrophotometer. DNA yields across samples were highly variable (mean yield = 339.83 ng mL⁻¹; standard deviation = 843.58 ng mL⁻¹).

4.2 Results of qPCR Analysis

Of the 261 total qPCR tests for the filter-extracted eDNA samples, only nine amplified to detectable levels during the 50 cycles of the *R. boylii* assay thermocycle (Table 1). However, these tests represent three contiguous samples (samples 91 through 93) and each technical replicate amplified. Of these nine reactions, five were above or just below the LOD. Per reaction copy numbers ranged between 1.628 – 16.28 copies per reaction.

All NTC reactions were negative for *R. boylii* DNA indicating no contamination during qPCR analysis (Table 1), as were the extraction blank qPCR reactions. Further, no IPC Cq values were delayed relative to the mean IPC Cq value of the NTC (mean NTC IPC = 30.212), indicating the absence of qPCR inhibition (Table 1). The PAC reactions were positive with Cq values consonant with the number of target copies of the frog's gBlock, indicating optimal assay performance.

Table 1: Results of qPCR and DNA yield analysis. Results for qPCR are reported as Cq, and where calculable, copy number of frog target DNA per PCR reaction. Copy number is reported by reference to the standard curve used to validate the assay. A lower Cq value is indicative of higher levels of target DNA. Mean IPC Cq is reported across technical replicates for each sample. DNA yields are reported within the capable range of the Qubit 2.0™ Fluorometer, 10 – 12000 ng mL⁻¹.

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
003	0	0	0	0	0	0	29.128	< 0.5
004	0	0	0	0	0	0	29.488	< 0.5
005	0	0	0	0	0	0	28.951	14.2
006	0	0	0	0	0	0	29.838	< 0.5
007	0	0	0	0	0	0	29.404	< 0.5
008	0	0	0	0	0	0	28.935	< 0.5
013	0	0	0	0	0	0	29.162	20
015	0	0	0	0	0	0	29.175	25
016	0	0	0	0	0	0	29.527	53
017	0	0	0	0	0	0	29.109	24.4

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
018	0	0	0	0	0	0	29.189	107
020	0	0	0	0	0	0	29.213	478
021	0	0	0	0	0	0	29.111	22.4
022	0	0	0	0	0	0	28.919	45.2
023	0	0	0	0	0	0	29.184	36
024	0	0	0	0	0	0	29.335	22.6
025	0	0	0	0	0	0	29.381	90.4
026	0	0	0	0	0	0	28.796	51.6
027	0	0	0	0	0	0	28.617	196
028	0	0	0	0	0	0	29.238	96
029	0	0	0	0	0	0	28.458	280
030	0	0	0	0	0	0	28.506	382
031	0	0	0	0	0	0	28.631	230
032	0	0	0	0	0	0	29.044	318
033	0	0	0	0	0	0	28.874	33.2
034	0	0	0	0	0	0	28.469	28
035	0	0	0	0	0	0	28.814	91.6
036	0	0	0	0	0	0	29.067	26.2
037	0	0	0	0	0	0	29.463	81
038	0	0	0	0	0	0	29.339	36.6
039	0	0	0	0	0	0	29.173	40.4
040	0	0	0	0	0	0	29.610	27.2
041	0	0	0	0	0	0	39.776	55.8
042	0	0	0	0	0	0	29.659	169
043	0	0	0	0	0	0	29.719	77.6
044	0	0	0	0	0	0	29.659	28.4
045	0	0	0	0	0	0	29.036	27.4
046	0	0	0	0	0	0	29.035	29.6

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
047	0	0	0	0	0	0	29.357	33.4
048	0	0	0	0	0	0	29.146	123
049	0	0	0	0	0	0	28.491	202
050	0	0	0	0	0	0	29.234	194
051	0	0	0	0	0	0	29.467	240
052	0	0	0	0	0	0	29.269	120
053	0	0	0	0	0	0	29.247	167
054	0	0	0	0	0	0	29.228	100
055	0	0	0	0	0	0	29.385	168
056	0	0	0	0	0	0	29.030	115
057	0	0	0	0	0	0	28.955	226
058	0	0	0	0	0	0	28.538	117
059	0	0	0	0	0	0	29.189	284
060	0	0	0	0	0	0	29.140	185
061	0	0	0	0	0	0	28.587	165
062	0	0	0	0	0	0	28.617	86
063	0	0	0	0	0	0	29.985	64.2
064	0	0	0	0	0	0	29.324	137
065	0	0	0	0	0	0	28.917	154
066	0	0	0	0	0	0	28.881	45.6
067	0	0	0	0	0	0	28.996	91
068	0	0	0	0	0	0	29.650	216
069	0	0	0	0	0	0	28.911	5660
070	0	0	0	0	0	0	29.077	230
071	0	0	0	0	0	0	30.046	292
072	0	0	0	0	0	0	29.712	175
074	0	0	0	0	0	0	29.801	216
075	0	0	0	0	0	0	30.010	324

Sample	qPCR Cq Value			qPCR Copy #			Mean IPC Cq	DNA Yield (ng mL ⁻¹)
076	0	0	0	0	0	0	29.622	105
077	0	0	0	0	0	0	29.504	54.6
078	0	0	0	0	0	0	29.505	96.8
079	0	0	0	0	0	0	29.700	212
080	0	0	0	0	0	0	29.806	16.6
081	0	0	0	0	0	0	29.436	142
082	0	0	0	0	0	0	29.286	106
083	0	0	0	0	0	0	29.600	128
084	0	0	0	0	0	0	29.400	55.4
085	0	0	0	0	0	0	29.231	56.4
086	0	0	0	0	0	0	29.611	94.6
087	0	0	0	0	0	0	29.042	64.4
088	0	0	0	0	0	0	29.366	576
089	0	0	0	0	0	0	29.059	586
090	0	0	0	0	0	0	29.277	584
091	45.75	48.72	40.47	*	*	1.628	29.185	3580
092	42.35	41.51	38.24	*	1.628	16.28	29.287	1630
093	38.74	38.09	37.52	16.28	16.28	16.28	29.219	3860
095	0	0	0	0	0	0	29.511	1290
096	0	0	0	0	0	0	28.917	1353
097	0	0	0	0	0	0	29.079	1600
Blank	0	0	0	0	0	0	29.342	< 0.5

0: No Cq observed. *: Uncalculable – Cq value is > intercept of standard curve (Appendix i; essentially, there are inferred to be fewer than one copy of target DNA per reaction as calculated by standard curve) and below LOD.

5. APPENDIX I: *R. BOYLI* qPCR ASSAY

The Precision Biomonitoring foothills yellow-legged frog (*Rana boylei*) qPCR assay for eDNA is a quantitative real-time PCR (qPCR) assay designed by Bedwell (2018), but validated and optimized for the detection of *R. boylei* environmental DNA (eDNA) obtained from filtered water samples.

Technical Specifications

The *R. boylei* qPCR assay was validated in accordance with parameters outlined in the *Minimum Information for Publication of Quantitative Real-Time PCR Experiments* (MIQE) guidelines (Bustin et al., 2009). The *R. boylei* assay thermocycler conditions and reagent concentrations were derived from Bedwell (2008), and optimized to a BioRad CFX96 Real-Time Detection System (see Table A1).

Table A1: Optimized Thermal Cycling Conditions of the *R. boylei* Assay.

Step	Time (s)	Temperature (°C)
1. Initial Denature	120	95
<i>Followed by 50x cycles of steps 2 and 3</i>		
2. Denature	15	95
3. Anneal	60	60

The performance of the *R. boylei* assay on this system was verified by constructing a standard curve using serial 10-fold dilutions of synthetic target fragment (gBlock) of which the copy number is known. The qPCR efficiency, limit of detection (LOD), and limit of quantification (LOQ) were interpreted from the results of the standard curve (see Table A2). The LOD is the lowest concentration of target for which positive amplification is observed in 95% of the replicates. The LOQ is defined as the lowest concentration of target for which 100% of replicates amplify and that can be accurately quantified with a coefficient of variance below a threshold of ≤35% obtained from back-calculated copy number for replicates in a standard curve (Forootan et al., 2017). The Standard curve was run on a MIC thermal cycler (Biomolecular systems).

Table A2: Validated *R. boylei* Assay Parameters.

Parameter	Validated Result
qPCR Efficiency	96.5%
LOD	1.85 copies/μL
LOQ	1.85 copies/μL
R ²	0.993
Equation	y = -3.408x + 41.30

Specificity Testing

The specificity of the *R. boylei* assay was assessed by Bedwell (2018). Based on these results the assay was determined to be species specific.

Table A3: *R. boylei* Assay Specificity

Species	No. of samples	Detection Result
Foothills yellow-legged frog (<i>Rana boylei</i>)	10	Positive
Cascades frog (<i>Rana cascadae</i>)	5	Negative
Bullfrog (<i>Lithobates catesbeianus</i>)	5	Negative
Western toad (<i>Anaxyrus boreas</i>)	5	Negative
California red-legged frog (<i>Rana draytonii</i>)	5	Negative
Sierran treefrog (<i>Pseudacris sierrae</i>)	5	Negative

References

- Bustin, S.A., Benes, V., Garson, J.A., Hellems, J., Huggett, J., Kubista, M., Mueller, R., Nolan, T., Pfaffl, M.W., Shipley, G.L., Vandesompele, J., Wittwer, C.T., 2009. The MIQE Guidelines: Minimum Information for Publication of Quantitative Real-Time PCR Experiments. Clin. Chem. 55, 611–622. <https://doi.org/10.1373/clinchem.2008.112797>
- Bedwell, M. 2018. Using genetic tools to investigate distribution and connectivity of two Sierra Nevada amphibians, *Rana sierrae* and *Rana boylei*. MS Thesis, Washington State University.
- Forootan, A., Sjöback, R., Björkman, J., Sjögreen, B., Linz, L., Kubista, M., 2017. Methods to determine limit of detection and limit of quantification in quantitative real-time PCR (qPCR). Biomol. Detect. Quantif. 12, 1–6. <https://doi.org/10.1016/j.bdq.2017.04.001>

Disclaimer

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6. APPENDIX II: GLOSSARY

C_q: quantification cycle; the PCR cycle at which the target is considered positively amplified in a given sample.

Internal positive control (IPC): used to detect PCR inhibition in a reaction that may result from inhibitory substances carried through the sampling and extraction process.

Limit of detection (LOD): the lowest concentration of DNA that can be detected by a given qPCR assay 95% of the time, typically expressed as target copies/μL (Bustin *et al.* 2009).

Limit of quantification (LOQ): the lowest concentration of target that can be accurately quantified with a coefficient of variance below a threshold of ≤35% obtained from replicates in an assay specific standard curve (Forootan *et al.* 2017). Typically expressed as target copies/μL.

No template control (NTC): omits any DNA template from a reaction and serves as a control for extraneous nucleic acid contamination.

Positive Amplification Control (PAC): used to verify that a qPCR assay is performing properly during analysis. Amplification controls consist of the target DNA and should always return a positive amplification with an expected C_q value for a given assay.

Quantitative Real-time PCR (qPCR): a highly sensitive polymerase chain reaction procedure which monitors the amplification and detection of a targeted DNA molecule in real time.

qPCR Assay: the collection of primers, hydrolysis probe, IPC, master mix, and cycling conditions on a specific thermal cycler designed and optimized to amplify and detect target DNA.

qPCR efficiency: determined from the slope of the log-linear portion of the standard curve. High qPCR efficiency is indicative of precise and robust qPCR assay performance.

TaqMan™: a type of qPCR assay which employs fluorescent DNA probes to increase specificity.

Target: universal term for the nucleic acid sequence to be amplified.

Technical replicate: replicates used to perform the same test multiple times on a single sample.

7. APPENDIX III: REFERENCES

- Bustin, S.A., Benes, V., Garson, J.A., Hellemans, J., Huggett, J., Kubista, M., Mueller, R., Nolan, T., Pfaffl, M.W., Shipley, G.L., Vandesompele, J., Wittwer, C.T., 2009. The MIQE Guidelines: Minimum Information for Publication of Quantitative Real-Time PCR Experiments. *Clin. Chem.* 55, 611–622. <https://doi.org/10.1373/clinchem.2008.112797>
- Forootan, A., Sjöback, R., Björkman, J., Sjögreen, B., Linz, L., Kubista, M., 2017. Methods to determine limit of detection and limit of quantification in quantitative real-time PCR (qPCR). *Biomol. Detect. Quantif.* 12, 1–6. <https://doi.org/10.1016/j.bdq.2017.04.001>

8. DISCLAIMER

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10. Any samples which remain after testing, will be retained for a period of 60 days only, and any documents arising from the service rendered will be retained for a period of two (2) years, unless otherwise agreed to by and between the customer and The Company in writing.
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12. The Company will not disclose information or test results to anyone other than the customer without the customer's written authorization and consent.
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14. Any legal costs and reasonable attorney fees incurred by The Company in enforcing any aspect of this agreement including legal or reasonable attorney fees will be the sole responsibility of the customer and will be payable by the customer to The Company on demand.

A6. Capitol Airspace Group: The Moose Camp Helipad



December 18, 2020

Lio Salazar, AICP
Senior Planner, Shasta County, Department of Resource Management
1855 Placer Street, Suite 103
Redding, CA 96001
Via e-mail to lsalazar@co.shasta.us

Re: Fountain Wind Project and the Moose Camp Helipad

Dear Mr. Salazar,

During recent conversations with your team, a question was raised regarding the potential for the Fountain Wind Project to have an impact on an unregistered helipad referred to as Moose Camp Helipad located near the coordinates 40-51-30.389 N, 121-51-5.208 W ([Figure 1](#)).

As a result of this discussion, Capitol Airspace researched Federal Aviation Administration (FAA) data and regulations to determine what protections would be applied during an FAA aeronautical study of the proposed wind project. Using the National Airspace System Resource (NASR) Aeronautical Dataset and the FAA Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) portal, Capitol Airspace confirmed that there are no existing or proposed helipads registered with the FAA at this location. However, Capitol Airspace analyzed this location as if it were registered with the FAA as a public-use heliport.

Under this hypothetical scenario, the FAA would apply an omnidirectional imaginary approach surface defined by 14 CFR Part 77.23(b) – this surface extends 4,000 feet from the designated take-off and landing area (purple outline, [Figure 1](#)) and rises at a rate of 8:1 (run:rise). The height of this imaginary approach surface would range from 3,761 to 4,261 feet above mean sea level (AMSL).

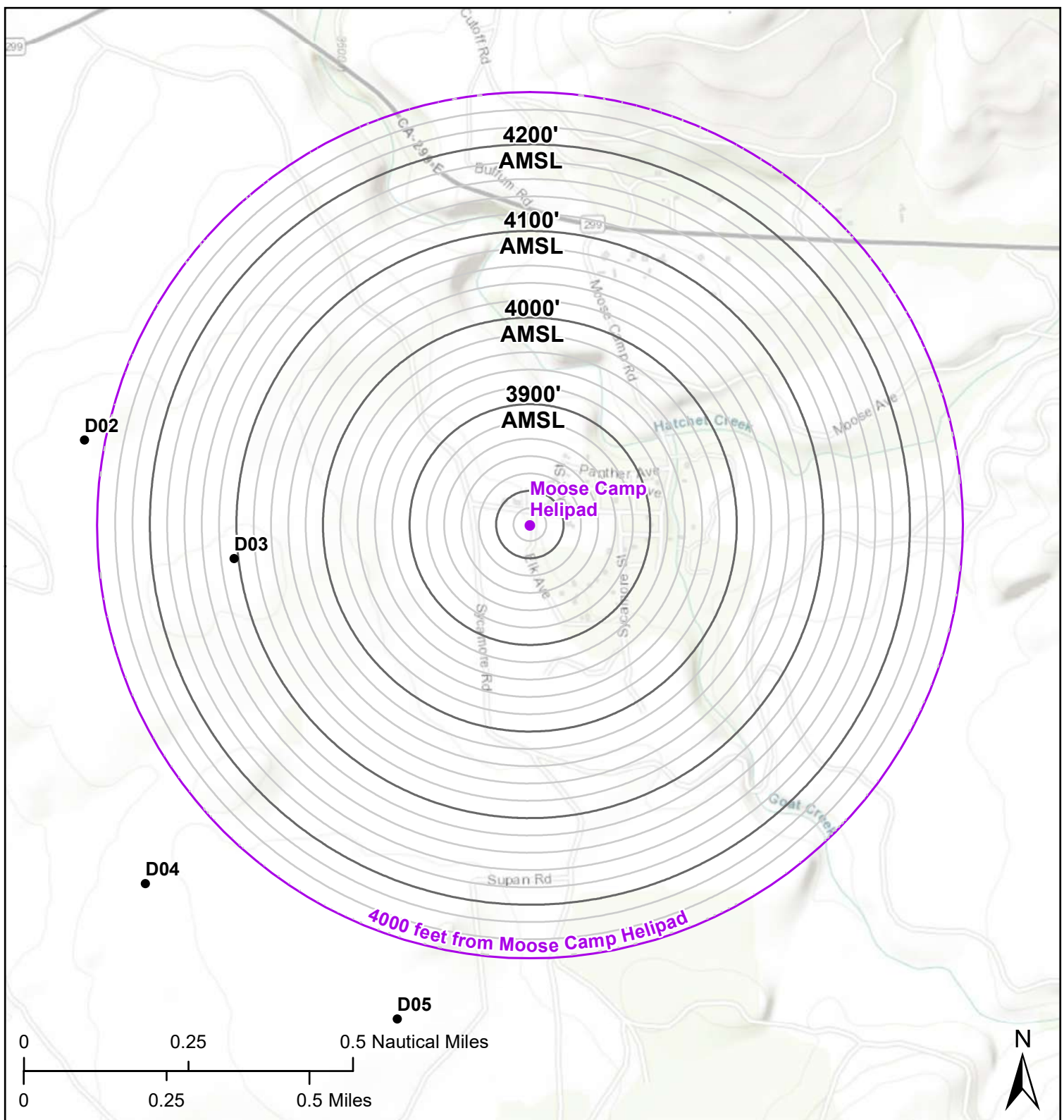
At 679 feet above ground level (AGL), one wind turbine would exceed this surface (D03, aeronautical study number 2020-WTW-5284-OE). However, one turbine exceeding an imaginary surface does not necessarily constitute a hazard to air navigation. Exceeding this surface requires the FAA to conduct additional analysis, referred to as “further study.” If the FAA determined that there would not be a significant effect on a helicopter’s ability to approach or depart from the helipad, then the FAA could still issue favorable determinations of no hazard.

Given that this turbine is more than 0.4 nautical miles from the landing area *and* that there are multiple approach corridors available from the northwest and southeast, it is highly unlikely that the Fountain wind project would affect Moose Camp Helipad operations.

Please direct any questions to me at 703-256-2485 or Joe.Anderson@capitolairspace.com.

Respectfully,


Joe Anderson
Director of Airspace Consulting



**Moose Camp Helipad 14 CFR Part 77.23
Omnidirectional Imaginary Surfaces**

- 100 foot contour
- 20 foot contour
- Moose Camp Helipad
- Filed Wind Turbine Location

Fountain Wind Project

14 CFR Part 77.23 Omnidirectional Imaginary Surfaces
Applied to Moose Camp Helipad

Plot Date:

10 December 2020

Coordinate System:

NAD 1983 UTM Zone 10N

Wesley Williamson

Figure 1



Capitol Airspace Group

Appendix B

Public Notices

Record Searchlight

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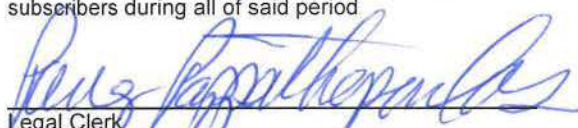
SHASTA COUNTY PLANNING
1855 PLACER STREET STE 103
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STATE OF WISCONSIN, COUNTY OF BROWN:

I hereby certify that the Record Searchlight is a newspaper of general circulation within the provisions of the Government Code of the State of California, printed and published in the city of Redding, County of Shasta, State of California; that I am the principal clerk of the printer of said newspaper; that the notice of which the annexed clipping is a true printed copy was published in said newspaper on the following dates, to wit:

August 3, 2020

such newspaper was regularly distributed to its subscribers during all of said period


Legal Clerk

I certify under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Subscribed and sworn to before on June 9, 2020:


Notary Public, State of Wisconsin, County of Brown


My commission expires

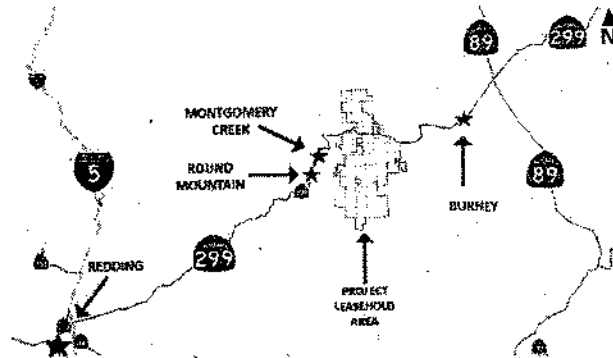
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**NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT
FOR THE PROPOSED FOUNTAIN WIND PROJECT**

Shasta County is the Lead Agency under the California Environmental Quality Act (CEQA), and has completed the preparation of a Draft Environmental Impact Report (Draft EIR) for the proposed project identified as the Fountain Wind Project (Use Permit 16-007).

The approximate 4,464-acre proposed project site is located within an approximately 29,500-acre leasehold area comprised of 76 Shasta County Assessor's parcels consisting exclusively of private property operated as managed forest timberlands. The property is located approximately one mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of California State Route 299 (SR 299), and near the private recreational facility of Moose Camp, and other private inholdings. Other nearby communities include Montgomery Creek, Round Mountain, Hillcrest, Wengler, and Big Bend. The proposed project site is also within a geographic area that is traditionally and culturally affiliated with the Pit River Tribe. Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north.



The Fountain Wind Project is a renewable wind energy generation development proposed on approximately 4,464 acres in unincorporated Shasta County. The applicant has applied for a use permit to construct, operate, maintain, and ultimately decommission up to 72 wind turbines and associated transformers together with associated infrastructure and ancillary facilities. Each turbine would be no more than 679 feet tall, as measured from ground level to vertical blade tip (total tip height), and would have a generating capacity of 3 to 5.7 megawatts (MW). The project would have a maximum total generating capacity of up to 216 MW.

Copies of the Draft EIR are now available for public review. Public comment on this document is invited during a 45-day review period extending from **Monday, August 3, 2020, through Friday, September 18, 2020, at 5:00 p.m.**

The County's consultant, Environmental Science Associates (ESA), has prepared the Draft EIR pursuant to CEQA. A Final EIR will be prepared following public review of the Draft EIR. The Shasta County Planning Commission will consider the information in the Final EIR when deliberating the proposed project, and the alternatives discussed in the EIR.

The Draft EIR discusses potentially significant environmental impacts in the following areas of concern: aesthetics, air quality, biological resources, communications interference, cultural and tribal cultural resources, hazards and hazardous materials, hydrology and water quality, noise and vibration, and wildfire.

This Draft EIR is being distributed directly to agencies, organizations, and interested groups and persons for comment during a 45-day formal review period in accordance with §15087 of the *State CEQA Guidelines*. **Your response must be received by the Shasta County Department of Resource Management, Planning Division, no later than 5:00 p.m. on Friday, September 18, 2020.**

The Draft EIR and other project related documents and technical studies may be reviewed online by clicking on the Fountain Wind Project link at www.co.shasta.ca.us/index/drm/planning/eir. A hard copy of the Draft EIR and electronic appendices are available for inspection by appointment at the Shasta County Department of Resource Management, Planning Division, 1855 Placer Street, Suite 103, Redding, CA 96001 during regular business hours and subject to any new laws, regulations, or orders concerning the operation of facilities. For an appointment to inspect a hard copy or to obtain electronic and/or hard copies, contact Lio Salazar, Senior Planner, by telephone at (530) 225-5532 or e-mail at lsalazar@co.shasta.ca.us. Hard copies will be provided at the requester's expense at the direct cost of reproduction; electronic copies on thumb drive or CD format are available at no cost. Hard copies of the Draft EIR and electronic appendices are available for review by appointment at the Anderson, Redding, and Burney branches of the Shasta Public Libraries, Cottonwood Community Library, and Hill County Community Clinic (Round Mountain) during regular business hours and subject to facility policies and/or any new laws, regulations, or orders concerning the operation of facilities:

Anderson Branch 3200 West Center St. Anderson, CA 96007 (530) 365-7685	Redding Branch 1100 Parkview Ave. Redding, CA 96001 (530) 245-7250	Burney Branch 37116 Main St. Burney, CA 96013 (530) 335-4317
Cottonwood Community Library 3427 Main St. Cottonwood, CA 96022 (530) 347-4818	Hill County Community Clinic (Round Mountain) 37116 State Highway 299 East Round Mountain, CA 96084 (530) 337-5750	

Future notifications regarding scheduled Planning Commission hearings on this proposed project will be published and distributed in accordance with law. Please send your comments to the Shasta County Department of Resource Management, Planning Division, 1855 Placer Street, Suite 103, Redding, CA 96001 to the attention of Lio Salazar, Senior Planner, at, or by e-mail at fw.comments@co.shasta.ca.us; an automated reply will confirm receipt of comments submitted by e-mail. For general questions and assistance, please contact Lio Salazar, Senior Planner, by telephone at (530) 225-5532 or e-mail at lsalazar@co.shasta.ca.us.

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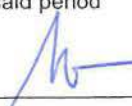
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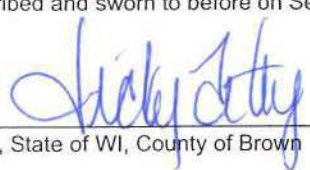
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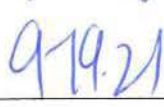
Legal Clerk

I certify under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Subscribed and sworn to before on September 22, 2020:



Notary, State of WI, County of Brown



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**REVISED NOTICE OF AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT
REPORT FOR THE PROPOSED FOUNTAIN WIND PROJECT TO EXTEND THE
PUBLIC REVIEW PERIOD**

Shasta County is the Lead Agency under the California Environmental Quality Act (CEQA), and has completed the preparation of a Draft Environmental Impact Report (Draft EIR) for the proposed project identified as the Fountain Wind Project (Use Permit 16-007).

The approximate 4,464-acre proposed project site is located within an approximately 29,500-acre leasehold area comprised of 76 Shasta County Assessor's parcels consisting exclusively of private property operated as managed forest timberlands. The property is located approximately one mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of California State Route 299 (SR 299), and near the private recreational facility of Moose Camp, and other private inholdings. Other nearby communities include Montgomery Creek, Round Mountain, Hillcrest, Wengler, and Big Bend. The proposed project site is also within a geographic area that is traditionally and culturally affiliated with the Pit River Tribe. Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north.

The Fountain Wind Project is a renewable wind energy generation development proposed on approximately 4,464 acres in unincorporated Shasta County. The applicant has applied for a use permit to construct, operate, maintain, and ultimately decommission up to 72 wind turbines and associated transformers together with associated infrastructure and ancillary facilities. Each turbine would be no more than 679 feet tall, as measured from ground level to vertical blade tip (total tip height), and would have a generating capacity of 3 to 5.7 megawatts (MW). The project would have a maximum total generating capacity of up to 216 MW.■

Copies of the Draft EIR have been and are now available for public review. Following the receipt of several requests to extend the Fountain Wind Project draft Environmental Impact Report (DEIR) public review period, and based on continued requests for a further extension, the unusual circumstances created by the COVID-19 pandemic, and the concurrence of the project applicant, the Director of Resource Management, acting in his capacity as the County's Environmental Review Officer pursuant to Shasta County Board of Supervisors Resolution No. 94-71, has extended the public review period. Public comment on this document is invited from the date of the original notice of availability, on **Monday, August 3, 2020**, through the extended public review period ending **Wednesday, October 21, 2020, at 5:00 p.m.**

The County's consultant, Environmental Science Associates (ESA), has prepared the Draft EIR pursuant to CEQA. A Final EIR will be prepared following public review of the Draft EIR. The Shasta County Planning Commission will consider the information in the Final EIR when deliberating the proposed project, and the alternatives discussed in the EIR.

The Draft EIR discusses potentially significant environmental impacts in the following areas of concern: aesthetics, air quality, biological resources, communications interference, cultural and tribal cultural resources, hazards and hazardous materials, hydrology and water quality, noise and vibration, and wildfire.

This Draft EIR is being distributed directly to agencies, organizations, and interested groups and persons for comment during a 45-day formal review period in accordance with §15087 of the *State CEQA Guidelines*. Your response must be received by the Shasta County Department of Resource Management, Planning Division, no later than 5:00 p.m. on **Wednesday, October 21, 2020**.

The Draft EIR and other project related documents and technical studies may be reviewed online by clicking on the Fountain Wind Project link at www.co.shasta.ca.us/index/drm/planning/eir. A hard copy of the Draft EIR and electronic appendices are available for inspection by appointment at the Shasta County Department of Resource Management, Planning Division, 1855 Placer Street, Suite 103, Redding, CA 96001 during regular business hours and subject to any new laws, regulations, or orders concerning the operation of facilities. For an appointment to inspect a hard copy or to obtain electronic and/or hard copies, contact Lio Salazar, Senior Planner, by telephone at (530) 225-5532 or e-mail at lsalazar@co.shasta.ca.us. Hard copies will be provided at the requester's expense at the direct cost of reproduction; electronic copies on thumb drive or CD format are available at no cost. Hard copies of the Draft EIR and electronic appendices are available for review by appointment at the Anderson, Redding, and Burney branches of the Shasta Public Libraries, Cottonwood Community Library, and Hill County Community Clinic (Round Mountain) during regular business hours and subject to facility policies and/or any new laws, regulations, or orders concerning the operation of facilities:

Anderson Branch
3200 West Center St.
Anderson, CA 96007
(530) 365-7685

Redding Branch
1100 Parkview Ave.
Redding, CA 96001
(530) 245-7250

Burney Branch
37116 Main St.
Burney, CA 96013
(530) 335-4317

Cottonwood Community Library
3427 Main St.
Cottonwood, CA 96022
(530) 347-4818

Hill County Community Clinic (Round Mountain)
37116 State Highway 299 East
Round Mountain, CA 96084
(530) 337-5750

Future notifications regarding scheduled Planning Commission hearings on this proposed project will be published and distributed in accordance with law. Please send your comments to the Shasta County Department of Resource Management, Planning Division, 1855 Placer Street, Suite 103, Redding, CA 96001 to the attention of Lio Salazar, Senior Planner, at, or by e-mail at fw.comments@co.shasta.ca.us; an automated reply will confirm receipt of comments submitted by e-mail. For general questions and assistance, please contact Lio Salazar, Senior Planner, by telephone at (530) 225-5532 or e-mail at lsalazar@co.shasta.ca.us.

September 22, 2020

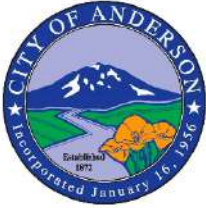
4387144

**NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT (EIR); NOTICE OF 30-DAY EIR SCOPING PERIOD AND REQUEST FOR WRITTEN SCOPING COMMENTS; AND
NOTICE OF PUBLIC EIR SCOPING MEETING
REGARDING THE PROPOSED FOUNTAIN WIND PROJECT**

PUBLIC SCOPING MEETING NOTICE: Shasta County will hold a public scoping meeting for agencies and individuals to learn more about the CEQA process for this project, and to receive comments about the scope and content of the EIR, including what potential environmental impacts of the project should be addressed in depth in the EIR. The merits of the project will not be discussed at this meeting, nor will comments regarding approval or denial of the project. No decision to approve or deny the project will be made at this meeting. The meeting will be held Thursday, January 24, 2019, at the Montgomery Creek Elementary School, located at 30365 State Highway 299 East, Montgomery Creek, CA 96065. Doors will open at 6:30 p.m. for informal viewing of project related information. The formal scoping meeting will begin at 7:00 p.m. (Publication Date: 01/16/19).

Appendix C

Letters Outside of Scope of CEQA



August 4, 2020

Leo Salazar, Senior Planner (Via email: lsalazar@co.shasta.ca.us)
Resource Management
County of Shasta
1855 Placer Street, Suite 103
Redding, CA 96001

Subject: Fountain Wind Project DEIR

Thank you for the notice regarding the opportunity to review the Draft EIR for the Fountain Wind Project.

I do not have any comments on the proposed project nor the Draft EIR.

Sincerely,

A handwritten signature in blue ink, appearing to read "Russ", is positioned above the printed name.

Russ Wenham
Director of Engineering and Development
City of Anderson

RW:rw

Lio Salazar

From: Charis Scofield <charis.scofield@gmail.com>
Sent: Saturday, August 15, 2020 8:23 PM
To: Fountain Wind Project
Subject: Wind Turbine proposal near Burney

To whom it may concern,

I am a resident and home owner in Shasta County and I oppose the putting in of 72 new wind turbines up by Burney. I do not believe the benefits outweigh the downfalls. We live in one of the sunniest areas in the nation - if we are focusing on producing green energy, it should be solar we are focusing on. Turbines disturb wildlife especially the bird populations, so many trees would be cut down, they are unsightly, inefficient for cost, and it sounds like the energy produced would benefit other places, not the people of the Burney area. That is not okay with me. I am also a local indigenous woman from the Winnemem Wintu tribe, and I know intimately the experience something being constructed in our area. to our habitat and residents' detriment for others' gain. People choose to live in Shasta County for a reason, especially the Burney area, and that reason is not to have huge wind turbines taking over the area. I believe this will also affect hunting and dislocate wildlife. We had enough dislocation of our wildlife during the recent fires. Not a good idea. Please do not approve this project. It is not worth selling out our neighbors in Burney.

Respectfully,
Charis Scofield

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Zalynn Baker join the Pit River Tribe in supporting a "No project alternative".

Sincerely,

Zalynn Baker

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Donna Carter join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,

Donna Carter

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit
No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I, Joan M. DiMaio, join the Pit River Tribe in supporting a **“No project alternative”**.

Sincerely,

A handwritten signature in cursive script that reads "Joan M. DiMaio".

Joan M. DiMaio

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Madison Harrison join the Pit River Tribe in supporting a "No project alternative".

Sincerely,



October 19, 2020

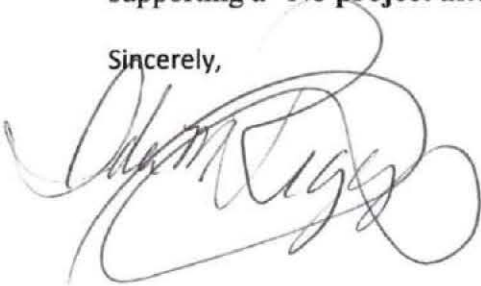
Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I, Ida M. Riggins join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ida M. Riggins', with a large, stylized flourish at the end.

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I, Ishnur C. Riggins join the Pit River Tribe in supporting a **“No project alternative”**.

Sincerely,

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I, William R. Riggins III, join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,

W. R. Riggins III

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we José Silver join the Pit River Tribe in supporting a "No project alternative".

Sincerely,



October 19, 2020

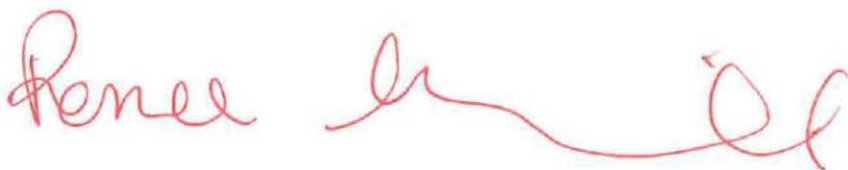
Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Renee Gemmill join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,



10/20/2020



MOUNT SHASTA BIOREGIONAL ECOLOGY CENTER

P.O. Box 1143 • Mount Shasta, CA 96067 • Phone & Fax 530.926.5655 • www.mountshastaecology.org

October 20, 2020

Shasta County Department of Resource Management

Planning Division

Attn: Senior Planner Salazar

1855 Placer Street, Suite 103

Redding, CA 96001

lsalazar@co.shasta.ca.us

fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project
Use Permit No. UP 16-007

Dear Senior Planner Salazar,

The Mount Shasta Bioregional Ecology Center supports the position of the Pit River Tribe in advocating for a “No Project Alternative” with regard to the proposed Fountain Wind Project.

It is clear that this massive project would create widespread significant adverse impacts to the environment and to the cultural resources of the Pit River Tribe that cannot be mitigated.

We are especially concerned about significant adverse impacts on the Pit River Tribe’s longstanding spiritual and cultural uses of the area; about adverse impacts visual quality, impacts on avian species including Golden and Bald Eagles, impacts on bats and raptors, impacts on the watershed from high water use, on biodiversity from water diversions and habitat destruction, and on the overall value and use of the area.

The Mount Shasta Bioregional Ecology Center greatly values the beauty of this forested area and its cultural significance, and therefore joins the Pit River Tribe in supporting a “**No project alternative.**”

Thank you for your consideration,

Michelle Berditschevsky

Michelle Berditschevsky

Founder, Staff Conservation Consultant

Honoring and Protecting Our Mountain Environment Since 1988

October 19, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Buzz Ward join the Pit River Tribe in supporting a "No project alternative".

Sincerely,

Buzz Ward

10-20-20

Date October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

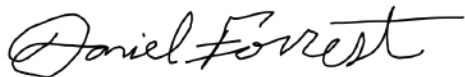
RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed Fountain Wind Project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. The Fountain Wind Project is an undesirable encroachment on the rural landscape and tranquility of the area that will cause more harm than good to local forests and wildlife, along with the destruction of tribal sites and traditional resources of vital importance to the Pit River People.

Due to this fact, I Daniel M. Forrest III, Hewisedawi Band Member/Cultural Representative of the Pit River Tribe, supports my Tribe's "No project alternative."

Sincerely,

A handwritten signature in black ink that reads "Daniel Forrest". The signature is written in a cursive, flowing style.

Daniel M. Forrest III

Date October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed Fountain Wind Project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. The Fountain Wind Project is an undesirable encroachment on the rural landscape and tranquility of the area that will cause more harm than good to local forests and wildlife, along with the destruction of tribal sites and traditional resources of vital importance to the Pit River People.

Due to this fact, I Oliver W. Forrest Jr., Hewisedawi Band Member/Cultural Representative of the Pit River Tribe, supports my Tribe's "No project alternative."

Sincerely,

A handwritten signature in black ink, appearing to read "Oliver W. Forrest Jr.", with a stylized flourish at the end.

Oliver W. Forrest Jr.

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed Fountain Wind Project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. The Fountain Wind Project is an undesirable encroachment on the rural landscape and tranquility of the area that will cause more harm than good to local forests and wildlife, along with the destruction of tribal sites and traditional resources of vital importance to the Pit River People.

Due to this fact, I Natalie F. Forrest-Perez, Hewisedawi Band Member/Tribal Historic Preservation Officer of the Pit River Tribe, supports my Tribe's "No project alternative."

Sincerely,

A handwritten signature in black ink, appearing to read "Natalie Forrest-Perez". The signature is fluid and cursive, with a large, stylized "P" at the end.

Natalie Forrest-Perez, Hewisedawi Member/THPO

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

I write to you on a day where another privately owned energy company will be shutting off electricity to thousands of Shasta County residents. Where they had an opportunity to invest in resilient and safer power grid systems, they instead chose profit for shareholders. When will we learn that the best interest of the our community is not in the hands of profit centered corporations that would extract from us our very souls if they could increase their revenue.

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I join the Pit River Tribe in supporting a **“No project alternative”**.

We need carbon free energy solutions, but not at the cost of turning over our mountains to industrial practices that disrupt wildlife, watersheds, viewsheds and soundscapes.

Sincerely,

Jonathon Freeman
Bella Vista, CA 96008

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the
Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

As a Yana/Madesi Cultural Elder and Member of the Redding Rancheria Tribe, I cannot support the Fountain Wind Turbine Project. The project will contribute to the destruction of the ridges and create mountain top removal of one of the most sacred mountains in this area- Snow Mountain- aka Wolf Mountain. It is a place of reverence, a place of prayer, a place of special powers that one can receive if they're intentions are right in the mind and the heart. I know this, as I have been to the mountain and have fasted and prayed and made spiritual connections. It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe and of my peoples, the Yana and Madesi, and that it would create numerous adverse impacts to the environment and Tribal Cultural Resources and these special and sacred places cannot be mitigated. Due to this fact, and on behalf of my mother's peoples and my grandchildren we join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,

James Hayward, Sr.
1927 Redding Rancheria Road
Redding, CA. 96001

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I/we Lisa MacDonald join the Pit River Tribe in supporting a **"No project alternative"**.

Sincerely,



Lisa MacDonald

P O Box 188

Round Mtn. C 96084

530-941-9082



TRIBAL HISTORIC PRESERVATION OFFICE
PALA BAND OF MISSION INDIANS
PMB 50, 35008 Pala Temecula Road | Pala, CA 92059
Phone 760-891-3510 | www.palatribe.com

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed Fountain Wind Project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. While we are generally supportive of sustainable energy projects that harness solar and wind energy, Fountain Wind appears to be an unnecessary and ill-fitting project that will cause more harm than good to local forests and wildlife, along with the destruction of tribal sites and traditional resources of vital importance to the Pit River peoples. Due to this fact, the Pala Tribal Historic Preservation Office joins the Pit River Tribe in supporting a **“No project alternative.”**

Sincerely,

Shasta C. Gaughen, PhD
Tribal Historic Preservation Officer
Pala Band of Mission Indians

October 21, 2020

Shasta County
Department of Resource Management
Planning Division
Attn: Senior Planner Salazar
1855 Placer Street, Suite 103
Redding, CA 96001
lsalazar@co.shasta.ca.us
fw.comments@co.shasta.ca.us

RE: Comments on the Draft Environmental Impact Report for the Fountain Wind Project Use Permit No. UP 16-007

Dear Senior Planner Salazar,

It is clear from the information provided in the Draft Environmental Impact Report for the proposed fountain wind project in the Ancestral Homelands of the Pit River Tribe, that it would create numerous adverse impacts to the environment and Tribal Cultural Resources of the Pit River Peoples that cannot be mitigated. Due to this fact, I Wanda Wilkes, Elder of the Madesi Band join my Tribe, the Pit River Tribe, in supporting a “**No project alternative**”.

As a Pit River Indian Tribal member of the Madesi band I am against the windmill project. Much has been taken from our Tribe and this project sits right in our Band’s territory. I say no. The significant adverse effects on the environment can not be mitigated.

Sincerely,

Wanda Wilkes, Madesi Band Elder and Pit River Tribal Member
36970 Park Ave.
Burney, CA 96013

Lio Salazar

From: Amy Holden <amy.93.holden@gmail.com>
Sent: Monday, August 10, 2020 8:52 AM
To: Fountain Wind Project
Subject: Fountain Wind

I am writing to express my strong opposition to the Fountain Wind Project.

I object to this project for the following reasons:

1. The project site encroaches on Native lands and threatens cultural resources
2. The development and operation of this facility threatens local species populations including raptors and bats
3. Project development increases fire risk by installing additional power lines and reducing wind barriers in an already fire prone region
4. The project cuts down forest that currently serves to sequester carbon and provide habitat and therefore currently serves environmental protection purposes that greatly outweigh any benefit the project offers
5. The project reduces the value and intrinsic beauty of nearby privately owned properties by destroying view sheds, and removing forest that provides shade, fire and wind protection.
6. The additional power is not needed by county residents and would in fact harm the region's environment, cultural heritage and biodiversity as detailed above
7. The mitigation solutions necessary to fairly offset the proposed damage to landowners, cultural heritage, habitat, and safety that an accurate Environmental Impact Assessment will require would greatly exceed the budget for this project.

Amy Holden

Lio Salazar

From: leon edmonds <winton777@gmail.com>
Sent: Tuesday, August 11, 2020 11:04 PM
To: Fountain Wind Project

Please We do not need no more wind turbines the negative impact will be horrendous in all fashions for all the future Generations of all living things

Lio Salazar

From: Tammy Blake <tammy28blake@gmail.com>
Sent: Friday, August 14, 2020 9:20 AM
To: Lio Salazar
Subject: Fountain Wind Project

Mr. Salazar,

I am a Shasta County resident. I'm writing to let you know that I strongly object to the Fountain Wind Project. We need our trees a lot more than we need those hideous turbines and the destruction that will come with their construction. Please, please don't forget exactly WHY Shasta County is one of the last wild and beautiful places on earth!! Nature!!! Trees!!!

We truly do need the trees more than we need the money from this company.

Thank you.

Sincerely,

Tamera Blake

tammy28blake@gmail.com

Lio Salazar

From: Michael Knight <knighttoday@gmail.com>
Sent: Friday, August 14, 2020 10:50 AM
To: Fountain Wind Project
Subject: Proposed wind project

I strongly object to Shasta County selling out to this corporate concern. I see nothing that proves to me there is any benefit to Shasta county outside the fees and taxes you will collect. There has got to be a better way of this county making taxes than selling out to some outside interest that is giving nothing but a few taxes to the residents of this county. These are OUR resources and we all should benefit from them. Outside interests do not give a hoot about us and will likely short change us somewhere along the line, especially if it is not a local company.

Represent the residents of this county or at the very least the state by turning this proposal down and not allowing this corporation the privilege of operating within our boundaries.

Michael Knight
of
Knights Happy Farm

knighttoday@gmail.com

Lio Salazar

From: Steve Shaw <steveepalocedro@icloud.com>
Sent: Friday, August 14, 2020 7:24 AM
To: Resource Management
Subject: Fountain wind project

Sent from Enough wind generation, this is ruining the beauty of Shasta Co.my iPad

AUG 19 2020

Attn: Lio Salazar

DEPT OF RESOURCE MGMT
PLANNING DIVISION

8/17/20

Re: Fountain Wind Project

I have been a property owner in Round Mt for 39 yrs. My concerns are many regarding this windmill project. I am totally against it. It will devastate this area.

Not only will the building, mining, drilling of structures ruin our water resources, which that is how we have water: underground springs, creeks, ponds, etc. Our property values have dropped as it is, with the prospect of this project going through, no one will want to buy near windmills or if your water source is no longer there or contaminated.

Environmentally, no more trees, wildlife will be gone, includes turtles, lizards, frogs. Geese and eagles will not migrate to this area and if they do, they will die because of blades etc. The weather will change, health issues will rise. The constant whirring and blinking lights will make neurological problems worse.

The traffic issue is another problem. Hwy 299

is only one way in and one way out. We are in a high fire area. What happens if a fire starts and all these trucks and equipment are running the highway? Will we be able to get out in times?

Please reconsider your plans to let this windmill project go through. Let the Intermountain people live in the way they are accustomed to. Please don't let money be your guide.

Thank you for your time & consideration.

Susan Westrup

18516 Little Rnd mt lookout Rd.

POB 92

Round mt, Ca. 96084

AUG 26 2020

DEPT OF RESOURCE MGMT
PLANNING DIVISION

To. whomever will listen and as to implore take not only into consideration but into heart as well, my written words to follow.

I as a concerned resident of Burney California have requested and received the draft of the environmental impact report regarding that of the fountain wind project and wish to have my say against it documented for reasons that I will impress to you through this letter for hope that anyone who reads it will truly take it into consideration and not set it aside.

Among the reasons that my favor is not for their placement among our region are these, the wind turbines we have already placed among our hills and ridges within sight of all who will look have already taken from us the trees once in their place, and therefore the oxygen once given by them. These turbines not only take from us this but also our birds drawn into their bladed tips and killed there in. With the new heights presented for the new project such will not cease and all for power that shall not even benefit our area let we gamble and make bid. Within this I see no reason.

The acres further lost to their placement will also take from our region - our air, our creatures habitat, and further more I dare say our safety. California is a blaze, fires caused by lightning and the foolishness of men have already ravaged the lands about us too. Just as the turbines not but the destruction of our forests came in their wake - you add the winds of these large metal structures suggested within the wind project we will face even greater threat if a fire should arise and be fed and driven by them - our area once threatened by flame shall not see →

any relief as the turbines of a proposed 679 feet
tall and spanning over 4,464 acres fuel the fire and
drive it deeper into ~~our~~ ^{our} lands.

Please hear our voices, see our people, and
reconsider the placement of these 72 new wind turbines.

Sincerely, ~~Heaven Sent~~
~~Carmacho~~

Chris Carmacho

Legendline

9517 S. Wales Way
Elk Grove, Ca. 95758

Shasta County Dept. of Resource Management

I have been going to Moose Camp,
off Highway 299 for seventy eight years.

I first went as a group of Camp Fire Girls.

My parents bought a cabin there and
then lost it in the fire of nineteen ninety one.

It has been a wonderful place for
families, children, and friends.

We would celebrate all the holidays
there.

Please remove D1-D5 it would save
the worst damage to Moose Camp.

Merna Swartz Stremple

RECEIVED
SHASTA COUNTY

AUG 28 2020

DEPT OF RESOURCE MGMT
PLANNING DIVISION

Lio Salazar

From: Carlos Rosales <crosales@lakeshastacaverns.com>
Sent: Thursday, August 27, 2020 9:45 AM
To: Fountain Wind Project
Subject: Lio Salzar

Another wind farm is definitely something we do not need in N. CA. The beauty of our forest and surrounding mountains are very important to our economy. We already have one wind farm, if you start another will that be enough? I'm sure you know about the wind farms in So. Ca. near Palm Springs, I've seen them and they look pretty ugly.

Please don't continue the ugliness in our beautiful area because a wind farm will only benefit a few people who don't live in the area and not our local economy.

Thank you

Carlos Rosales
Assistant General Manager

Lake Shasta Caverns
20359 Shasta Caverns Road
Lakehead, CA 96051

Tel. 530-238-2341
Fax. 530-238-2386

Email: crosales@lakeshastacaverns.com

From: [Laura Snavelly](#)
To: [FountainWind411](#)
Subject: Subscribe
Date: Friday, August 28, 2020 2:16:27 PM

I would like to say I am against this project IF it means cutting down thousands of acres of trees.

Sincerely

Laura Snavelly

Get [Outlook for Android](#)

From: [olenelo](#)
To: [FountainWind411](#)
Subject: olenelo@att.net
Date: Friday, August 28, 2020 2:13:05 PM

I TOTALLY OPPOSE THE FOUNTAIN WIND PROGECT
SHASTA COUNTY DOES NOT HAVE TO BE A SACRIFICIAL LAMB FOR
SOUTHERN CALIFORNIA.AND SHASTA COUNTY DOES NOT HAVE TO HAVE
THE EXTRA REVENUE. WE WANT EACH AND EVERY HEALTHY TREE TO LIVE
OUT IT'S EXPECTED LIFETIME.
OLEN D. STURGEON- Redding Resident of 34 years!

Sent from my Samsung Galaxy smartphone.

Lio Salazar

From: Virginia Phelps <phelpsvirginia@yahoo.com>
Sent: Sunday, August 30, 2020 9:02 PM
To: Fountain Wind Project
Subject: Fountain Wind Project

My Response to Fountain Wind Project Objectives

5. Create temporary and permanent jobs in Shasta County and contribute to the County's tax base.

More permanent jobs can be created by focusing on upgrading current home/apartment/business buildings to be more energy efficient. More people working will allow creating more local tax dollars. Local jobs and healthier buildings will help lessen the costs of medical care and strengthen families.

4. Assist California in meeting the renewable energy generation targets set in Senate Bill (SB) 100.4

8. Offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels.

9. Provide emissions-free energy for approximately 100,000 households.

All environmental costs for manufacturing must be included in the energy saving/creation calculations.

"The mining and processing of rare earth materials, which are essential components of wind turbines, create devastating environmental impacts. Rare earth processing "requires a cocktail of chemical compounds and produces a 'tremendous amount' of solid waste, according to the U.S. Environmental Protection Agency," Yale University Environment 360 reports."

Virginia Phelps

Sent from [Mail](#) for Windows 10

Lio Salazar

From: arne hultgren <a.hultgren@me.com>
Sent: Monday, August 31, 2020 11:38 AM
To: Fountain Wind Project
Subject: Comments-Fountain Wind Draft EIR

Dear Mr. Salazar:

As a Professional Forester and past employee of Roseburg and Landvest, I am closely acquainted with the Project, and lands in question. The timberlands have been managed under the auspices of CALFIRE's timber harvest regulatory program since before 1971. All past permitted activity has been certified by the State as compliant with the California Environmental Quality Act (CEQA), consequently adverse environmental impacts to the area have been mitigated over past few decades.

In 1992 the Fountain Fire destroyed over 64,000 acres, 25,000 of which was on the Project Area. Since the fire, those land were reforested by the landowner, *despite no legal obligation to do so*. As a result, there is a vigorous stand that will provide timber to Shasta County over the coming decades. These positive measures need to be considered when evaluating potential adverse impacts.

In addition to the careful stewardship of those forests, the landowner apparently seeks to implement a compatible use in the form of a wind-generation project designed to take advantage of the steady winds in this area. Consequently these lands will provide not only a steady supply of timber, but also clean, renewable power to a State that has endured recent rolling blackouts due to an inadequate power supply. And while the project would not become operational for another 2-3 years, it is the only large renewable power project, this far along in the permitting process, that can assist the State in the foreseeable future to remedy the rolling blackouts we are currently experiencing.

An additional impact to consider, favorable to our power-starved State, is the fact that it will generate more power with greater certainty than solar methods. Solar power only makes usable amounts of energy between the hours of 9AM and 5PM, making it nearly useless without massive battery banks that are not yet feasible.

As an environmental professional who has worked on these lands since 1995, a close review of the draft EIR shows it to be thorough and accurate. *All significant impacts have been mitigated, as evidenced by the extensive substantial evidence in the record*. Many of the adverse impacts speculated by the opponents will simply not come to pass, as evidenced by the existing Hatchet Ridge wind project which has operated for the past 10-years without significant impacts.

In short, I urge the county to quickly approve the Project at a time when the additional power is so desperately needed by the State to backfill the shortage of electrical power generation.

Respectfully submitted by,
William Hultgren
Professional Forester #2581
540 Deas Way
Mount Shasta, CA 96067

Lio Salazar

From: David Woodward <daveandmily@gmail.com>
Sent: Monday, August 31, 2020 7:34 PM
To: Lio Salazar
Subject: Fountain Wind Project Draft EIR Comments

Mr Salazar,

I am a co-owner of one of the parcels of the Buffum Homestead north of Highway 299, Assessment Number 027-140-023-810. My great, great grandfather, Frank Buffum, homesteaded these 160 acres beginning in 1907 and it has served through six generations of our now widespread family as a place of respite and gathering. As you know, this area was devastated by the 1992 Fountain Fire and is finally beginning to regain the deeply forested character I loved from my childhood. Hydropower and lumber have long been a part of the character of the land, but wind projects are a "city of a hill" which cannot be hidden, altering the essential character of the terrain. I have been a licensed Professional Engineer in the State of California for 31 years and work for one of the largest power consulting firms in the U.S., but am loathe to see the essence of an unspoiled area marred by these elegant behemoths boasting to be some of the largest in the nation. There is no aesthetic mitigation possible for such dramatic hostage-taking of the land. In a world when intermittent renewables like wind contribute marginally to our power supply, this loss would be tragic. I am opposed to the project.

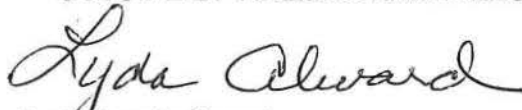
David Woodward

Shasta County Department of Resource Management, Planning Division
1855 Placer ST. Suite 103
Redding, CA 96001

Att: Lio Salazar:

The following comments are concerning Draft EIR for the proposed project identified as the Fountain Wind Project (Use permit 16-007):

- I am a home owner at Moose Camp. This home has been in our family since the 1960's and I wish to keep it for my grandchildren and great grandchildren. We rebuilt after the Fountain Fire. We love the wildlife, the quiet mountain area, and the proximity of Shasta Counties best of outdoors.
- IMPACT OF INDUSTRIAL WIND TURBINES ON A RESIDENTIAL AREA:
 - 50 homes as close as 2200 feet away
 - KOP (Key Observation Point) EIR says 75 Shasta County taxpayers don't matter
 - KOP #1 is twice as far away from the nearest wind turbine than is Moose Camp
 - Look at Google Earth - view of 50 Moose Camp residences, never shown in draft EIR
 - MOOSE CAMP NEEDS TO BE ADDED TO KOP THEN TO FINAL EIR
 - State of Wyoming requires disturbs to be located 5.5 times total turbine height away from residences
 - Life span of a wind turbine is only 20 to 25 years . Xcel Energy's Ponnequin wind farm recently retired 44 turbines at average age of 18 years. Blades are so huge they have to be trucked in - in 2 parts, then assembled. Blades are made of toxic material - how to dispose of those when they are retired
 - 5% of land is now used for power, If all alternative plans are put into use 25% of our wild land will be polluted with windmills
 - Shasta County already and still is doing their part regarding energy by making hydroelectric and sending it south.
- ◆ MOOSE CAMP IS DEMANDING THE REMOVAL OF PROPOSED WIND TURBINES (D1 THRU D5). THE VAST MAJORITY OF INDUSTRIAL WIND FARMS ARE LOCATED OUTSIDE OF RESIDENTIAL AREAS



Lyda Swarts Alward
Moose Camp Homeowner
Shasta County Voter

RECEIVED
SHASTA COUNTY

SEP 08 2020

DEPT OF RESOURCE MGMT
PLANNING DIVISION

SEP 14 2020

DEPT OF RESOURCE MGMT - 9-9-20
BUILDING DIVISION

Mr. Salazar,

Along with the majority of the local residents, I hope you will take my opposition to the Fountain Wind Project here in Round Mountain. I live on Fire by Rd. I've been here 18 years. My home will be paid for next year. Number 3 of the enclosed list of reasons I oppose the project is who is going to pay me for my loss of property value. Not to mention I don't want to leave here to begin with. I imagine your

2

Reaction to an outsider
wanting to turn your
home and investment
to a worthless Quagmire.
If you are dead set on
ruining everything for us
up here you may want to
figure a way to reimburse
us for our loss. Just put
yourself in our position
and ask what you would do
in a like position. I am
keeping this civilized as
I can't imagine Anyone
Being so pig headed and
so full of themselves that
you would talk away the
means of a good life in
retirement because you
know better or you have
a deal under the table

3

With the big bazookas
down there in planning,
the project doesn't have
any benefit for Shasta
County and all the negative
aspects. Tell the people
involved to put the project
in their back yard. People
up here are upset and
mostly concerned that the
fix is in. Who do you
work for? Them or us?

thank you

Lynn A. Owens
30230 Frisby Rd.
Round Mountain, Ca
96084

FOUNTAIN WIND NEGATIVE IMPACTS

1. **Aesthetics:** Visual pollution, obtrusive lighting (day and night) and industrialization of Forest Lands, able to be seen from neighboring counties. Only the beginning "Coming to a neighborhood near you"
2. **Wildfires:** Increases risk, new transmission lines, turbines attract lightning, located in highest rated fire hazard zones by both Cal Fire and CPUC. Shallow soil and soil type makes lightning grounding systems more difficult and problematic.
3. **Economic & Social Impacts:** Drastically reduces property values for all properties that enjoyed views of Shasta County's eastern range. Local properties near turbines may be worthless, local community likely to wither as people move or abandon properties and fewer people move in. Any positive tax revenue from Turbines may be offset by reduced property taxes due to loss in assessed value.
4. **Tourism:** No longer a place to enjoy Nature. Tourists will be driving through an Industrial Wind Farm to visit Intermountain Communities, beautiful Burney Falls, and Fall River areas.
5. **Tribal Cultural Resources:** Destroys sacred cultural resources and history, Pit River Nation is opposed, other neighboring tribes opposed.
6. **Hydrology and water quality:** Miles of new roads, blasting. Soil compaction, Hundreds of tons of concrete and other materials, transformer oils, herbicides usage. Likely to affect local springs and waterways.
7. **Biological Resources (wildlife):** Threatens local bald eagles, spotted owls, raptors, migratory birds (located in "Globally Significant Avian Area"). Likely to affect various mammals due to ability to hear and use infrasound and other noise affects shadow flicker, etc.
8. **Public Health:** Shadow Flicker, Noise, Infrasound, Increased stress. Shadow flicker already observed across Hwy 299 from Hatchet Ridge Wind Turbines.
9. **Not as Green as Advertised:** Only produces 20-25% of advertised capacity, clears 2250 acres of carbon sequestering forest, requires fossil fuel backup when winds not blowing, curtails existing green hydropower when winds blowing implies 0% green benefit.
10. **Energy:** Round Mountain substation already has voltage stability issues, already producing more power than we need (CA ISO paid Arizona to take power in 2018), PG&E requested permission to Curtail Hatchet Ridge power during negative pricing events (i.e. too much power on grid). PG&E has enough Renewable Energy to meet requirements to 2038 according to PG&E 2018 letter to CPUC.

The construction of Industrial Wind farms cannot be justified in the rural and wild places that developers usually target! Please visit <https://www.stopfw.com> for further information.

Lio Salazar

From: richard holden <rmholden@fastmail.fm>
Sent: Sunday, September 13, 2020 5:44 PM
To: Fountain Wind Project
Subject: FOUNTAIN WIND PROJECT

I object to the Fountain Wind Project for the following reasons:

1. If it is approved and built it will negatively impact tourism in Northern California. Because of the unknowable dollar amount that will be lost to all Californians, this project needs to be reviewed, and comments need to be considered from all citizens. This project will have international repercussions. The region being immediately affected will have 600 foot tall windmills on the most travelled approach to Burney Falls "the Eighth Wonder of the World" (according to president Theodore Roosevelt). I believe it is absurd for the approval of a project of this magnitude to be up to one county.
2. The project reduces the property value and intrinsic beauty of nearby privately owned properties by destroying view sheds and removing forest that provides fire and wind protection.
3. The project developers have not offered recompense for the loss of property value that will result if this project is completed.
4. The project site encroaches on Native lands and threatens cultural resources.
5. The development and operation of this facility threatens local species populations including raptors and bats. There are several trout streams that would be negatively impacted.
6. The project increases fire risk by installing additional power lines and reducing wind barriers in an already fire prone region. Cal Fire states that there is elevated risk to people and property from wildfires associated with power lines
7. The project cuts down forest that currently serves to sequester carbon and provide habitat and therefore currently serves environmental protection purposes that greatly outweigh any benefit the project offers
8. The additional power is not needed by county residents and would in fact harm the region's environment, cultural heritage and biodiversity as detailed above
9. The mitigation solutions necessary to fairly offset the proposed damage to landowners, cultural heritage, habitat, and safety that an accurate environmental impact assessment will require would greatly exceed the budget for this project.
10. Now more than ever our county needs to demonstrate leadership to protect the interests of the citizens of Shasta County and tell the project developers, and the governor of California, and anyone else who wants to destroy our beautiful county, that we will not allow it.

richard holden
rmholden@fastmail.fm

Lio Salazar

From: K C <Cobb_72@hotmail.com>
Sent: Monday, September 14, 2020 1:48 PM
To: Fountain Wind Project
Subject: Stop the foundation wind project

I oppose the Fountain Wind project as a Shasta County resident. Please stop this project. Protect our birds, bats, and forest lands.

Kandace Baugh
514 Country Oak Dr
Redding Ca 96003

Sent from my Verizon, Samsung Galaxy smartphone
Get [Outlook for Android](#)

Lio Salazar

From: Virginia Phelps <phelpsvirginia@yahoo.com>
Sent: Monday, September 14, 2020 2:45 PM
To: Fountain Wind Project
Cc: Lio Salazar
Subject: Fountain Wind Project

Please include a “life cycle analysis” of environmental impacts associated with the manufacture of components or other materials that would be used to construct the Fountain Wind Project.

Miscellaneous — The mining and processing of rare earth materials, which are essential components of wind turbines, create devastating environmental impacts. Rare earth processing “requires a cocktail of chemical compounds and produces a ‘tremendous amount’ of solid waste, according to the U.S. Environmental Protection Agency,” Yale University Environment 360 reports.

Virginia Phelps

Sent from [Mail](#) for Windows 10

Lio Salazar

From: Bev Armstrong <bev2111@yahoo.com>
Sent: Tuesday, September 15, 2020 11:36 AM
To: Fountain Wind Project
Subject: Fountain Wind

I object to the Fountain Wind project. Please do not let this happen Sent from my iPhone

Lio Salazar

From: Robyn Moore <czimoore7@gmail.com>
Sent: Tuesday, September 15, 2020 3:52 PM
To: Fountain Wind Project
Subject: Attn. Lio Salazar Re: The Fountain Wind Project

To: Lio Salazar, Senior Planner

Please accept this email as my disapproval of any further wind turbine placement in the Burney/Hatchet Mtn area. As a part of Shasta County's Resource Management Department you are aware of the many resources that can be negatively impacted by this level of industrialization. If this was such a great plan for our state we would be lining the coastal hills with windmills which would be much more efficient but those folks won't tolerate the eyesore and they have the money to shut any plan down. This is a poor area so the folks in the area only have their voice to fight, please listen. The beautiful property that has been in my family for 100 years (no I'm not exaggerating) has seen many changes due to Mother Nature, drug gangs, deforestation to name a few. Over the years the eco System has been disrupted by both natural and human causes. The beaver are gone, native fish struggle and so many birds we saw in the summer months are no where to be found. Allowing this additional assault on this beautiful landscape will appease bureaucrats and make some foreign companies a lot of money for a short time but it will do irreversible damage to flora and fauna of the area for 100 of years to come.

I'm not an idiot and I know money will prevail but I have to try. Please don't allow this project to proceed. They have some of their silly windmills, that's enough!

Thank you for your time.

Robyn Moore

Property Owner, Ward Camp off T-Line on Hatchet Mtn. Summit.

Sent from my iPhone

Lio Salazar

From: sharon kersten <sykersten@gmail.com>
Sent: Thursday, September 17, 2020 7:41 PM
To: Fountain Wind Project
Subject: Fountain Windmill Project Application
Attachments: Windmill FW Planning Dept. letter 9.2020.pdf; Windmill letter 8.19.19.pdf

17 September 2020

Please see PDF's below for your consideration. Please contact if you are unable to open the PDF files.

Lio Salazar

From: Sharon Bauer <sbauer77@yahoo.com>
Sent: Friday, September 18, 2020 4:16 PM
To: Fountain Wind Project
Subject: Fountain Wind Project

Fountain Ridge Wind Project

These are my comments on the Fountain Wind ridge project. I live in Burney. I am in opposition to this project.

I see these this wind farm is to be located in and high fire danger area and these have a high risk of starting a fire. This high fire danger area is decided by the PCUC and Cal fire.

The wind turbines will lower property values in this area as people with not want to live near these due to sound and light they emit. The loss in assessed value of property will be translated into less tax dollars.

The health issues of blinking lights and vibrations will drive people away. I live near the town of Burney and I can hear the wind turbines that are up there now. From my home.

What will it be like when the new ones are almost 700 ft tall? They will be seen from Burney?

These wind farms are not green. They only produce 20-25% of advertised capacity. They will clear 2250 acres of forest. They require back up power when the wind does not blow enough and that makes our voltage stability issues even greater then it already is.

So in conclusion I don't believe these are a good option in the forests of Shasta Co.

Sincerely,
Sharon Bauer

Sent from my iPad

October 8, 2020

Lio Aslazar, Senior Planner
Shasta County Department of Resource Management
Planning Division
1855 Placer Street, Suite 103
Redding CA, 96001

SCH # 2019012029
UP 16-007

Dear Mr. Aslazar;

Comments on the Fountain Wind Project

Sir, the following will be Henrich Family Trust comments regarding the Draft Environmental Impact Report (DEIR) to the Fountain Wind Project. Our property (121*51'16.04 W by 40*48'.078 N) is located off the T-Line, approximately 5 miles east of the end of pavement on Terry Mill Road.

The Henrich family has owned this property since June 1968 and has seen three generations enjoy this area. After reviewing the DEIR there are several points that I will submit that will significantly impact our property and the area that is closely adjacent to it.

- Environmental impact that this project will have regarding timber, grazing, natural vegetation
- Financial effect on the property value
- Visual/aesthetics seen from the property
- Biological resources that the immediate area supports

Environmental impact that this project will have regarding timber, grazing, natural vegetation

The associated infrastructure that this project undertakes will have an adverse effect within the project area. The construction of 23 miles of new roads and upgrading the existing 28.9 miles by widening them to approximately 10 ft, in addition to also adding a 10 foot buffer, will result in harvesting/eliminating approximately 341 acres of timber and vegetation. Also negatively affecting the existing environment are the addition of:

- Overhead/underground electrical collector system
- Overhead/underground fiber optic system
- On site switching stations
- 14 temporary lay down areas
- Storage and stage building and equipment areas (O&M)
- 4 permanent meteorological evaluation towers (METs)
- Sonic detection and ranging towers (SODAR)
- Light detection and Ranging towers (LIDAR)
- 2 storage sheds and 3 batch plants

As you can see this will result in a significant environmental impact of this pristine area.

Financial effect on the property value

Even though the Henrich family has never considered, nor will we ever consider, selling our property, common sense says that the property value and the value of all privately owned properties that are within the project area will be affected significantly.

Visual/aesthetics seen from the property

With each turbine that stands at 679 feet tall, and a rotor diameter of 531.5 feet wide, you can imagine the visual effect this will have on our property. As a comparison, we have two trees that survived the 1992 fountain fire that are located near our cabin. One of these trees is a sugar pine that is approximately 120 feet tall and a dbh (diameter breast height) of 5 feet. The other tree is a black oak that is approximately 40 feet tall and a dbh of 4.5 feet. Both trees are probably some of the oldest on our property. These turbines will definitely be the tallest non-natural manmade structures in the area. The overall adverse impact of having the following turbines, KO1, KO2, KO3, KO4, KO5 and LO4, located (per plot map) in the area of the Henrich property will be significant. With the associated height and the noise level (43 to 50 dBA) we will be seeing and hearing these structures each and every moment on our property.

Biological resources that the immediate area supports

I am not a wildlife biologist nor a forester, however removing this much natural resources from the project area and constructing the infrastructure will have an adverse impact on our local wildlife. From 679 feet to the ground level (5 acre foot print on each pad) I can't imagine negative outcome this will have on our birds and mammals that live in the project area.

Conclusion

I am not a NIMBY (not in my back yard) nor am I against clean energy, however a project of this magnitude can't help but affect the residents and wildlife who live in close proximity of the Fountain Wind Project. We have owned and enjoyed our property for 52 years and I can only hope that the folks that make the decision to allow or seek another alternative, take in consideration how this project will affect our local community, families and wildlife for generations to come.

Sincerely,

Pedro H. Henrich
5121 Cedars Road
Redding, CA 96001
(530) 246-0140
phenrich@charter.net

October 11, 2020

Lio Salazar, Senior Planner
Shasta County Department of Resource Management, Planning Division
1855 Placer Street, Suite 103, Redding, CA 96001

Public Comments, Fountain Wind Project

I have lived at my residence in Montgomery Creek for 30 years, and have identified any and all wildlife I have seen during that time, some of which will have to navigate through this wind turbine project area via the Pacific Flyway, much to their demise.

My home is located in Montgomery Creek, 10 miles from Big Bend. From my residence, I can view 13 turbines from Hatchet Ridge, headlights on 299E at night, Burney Mountain, Magee Peak, Snow Mountain and Round Mountain. My residence was listed for sale with a "view that would knock your socks off". Well, if this project comes to fruition, that will no longer be true, as I will also be able to see all 72 of these 679 feet or taller Wind Turbines, which will be the tallest in the United States, from my home, as well as them being reflected off of a mirrored wall in my living room. It will also produce Shadow Flicker throughout my residence and property.

The birds I have identified are as follows: Acorn Woodpecker, American Coot, American Robin, Anna's Hummingbird, Bald Eagle, Band-Tailed Pigeon, Belted Kingfisher, Bewick's Wren, Black Headed Grosbeak, Blue Grouse, Brown Creeper, Brown-headed Cowbird, Canada Goose, Cassin's Finch, Common (Red -shafted Flicker, Common Merganser, Common Raven, Dark Eyed (Oregon) Junco, Dipper, Dusky Fly Catcher, Evening Grosbeak, Flammulated Owl, Great Blue Heron, Hairy Woodpecker, House Finch, House Sparrow, House Wren, Hutton's Vireo, Killdeer, Lesser Goldfinch, Mallard, Mountain Blue Bird, Mountain Chickadee, Mountain Quail, Osprey, Pileated Woodpecker, Pygmy Owl, Red Breasted Nuthatch, Red-naped Sapsucker, Red-tailed Hawk, Rufous-sided Towhee, Rufus Hummingbird, Scrub Jay, Stellar's Jay, Tri-Colored Blackbird, Trumpeter Swan, Turkey (Merriam), Turkey Vulture, Varied Thrush, Western Bluebird, Western Tanager, White-crowned Sparrow, Wood Duck, Yellow-rumped (Audubon's) Warbler, Harry Woodpecker, and Winter Wren. Those underlined above are some of the birds that will migrate through this project using the Pacific Flyway.

I have fed over 20 hummingbirds all summer, of which most have left to go South, but I currently have several remaining. Usually one or two will stay all winter long, as long as I watch their feeders for ice. They will have to traverse the acreage of this project to migrate.

Also butterflies also use the Pacific Flyway to migrate. Acmon Blue, Anise Swallowtail, Blue Copper, California Dogface, California Hairstreak, California Sister, California Tortoiseshell, Clouded Sulphur, Clodius Parnassian, Common Buckeye, Edith's Checkerspot, Monarch, Oregon Swallowtail, Painted Lady, Pale Swallowtail, Pipevine Swallowtail, Two-tailed Swallowtail, Variable Checkerspot, Western Meadow Fritillary. Those underlined are some known to use the Pacific Flyway.

One wonders how such delicate creatures such as hummingbirds and butterflies will be able to navigate through a wind turbine project with heights of 679 feet or higher. That in addition to the over one million bats that are killed each year by wind turbines.

Wind turbines cause bird deaths from turbine collisions between 140,000 to 500,000 birds per year. (www.fws.gov).

"Wind turbines have also emerged as one of the greatest human threats to many species of large, threatened and high-conservation value birds, after habitat loss from agriculture.

Wind energy threatens golden eagles, bald eagles, burrowing owls, red-tailed hawks, Swainson's hawks, American kestrels, white-tailed kites, peregrine falcons, and prairie falcons, among many others.

The expansion of wind turbines could result in the extinction of the golden eagle in the western United States, where its population is at an unsustainably low level.

Any additional mortalities to the golden eagle threatens the species with extinction, scientists with US Fish and Wildlife warned 10 years ago, before the last decade's massive expansion of wind farms.

For decades the wind industry has put out a steady stream of grossly misleading information about its wildlife impact. It continues to claim that the impact of wind turbines is relatively low, and compares the bird deaths it causes to those of housecats, or buildings.

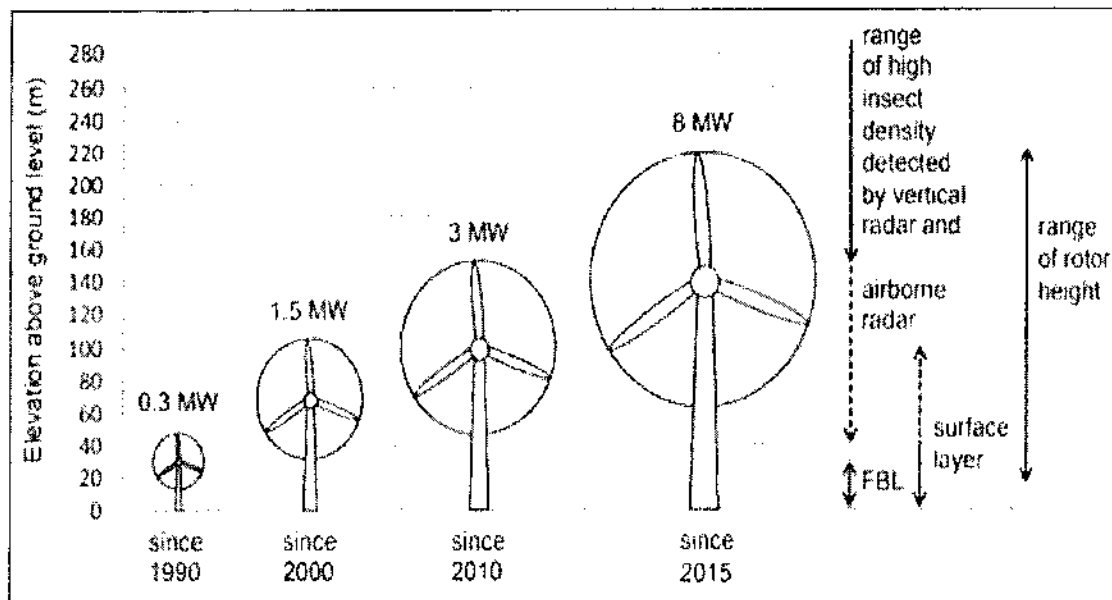
But where many of the birds killed by wind turbines are large, threatened, and of high-conservation value, most of the birds killed by house cats, and from collisions with buildings are small, unthreatened, and of low-conservation value, like robins and sparrows.

And because big birds have much lower reproductive rates than small birds, their deaths have a far greater impact on the overall population of the species.

For example, golden eagles will have just one or two chicks in a brood, and usually less than once a year, whereas a songbird like a robin could have up to two broods of three to seven chicks a year.

Insects, birds, bats, and wind farm developers are all attracted to the same thing, Trieb notes: high winds. "Wind-rich migration trails used by insects for millions of years are increasingly seamed by wind farms."

Dead insects on wind turbine blades are as visible as dead insects on a car windshield. Scientists have reported the significant build-up of dead insects on wind turbine blades for three decades and in different regions around the world." Researchers calculated in 2001 that the build-up of dead insects on wind turbine blades can reduce the electricity they generate by 50%.



Insects cluster at the same altitudes used by wind turbines.
Insects cluster at the same altitudes used by wind turbines.
INSTITUTE FOR ENGINEERING THERMODYNAMICS"

<https://www.forbes.com/sites/michaelshellenberger/2019/06/26/why-wind-turbines-threaten-endangered-species-with-extinction/#6a16af9d64b4>

The County approved the Hatchet Wind Project to count bird fatalities after the project was approved. There are 44 turbines in this project. Bird fatalities were counted under 22 turbines, every two weeks, while the other 22 turbines, the count was made once every month. I realize those who live in Redding, may be ignorant of the facts regarding wildlife kills, as they live in town with grass, pavement, etc. For those of us who live in timbered land, a dead animal or bird, will not remain on the ground for two weeks or a month; the moment they fall to the ground, "they are on a menu". Of course, there have been stories flying around that the workers were told "to be sure that no dead wildlife was found". Of course, the County has to assume that wealthy developers would never submit a falsehood. And large birds could be thrown hundreds of feet from the turbines too. Regardless, a study of this magnitude was absolutely useless.

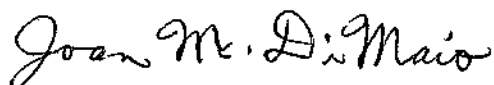
There are approximately 50 private ponds in the communities of Moose Camp, Wengler, Montgomery Creek and Round Mountain where Canada Geese, Snow Geese and many other varieties of water fowl reside and raise their young, that will be passing through this project.

The Board of Supervisors were asked to visit the area of this project site, which was denied because of Covid. I would like to know how a Board or Commission can be knowledgeable enough to vote on this project, without even touring the site and witnessing first hand how this project will be viewed and received by residents and other travelers?

Also, the \$50,000,000 in tax revenue that the developer is publishing that the County will receive; that is also a falsehood. Since the State of CA shells out to whom and where tax monies are to be distributed, it has been calculated, that the County will only receive 12% of these funds. Also, very few citizens of this County are aware of the shortfalls the County has in their retirement funds, so that is why they are also so anxious to accept any of these projects from foreign countries that are presented and have no interest here other than the "almighty dollar".

I would ask that you do what is good for the County and it's people, as this area is not a proper fit for this project. And it will crush tourism as we see it and it is rated the highest in wild fire risks by the State of California. Please consider what this project will do to this area, and whether you believe it or not, home values can go down from 50-100%, especially since the turbines raise temperatures 8-12 degrees, and our watershed is from Snow Mountain, and eventually when wells dry up below, homes and properties will not sell without a water source. Residents here depend upon wells, streams and creeks for their water source, something those in the city do not have to deal with.

Thanks for your time,

A handwritten signature in black ink that reads "Joan M. DiMaio". The script is cursive and fluid, with the first letters of each word being capitalized and prominent.

Joan M. DiMaio



Anna's Humminmgbird "sitting down on the job"



Anna's Hummingbird nectaring of Rose of Sharon



California Sister Butterfly



Monarch Butterfly



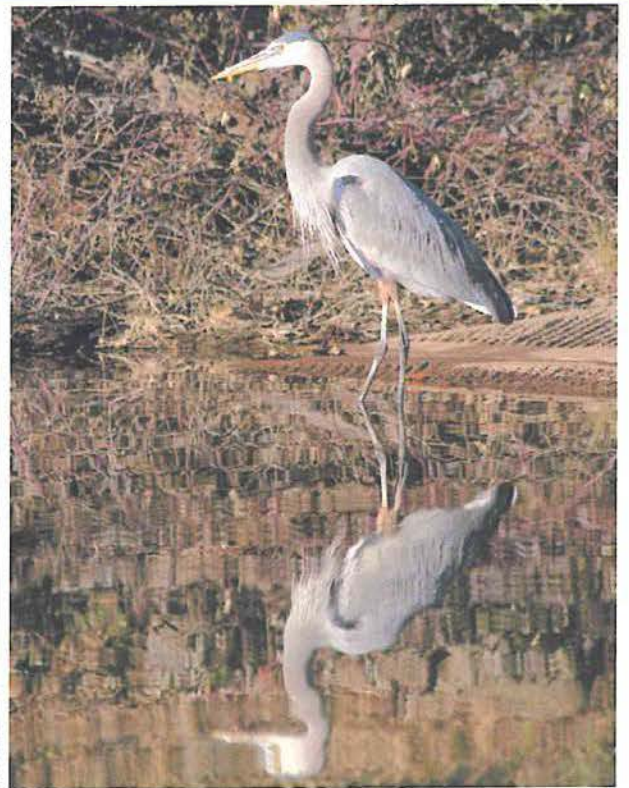
Douglas (Pine) Squirrel



Black-tailed Doe nursing her newborn fawn



Bald Eagles



Great Blue Heron

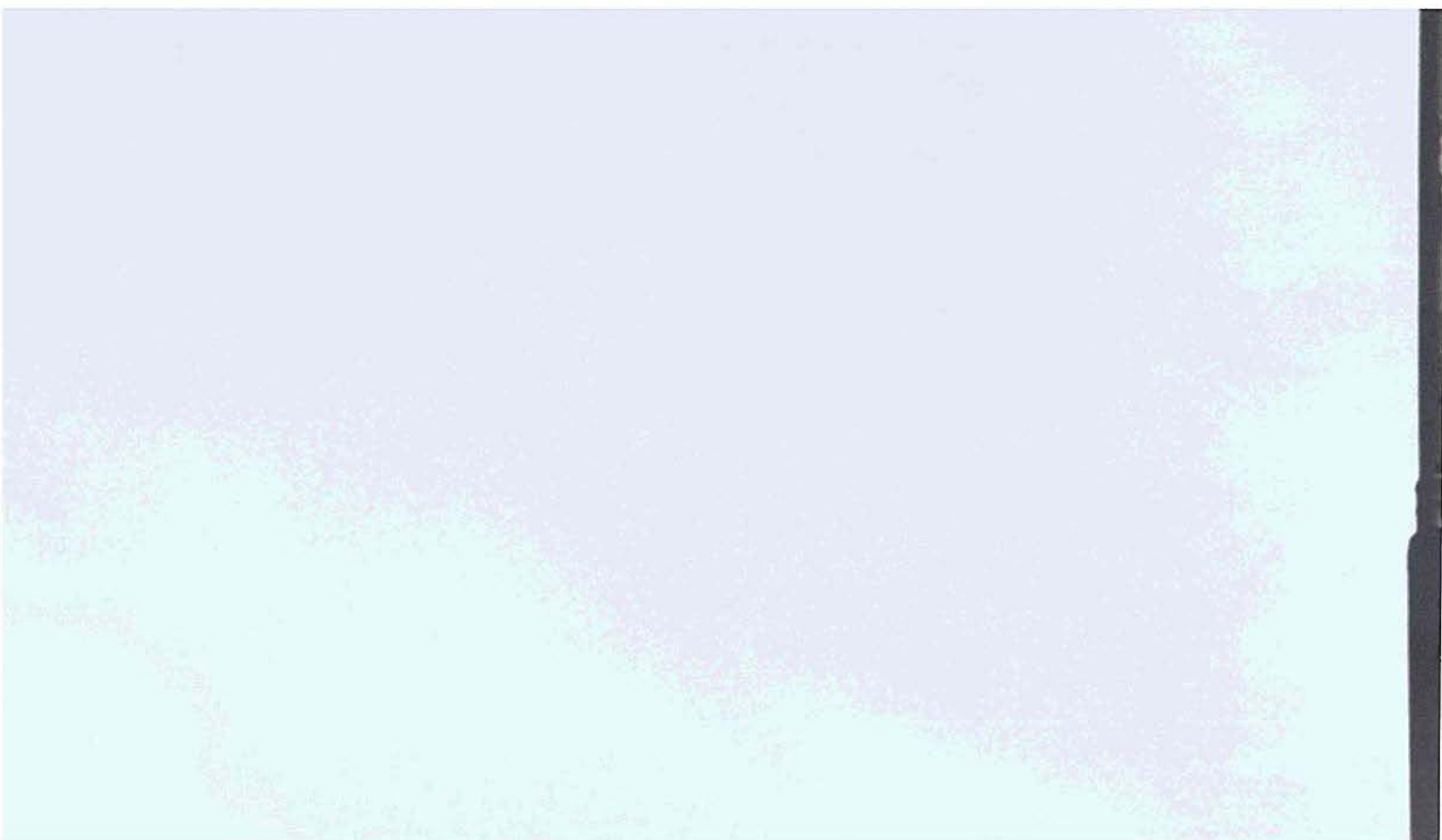


Merganser Duck Family



Mallard Duck Family

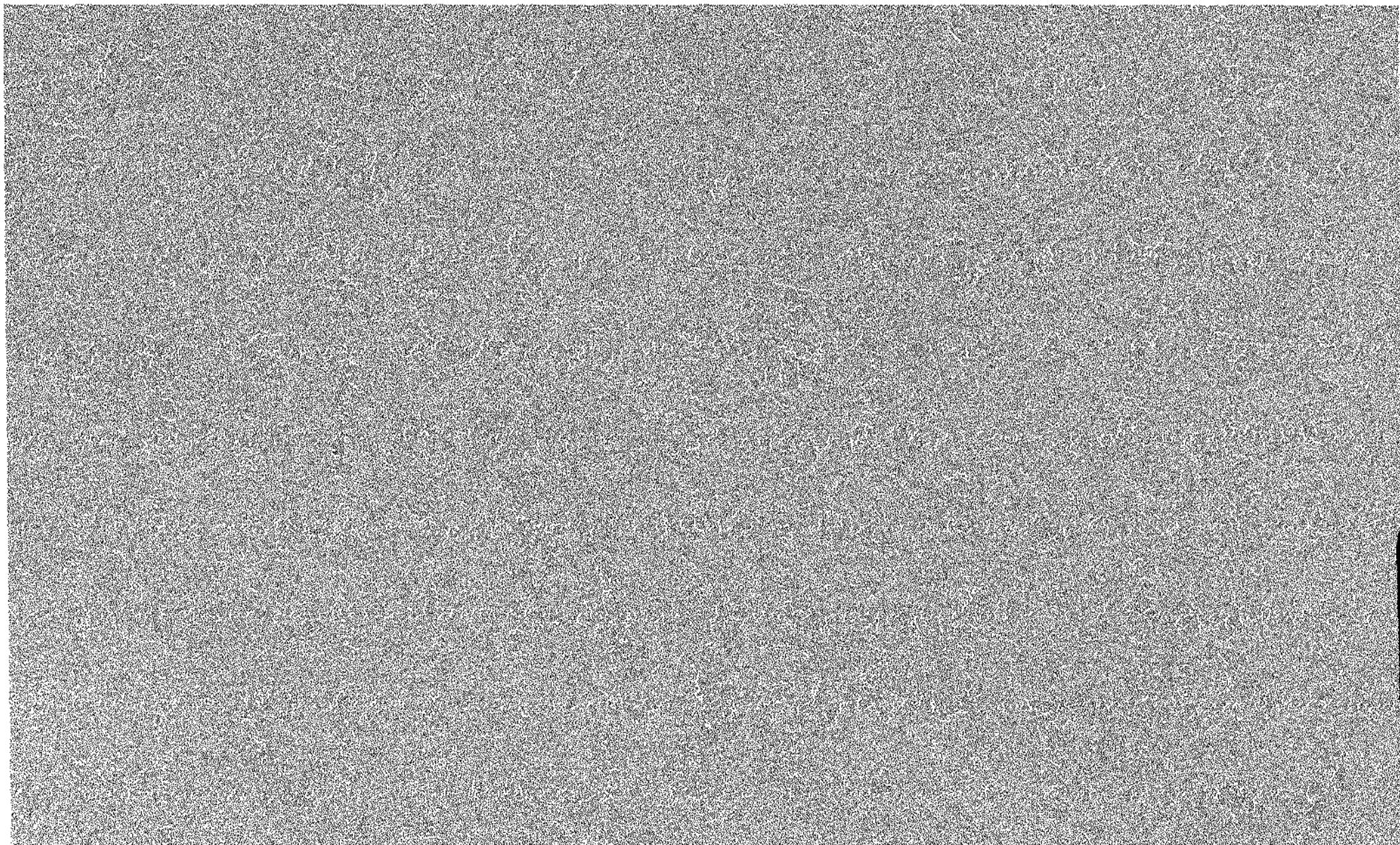
Canadian Geese that have just flown thru the project area. 4-16-2020



Canadian Geese that have just flown thru the project area. 4-16-2020



Canadian Geese that have just flown thru the project area. 4-16-2020



Oct 12, 2020

Don M. Bloom
6904 Beatie Rd.
Anderson Ca. 96007
(530) 945-9800
don.6904@yahoo.com

RECEIVED
SHASTA COUNTY

OCT 15 2020

DEPT OF RESOURCE MGMT
BUILDING DIVISION

Shasta County Planning Commission
1855 Placer St #103
Redding Ca. 96001

Commissioners;

I'm writing this letter to voice my opposition to the proposed Fountain Wind Project. As a proponent of clean and renewable energy I have followed this project closely. To this point I have found the trade offs to be more negative to our over all quality of life then positive. As a person who has lived and worked in the north state for over 60yrs. and has been involved in planning and local government, I find the possible negative impacts to our area unexceptable. The sheer size and scope of this project make the possible negative impacts unreparable for future generations to come.

As you well know, once a project goes through the planning process and is premitted it has a life of its own for good or bad. Please don't make a mistake on this one. A bad decision on this project will have consequences on our community now and forever.

Sincerely,

Don M. Bloom

October 15, 2020

My name is Lindsay Martin and I am against the Fountain Wind Project. My family owns a cabin and property off of Terry Mill road behind the Roseberg gate. There are numerous turbines that are planned to be installed very close to our property. This would have a devastatingly negative effect to our property and the environment surrounding it. After reviewing the DEIR, I am very concerned about the noise of the turbines and how they will affect the wildlife in the area. We all enjoy seeing the wildlife when we go up to the cabin and the building/running of the turbines would ruin that. This project will take away the peacefulness and tranquility of our little oasis.

The cabin has been in our family for many, many years. My grandfather bought it not long after immigrating from Germany to provide for a better life for his family. My dad has spent most of his life up on this property learning how to live and survive in the wilderness. I have enjoyed numerous camping trips and family vacations up there. And now we take our son to the property and teach him about nature and how to appreciate the simple things. I am extremely worried the building of these turbines will ruin the roads around the property, run out the wildlife, and basically wreck a family tradition that my grandpa worked so hard to attain.

Thank you for your time,

Lindsay Martin

Janna Scott

From: Jeanne Danielson <oakrunlbr@gmail.com>
Sent: Monday, October 19, 2020 3:27 AM
To: Fountain Wind Project
Subject: Response to Fountain Wind Project Draft EIS
Attachments: Response to Fountain Wind Project Draft EIS.docx

This may be a duplicate of a message sent yesterday. My computer has problems since the latest PGE PSPS outage. The attached document has been virus scanned by Kaspersky Internet Security.

10/20/2020

Dear Sir or Madam

Please read my letter, which serves as a comment in opposition to the Fountain Wind Project.

Wild places have been here for thousands of years. The interactions between forest and its inhabitants is an incredible program that has grown over millenia and continues to flourish. Much of the beauty in Shasta County is in these hills. Now, a large corporation has thought to buy up 40,000 acres in order to bulldoze the trees, and put up 60 foot man-made towers, miles of power lines and utility road ways. We are faced with a long lasting decision. This is the legacy for the future. To allow this construction is to give permission to the mangling of the areas that surround my property . Event though the acres around this site are private property, the land and its beauty is a shared treasure for all of us.

This project is a contradiction to forest management. Californians have lost millions of acres of forests in the past 3 years, and cannot at this point waste a single acre of productive forest. The incredible loss of habitat has devastated herds and populations of the creatures that have lived in these hills for lifetimes. We must manage our forests, which includes managing areas to stay wild; planning for small fires to burn through and remove understory; and leaving the dirt uncompacted so water from rain can percolate into the subsoil. Putting these windmills in this place is wrong. It will remove more trees when we need to think of how to manage to keep the trees we have. It will compact the soil, and scare away the wildlife. And it will further exacerbate the forest fire suppression problem, as natural fires will not be allowed to burn through this area from now on in case of damage to the windmill equipment. Any changes to the area should be for the betterment of the area, or at least have no impact.

These gigantic pieces of metal and their conjoined power lines are an accident waiting to happen. When a windmill motor fails, it starts an intensely hot fire. As we've seen, at certain times of year, a hot spot can be catastrophic and lead to an inferno that can wipe out small towns. Paradise, CA was just a little larger than Burney, CA is today.

The area around Burney is a gorgeous, scenic place. It is one of the prettiest places that we have preserved in this area. Capitalizing on a piece of this wonderland is a violation of the inherent rights of all who live and breathe here. Remember these hills have been growing and thriving for generations. What will happen in 30 years, or 150 years, when this power company no longer uses the windmills, and our technology has evolved. What can we say we did with this decision? Parceled up the forest and sold it for a few years of industry or stood up for what is right. We're not for sale. Put the windmills up somewhere where the cost is not the trees, or the wild spaces.

Sincerely,
Rebecca Holden

Shasta County citizen

Lio Salazar

From: Rick Kauer <rickkauer@gmail.com>
Sent: Wednesday, October 21, 2020 12:13 PM
To: Rita Kauer
Cc: Fountain Wind Project; Shasta County BOS
Subject: Re: Fountain Wind Project/Moose Camp

I think it's perfect!

On Wed, Oct 21, 2020 at 12:02 PM Rita Kauer <ritakauer@hotmail.com> wrote:

To Whom it May Concern;

We are writing this letter to you to express our deep concern regarding the Wind Project - as it effects our Recreational Community - Moose Camp. As a community we have been fighting this project, not so much as stopping the entire project but stopping the wind mills that surround our community.

Moose Camp Recreational has been there since the 1920's. It is NOT a camping ground where people come and set up tents etc it is an actual community with over 50 cabins, with a rich history of community, enjoyment and support for each other. In other words it is a sanctuary for all of us away from the realities of life. We do not want to see that our beautiful forests that surround us marred by huge wind mills.

In addition, we do not feel that Moose Camp was given serious consideration in the Enviromental report for the following issues were never considered:

1. Designated "KOP" (Key Observation Point) within Moose Camp - photo simulations and accompanying comments for only neighborhood within project boundaries.
2. Maps that show the 50 Moose Camp residences in relation to proposed wind turbines with distances from turbines noted
3. Photo simulations and accompanying comments of all turbine views (every turbine that would be visible from a car along the route) of what drivers will see on Highway 299 driving from Round Mountain all the way to Burney and from Burney all the way to Round Mountain.
4. Any mention of how wind turbines will affect Moose Camp helipad operation
5. How wind turbines would affect CALFire ability to fight fires with helicopters and tanker planes?
6. What effects of a large wildfire would be on residents of the surrounding area if wind turbines were to burn down? Specifically air quality effects from melted turbines?
7. Effects of blasting along with construction and heavy use of roads surrounding Moose Camp on our 3 wells and water table in the area.
8. Specific use of Moose Camp road and Moose avenue during and after construction of the project. How many trips and what kind of vehicles.
9. The noise for months and months disrupting our community. When everything is so dry how can you safely build without fear of starting fires.
10. These are some of our main and important concerns that need to be addressed in the report. We just don't see how a project that will be so massive of an invasion to our land, when we won't even be using the power generated, is a good thing. We know that there are massive money credits etc being thrown out there but that is a short -sided goal when the long term problems need to be looked at too. Please take our concerns seriously, Moose Camp along with the smaller towns

may be just small in your map but it is a place many call home. There is a lot of land out there away from communities - go build on them

~Rita Kauer and Richard Kauer, Moose Camp

Andrew Meredith
Executive Director
North State Builds
900 Locust Street #2
Redding, CA 96001

October 21st, 2020

Lio Salazar
Senior Planner
Shasta County Department of Resource Management
1855 Placer Street, Suite 103
Redding, CA 96001



RE: Fountain Wind Project

Dear Mr. Salazar,

On behalf of the thousands of skilled tradespersons and hundreds of affiliated contractors associated with North State Builds, I am writing to opine on the proposed 'Fountain Wind Project' in eastern Shasta County. For reference, our organization is a partnership of California's three most northern Building & Construction Trades Councils, all of whom are affiliated with the California State Building & Construction Trades Council. We are the largest coalition of skilled and trained workers, affiliated construction trade unions, and qualified contractors in Northern California.

We would like to first commend your department, and the County of Shasta as a whole, for so diligently and thoroughly evaluating the environmental issues associated with this project. We believe you've identified several approaches that minimize and mitigate issues; you've even applied appropriate avoidance measures where warranted. Collectively, these efforts have helped create a project that we believe is compatible with the important objectives of CEQA, while addressing the interests of third parties.

In terms of benefits, this project checks so many boxes for Shasta County. Any perceived environmental issues will be greatly offset by the increased property tax base, an increase to our county sales-tax revenues, and direct economic investment by the project applicants through community programs. In terms of job creation, the applicant has committed to prioritizing the employment of local, skilled and trained workers for the construction phase of the project. Such an approach guarantees the workers will earn area-standard wages that will turn over many times locally, maximizing the economic impact. By hiring local, they will also be minimizing the carbon footprint of the construction portion of the project.

With all the previous being said, we support this project whole-heartedly as proposed. We also support associated mitigation measures that provide a level of flexibility in design and construction, which can further reduce impacts, reduce carbon emissions, and possibly generate more renewable energy. This project has been studied extensively for multiple years; now is the time to approve this project. The applicant has also reduced the project size numerous times in direct response to the feedback received through exhaustive public outreach. They have gone above and beyond, in our opinion, to 'right-size' the project and maximize its positive impacts in Shasta County.

Our local labor force is ready and willing to undertake the construction of this monumental project for the region. We are excited about seeing this project break ground soon!

Respectfully,

A handwritten signature in black ink, appearing to read "Andrew Meredith", is written over a light blue circular background that matches the North State Builds logo.

Andrew Meredith
Executive Director
North State Builds

www.northstatebuilds.com

State Building and Construction Trades Council of California

ROBBIE HUNTER
PRESIDENT

J. TOM BACA
SECRETARY-TREASURER

Established 1901
Chartered by
BUILDING AND CONSTRUCTION TRADES
DEPARTMENT
AFL - CIO

October 21, 2020

Mr. Lio Salazar, Senior Planner
Shasta County Department of Resource Management
1855 Placer Street, Suite 103
Redding, CA 96001

RE: Fountain Wind Project - SUPPORT

Dear Mr. Salazar:

On behalf of the 450,000 working men and women of the Building Trades, including 68,000 apprentices, I write in support of the Fountain Wind Project in eastern Shasta County.

The Fountain Wind Project will provide much-needed local employment while providing critically important clean energy for the residents of Shasta County and the state of California as a whole. Indeed, this need for clean energy has been highlighted by the recent statewide electrical blackouts and alerts.

California is moving forward with solar, geothermal, pump storage, biomass, and, of course, wind turbine power generation. Working together, using our own natural resources, we can meet the challenges of climate change, provide energy to the residents of California, and create jobs for our citizens.

Thank you for your consideration of this project.

Sincerely,



ROBBIE HUNTER
President

RH:bp
opeiu#29/afl-cio



5800 Airport Rd., Redding, CA 96002
530-221-5556

October 21, 2020

Lio Salazar, Senior Planner
Shasta County Resource Management Department
Planning Division
1851 Placer Street, Suite 103
Redding, CA 96001

Re: Fountain Wind Project DEIR

Dear Mr. Salazar:

The Shasta Builders' Exchange, a not for profit organization representing the construction industry of Shasta County since 1955, has reviewed the Draft Environmental Impact Report for the Fountain Wind Project (Use Permit 16-007). Our organization looks forward to commenting on this project, with the intent to support the approval of the Fountain Wind Project, at the Planning Commission Public Hearing to be held later this year or early in the next year.

Thank you for accepting this comment letter. We appreciate your time and consideration.

Kind regards,

Chad Scott
Executive Director
Shasta Builders' Exchange
530-221-5556
chad@shastabe.com



P.O. Box 492794, Redding, CA 96049
(530) 222-5251

October 21, 2020

Lio Salazar, Senior Planner
Shasta County Resource Management Department
Planning Division
1851 Placer Street, Suite 103
Redding, CA 96001

Re: Fountain Wind Project DEIR

Dear Mr. Salazar:

Our organization, Shasta VOICES, is a strong non-profit private-sector business group with over 1,300 members and supporters who live and work in the Shasta County area, advocating for a stable and sustainable economic future in our community.

This letter is in response to the noticed public review period of the Draft Environment Impact Report for the Fountain Wind Project. Our comment at this time is to let you know that we are looking forward to making a factual, supportive presentation at the upcoming Planning Commission meetings on the proposed project, having performed a good deal of research on the subject.

We will look forward to receiving our confirmed receipt of this letter by email, as stated in the public notice, and all future public notifications regarding scheduled Planning Commission hearings for the proposed project.

Thank you for accepting this comment letter.

Sincerely,

Mary B. Machado
Executive Director
On Behalf of the Board of Directors
Phone: (530) 222-5251; Email: mary@shastavoices.com

Lio Salazar

From: Karen Sublette <ksublette@gmail.com>
Sent: Wednesday, October 21, 2020 2:53 PM
To: FountainWind411@esassoc.com; Lio Salazar
Subject: Buffum homestead land

To whom it may concern,

I have written before (see below), as have many of my cousins. Please do not allow the Fountain Wind Project to devalue our Buffum Homestead land.

Thank you.

Karen Sublette
(formerly Karen Sublette de Valdés)

Fountain Wind Project

Inbox



Karen Sublette <ksublette@gmail.com>

Fri, Feb 2

to Isalazar



The Fountain Wind Project may affect the Buffum Homestead, my family's land, which is the northwest quarter of section 22. I own the northwest quarter of that homestead. My great-grandparents homesteaded there, over a century ago. Six generations of our family have used and shared it, over the years.

We get together, there, in the summers, some of us (myself included) used to spend whole summers, there. Since our cabins were burned, in the Fountain Fire, of 1992, we have camped on the land we grew up enjoying. Our children and grandchildren now spend time there, too. We all value that land, its beauty, the flora and fauna, clear air, and freedom from noise and light pollution. I am worried that the sound and sight of the huge wind turbines will interfere with what we value.

My son manages the water, from Buffum creek which flows through my land, and is diverted, during the warmer months, to bring water to our family's campsites and to water the seven acre meadow. That water has been clean, drinkable, and sufficient to keep the meadow green and provide for our needs. I am concerned that Buffum creek or the springs that feed it may be disturbed by the project.

While I don't know enough about the effects of these large turbines on the land and animals in the area, to have a clear opinion of whether they are dangerous, or to what degree, I am concerned about the bats and birds that might be harmed by them.

I know other members of the family have written to you. Please take our concerns into account, and help protect our family's homestead.

Thank you.

Karen Sublette
1432 Sardine Creek
Gold Hill OR 97525
541 855-7839

Lio Salazar

From: Lon Alward <lon@uslendingcompany.com>
Sent: Friday, October 23, 2020 9:13 AM
To: Fountain Wind Project
Subject: RE: Wind Project

This should be enough to turn the project down??

https://www.bloomberg.com/news/features/2020-02-05/wind-turbine-blades-can-t-be-recycled-so-they-re-piling-up-in-landfills?fbclid=IwAR2sdRjvHDMnf879kGAN6p14J5Efl_pxp_9WbS_TtTtW82XwZNUeur4odgk

Lon Alward | Loan Officer

NMLS 284494 | CA-DOC284494 | AZ 0941088 | ID MLO-20907 | OR 284494

Direct 530.605.4870 **Cell** 530.515.1086

Office 530.244.6830 **Fax** 530.222.3270



2280 N. Bechelli Lane, Redding, CA 96002

lon@uslendingcompany.com

In an effort to reduce COVID-19 our office will be temporarily closed to outside guests.

If you have documents to drop off, please use the mail slot or the locked box out front.

Thank you & Stay Healthy

APPLY ONLINE NOW



SEND FILES SECURELY





your path home.

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From: Fountain Wind Project <fw.comments@co.shasta.ca.us>

Sent: Wednesday, September 9, 2020 11:01 AM

To: Lon Alward <lon@uslendingcompany.com>

Subject: Automatic reply: Wind Project

External Email This email originated outside our company's email system. Do not trust the content if the sender is unknown.

Thank you for submitting a comment in response to the Fountain Wind Project Draft Environmental Impact Report (DEIR) Notice of Availability.

A Final Environmental Impact Report (FEIR), including a response to comments received during the DEIR comment period, will be prepared prior to any decision making for the project. Additional public input opportunities will be provided as part of the decision making process to occur after the FEIR is prepared, including the opportunity to provide written and oral comments to the Shasta County Planning Commission as to whether the Commission should certify the Environmental Impact Report (EIR) and approve or deny the use permit (UP16-007) for the project. A public notice of all hearings before the Commission will be made in accordance with applicable law.

If you are interested about knowing more about the DEIR, FEIR, and decision making process, please visit the Fountain Wind Project EIR website at the link below and click on the process graphic banner. In addition, if you are not already receiving project updates via e-mail and would like to receive them, please subscribe by emailing FountainWind411@esassoc.com. Finally, if you are not currently receiving project related public legal notices by mail, you may request that project related public legal notices be sent to your mailing address by contacting Lio Salazar using the contact information below.

Please note that this mailbox is for Fountain Wind Project Draft Environmental Impact Report comments only. Messages addressing general questions or requests for assistance that are submitted to this mailbox will not receive a response. For general questions or assistance, please contact Lio Salazar, Senior Planner by telephone at (530)-225-5532 or by e-mail at lsalazar@co.shasta.ca.us.

<https://www.co.shasta.ca.us/index/drm/planning/eir/fountain-wind-project>

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Lio Salazar

From: Kathy Willett <kbwillett@gmail.com>
Sent: Monday, October 26, 2020 7:58 PM
To: Lio Salazar
Subject: One last comment

I hope the time delay will not take away from the sentiment below. Yet another power outage where PG&E says all clear and yet no power restored to the area at the Fountain Wind Project! You have put our area through enough grief, inferior service and danger to last a lifetime. Don't even think of adding to our problems with your ridiculous turbines! No power tonight in the freezing cold, your planning commissions first priority should be to keep our power on! An anonymous quote:

Dear PG&E - screw you! Do not send me a text telling me that the weather is all clear and act like you are going to try and restore my power when you know i will be the last area you go to. I am not stupid enough to believe that when the bay area gets the all clear in the morning I will be your top priority. But please have your helicopter pilot land in my field come in the house and defrost the frozen corpses in here or at least let the authorities know. I guess you decided for us - we can burn to death or freeze to death (at least those of us who live in mountains). Thanks for making that choice for me and sending all your money to the Dems in California so that we can continue to live in a 3rd world country that thinks putting wind power in forests prone to catching fires (that will have to be turned off during these events can spark more fire and destroy the natural storage of carbon is an innovative idea that will solve all our problems). Sounds brilliant... so glad your money is going to those politicians and causes instead of fixing your equipment.

Sentiments courtesy of:
Kathy Buffington Willett
Round Mountain, CA

Sir

As a Resident of Round Mt I'm apposed to the windmills proposed for this area. Some Reasons are the Devistation of life as we know it, The forest, water, animals, peace and beauty of the area. We have little or nothing to gain and much to lose by this being allowed. My hope is it will not be allowed.

Thank You for
your consideration
Respectfully

Dennis Venema
PO Box 287
Round Mt, CA 96084

Dear Mr. Lio Salazar:

I am the great great grandchild and landowner of the original Buffum Homestead in Shasta County. I am writing to show my objection to building the wind turbines in close proximity to our Homestead.

My relatives built the Homestead in the 1890s and developed the land. We have continued to develop the land over the decades. I personally have spent a lot of time and money maintaining our original water rights through legal counsel, digging ditches and laying pipes. Each of us has done something to improve the land over our lifetime, despite being scattered across the United States.

You may wonder why we work so hard on these 160 acres of land during our vacations. You see, our forefathers established within us, a love of the land, the love of God and the love of family. We have met on this mountain every year since the 1890s except the year that there was gas rationing and the family didn't have the gas to get there. We fly from Colorado, New York, Michigan; drive from Oregon and from all over California to enjoy God's country, have spiritual renewal and build relationships. We do this on the 160 acres that our forefathers left to us, as a beautiful gift to be treasured and guarded.

You have gathered volumes of evidence about what the wind turbines do to birds, insects as well as the other wildlife. You know that these turbines are an eye sore. Do we really want to destroy this beautiful mountainous land? No, we don't. In Colorado, we put the turbines out on the prairies and not the scenic Rocky Mountains. I ask that the same be done in California. We want to preserve our beautiful land and continue to make it better.

Despite the horrible fire that raged through our land in 1992, we rebuilt the Homestead. We still come out each year and have become a stronger family. We spend thousands of dollars each year to gather together as the Buffum Clan. If you put these wind turbines on our land, the peace, beauty and nature will all be diminished so much that a lot of us will be less likely to come. This land is more than 160 acres of property, it is our roots, our place of peace and refuge and our place of much love. Please help us protect it.

Sincerely,

Anne Marie Woodward M.D.

RECEIVED

SEP 18 2020

September 16, 2020

COUNTY OF SHASTA
DEPARTMENT OF

Department of Resource Management
Planning Division
1855 Placer Street, Ste. 103
Redding, Ca. 96001

Re: Hatchet Mountain "Wind Farm" Expansion
(AKA. "Fountain Wind")

Dear Sirs:

This letter is to express my strong opposition to any plans for expansion of a "wind farm" in the area of Hatchet Mountain.

I own property, pay taxes, and have lived in this area for over sixty years. My opposition to this proposal is based on research that documents economic impacts to surrounding communities due to reduction in land values, harm to wildlife as habitats are destroyed to build huge, unsightly towers, use of fuel generated blades that are Not biodegradable after their 30 year lifespan, and the mis-allocation of energy produced by these destructive machines to large urban areas so that they can keep street lights on all night.

I have lived through the Fountain Fire in 1993 and watched the area struggle to regenerate biologically and economically. Please do NOT destroy all the progress by allowing corporate greed from businesses out-of-the-area to provide false promises of "green" energy. Thank you

Sandra Willburn

- Sandra Willburn
17262 Donn Lane-Round Mountain

Appendix D

Letter Exhibits

- D1. Exhibit to Letter T2, Tony Yiamkis
- D2. Exhibits to Letter P20, Steven L. Johnson
- D3. Exhibits to Letter P21, Beth Messick
- D4. Exhibits to Letter P27, Margaret Osa
- D5. Exhibits to Letter P45, Kelly Tanner

D1. Exhibit to Letter T2, Tony Yiamkis

10/12/2020

Alternative Wind Turbine Locations - ANSI Blog

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Alternative Wind Turbine Locations

📅 March 31, 2016 (<https://blog.ansi.org/2016/03/alternative-wind-turbine-locations/>) 👤 Brad Kelechava
(<https://blog.ansi.org/author/brad-kelechava/>) 💬 Leave a comment (<https://blog.ansi.org/2016/03/alternative-wind-turbine-locations/#respond>)

As we discussed in our post on local opposition to wind energy projects (<http://ansidotorg.blogspot.com/2015/12/local-opposition-to-wind-energy-projects.html>), the majority of people in the United States support renewable energy but do not prefer to have windmills located near them. This is demonstrated by complaints of the noise from a spinning wind turbine, the perception that windmills are ugly and obstruct otherwise natural and beautiful views, and other outrages that some might say derive from a NIMBY (Not In My Backyard) attitude. A potential solution to this issue could be to install wind farms in certain locations where their sound and appearance isn't likely to become a problem.

Wind Turbines in the Desert

The word "desert", just as its synonymic verb counterpart, came to English through the Old French derivation of the Late Latin *desertum* (<http://www.etymonline.com/index.php?term=desert>), meaning "thing abandoned". Since deserts house smaller populations than other geographic regions, while occupying one-fifth of the world's land (<https://biomee.wikispaces.com/Desert+Biome>), it makes sense to install wind turbines in them. A smaller population could mean less people to complain.

T2-7

10/12/2020

Alternative Wind Turbine Locations - ANSI Blog



(https://blog.cachefly.net/wp-content/uploads/2017/09/iStock_000008784965_Small.jpg)

Some deserts already support active wind farms. The Desert Sky Wind Farm (<http://www.desertskywind.com/>) in Texas consists of 107 wind turbines that are rated 1.5 megawatts each. This produces enough power for 40,000 homes.

Concerns – the majority of the population doesn't reside in or near a desert, so the energy demand is not as high as it is in other areas. That being said, there is still a notable need for energy in desert climates, since temperatures are much higher on average than they are in temperate climates. Another issue is the fact that this desert real estate might be better suited for solar power arrays, due to the extreme levels of sunlight.

Wind Turbines in the Mountains

At higher altitudes, there are stronger winds. In addition, the elevation gradient of hilly areas might allow wind turbines to be placed closer together (<http://www.renewableenergyworld.com/articles/2012/07/should-the-wind-turbine-industry-head-for-the-hills.html>) than they normally would, increasing the maximum potential electricity in an area of land. These qualities, combined with the limited population living in mountainous areas, makes mountain regions very suitable for wind energy.

T2-7
cont.

10/12/2020

Alternative Wind Turbine Locations - ANSI Blog



(https://blog.cachefly.net/wp-content/uploads/2017/09/iStock_000000482016_Small.jpg)

Concerns – wind farms located in the mountains might also be ideal candidates for public complaints on the obstruction of nature. While less people live in mountainous areas than coastal regions, there is still a population that can notice the alterations that the windmills make on an appreciated natural landscape.

Wind Turbines in Airports

Airports are quite obviously manmade features that can occupy a considerable amount of space. Since they are already relatively lacking in nature, as well as being significant sources of noise pollution, they might also be ideal for wind farms. The airports themselves can make use of the electricity, or it can be brought to the grid of a nearby city.

T2-7
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10/12/2020

Alternative Wind Turbine Locations - ANSI Blog



(https://blog.cachefly.net/wp-content/uploads/2017/09/iStock_000020373655_Small.jpg)

The Galapagos Ecological Airport (<http://www.cnn.com/2015/08/04/travel/galapagos-ecological-airport-wind-and-solar-power/>) was made to be overwhelmingly green, befitting the huge biodiverse history of the Galapagos Islands. Among the immense, environmentally friendly resume of this airport of solar panels, endemic plant species, and ecologically responsible furniture, there are windmills on-site.

Concerns – these windmills have to be very carefully placed, and there might be many limitations on their specific locations. Windmills tend to capture more energy at greater heights, but those same heights could interfere with planes landing and taking off.

Wind Turbines off Highways

Highways and other major roads are also manmade features that stretch miles and miles throughout the world. Placing windmills near them keeps engineered turbines near engineered cars and roads, where there is already a lot of noise.

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10/12/2020

Alternative Wind Turbine Locations - ANSI Blog



(https://blog.cachefly.net/wp-content/uploads/2017/09/iStock_000001770903_Small.jpg)

Concerns – while highway-based windmills are not necessarily placed in the middle of somewhere natural, some might find them to be obstructing their view of surrounding features. A long car drive through the country might be a little different if all you can see out your window are spinning white blades.

Wind Turbine Standards

The construction of these alternative windmills is covered from the variety of existing standards on wind energy. They address a wide range of considerations that come with their design. For example, ISO 12494:2017 – Atmospheric icing of structures (<https://webstore.ansi.org/RecordDetail.aspx?sku=ISO+12494%3A2017&source=blog>) would be applicable for wind turbines located in mountains and other places consistently exposed to lower temperatures. For more general purposes, IEC 61400-1 ED. 3.0 B:2005 – Wind turbines – Part 1: Design requirements (<https://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61400-1+Ed.+3.0+b%3A2005&source=blog>) and IEC 61400-2 ED. 3.0 B:2013 – Wind turbines Part 2 Small wind turbines (<https://webstore.ansi.org/RecordDetail.aspx?sku=IEC+61400-2+Ed.+3.0+b%3A2013&source=blog>) cover windmill design.

Please visit the ANSI Webstore to learn more about Wind Turbine Standards
(<https://webstore.ansi.org/energy/wind-turbine/default.aspx?source=blog>)

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Wind Turbines (ANSI/ASSP A10.21-2018) (https://blog.ansi.org/2018/08/standard-construction-wind-turbine-assp/)	Total Wind
(https://blog.ansi.org/2018/05/total-wind-power-capacity-turbine-database/)	Power Capacity, According to the
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A Holistic Approach for Wind Farm Site Selection by FAHP

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¹*Istanbul Technical University, Environmental Engineering Department*

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Turkey*

1. Introduction

In recent years an increasing number of countries have implemented policy measures to promote renewable energy. However, the most important problem that the policy makers face with is the conflicting linguistic terms and subjective opinions on energy and environment policy. As the environmental policy and energy policy always go hand in hand, it is quite clear that wind as a renewable resource should be competitive with conventional power generation sources. From technical, environmental, socio-economical and socio-political standpoint, wind power is the most deserving of all of the cleaner energy production options (geothermal, solar, tidal, biomass, hydro) for more widespread deployment. Although wind power is a never ending green resource, assessment of environmental risks and impacts- which comprise the backbone of environmental policy- in the context of specific projects or sites often are necessary to explicate and weigh the environmental trade-offs that are involved. In the case of wind farms, a number of turbines (ranging from about 250 kW to 750 kW) are connected together to generate large amounts of power. Apart from the constraints resulting from the number of turbines, any site selection should think over the technical, economic, social, environmental and political aspects. Each aspect uses criteria for its own evaluation. Decision making by using multi criteria decision analysis is an attractive solution for obtaining an integrated decision making result. Although Lee et al. (2009), Kaya and Kahraman (2010) and Tegou et al. (2010) has studied wind farm site selection by using different kinds of Analytic Hierarchy Process (AHP), Cheng's extent analysis of Fuzzy AHP (FAHP) is used in this study and a holistic hierarchy were developed.

The analytic hierarchy process (AHP) is a multi-criteria decision making tool to deal with complex, unstructured and multi-attribute problems. This method is distinguished from other multi-criteria methods in three ways: I. Construction of the hierarchy structure II. Pair-wise comparisons of different criteria III. Weighing with respective to the overall objective. In AHP, decision makers quantify the importance of criteria by using Cheng's 1-9 scale. To overcome the disadvantage of reluctant and inconsistent comparison judgments, fuzzy analytic hierarchy process (FAHP) might be used on each factor to determine the weight of

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Technical factors are related with the suitability of site for wind energy production. An average wind speed must be sustained in the area in order to product wind energy. Land topography and geology must ensure some specifications for tribune construction. Tribune size is also a distinguishing factor, because it changes region to region due to some regional differences. Additionally, wind farm sitting depends on existing grid structure and connection conditions for transmission process. Capital costs such as construction, equipment e.g., land and operational & management costs change from site to site based on site specifications. Electricity market in the region will affect the capacity of the farm directly. Incentives provided by some regional governance can determine the attractiveness of the site for wind farm due to economic reasons. When the wind energy production process evaluated in a systematic manner, it is seen that possible environmental impacts are related with noise, aesthetic, wild life and endangered species near wind farm site and electromagnetic interference. Socio-political aspects consist of regulating barriers, public acceptance, land use in the area and distance from residential area. Regulatory actions differ for regions and set some restrictions or incentives related with the sitting wind farms such as limitations for distance from grid or land use in the area. As a party of wind farm projects, public may oppose wind farm sitting due to some regional specifications such as environmental aspects. Alternative and especially existing land use options in the region might reduce or increase the suitability of wind farm sitting such as being a touristic or strategic region. More factors could be added to or some factors could be eliminated from hierarchy based on the need of analysis or characteristics of the sites that are being evaluated.

In conclusion, although wind is one of the renewable energy sources and have begun to be preferred commonly; wind farm sitting must be evaluated with a holistic approach by considering all of the aspects such as technical, economic, environmental and socio-political in order to integrate energy policy with environmental policy for sustainable environment.

2. Wind farm

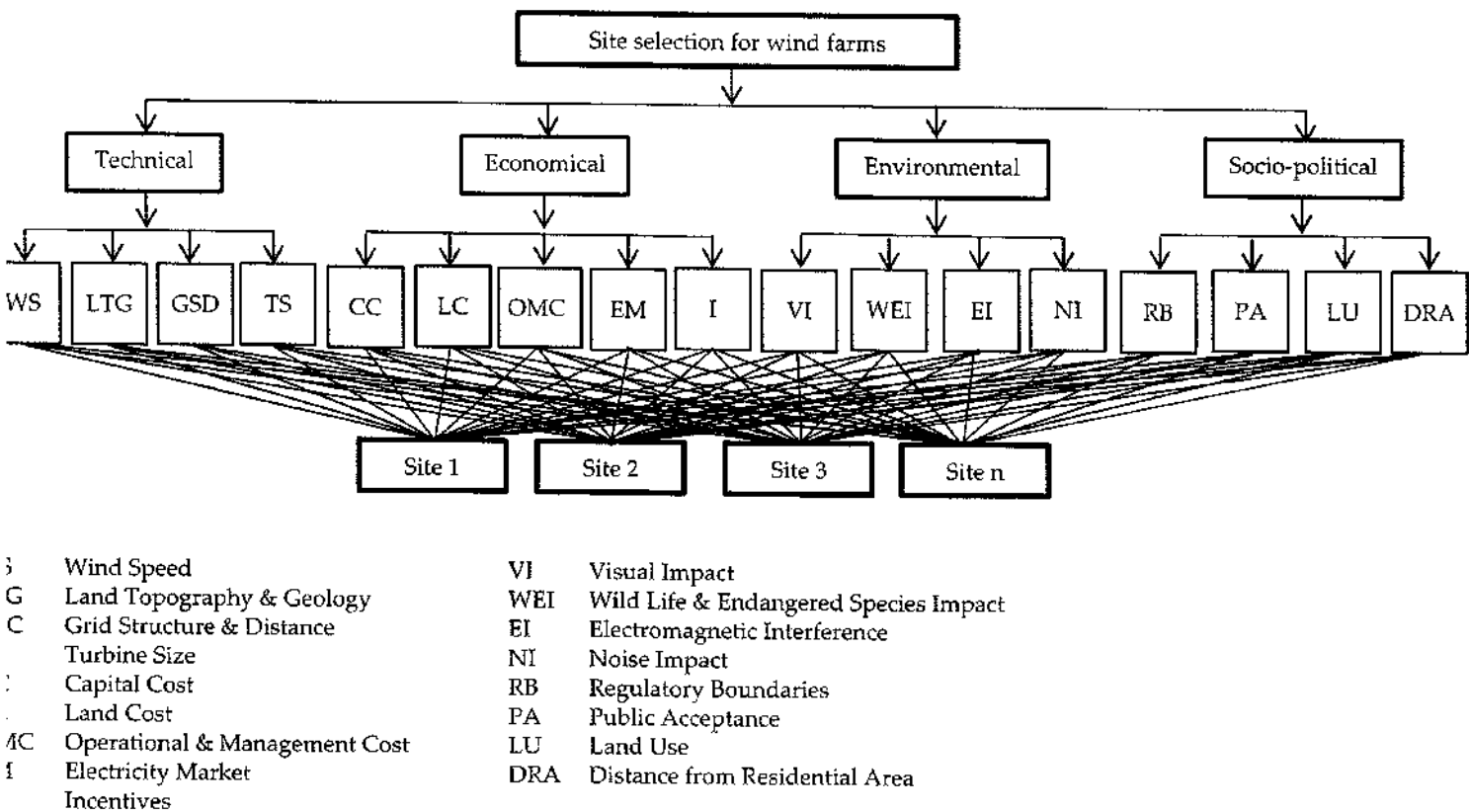
In recent years, many people have recognized the value of wind power as a major renewable energy source of long term; because wind is free, clean and renewable. Thus, using wind power helps to reduce the dependence on traditional fossil fuel based power generation. This in turn ensures the environmental sustainability and security of supply. Furthermore, wind energy is reported to be close to become financially self-sustaining without the extensive governmental support (Welch and Venkateswaran, 2009).

Wind energy can be harnessed by a single wind turbine or several power generating units which are commonly called as wind farm. A wind farm has the following components:

- wind turbines
- towers
- transformers
- internal access roads
- transformer station
- transmission system connecting the facility to the national grid (UNDP, 2010).

The blades of the turbine collect the kinetic energy of the wind. Flow of the wind over the

T2-7
cont.



expected wind power capture, increased maintenance costs, and so on (Kusiak and Song, 2010). Finding a wind farm site is so critical that the site is required to maximize the energy production and minimize the capital cost (EWEA, 2009). The decision of which areas to consider for siting wind farms and where to place wind turbines is a complex study involving not only technical considerations, but also economic, social and environmental requirements (Tegou et al., 2010). This complexity is resulting because of the combination of obstacles in siting process including environmental, topographic and geographic constraints, public opposition, regulatory barriers etc.

2.1 Technical considerations

Many technical factors affect the decision making on site selection including wind speed, land topography and geology, grid structure and distance and turbine size. These technical factors must be understood in order to give pair-wise scores to sub-factors.

2.1.1 Wind speed

The viability of wind power in a given site depends on having sufficient wind speed available at the height at which the turbine is to be installed (Vanek and Albright, 2008). Any choice of wind turbine design must be based on the average wind velocity at the selected wind turbine construction site (Ucar and Balo, 2009). In most of the countries, meteorological stations may provide average wind velocity data and wind maps for the regions. Cubic wind speed directly related with the energy generation potential of wind. Site's wind energy potential can be formulated with the wind power density which represents the effect of wind speed distribution and wind speed. Wind speed data must be recorded for at least 1 year in order to have mapping for potential energy yield over site. WindPro, WAsP, MesoMap are most widely used wind source mesoscale mapping software that use a variety of parameters in order to combine weather and wind flow models (Ozerdem et al., 2006).

2.1.2 Land topography and geology

The speed and the direction of wind can be various depending on the characteristics of topography (Brower, 1992). Wind farms typically need large lands. Topography and prevailing wind conditions determine turbine placement and spacing within a wind farm. In flat areas where there is nothing to interfere with wind flow, at least 2600-6000 m²/MW may be required (Kikuchi, 2008). More land may be needed in areas with more rugged or complex topography and/or wind flow interference. Wind turbines are usually sited on farms that have slope smaller than 10-20% (Baban and Parry, 2001). Garrique or maquis are more advantageous than forests as land cover for wind farm sitting (Tegou et al., 2010). It would be needed to clear and grade land in order to provide roads for trucks, constructions trailer or equipment storage area, access to construction site. Soil stability, foundation requirements, drainage and erosion problems must be assess by conducting geotechnical study (Ozerdem et al., 2006).

2.1.3 Grid structure and distance

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cont.

power quality. The impact depends primarily on the degree to which the intermittent source contributes to instantaneous load (i.e. on power penetration). At low penetrations, wind farms can be connected to the grid as active power generators, with control tasks concentrated at conventional plants. Many studies agree that penetrations of up to 10-20% can be absorbed in electricity networks without adversely affecting power quality and needing extra reserve capacity (Weisser and Garcia, 2005). Grid distance is one of the 10 most important steps that were determined by American Wind Energy Association (AWEA) for wind farm building (AWEA, 2007).

2.1.4 Turbine size

Required height for the installation of turbine above ground is one of the important factors that affect the annual energy generation (Herbert et al., 2007). Turbine size is related with the energy output, because the bigger the turbine size is, the more wind it is exposed to. However, bigger turbines need bigger turbine towers which can be limited with construction and maintenance related with site dependent specifications (Munday et al., 2011).

2.2 Economic considerations

The economic sub factors that affect the site selection include capital cost, land cost and operational and management costs. One of the biggest advantages of renewable energy sources is that there is no fuel cost during operation of the plant, therefore contribution of capital cost to the overall wind farm economy is very high. It is important to make economical evaluations by considering time value of money due to long periods of service life of wind farm projects (Ozerdem et al., 2006).

2.2.1 Capital cost

Construction, electrical connection, grid connection, planning, wind turbines, approvals, utilities and management are the main components of capital cost for wind farm projects (Lee et al., 2009). There will be meteorological towers which will include anemometers to measure wind speed and direction, a data logger and meteorological mast. Steel tube or lattice could be used to construct these towers and would be free standing or guyed. It is required to take a special permit in order to build such a meteorological tower (AWEA, 2007). Capital cost related with these components will change due to region that wind farm is located. It would be needed to clear about 150-250 feet around a wind turbine site to prepare wind turbine construction. Electrical collection lines are constructed in order to connect wind turbines and collection substation. Based on the land geometry, costs of these lines vary. Even, O&M building would need new roadways, sewage collection system to main collector or installation of municipal water connection. In addition, construction debris is also one of the expenses that must be considered.

Capital cost of a typical wind farm project change between £600,000 and £1,000,000 per MW per annum. Turbine costs (64%), construction (13%) and electrical infrastructure (8%) costs constitute the major items of capital expenditures (Munday et al., 2011). The amount of

T2-7
cont.

2.2.2 Land cost

Generally, wind power production cost is currently higher than that of the conventional fuels. Technology of the production is the main effect of cost in the case of production cost. But for the site selection, main economic factor is the cost of the land where the wind farm is constructed; because, the cost of land primarily depends on the region, soil condition and the distance from the residential area. Since large areas are needed for wind farms, the rent or cost of the land becomes the major factor of site selection. For a commercially viable project, the size of the site is a crucial parameter. As the size of the site gets bigger, the possibility of facing with more than one landowner increases. The ideal situation is to communicate with few landowners who can give exclusive rights to the wind power project owner.

2.2.3 Operational and management cost

There will be control functions such as supervisory control and data acquisition (SCADA) which will provide control of each wind turbine in O&M facilities. It is estimated that O&M cost of wind farms require about £8000-£10,000 per MW per annum. Business rates, maintenance expenses, rents, staff payments are main components of O&M costs. O&M cost are usually very small percentage of total investment costs of wind farm projects (Munday et al., 2011).

2.2.4 Electricity market

Existing of an electricity market for the energy generated is an important factor affecting the economic benefits of the project. There should be energy demand in regions close to wind farms. When the intermittency of the wind energy taken into consideration, a continuous electricity market gains an extra importance for the region wind farm sited.

2.2.5 Incentives

Incentives are economic tools applied in order to encourage investors to support socially beneficial projects such as renewable energy projects that reduce the number of thermal power plants and so the carbon emissions. Regions, where advantageous incentives applied for wind energy generators, are very fascinating for the economic considerations.

Applications of incentives such as specific levy exemptions and renewables obligations certificates vary from region to region (Munday et al., 2011). For example, China has been applying some concession programs for wind power generation since 2005 (Zhang, 2007). In Turkey, in the Law on The Utilization of Renewable Energy Resources For The Purpose of Generating Electrical Energy, there is a special case for the investors in the cost of land. In the case of utilization of property which is under the possession of Forestry or Treasury or under the sovereignty of the State for the purpose of generating electricity from the renewable energy resources included in the law, these territories are permitted on the basis of its sale price, rented, given right of access, or usage permission by the Ministry of Environment and Forestry or the Ministry of Finance (Erdoğan, 2009). A 50% deduction shall be implemented for permission, rent, right of access, and usage permission in the investment period.

T2-7
cont.

a renewable energy source, wind farm do not cause reduction in natural resources. As a result of having no input other than wind, there is no formation of emission during the energy generation process. Wind turbines can generate noise while they are working and their image can be incompatible with the general view of the region. Wild life and endangered species could be disturbed during the construction of wind farm.

2.3.1 Visual impact

Wind turbines are located in windy places, and most of the time, those places are highly visible. To many people, those big towers with 2 or 3 blades create visual pollution. To minimize the impacts of visual pollution, many investors implement the actions listed below:

- The wind turbine tower, nacelle and blades as well as the transformer box, is painted a neutral color to blend in with the surroundings.
- The turbine is sited to reduce the possibility of shadow flicker falling on surrounding inhabited structures.

2.3.2 Wild life & endangered species

Wind farms affect birds mainly through the actions listed below:

- collision with turbines and associated power lines,
- disturbance leading to displacement including barriers to movement,
- loss of habitat resulting from wind turbines (Bright et al., 2008; Kikuchi, 2008).

To minimise the risk of bird collision, site selection should be done precisely. But decision making in site selection is problematic due to the reason that migration roads of birds may vary from one year to another. Long term monitoring before giving the decision is necessary. Also, soil and water habitat must be protected from possible effects of wind farm projects (AWEA, 2007).

2.3.3 Electromagnetic interference

Electromagnetic interference is an electromagnetic disturbance that interrupts, obstructs, or degrades the effective performance of electronics or electrical equipment (Manwell et al., 2002). Wind turbines may reflect, scatter or diffract the electromagnetic waves which in turn interfere with the original signal arriving at the receiver. Although several parameters that influence the extent of electromagnetic interference are listed in the study of Manvell et al. (2002) the blade construction material and rotational speed are key parameters (AWEA, 2007).

2.3.4 Noise impact

Noise can generally be classified according to its two main sources: aerodynamic and mechanical. Aerodynamic noise is produced when the turbine blades interact with eddies caused by atmospheric turbulence. Mechanical noise is generated by the rotor machinery such as the gearbox and generator. Noise could be reduced by better designed turbine blade geometry and by selection of proper operating conditions (Cavallaro and Ciraolo, 2005).

T2-7
cont.

regulatory procedures may set restrictions or incentives to apply wind farm projects. Public acceptance is vital for the application of that kind of projects. Public may oppose projects because of possible environmental or social effects. Distance from residential area gain importance not to interfere with social life during wind farm construction or operation.

2.4.1 Regulatory boundaries

There may be some national or international level regulation related with the construction and operation of wind farms. These regulations must be explored before evaluating the socio-political position of a wind farm project. Most of them probably change from region to region. For example this distance is given as 300 m in the study of Clarke (1991), and 500m in the study of Yue and Wang (2006). Some nations encourage use of renewable energy resource and develop special regulations for the renewable energy generation plants. On the other hand, there could be some restrictions related with the construction and operation of energy generating plant. For example, in many of the national legislations, there is a distance where wind turbines are located from bird flyways.

2.4.2 Public acceptance

Public is the most vital component of a region and their opposition to issues can lead to abolish proposed projects. Support of public for wind energy generation is expected to be high in general but proposed wind farms have often been met with strong local opposition. In the study of D.van der Horst and Toke (2010), it is stated that nearby residents are more likely to become involved in decision making. It is recommended to inform public before deciding to construct a wind farm in a region especially where alternative land use is more beneficial to public than wind farm sitting (AEWA, 2007).

2.4.3 Land use

Land use affects the decision of wind farm siting from two points of view. Firstly, there are some cases where no wind farms can be built although sufficient wind speed was detected. These cases are mainly related with land use or condition. Land related constraints are:

- forest area
- wetlands
- land of high productivity
- archaeological sites
- aviation zones
- military zones

Alternative land uses of site where wind farm to be constructed affect the decision of wind farm site. More beneficial land uses for public especially such as agriculture, potential of being residential or industrial area, tourism cause oppositions and more detailed analysis of decision.

2.4.4 Distance from the residential area

Wind turbines are giant machines that can be over 120m tall and have blades that sweep up to 6000m² in area. Because of their big size, these machines have the potential to disturb

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cont.

residential area. In addition, construction of wind farm can disturb social life in the region for a long time due to large trucks carrying blades and debris from site excavation and construction machines.

3. FAHP Chang's model

AHP is a multi-criteria decision making tool which provides to structure complex problems in a hierarchic manner, as a result it simplifies evaluating all of the criteria which are relevant with the decision that must be given (Saaty, 1980). All of the alternatives are compared pairwise based on each criterion by using a preference scale and a priority list of alternatives is achieved for each criterion (Taha, 2003). Most widely used preference scale is 1-9 scale which lies between "equal importance" to "extreme importance". Fuzzy AHP enables the decision analyst to give more realistic scores for alternatives for the cases in which there are lots of uncertainties. For different perspectives, a variety of modified versions of fuzzy AHP can be used. Chang's model of extent analysis (1992) is one of them which depends on degree of possibility of the each criterion. Triangular fuzzy numbers (l, m, u) are used in order to develop pair wise comparison scale and a pair wise comparison matrix is constructed for each level in the hierarchy. Then, subtotals of each row in the matrix are calculated in order to have a new set. Overall triangular fuzzy values (l_i, m_i, u_i) for criterion M_i is obtained by calculating l_i/Σ l_i, m_i/Σ m_i, u_i/Σ u_i, (i=1,2,...,n). Membership functions, which mean corresponding weights of alternatives in the related matrix, are calculated for each criterion by using these values. They are normalized and final importance weights of each criterion are obtained.

To apply the process depending on this hierarchy, according to the method of Chang's (1992) extent analysis, each criterion is taken and extent analysis for each criterion, g_i is performed on, respectively. Therefore, m extent analysis values for each criterion can be obtained by using following equation 1 (Kahraman, et al., 2004):

$$S_i = \sum_{j=1}^m M_{ji} \otimes \left[\sum_{j=1}^m \sum_{k=1}^m M_{jk} \right]^{-1} \quad (1)$$

Where g_i is the goal set (i = 1, 2, 3, 4, 5,, n) and all the g_i M (j = 1, 2, 3, 4, 5,,m) are Triangular Fuzzy Numbers (TFNs). The steps of Chang's analysis can be given as in the following:

Step 1. The fuzzy synthetic extent value (S_i) with respect to the i_{th} criterion is defined as equation 1.

Step 2. The degree of possibility of M₂ = (l₂, m₂, u₂) > M₁ = (l₁, m₁, u₁) is defined as equation 2:

$$V(M_2 \geq M_1) = \sup_{x \leq y} [\min(\mu_{M_1}(x), \mu_{M_2}(y))] \quad (2)$$

Step 3. x and y are the values on the axis of membership function of each criterion. This expression can be equivalently written as given in equation 3 below:

$$\begin{cases} 1, & \text{if } m_2 \geq m_1, \\ \dots & \dots \end{cases}$$

T2-7
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4. Case study: Turkey

Turkey, with a fast growing economy and population, has been experiencing substantial demand growth in all segments of the energy sector. This demand is mainly met by importing of energy primarily oil and natural gas. With the enforcement of the Electricity Market Law in 2001, the Natural Gas Market Law in 2001, the Oil Market Law in 2005, Liquefied Petroleum Gases Law in 2005 and the Market Law in 2005, significant steps were taken for the creation of a competitive and functional market in Turkish energy sector. Liberalization which aims to create a competitive environment and to enhance the investment is now being applied under the supervision of the Energy Market Regulatory Authority (EMRA).

In order to reduce the energy import dependency, utilization of renewable energy sources has been supported since 1984. Diversifying the country's natural resource supply and increasing the share of renewable energy sources are at the top of the list of the Turkish Ministry of Energy and Natural Resources' four year strategic plan (2010-2014) (ETKB, 2010). With this aim, first in 2005, The Law on The Utilization of Renewable Energy Resources For The Purpose of Generating Electrical Energy was enacted. By the end of 2010, an amendment to this law (Law number 6094) was done. The main reason of amendment is the reconstruction of the supporting mechanisms (feed-in tariff and purchase guarantee) to increase the investments. With the supporting mechanisms and the developments in the renewable energy technologies, Prime Ministry Undersecretariat of State Planning Organization put a target of increasing the share of renewable resources in electricity generation up to at least 30% by 2023 (DPT, 2009).

To reach the target, maximum use of renewable resources must be ensured. Among the renewable energy resources, wind has been the most popular for the investors. Turkey has a very large potential for wind power. Turkey has a minimum wind energy potential of 5.000 MW in regions with annual wind speed of 8.5 m/s and higher, and 48.000 MW with wind speed higher than 7.0 m/s (REPA, 2007). However, not all of the sites having high wind velocity are suitable for wind farm construction due to several reasons explained in the study. Therefore, it is necessary to evaluate potential sites for wind farm construction by considering using a holistic approach such as proposed in this study.

4.1 Scenario: Alternative sites for wind farm in Turkey

According to the data published on the webpage of the Ministry of Energy and Natural Resources (ETKB), Turkey's installed power for wind energy reached the level of 802.8 MW as of the end of 2009. Upon taking effect of the Renewable Energy Law, licenses were granted to 93 new wind projects which deliver a total installed power of 3.363 MW.

To decrease the time and cost of any feasibility analysis, General Directorate of Electrical Power Resources Survey and Development Administration (EIE) developed a wind map which provides three different numerical atmosphere analysis model combined with meteorological data (Figure 2). For potential wind farm locations, map is integrated to a geographical information system model. This map includes topography, rivers, lakes, civilization areas, special forest terrain, highways, railroads, harbors, airports, energy transmission lines and transformer stations.

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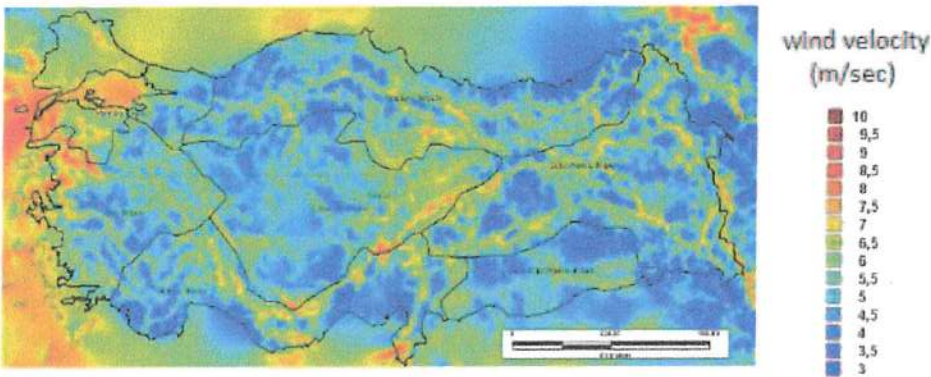


Fig. 2. Average yearly wind velocity distribution of 50 m height (REPA, 2007).

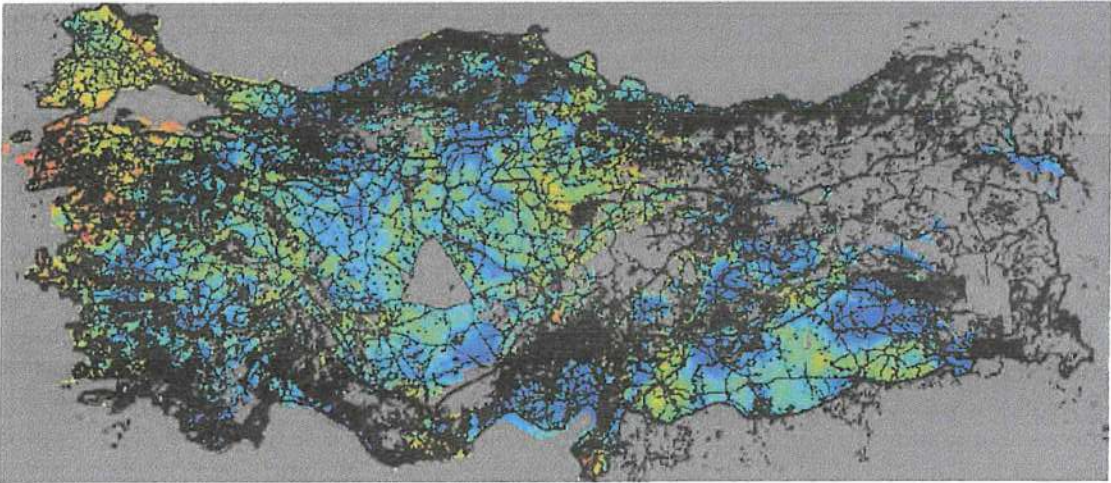


Fig. 3. REPA map of unusuable area for wind farm siting (Edremitlioğlu et al., 2007)

Based on the REPA map, it may be concluded that the regions of north Aegean, Marmara and East Mediterranean have high wind energy potential. Annual average wind speed and wind density values for the regions of Turkey were given in Table 1 in order to compare with Figure 2 where wind velocity distribution is given for each point in Turkey.

Region	Annual average wind speed (m/s)	Annual average wind density (W/m ²)
Marmara	3.3	51.9
Southeast Anatolia	2.7	29.3
Aegean	2.6	23.5
Mediterranean	2.5	21.4
Black Sea	2.4	21.3
Central Anatolia	2.5	20.1

T2-7
cont.

It is clear that wind distribution map is more meaningful than annual average wind speed data for regions. As a result, wind velocity distribution map should be used in order to determine alternative sites for wind farm construction, and to make decision analysis for selecting the most suitable location among the alternative sites.

It is planned to construct a wind farm that has a capacity of 750 MW according to the strategic plan of ETKB. Based on the Figure 2 and Figure 3, Karaman (Sertavul), İzmir (Bergama), İstanbul (Tuzla) and Muğla (Gökova) are selected as candidate sites for wind farm construction due to their potential wind speed and not being an unusable area. Necessary information about alternative sites were given that would be useful while assessing alternative sites for wind farm construction. However, they must be assessed from much more points of view than wind speed; necessary data must be gathered in order to make evaluation between alternatives by using proposed hierarchy. For this cases study, economical factors of electricity market and incentives and social factors of regulatory boundaries were not considered, since electricity that is produced by each alternative site will be delivered to the central grid system of Turkey. Therefore, electricity market is the same for all of the alternatives. Also, all of them share the same restrictions or the opportunities from the incentives and regulatory boundaries point of view; there is no change region to region for incentives and regulations.

4.1.1 Properties of alternative sites for wind farm construction

Karaman (Sertavul) is located in Central Anatolia of Turkey and have average wind speed of around 7-7.5 m/s (Figure 1) which has the potential of wind power and above the average speed of Turkey. However, land topography and geology is not so suitable to construct wind farm. It is relatively a steeper land and there are high mountains having 2000 m average height round the site. On the other hand, selected area is far away from surface and ground water sources. Although, Karaman has a rich wild life & endangered species; location of candidate wind farm site does not endanger the life of a substantial number of species. Population density is high in the central of city, as a result noise and visual impact may not be considered as an important environmental issue of wind farm due to its being very far away from central of city. In addition, location does not have a beneficial alternative land use such as being an agricultural, touristic or strategic area (URL-1). However, the grid is not so close to wind farm area due to being a relatively isolated area (ETKB, 2010).

Istanbul is located in the south west of Turkey in Marmara Region. Tuzla is located in the Anatolian (Asia) region of the city. Tuzla has an average wind speed of 7-7.5 m/s (Figure 1). Relatively steeper lands and solid rocks are dominant geologic formation in the region. However, sources of groundwater and foundation are spread in the region and precautions have to be taken about the stability of constructions. Tuzla has high population density and boundaries of residential area are extensive. There are lots of industrial estates and zones due to its being close to important transportation means. Visual and noise impact of wind farm become important as a result of the topography and existing layout of the region (residential areas and industries). On the other hand, the region is not rich of wild life and endangered species (URL-2). Alternative land uses are critical for Tuzla, because region is one of the most widely preferred areas for industrial zones and depending on this the demand for residential area close to these zones is high. Tuzla is close to grid and

T2-7
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higher in central of the region than in rural areas. However, there are very steep lands, protected areas due to archaeological heritages in the region and primary seismic zones; selected wind farm site is relatively a plain area, the potential of earthquake is not so high and it is far away from protected areas. There are not wild life and endangered species that must be protected in the site. There is another wind farm site in the region which will provide compatibility of proposed wind farm project with the view of the region. In addition, area is far away from the residential area and noise and aesthetic possibly will not disturb residents of the region (Bergama, 2009). Although proposed site has not any beneficial alternative, it may be attractive for touristic plants due to its being relatively close to touristic areas. Wind speed is about 8-8.5 m/s (Figure 1) in the region and there is a high potential of energy production. Moreover, there is a ready grid to transmit energy to central system very close to site (ETKB, 2010).

Muğla is located in the south west of Turkey in Aegean Region. Wind speed of the region is around 6 m/s (Figure 1) and it is the smallest among the other alternative sites. However, land topography of Muğla is very plain and formation of earth is relatively strong enough for wind farm sitting. Population density of Muğla varies seasonally. Population is heavily crowded in the seaside in summer and low in winter. Wild life and endangered species is a very important environmental aspect for Muğla (URL-3). Noise and visual impact could be neglected, when the existing residential layout which is far away from the site and facilities such as thermic central near the site are taken into consideration. Alternative land use of Bergama is also valid for Muğla, however Muğla has much more problematic facilities in the site which decreases the possibility of alternative land use in the site. There is a grid close to site and structure is compatible with the planned wind farm project (ETKB, 2010).

4.1.2 Application of proposed hierarchy to case study

Four alternative sites for wind farm sitting are evaluated based on the necessary information given about sites and scenario by using the methodology explained. All of the factors in the same level were compared with each other by using the scale (Table 2) formed in order to make pair-wise comparison. Comparisons are made based on the priority of the factor relative to the other factor being compared.

Evaluation is made by the authors of the study who have background of environmental, chemistry, energy systems and industrial engineering and business administration. Therefore, expert opinions on technical, economic, environmental and social factors could be provided. For further applications, contributions of experts on earth science and social science and representatives of non-governmental organizations are advised in order to have an extended analysis of decision making on real-time issues.

An individual score must be given for each factor comparison by discussing and sharing the knowledge about factors in order to have a holistic evaluation. Based on the scores given for comparison, synthetic numbers were formed by using equation 1 and minimum ones were chosen by using equation 2. Priority numbers of factors were derived from normalized synthetic results (Table 3). Secondly, alternatives are compared based on each sub factor in order to have priority numbers of alternatives which are specific to factor considered. These priority numbers were obtained by following the same procedure explained above. For the

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Intensity of Importance	Triangle Fuzzy Number
Very low	(1/9, 1/9, 1/7)
Low	(1/9, 1/7, 1/5)
Moderately Low	(1/7, 1/5, 1/3)
Moderate Low	(1/5, 1/3, 1)
Just equal	(1, 1, 1)
Moderate High	(1, 3, 5)
Moderately High	(3, 5, 7)
High	(5, 7, 9)
Very High	(7, 9, 9)

Table 2. Triangle Fuzzy Number for Intensity of Importance

4.1.3 Results and discussion

First group of results, which are related with the priority of factors for site selection, are more general than others. They have been scored by considering general aspects related with the aim. According to the results given in Table 3, among the factors effecting the wind farm site selection, environmental (0.33) and social ones (0.29) are mostly effective.

Technical factors are relatively close to social factors; however economic factors have the least priority from site selection point of view. All of the production and service facilities must ensure the sustainability of life and environment. Selection of a project that costs very low in spite of harming environment and society should not be allowed. Technical and economic feasibility must be optimized based on the restrictions of environmental and social sustainability. Damage on wild life and endangered species and electromagnetic interference have the same and highest priority (0.32) for selection due to their being irreparable injuries. Noise and visual impact is relatively tolerable (0.19 and 0.18, respectively) than other environmental effects, because there are precautions that can be taken during or after wind farm construction.

Land use is the most important social factor (0.45), since there is a need for big lands in order to construct wind farm and these lands may be used for much more beneficial purposes such as agriculture, tourism or strategic. Distance to residential area must be considered seriously due to its effect on society both during and after the construction. If environmental and other social factors are sustained, public acceptance will also be provided mostly. Therefore, its direct effect on the site selection become as least effective social factor.

Among technical sub factors, wind speed and grid structure and distance have the highest priority (0.31) due to their effects on energy efficiency, capacity factor and being ever ready. On the other hand, land topography and geology (0.25) determines the stability of the wind turbines and technical feasibility of their construction. Also, turbine size does not have a direct contribution to technical feasibility (0.13), required turbine size for the planned capacity would be restricted with alternative suppliers of turbine generators and available land resources.

Capital cost is the most distinguishing factor (0.46), because it is known that capital cost is

T2-7
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to total cost is mostly very small which include the expenses of the employees and maintenance of equipment in general.

Factors	S number Eq 2	minV(Si>Sj) Eq 3	Priority normalization
Technical Factors	[0.06, 0.19, 0.71]	0.73	0.24
Wind Speed	[0.19, 0.5, 1.33]	1	0.31
Land Topography & Geology	[0.05, 0.16, 0.49]	0.8	0.25
Grid Structure & Distance	[0.08, 0.26, 0.80]	1	0.31
Turbine Size	[0.04, 0.07, 0.22]	0.43	0.13
Economic Factors	[0.04, 0.08, 0.36]	0.44	0.14
Capital Cost	[0.15, 0.54, 1.67]	1	0.46
Land Cost	[0.11, 0.34, 1.06]	1	0.46
O&M Cost	[0.07, 0.12, 0.23]	0.16	0.07
Environmental Factors	[0.1, 0.42, 1.43]	1	0.33
Visual Impact	[0.05, 0.16, 0.49]	0.56	0.18
Wild Life & Endangered Species	[0.14, 0.43, 1.19]	1	0.32
Electromagnetic Interference	[0.06, 0.16, 0.47]	1	0.32
Noise Impact	[0.06, 0.17, 0.53]	0.6	0.19
Social Factors	[0.08, 0.37, 1.07]	0.9	0.29
Public Acceptance	[0.07, 0.13, 0.45]	0.42	0.19
Land Use	[0.15, 0.54, 1.67]	1	0.45
Distance to Residential Area	[0.11, 0.34, 1.06]	0.81	0.36

Table 3. Calculating the priority numbers by Chang Model

Detailed results of calculations for each alternative are shown in Table 4. Priority numbers of the alternatives for each main factor is shown in Figure 4. From environmental point of view, Karaman and İzmir has the same and highest priority as a candidate for wind farm sitting. İzmir is one of the preferable regions due to its having very small number of wild life and endangered species and being relatively isolated from the electromagnetic interference potential. Moreover, location of the selected site has a low potential of visual and noise impact. Although wild life and endangered species are relatively rich in Karaman, it is also the most preferred site based on environmental factors due to its being isolated from residential area which leads to low noise and visual impact.

Although İstanbul is the most preferred site because of being poor in number of wild life and endangered species, it is the least preferred site from other environmental points of view due to high number of industrial zones and its being close to residential area.

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cont.

Karaman															
S number		minV (Si>S)	P*	S number		minV (Si>S)	P	S number		minV (Si>Sj)	P	S number		minV (Si>Sj)	P
Technical Factors															
VS	[0.17, 0.61, 1.88]	0.75	0.35	[0.17, 0.39, 1.13]	0.39	0.18	[0.73, 1.00, 1.56]	1	0.47	[0.17, 0.16, 0.24]	0	0			
SD	[0.08, 0.16, 0.52]	0.20	0.08	[0.17, 0.44, 1.25]	0.63	0.26	[0.31, 1.00, 2.81]	1	0.41	[0.17, 0.44, 1.25]	0.63	0.26			
LTG	[0.08, 0.16, 0.52]	0.20	0.08	[0.13, 0.39, 1.25]	0.61	0.23	[0.17, 0.61, 1.88]	0.80	0.31	[0.31, 1.00, 2.81]	1	0.38			
FS	[0.17, 0.61, 1.88]	0.63	0.24	[0.13, 0.22, 0.63]	0.41	0.16	[0.21, 0.83, 2.50]	1	0.39	[0.13, 0.22, 0.63]	0.54	0.21			
Economic Factors															
CC	[0.08, 0.16, 0.52]	0.29	0.10	[0.21, 0.83, 2.50]	1	0.33	[0.13, 0.39, 1.25]	0.70	0.23	[0.27, 0.78, 2.19]	1	0.33			
LC	[0.31, 1.00, 2.81]	1	0.40	[0.12, 0.38, 1.15]	0.57	0.23	[0.17, 0.44, 1.25]	0.63	0.12	[0.13, 0.22, 0.63]	0.29	0.12			
DMC	[0.17, 0.61, 1.88]	0.88	0.35	[0.08, 0.17, 0.63]	0.51	0.20	[0.13, 0.39, 1.25]	0.12	0.05	[0.21, 0.83, 2.50]	1	0.40			
Environmental Factors															
VI	[0.31, 1.00, 2.81]	1	0.42	[0.08, 0.16, 0.52]	0.02	0.08	[0.17, 0.44, 1.25]	0.63	0.26	[0.17, 0.44, 1.25]	0.63	0.26			
VL	[0.13, 0.39, 1.25]	0.61	0.23	[0.31, 1.00, 2.81]	1	0.38	[0.17, 0.61, 1.88]	0.80	0.31	[0.08, 0.16, 0.52]	0.20	0.08			
EI	[0.17, 0.61, 1.88]	0.97	0.30	[0.08, 0.17, 0.63]	0.45	0.14	[0.21, 0.67, 1.88]	1	0.31	[0.17, 0.44, 1.25]	0.82	0.25			
VI	[0.23, 0.56, 1.56]	1	0.29	[0.08, 0.16, 0.52]	0.42	0.12	[0.21, 0.67, 1.88]	1	0.29	[0.21, 0.67, 1.88]	1	0.29			
Social Factors															
PA	[0.17, 0.61, 1.88]	0.88	0.28	[0.08, 0.17, 0.63]	0.38	0.12	[0.21, 0.83, 2.50]	1	0.32	[0.13, 0.39, 1.25]	0.83	0.27			
LU	[0.31, 1.00, 2.81]	1	0.38	[0.08, 0.16, 0.52]	0.20	0.08	[0.17, 0.61, 1.88]	0.80	0.31	[0.13, 0.39, 1.25]	0.61	0.31			
DRA	[0.31, 1.00, 2.81]	1	0.36	[0.09, 0.16, 0.52]	0.20	0.07	[0.17, 0.44, 1.25]	1	0.36	[0.17, 0.44, 1.25]	0.55	0.36			

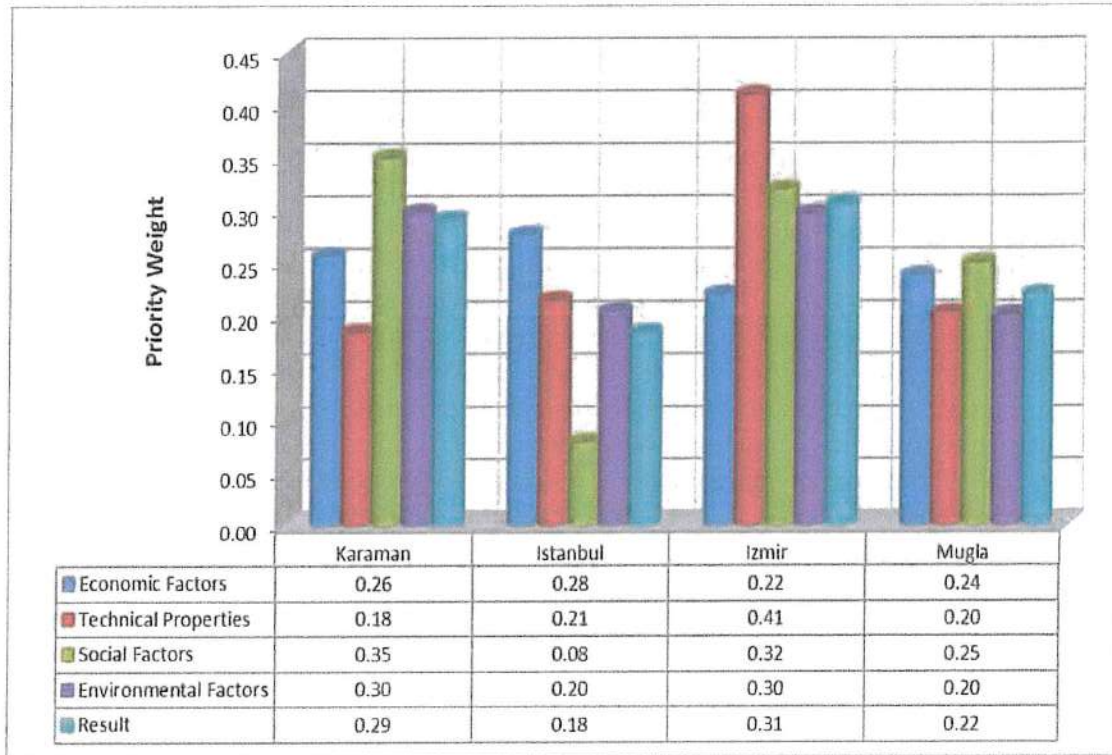


Fig. 4. Priority weights of each factor for the alternatives

Social factors lead to selection of Karaman as most appropriate site (0.35) for wind farm project. Expectation of society to become a developed city results in the acceptance of such an energy production project which is already does not cause serious environmental problems. In addition, there is no alternative beneficial use for the land and residential area is far away from the site. Same reasons are valid for Izmir which has about the same priority number (0.32) with Karaman.

For Muğla, public acceptance and alternative land uses are critical. Muğla has a thermal power plant and against to the further projects around the region. Istanbul is certainly the least preferred site due to social factors. High potential of being an industrial zone bring the alternative land use in the foreground and public acceptance become restricted due to both alternative land use and environmental impacts. Also, being a dense residential area is a big disadvantage that cannot be tolerable in any way.

İzmir is a distinguished alternative from technical points of view. Average wind speed is higher than the other sites and there is a close grid in the site serving for another wind farm. Therefore, its turbine size is small as possible as due to high wind speed and there is no

T2-7
cont.

Istanbul, Muğla and Karaman have almost the same priority number for technical factors which are 0.21, 0.20 and 0.18, respectively. Although average wind speed is relatively high in Karaman and there is no debate about turbine size due to large available area, long distance between wind farm and grid in Karaman and construction problems due to land topography and geology cause Karaman to be in the last order based on technological factors. Muğla also has low priority due to low wind speed and high turbine size which need large area. Low wind speed and especially the availability of wind reduce the electability of Istanbul.

Economic priorities of the sites are very close to each other. Istanbul is the most advantageous city from economic point of view due to low capital cost need which has the highest share in the total cost. There are lots of construction firms in Istanbul and land topography and geology is not so hard in Istanbul for construction. Most of the construction equipment is readily available and the need of construction of extra roads, equipment storage areas etc. are minimum owing to existing infrastructure.

Muğla also have the same advantageous for capital cost. Land cost is lowest in Karaman and highest in Muğla where public acceptance is doubt and alternative use of the site is possible. Muğla and Karaman have the lowest operational and maintenance cost due to cheap work force.

When all of the priority numbers of each alternative are aggregated, results shown in Figure 5 are achieved. Izmir is the most preferred site for wind farm construction and Karaman has around the same priority number with the Izmir. They have almost the same characteristics for environmental, social and economic factors, however wind speed of Karaman is lower than Izmir and grid distance is much closer in Izmir than it is in Karaman. As priorities of technological factors are lower than priorities of environmental and social factors; there is not a big difference between Izmir and Karaman to construct wind farm.



Fig. 5. Priority weights of alternatives

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cont.

For example, Karaman can be selected due to its higher priority for economic and social factors rather than Izmir.

Moreover, Karaman and Izmir can be analysed in detail which is not possible for more than two alternatives from economic and social point of view. Muğla and Istanbul, which has low priority for environmental, social and technical point of view, is certainly must be eliminated according to the results.

5. Conclusion

Wind energy has become widely used in recent years in order to increase the usage of renewable energy sources instead of fossil fuels or nuclear energy. Therefore, wind farm site selection is a vital issue that must be analysed deeply in order to have efficient wind power generation from technical and economic point of view without damaging environment and society. However, there are lots of factors that make contribution to selection of wind farm site and they must be organized with a systematic hierarchy in order to make decision with a holistic approach. Also, uncertainties could appear about the effects of these factors. Due to these reasons, Chang's extent analysis of FAHP is a proper method for decision making on wind farm site.

This methodology provides three groups of the result which are priority numbers of the factors based on the wind farm site selection, priority numbers of the candidate sites specific to each factor and aggregated priority number of each alternative based on all of the factors affecting wind farm selection. Therefore, methodology offers a number of advantages for analysing the wind farm site selection deeply.

First of all, it enables the user to identify the source of the problem related with the inappropriateness of the site owing to priority numbers of the site specific to each factor. Secondly, priority numbers of the factors based on the wind farm site selection give the opportunity of reflecting the importance weight of the factor on site selection in quantitative assessments. Overall results provide to distinguish the alternatives from each other and reduce the number of alternatives especially for further detailed decision analysis.

Technical, economic, environmental and social factors are the main factors contributing site selection problem. Environmental and social factors are distinctive ones that distinguish technically and economically feasible sites. Different alternatives could be the most suitable area for wind farm according to different factors. Composing of these factors gives the most suitable site according to combined effect of factors.

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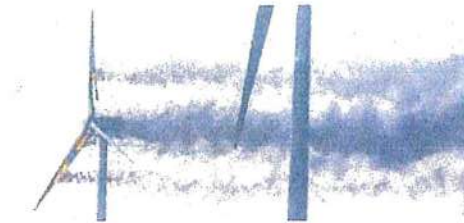
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T2-7
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D2. Exhibits to Letter P20, Steven L. Johnson



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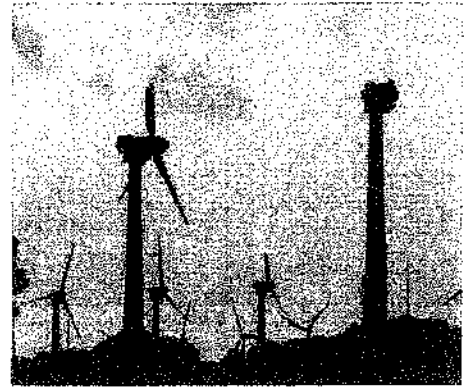
Experts favour the bold: Wind Turbines on Fire

[The Canadian Press](#)

14,000 ABANDONED WIND TURBINES LITTER THE UNITED STATES by The Elephant's Child

July 7, 2013, 7:19 am

Filed under: Democrat Corruption, Economy, Energy, Environment, Junk Science | Tags: A Green Religion, Abandoned Wind Farms, Another Bad Idea
abandoned wind turbines 2



The towering symbols of a fading religion, over 14,000 wind turbines, abandoned, rusting, slowly decaying. When it is time to clean up after a failed idea, no green environmentalists are to be found. Wind was free, natural, harnessing Earth's bounty for the benefit of all mankind, sounded like a good idea. Wind turbines, like solar panels, break down. They produce less energy before they break down than the energy it took to make them. The wind does not blow all the time, or even most of the time. When it is not blowing, they require full-time backup from conventional power plants.

Without government subsidy, they are unaffordable. With governments facing financial troubles, the subsidies are unaffordable. It was a nice dream, a very expensive dream, but it didn't work.

California had the "big three" of wind farm locations — Altamont Pass, Tehachapi, and San Geronio, considered the world's best wind sites. California's wind farms, almost 80% of the world's wind generation capacity ceased to generate even more quickly than Kamoa Wind Farm in Hawaii. There are five other abandoned wind farms in Hawaii. When they are abandoned, getting the turbines removed is a major problem. They are highly unsightly, and they are huge, and that's a lot of material to get rid of.

Unfortunately the same areas that are good for siting wind farms are a natural pass for migrating birds. Altamont's turbines have been shut down four months out of every year for migrating birds after environmentalists filed suit. According to the Golden Gate Audubon Society 75-110 Golden Eagles, 380 Burrowing Owls, 300 Red-Tailed Hawks and 333 American Kestrels are killed by the turbines every year. An Alameda County Community Development Agency study points to 10,000 annual bird deaths from Altamont wind turbines. The Audubon Society makes up numbers like the EPA, but there's a reason why they call them bird Cuisinarts.

Palm Springs has enacted an ordinance requiring their removal from San Geronio Pass, but unless something else changes abandoned turbines will remain a rotting eyesores, or the taxpayers who have already paid through the nose for overpriced energy and crony-capitalist tax scams will have to foot the bill for their removal.

President Obama's offshore wind farms will be far more expensive than those sited in California's ideal wind locations. Salt water is far more damaging than sun and rain, and offshore turbines don't last as long. But nice tax scams for his crony-capitalist backers will work well as long as he can blame it all on saving the planet.

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**National
Wind
Watch**

Presenting the facts
about industrial wind power

filed: January 15, 2013 • Australia, Press releases

Communities burned by turbines

| **Credit:** Australian Industrial Wind Turbine Awareness Group --

The past week's extreme weather conditions and high fire dangers across the nation, especially eastern Australia, have once again heightened awareness of the dangers and difficulties of fighting fires in close proximity of industrial wind energy developments.

Over the last week aerial water bombing has been critical in containing fires in many areas of proposed wind turbine developments. **If the wind turbine developments had already been in existence aerial water bombing would not have been able to be utilised** and fire would likely have continued to spread out of control, destroying life, more homes, property and livestock.

As stated by the NSW Rural Fire Service: "Aircraft are one of the most essential tools of the Rural Fire Service. www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=1120

Aircraft support firefighting efforts not only by water bombing, but by supporting back burning and hazard reduction operations, reconnaissance flights, air attack supervision and conducting medical evacuations.

Fires can strike quickly and be incredibly dangerous.

Aggressive initial attack is the key strategic principal that most fire authorities now pursue. The utilizing of fire fighting aircraft in this initial attack is an

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important strategic approach as they have the capacity to react quickly and decisively to fires in most terrains, which also assists ground crews in containing fires.

Whilst each wind turbine development and situation would have varying operating implications, it is very clear that wind turbine developments impose significant threats to the ability to safely operate aircraft in the vicinity of the turbines, especially under the extreme conditions associated with bush fires in Australia.

The pilots operating the water bombing aircraft are highly qualified and will always consider the degree of risk associated with infrastructure, and the conditions in which they are flying. They will always put the safety of themselves and their aircraft first.

Heavily laden fire or spray aircraft have imposed limits on their manoeuvring ability and must be operated very conservatively. Along with the increased risk of accidents and collisions given the height of the turbines, turbulence and visibility due to smoke and the known interference wind turbines produce on hampering radio reception, no professional pilot would take the risk of flying within what they deem a safe distance of the development, as it would be a threat to legal aviation activities.

Essentially fires that burn near industrial wind turbine developments can only be fought by ground crews and aerial support when the fire has travelled a safe distance from the turbines. That may include having to let the fires burn through turbine clusters, increasing the ferocity of the fire and making its containment on the downwind side of the cluster all the more difficult and dangerous.

A sad fact is that we know that aerial fire bombing is essential to fight fires in our harsh climate and landscape and can prevent the loss of life, home, property and livestock and yet some pilots who perform aerial fire bombing

Letters, Scotland:
Stuck in a wind farm sink estate
New Brunswick:
Wind shifting against green energy project in northern community
Ireland:
Derrybrien wind farm racks up €5m in daily EU fines
Nebraska:
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Broome County wind farm critics: Costly tax break, few jobs for exported electricity
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Ohio:
OPSB removes modified turbine feathering requirement from Icebreaker project
Ireland:
Delvin, Raharney and Ballivor 'will not accept industrial turbines'
Wales:
Young osprey dies following turbine collision
Estonia:
Construction of Risti wind farm questioned by local municipality
New York:
Five state agencies sign on to wind farm plan
Connecticut, Maine, Massachusetts, Rhode Island, Vermont:
Mills joins push for region's electric grid operations to reflect state climate goals

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have privately told concerned rural residents that they are not allowed to speak out about the increased risk wind turbines pose.

Aerial fire fighting clearly will be constrained because of pilot safety issues and pilots who are not bound by their contractual or employment constraints from speaking out have said so. David Anderson, the pilot quoted in the following recent news report from South Australia's Yorke Peninsula, where locals are concerned about the impact the CERES Project will have on the safety of families and homes within this large wind development, has made this point clearly. (David Anderson actually OWNS and is chief pilot for Australian Helicopters, who are contracted to fly the MedVac rescue helicopters, so is well placed to give a professional opinion in this matter.)

Link to story:

<http://au.news.yahoo.com/latest/a/-/latest/15786582/bushfire-fears-over-wind-turbines/>

Until now the fire authorities have asserted publically that wind turbines would pose no greater risk than any other elevated hazard such as power lines. However, in a letter dated 9th January 2013 the South Australian CFS Chief Greg Nettleton wrote that "in some circumstances aircraft will not be utilised because risks caused by vertical obstructions exceed safe operating conditions." In specific relation to the proposed Ceres Development, he writes that the CFS would "adopt a position that **it is unlikely water bombing aircraft would operate in the immediate vicinity of the wind turbine farm** if the risk exceeds safe operating conditions (and we) would consider the wind turbines' effect on safe aircraft operations when combating a fire in or adjacent to the wind turbine farm.

David Pearce, Manager of the South Australian CFS Aviation Service, has stated that "visibility in the vicinity of a fire is generally poor due to the smoke" and that any obstacle in the airspace where we're running aircraft is a problem for aircraft obviously."

New York:
Farmersville Town Board votes 3-2 to appeal Alle-Catt decision
Australia:
Majority of Moyne Shire candidates against future wind projects in local government area
U.K., Wales:
North Wales seabirds face 'extinction' if Boris Johnson's 'limitless' wind farm plan takes off
England:
National Grid is forced to search for emergency power sources due to lack of wind
Scotland:
Raw Deal: Shetland cancer patient fears peaceful life will be shattered by £580m ring of wind turbines
Opinions, Washington:
Horse Heaven wind farm project offers few benefits for Tri-City economy
New York:
Port Cortlandt pulls plan for wind turbine plant, dock
Alberta:
County council approves ABO Wind request to place collector lines in County road allowance
Virginia:
State rule delays city adoption of green energy
Washington:
'Have you ever?' Wind turbine blunder causes Tri-Cities highway stir
England:
Lack of wind sparks

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The Aerial Agricultural Association of Australia state in their Windfarm Policy "Windfarms and their preconstruction wind monitoring towers are a direct threat to aviation safety."

Hart Aviation in their Assessment for the Crudine Ridge Wind Farm for Wind Prospect state: "Helicopter or fixed wing aircraft operations within the confines of any wind farm and below the top of the wind turbines are potentially hazardous and not recommended."

Government planning authorities are approving inappropriate industrial wind turbine developments in some of the most fire prone areas in the world where there is an inability to use effective fire fighting procedures. The lack of aerial support in amongst turbine clusters are putting ground crews that may follow wind turbine access trails normally along ridge lines at extreme risk.

Wind developers state that the roads that are built throughout wind turbines projects allow greater access for vehicles in the event of fires. The grim reality is that these roads would become death traps for fire fighters given they would not receive aerial support due to the obstruction posed by the turbines for pilots.

Wind energy developments are continuing to be built in fire prone areas with a total disregard for extra fire protection requirements that should be in place due to the increased fire risks from wind energy developments

- Each turbine is a potential incendiary device, with up to 800 litres of highly flammable gear box oil in the nacelle.
- Fire can start from turbine operation or lightning strike to the turbine.
- Turbines are continuing to operate on days of high fire danger (when other potential sources of fire ignition must cease operating e.g. harvester, grain trucks, etc)
- Burning spinning turbines have the potential to spread burning flying debris over a wide area increasing the danger to life and property and spreading of fire.

National Grid energy alert

Canada, New York, U.S.: Mitsubishi eyes Great Lakes for offshore wind development

U.K.:

Puffins will be driven to extinction by offshore wind plan, warns RSPB

Cyprus:

Rare eagle found dismembered most likely killed by wind turbine, authorities say

Scotland:

Destruction of osprey nest condemned as 'wildlife crime'

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- Rural fire brigades are not equipped to extinguish fires in 150m high burning turbines and must wait for the turbine to collapse before they can safely extinguish the fire.

In November 2010 a turbine at Starfish Hill, South Australia ignited. On arrival, CFS officers could do little but watch the blaze from half a kilometre away, as the situation was deemed too dangerous to approach. "There was not a damn thing you could do about it," said Mr Crawford (Group Officer for the Southern Fleurieu CFS) of the turbine fire. When Work Safe arrived to the scene, CFS officers were told to retreat a further 500 metres away from the fire, as the blades continued to spin. "There were tips of the blades flying some distance," said Mr Crawford. "You could go no closer than a kilometre away. <https://www.wind-watch.org/news/2010/11/20/cant-fight-the-fire/>

Current fire fighting strategies are inadequate to protect people living in the vicinity of wind energy developments from raging fires in our often hostile Australian climate.

It is only a matter of time before there is going to be a catastrophic fire that could have been avoided, because proper due diligence by all responsible authorities has been ignored.

Planning authorities MUST NOT site wind turbines in areas where there is a high fire danger and risk to life and property.

Fire authorities MUST ensure that wind turbines DO NOT OPERATE on days of high fire danger and must put strategic policies in place for wind energy development zones, recognising that aerial bombing is severely constrained in these areas.

Links to the reality of turbine fires:

www.turbinesonfire.org

<https://www.wind-watch.org/news/2006/02/12/scorched-out-turbine-fire->

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[at-south-australia-wind-farm/](#)
www.adelaidenow.com.au/burning-wind-turbine-starts-fires/story-e6freol3-1111118739534
<https://www.wind-watch.org/news/2006/02/12/scorched-out-turbine-fire-at-south-australia-wind-farm/>
www.abc.net.au/local/stories/2009/02/04/2482542.htm
www.abc.net.au/news/2013-01-08/approval-sought-for-major-wind-farm/4457230

Links to wake turbulence caused by wind turbines:

<https://www.wind-watch.org/documents/how-much-efficiency-is-lost-by-putting-hawts-near-one-another-in-a-wind-farm/>
www.arising.com.au/aviation/windturbines/index.html

Under the section 266 of the Criminal Code – it is the duty of

everyone who has in their charge or under his control anything, whether living or inanimate, or who erects makes or maintains anything whatever, who in the absence of precaution or care may endanger human life, is under a legal duty to take responsible precautions against and use reasonable care to avoid such danger, and is criminally responsible for the consequences of omitting without lawful excuse to perform such duty.

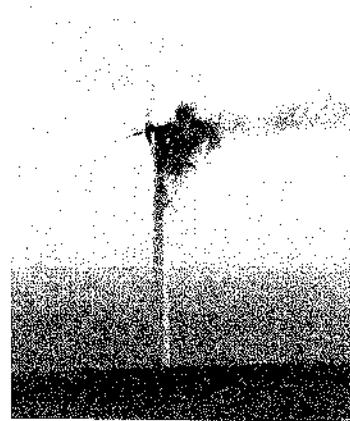
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Starfish Hill, Australia

Source: Australian Industrial Wind Turbine Awareness Group

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Why Wind Turbines Catch Fire

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Fire is the second most common type of catastrophic wind turbine accident behind blade failure. However, by understanding and addressing fire risks, you can mitigate or even prevent fire damage in wind turbines. We will explore some of the reasons why wind turbines catch fire and options for mitigating risk.

Why Wind Turbines Catch Fire

Wind turbines catch fire because components inside the turbine fail, generating heat or sparks and igniting flammable materials. Among wind turbine components, converter cabinets and capacitor cabinets catch on fire most frequently. Fires can also start in the wind turbine's transformer or in the emergency brake behind the gear box. While some fires are caused by component failures, others result from lightning strikes.

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Why Wind Turbines Catch Fire

Products	Applications	Resources	Support
Indirect Release Systems	Manufacturing & Machining	Blog	Instruction
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resulting in a fire. Newer turbines may feature electric braking systems, which are less susceptible to fire. However, mechanical brakes are often used as back ups to electrical braking systems.

Fires in the Transformer

Wind turbine transformers, located in the nacelle or at the base of a turbine, are a third ignition point for wind turbine fires. Transformers convert energy into the appropriate voltage for the electrical grid. Electrical faults in the transformer, like faults in the converter and capacitor cabinets, can lead to a fire. Additionally, some transformers contain flammable oil, which increases the likelihood that a fire will start or spread in this area of the turbine.

Fire Protection for Wind Turbines

Wind turbines are expensive and valuable pieces of equipment. According to GCube Insurance, the average wind turbine fire costs \$4.5M. Fires in wind turbines can also put wind turbine technicians at risk and even cause wildfires in the surrounding area.

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The Wind Turbine Fire Problem, By the Numbers

The Calthness Windfarm Information Forum (CWIF) reported 20 wind turbine fires globally in both 2011 and 2012. That is out of a total of 150 total wind turbine accidents. Therefore, fires represented 12.5% of all incidents in both years.

Fire is the second leading cause of accidents in wind turbines

CWIF identified 200 reported fire incidents between 1996 and 2012, an average of 11.7 fires reported per year. That makes fire the second leading cause of reported accidents in wind turbines. Overall, the top 3 causes of accidents in wind turbines, according to the study, are:

1. Blade failure (19%)
2. Fire (15%)
3. Structural failure (9.7%)

31% of wind turbine fires go unreported

According to analysis by the International Association for Fire Safety Science (IAFSS), *The Telegraph* and Renewable UK both estimate a total of 1,500 wind turbine accidents from 2006-2010. That includes both reported incidents and unreported incidents.

However, research by CWIF identified only 142 reported incidents during the same time period. Therefore, we can assume that 31% of incidents are never reported.

Wind turbines catch fire at a rate of 1 in 1,710

An estimated 300,000 wind turbines operated globally in 2011. Based on data in the IAFSS report, we can assume there were 117 fires that same year (both reported and unreported). That means 1 in every 1,710 turbines caught fire in 2011.

Another data set produced by DNV GL, an internationally accredited registrar and classification society, estimates the rate of fire in wind turbines at 1 in 2,000 each year. The DNV GL analysis examined all wind turbine fires, regardless of whether the fire resulted in a total loss of the turbine.

A 2020 article in *Wind Power Engineering Magazine* also estimates that 1 in 2,000 wind turbines catch fire each year.

Necelle fires lead to total loss or significant damage in 50% of all cases

When a fire does occur, the typical action is to wait for it to burn out. Without suppressing the fire, significant structural damage and total loss result in nearly all cases (90%).

What do wind turbine fire statistics mean for wind farms?

Overall, the data shows that wind turbine fires are relatively rare. However, a single wind turbine fire can be very expensive for a wind farm. Each turbine costs over \$1 million and generates \$1,500-\$2,000 of revenue per day. Offshore turbines, which are larger and more complex, can cost up to 3 times that and generate more revenue.

10/20/2020

The Wind Turbine Fire Problem, By the Numbers

Products	Applications	Resources	Support
Indirect	Manufacturing	Blog	Instruction
Release	& Machining	Case	Manuals
Systems	Airport	Studies	Training
Direct	Ground	Video	Programs
Release	Support	Brochures	Certifications
Systems	Equipment		& Approvals
High	Wind Turbines		Material
Pressure	Electrical		Safety Data
CO2	Panels		Sheets
Systems	Military		(MSDS)
Engineered	Ground		Submit A
System	Vehicles		Support
	Military		Ticket
	Aircraft		

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Firetrace International



Imagine witnessing a wind turbine fire in person. Most people would be shocked to see a 450 foot turbine in flames. Reports of wind turbine fires appear in the news a few times each year. But how often do wind turbines really catch on fire? And what is the impact? Here's a look at some of the statistics.

Wind turbine fires account for 10-30% of all catastrophic wind turbine accidents.

10/20/2020

The Wind Turbine Fire Problem, By the Numbers

The capital cost of replacing a turbine is significant, and downtime can add up quickly. Fortunately, cost effective fire suppression technology can help to mitigate risks. Firetrace systems automatically detect and suppress fires at their source. The systems are self contained and do not require electricity or a water supply to operate, which makes them a feasible solution for wind turbine fire protection.

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The true cost of wind turbine fires and protection



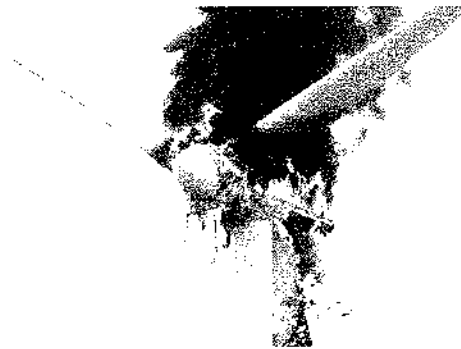
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By WPED Contributor | September 8, 2020

By Angela Krcmar, Global Sales Manager, Wind, Firetrace International

The American wind industry has stayed resilient through a difficult year, with a positive outlook for development in the years ahead. However, in order to continue to grow and thrive throughout this crisis, owners and operators cannot afford to be complacent around fire risk. A high-profile fire can not only devastate current projects, but also jeopardize the prospects of future development across the industry – and this risk only grows as turbines get bigger and move into more remote sites on- and offshore.

However, to date, the industry has underestimated the risk and cost of wind turbine fires. Even assuming an average of one fire per 2,000 turbines per year, based on incomplete reporting of fire incidents, a wind farm can expect to face one to two fires over the course of its operational lifetime. If the industry is to take action to prevent unsustainable losses from fire, owners and operators must first understand how much fires truly cost, how incidents start and what action can be taken to protect against fires.



The true cost of a fire incident

A fire incident at a turbine can cost up to \$4.5 million, according to a GCube report from 2015 – and as turbines have grown in size and upfront cost, this figure is likely to have increased dramatically. Assuming an average wind turbine costs \$1 million per megawatt of generating capacity, offshore wind turbines ranging from 3 to 10 MW can cost up to \$10 million, which would need to be paid up-front if out of warranty. Additionally, once a fire starts, the project must be shut down and taken off grid for a period of time as a safety precaution, resulting in lost revenue.

Turbine fires can have costs beyond the wind farm. A fire can spread down the tower to land surrounding the project if not carefully managed. This can potentially result in wildfires, causing extensive damage to the wider area and ultimately leading to significant reputational damage not only for the individual site but for the industry as a whole.

How do fires start?

Wind turbines catch fire for the same reasons as other heavy machinery – components inside the turbine fail, generating heat or sparks and igniting flammable materials such as plastics, resins, fiberglass and hydraulic lubricants. Most turbine fires originate in the nacelle, typically at three points of ignition: converter and capacitor cabinets, nacelle brake and transformer.

The most common location for an electrical fault in a wind turbine is the converter cabinets and capacitor cabinets in the nacelle. When an electrical fault produces an arc flash or sparks, surrounding plastics in the electrical cabinet can quickly ignite other sources resulting in total loss of a nacelle.

Transformers, located in the nacelle or at the base of a turbine, are the second most-common ignition point for wind turbine fires. Transformers convert energy into the appropriate voltage for the electrical grid, and as with converter and capacitor cabinets, sparks and arc flashes due to electrical faults can lead to a fire.

The nacelle brake, which is commonly found behind the gearbox, is another component that can be an ignition point, albeit due to friction rather than electrical failure. In an emergency, the nacelle brake stops the turbine's blades from spinning. The mechanical braking system can generate a huge amount of friction and heat, sometimes

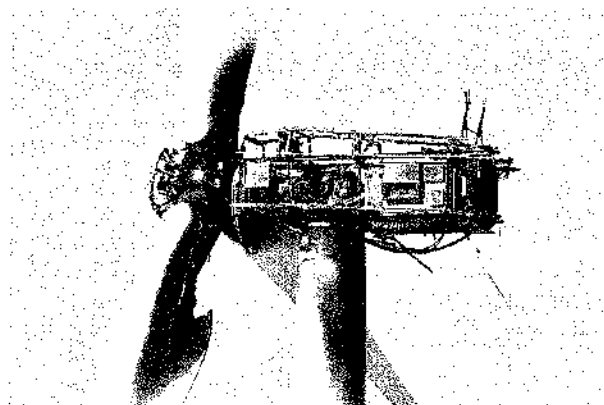
10/20/2020

The true cost of wind turbine fires and protection



From a single spark to irreparable damage

According to the Office of Energy Efficiency and Renewable Energy, the average wind turbine hub height has grown from 20 m to 88 m since the 1980s in order to access higher wind speeds. However, this height also means the nacelle is often out-of-range for ground-based firefighting. Sending a team up the tower to manually fight the fire constitutes a significant health and safety risk. If the fire is left to burn, the whole turbine can be damaged beyond repair in a matter of hours.



Offshore wind turbines are at particular risk of severe damage from fire, due to the remote nature of offshore project sites. Since many sites are situated at least 45 minutes from shore, in the event of a fire, an emergency response team is unlikely to arrive in time to prevent significant and irreparable damage.

Cost-benefit of fully protecting against fires

In order to reduce the severity of nacelle fires, automatic fire suppression systems must be installed at the main points of ignition. While preventative technology such as arc flash detection and condition monitoring systems can reduce the risk of a fire, only suppression systems can put a fire out once it has started.

Firetrace is one of the few experienced providers of these systems, which are designed with flexible heat detection tubing. Once a fire breaks out, this tubing ruptures and a suppression agent is released automatically through the tubing or via nozzles nearest the point where the most heat is detected, extinguishing the fire precisely where it starts and before it can take hold.

Once a turbine's capacity exceeds 3 MW, the cost of fire suppression to protect all three risk areas is outweighed by the cost of replacing that turbine. Installation of fire suppression systems at all three ignition sources typically costs less than \$30,000 – less than 1% of the average installation cost of a 3-MW onshore wind turbine and less than 0.6% of the average cost of a fire loss. When factoring in the average frequency of one to two fire incidents over the course of a wind farm's lifetime, the benefit of full protection of all ignition points outweighs the cost of installation.

The unintended consequences of a fire incident in a wind turbine can have far reaching operational, safety and health risks. By investing in fire suppression, owners, operators and their insurers can prevent not only the immediate, short-term costs of wind turbine replacement, but also the long-term reputational risk. If the wind industry is to thrive in the coming years, it must take action to manage and protect against fire incidents.

Angela Krcmar has over 10 years of experience in the fire protection industry focusing on the renewable sectors including wind and battery storage. For the past 10 years Mrs. Krcmar has led Firetrace efforts in the wind industry, contacting and visiting wind farms, owners and manufacturers in an effort to discuss needs and advantages of fire protection for wind applications. With the increases in the size and value of turbines, the cost of potential equipment losses, employee safety, downtime and increases in insurance premiums the need for fire protection is rapidly being recognized and owners, operators and manufacturers are now exploring their options.



Mrs. Krcmar is an active member of the AWEA Wind Environmental, Health, and Safety Standards Committee Meeting, member of the NFPA 855 Committee for Standard for the Installation of Stationary Energy Storage Systems and contributing member of the UL 6141 technical standards panel.

Comments

<https://www.windpowerengineering.com/the-true-cost-of-wind-turbine-fires-and-protection/>

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Wind turbine fire 2 dead

7 Jan, 2016 | Modified 7 Jan, 2016 | Views 4383

Two young mechanics, ages 19 and 21, died when a fire broke out in a wind turbine where they were performing routine maintenance.



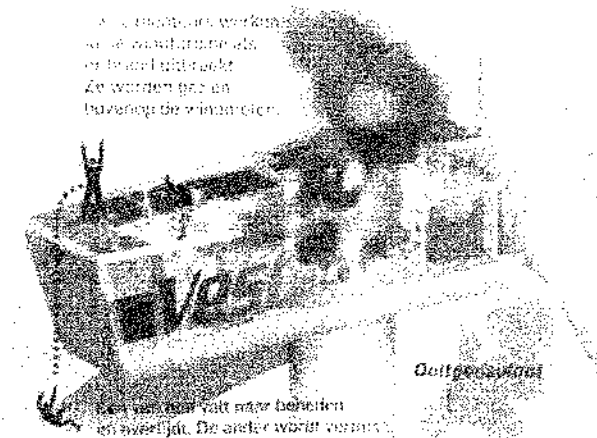
October 31, 2013 (Netherlands) – Two young mechanics, ages 19 and 21, died when a fire broke out



in a wind turbine where they were performing routine maintenance. The tragedy occurred at Deltawind's Piet de Wit wind farm in the Netherlands, but highlights the hazards associated with fires caused by wind turbines.

According to the Netherlands Times, "because of the height, the fire department initially had trouble extinguishing the fire in the engine room." The fire started in the afternoon, but it took until evening for a special team of firefighters to arrive and ascend with a large crane.

One victim was found on the ground beside the wind turbine; the other body was recovered by the specialized team. Two other mechanics escaped safely. A witness reported seeing two men jump through flames into a staircase.



Reference

Original story in Dutch:

Monteur overleden bij brand windmolen - <http://www.delders.nl/2013/11/30/monteur-overleden-bij-brand-windmolen/>

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1/24/2020

California lawmaker demands probe of PG&E's chief regulator for lax oversight

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California lawmaker demands probe of PG&E's chief regulator for lax oversight



PG&E on this Oct. 14, 2017, file photo. Fresno County is asking the state to probe the company's chief regulator for lax oversight after a massive fire destroyed a large industrial facility in the Central Valley. The fire, which started in a PG&E facility, destroyed a large industrial facility in the Central Valley. The fire, which started in a PG&E facility, destroyed a large industrial facility in the Central Valley. The fire, which started in a PG&E facility, destroyed a large industrial facility in the Central Valley.

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California lawmaker demands probe of PG&E's chief regulator for lax oversight

By MICHAEL LIEDTKE | The Associated Press

SAN FRANCISCO — A state lawmaker on Wednesday demanded an extensive review of the California Public Utilities Commission to determine whether regulators' lax oversight enabled neglect at Pacific Gas & Electric that triggered catastrophic wildfires, a messy bankruptcy and exasperating blackouts.

The request by Assemblyman Adam Gray could turn up the heat on the commission as it prepares to play a key role in determining PG&E's future.

The nation's largest utility has submitted a rehabilitation plan that must be approved by the commission and a federal bankruptcy judge by June 30 to qualify for coverage from a special fund state lawmakers created to help insulate California utilities from massive losses if their power lines ignite more devastating fires.

PG&E landed in bankruptcy nearly a year ago after a series of wildfires blamed on the utility in 2017 and 2018 killed nearly 130 people and destroyed nearly 28,000 homes, raising the specter that it might be asked to pay more than \$50 billion in claimed losses.

Gray, a Democrat from Merced, thinks it's time for his fellow lawmakers to assign the state auditor to dig deeper into the commission and analyze "what went wrong" at an agency that can sometimes seem arcane to the millions of Californians who depend on it to set the prices they pay for electricity and natural gas.

PG&E deserves plenty of blame for neglecting to upgrade its power system during the past decade as climate change increased wildfire risks, but "government incompetence is also part of the story," Gray said in a statement. He asserted the commission "knew about the decaying and outdated condition of PG&E's infrastructure, yet they failed to act."

The commission did not immediately respond to requests for comment.

Things have gotten so bad that PG&E now resorts to deliberately turning off power in some areas in hot, dry and windy conditions to reduce the chances of causing even more fires, a tactic it used eight times in 2019, affecting as many as 2 million people at some points and keeping the electricity off for several days

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California lawmaker demands probe of PG&E's chief regulator for lax oversight

The commission is conducting an investigation into how the utility handled those power shutoffs, a practice management expects to rely upon for at least several more years each summer and autumn.

In a related matter, PG&E reported to a federal judge Wednesday it failed to meet several commitments outlined in a fire-prevention plan that was approved by the commission last year.

The plan called for strengthening tree-trimming efforts and power line inspections, among other things. In the report, PG&E said it completed 46 of 53 specific commitments in the plan.

A consumer watchdog said he was concerned PG&E wasn't able to achieve what he described as crucial public safety goals.

The court filing demonstrates "a greater need" for the commission to "have its own inspectors in the field to be able to verify that this work is being done," Mark Toney, executive director of The Utility Reform Network told The San Francisco Chronicle.

It isn't the first time the commission has been accused of falling down on the job and contributing to the problems facing PG&E. But the findings of a state audit could prod state lawmakers to propose drastic reforms of the century-old agency.

Perceived shortcomings at the commission have already prompted three different governors to overhaul the regulator since PG&E first sought bankruptcy protection from 2001 to 2004. Last summer, California Gov. Gavin Newsom appointed a new commission president, Marybel Batjer, a former casino executive before she served as an operations administrator in state government.

PG&E got out of bankruptcy the first time after working out a plan, much of it in secret, with the commission president at that time, Michael Peevey, a former executive at another utility. That deal was widely criticized by consumer advocates, who called it an unmerited \$7.2 billion bailout that required PG&E's customers to pay higher electricity rates.

The decision on whether to open a commission probe will now fall to the Joint Legislative Audit Committee. The 14-member committee is evenly split between the Assembly and Senate, but consists of nine Democrats and five Republicans. Democrats have a supermajority in both houses.. The five Republican members are outnumbered by the nine Democrats. The committee is expected to consider

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THE CAMP FIRE PUBLIC REPORT

A SUMMARY OF THE CAMP FIRE INVESTIGATION

June 16, 2020

PREFACE

During the early morning hours of Thursday, November 8, 2018, the Cal Fire Captain in charge of the Jarbo Gap station in the Feather River Canyon could hear the “Jarbo Winds” as they were known locally begin to howl as he got up to fix breakfast for his crew. As he fixed that breakfast he started to hear what he thought was rain begin to hit the roof and sides of the fire station. He started to look outside when the wind took the door from his hand. He discovered it wasn’t rain he was hearing, but pine needles from the surrounding forest forcibly pelting the outside of the station. He went back inside to continue fixing breakfast, but was interrupted as the station’s dispatch radio feed went off alerting him to a possible fire in the Canyon.

The Cal Fire crew immediately rolled out of the station up Highway 70 and the Canyon, past the small enclave of Pulga and up river to the Poe Dam. Arriving above PG&E’s Poe Dam just before sunrise, the Captain and crew saw the beginnings of a conflagration under the PG&E high voltage power line on the ridge top across the river from them. The sight sent a chill through the Captain and crew because they could see the fire was already exploding toward the south and west riding the Jarbo Winds, which were so high the Captain struggled to remain upright. The Captain radioed into his headquarters with urgency in his voice – his crew would never be able to get in front of this fire to control it and in a prophetic understatement he told dispatchers: “This has the potential of a major incident.”

In less than an hour, the fire had torn through Pulga and the mountain hamlet of Concow and reached the eastern outskirts of Paradise – throwing softball-sized embers ahead to the north into Magalia and over the town into the Butte Creek Canyon on the west side. Paradise and its residents were hit from three side by massive walls of fire. Chaos and confusion reigned. Thousands of homes and businesses were lost in the matter of a couple of hours. A town of some 26,000 people was utterly destroyed.

Eight-four souls were lost in the most horrific way imaginable – burned to death.

Within a few hours of the fire, Cal Fire arson investigators began to make their way to where the responding Captain had seen the start of the fire. Traveling up Camp Creek Road (from which the Camp Fire took its quirky name), the investigators came to what appeared to be the fire’s beginning. The ground under what was PG&E’s transmission tower #27/222 showed clear signs of the fire’s beginning and a burnt path toward the southwest. Looking up, the investigators saw a detached line hanging down into the steel superstructure of the high-voltage transmission tower.

Something had broken - and sent the live 115 kilovolt (kV) power line (also known as a conductor) to arc against the steel tower and shower molten steel and aluminum metal onto the grass and brush below. A painstakingly detailed arson investigation began.

Within a few hours, the Cal Fire investigators had begun to reach their preliminary conclusions that the Camp Fire was started by the failure of a suspension hook holding up an insulator string which in turn held up the highly energized line. The investigators had found the broken iron

hook, also known as a “C hook”, and it appeared to have not just broken, but had worn through after a great deal of time hanging in the windy environs of the Feather River Canyon.

The investigators reached out to the Butte County District Attorney’s Office on November 9, 2020 and discussed their initial findings with the office ~ including their concern that a PG&E helicopter had been seen hovering above the suspect tower.

The Butte County District Attorney’s Office had had past dealings with PG&E and its criminal violations of failing to clear vegetation from its lines which sparked fires. The office also knew PG&E was a federal felon for its criminal actions leading to the San Bruno gas line explosion.

A directive was given the Cal Fire arson investigators that the DA’s office was opening a joint investigation with them and to treat the fire origin site as a crime scene and to prevent anyone, including PG&E, from entering. (The Cal Fire investigators had already started the process of securing the scene with private security.)

And so began the Camp Fire Investigation. . .

The next week Cal Fire arson investigators directed PG&E linemen under their close scrutiny to begin the dismantling of tower 27/222 and seized relevant portions for evidence. Later, Butte County District Attorney investigators teamed with Cal Fire arson investigators to examine other power lines in the vicinity of the suspect tower. Evidence from those surrounding towers was seized with the assistance of experienced linemen from PG&E under the close scrutiny of a loaned Federal Bureau of Investigation (FBI) Evidence Team.

Prosecutors were taken from normal day-to-day business in the office and assigned to oversee the investigation. Thus began the arduous task of gathering information from PG&E and others to determine the who, what, how and why of the Camp Fire.

Early into the investigation it became clear that as we began to collect terabytes of data from a facially cooperative PG&E that more broad based and intrusive subpoenas would be needed to dig out data from the extensive PG&E files including its vendor files. Additionally as PG&E witnesses, past and present, were being contacted for interviews, we found PG&E has hired attorneys to represent them and encourage silence.

We partnered with the California Attorney General who assigned experienced prosecutors to assist in the investigation and it was decided a special investigative criminal grand jury should be sworn to subpoena evidence and examine reluctant witnesses under oath. This grand jury was in addition to the regular “watchdog grand jury” that is sworn in every June in Butte County. This special grand jury of 19 ordinary Butte County citizens was selected from 100 summoned potential jurors and sworn in on March 25, 2019.

As an investigatory grand jury, it was the duty of the jurors to sift through all the evidence, hear the witnesses and keep an open mind as to whether there truly was any criminal liability on the part of anyone for causing the Camp Fire. This dedicated group of citizens then meet in secrecy for the next year and heard nearly 100 witnesses, reviewed approximately 1600 exhibits, and produced some 6000 pages of transcript. It cannot be overemphasized the patience and sacrifice

of these citizens, meeting once to twice a week for almost a year. And since they were sworn to secrecy, they were not even able to tell their employers, friends and family what they were so diligently working on. Even more amazing was their dedication to their important work to seek justice. Such was their dedication that only three grand jurors were unable to finish their term.

The remaining 16, after their months of hard work and review of all matters, returned an Indictment finding sufficient evidence to charge the Pacific Gas and Electric Company with 85 felony counts -- one count of unlawfully and recklessly causing the Camp Fire as a result of its gross negligence in maintaining its power line, and 84 individual counts of involuntary manslaughter naming each of the persons directly killed in the Camp Fire by PG&E's criminal negligence. The Indictment also included three special allegations for PG&E's causing great bodily injury to a firefighter; causing great bodily injury to more than one surviving victim; and causing multiple structures to burn (listed as approximately 18,804 structures). (See attached Indictment.)

PG&E, who had been represented by criminal defense attorneys during the investigation and Grand Jury proceedings, was informed of the Indictment and decided to plead guilty "as charged" to all counts -- thereby agreeing the evidence of its criminal negligence has been established beyond a reasonable doubt.

The following Camp Fire Public Report is a summary of the massive undertaking to determine if there was sufficient evidence to convict PG&E of its criminal behavior which lead to the Camp Fire and the awful destruction that followed. The Report also forms the core of legal documents filed with the Butte County Superior Court today to establish the Factual Basis for the pleas by PG&E to the Indictment and the People's Statement in Aggravation for the sentencing of the defendant corporation.