SHADOW FLICKER ASSESSMENT OF THE GOODHUE WIND PROJECT

Prepared for:

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Introduction

HDR performed a shadow flicker analysis for the proposed Goodhue Wind Project (Project) in Goodhue County, MN. The analysis assessed the potential impact of shadow flicker from 50 wind turbine generators (WTGs) on 289 potential receptors (Figure 1). Out of the 50 WTGs considered in the analysis, 36 are GE 1.6 xle and 14 are GE 1.5 xle. A widely accepted shadow flicker model, WindPro (Version 2.7.473, June 2010), was employed to estimate the maximum and expected number of hours per year that shadows would be cast upon these receptors.

Background

Shadow flicker caused by WTGs is defined as alternating changes in light intensity caused by moving rotor blades at a given stationary location, or receptor, such as the window of a home. In order for shadow flicker to occur, three conditions must be met: 1) the sun must be shining with no clouds obscuring the sun; 2) the rotor blades must be spinning and be located between the receptor and the sun; and 3) the receptor must be sufficiently close to the turbine to be able to distinguish a shadow created by the turbine. Shadow flicker intensity and frequency of occurrence at a given receptor are determined by such factors as the sun angle and sun path, turbine and receptor locations, cloud cover and degree of visibility, wind direction, wind speed, nearby obstacles, and local topography.

Shadow flicker may be analytically modeled, using geometry and site-specific data to estimate the number of hours per year that flickering shadows may be cast upon a given receptor. The movement of the sun over the year is simulated and assessed at one-minute intervals to calculate the potential frequency of shadows at receptors in the Project area. The model produces “actual expected shadow” results, where historical sunshine probability and wind direction data representative of the Project site are incorporated in the assumptions. However, even these actual expected shadow scenarios may produce higher shadow flicker values than one would experience at the receptors as the scenarios do not account for the numerous factors that can influence the intensity of shadow flicker, but instead report only the potential occurrence of flicker. For example, these results do not consider the potential screening effect of nearby vegetation or buildings.

In the United States, there are no federal standards related to shadow flicker. Some states require that an applicant provide an analysis of shadow flicker when applying for permits but specific numerical thresholds have not been set at the state level throughout the United States as of this report.

Shadow Flicker Model

The WindPro software package was employed to document the flickering effects of the Project and has been widely accepted in the review of other wind energy projects. By simulating the sun path throughout a whole year, the software calculates the number of hours per year as well as maximum minutes per day during which a given receptor could realistically expect to be exposed to shadow flicker from nearby WTGs. To calculate the actual expected shadow model results, the following inputs were required:

- Location of WTGs and receptors: The location of potential WTGs was determined by AWA Goodhue, LLC while receptor data was provided by Westwood. The receptor data was initially produced by Goodhue County Land Use Management Department (2010) and reviewed and verified by Westwood. (Figure 1). All proposed WTGs are located in the Goodhue County, MN. Only potential receptors within 2 kilometers (2000 meters) of a turbine were considered. All positions were referenced to the Universal Transverse Mercator (UTM), North American Datum 1983 (NAD 83), Zone 15 coordinate system.

- Topography: Elevations for WTGs and receptors were derived from the U.S. Geological Survey (USGS) 2009 digital elevation model (DEM) data provided by Westwood. Westwood used ArcGIS to convert the DEM data into 3 meters contours used in the model. WindPro accounts for terrain elevation differences when calculating shadow paths.

- Turbine Type: For the purposes of this analysis, two different turbine models were used. Fifty WTGs were modeled, 36 of which are GE 1.6 xle 1.5 megawatt (MW) turbines. This unit has a hub height of 262.46 feet (80 meters) and a rotor diameter of 270.66 feet (82.5 meters). The remaining 14 turbines are GE 1.5 xle 1.5 (MW) turbines, which have identical physical parameters as the 1.6 xle model.

- Sunshine Probability: NOAA's National Climatic Data Center provided the average percent of possible sunshine. This is the total time that sunshine reaches the surface of the earth and is expressed as the percentage of the maximum amount possible from sunrise to sunset with clear sky conditions[1]. This data represents the average percent of possible sunshine (through 2009) of a nearby station in Minneapolis-St.Paul, MN.

- Wind Direction: On-site measured wind data was analyzed to calculate the percent of annual hours of operation for each wind-direction sector. Although the WTGs will not operate all of the time, the model assumes that it will.

TABLE 1. SUNSHINE PROBABILITY IN MINNEAPOLIS-ST. PAUL, MN

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
53%	59%	57%	58%	61%	66%	72%	69%	62%	55%	39%	42%

TABLE 2. OPERATIONAL TIME

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW
5.60%	2.79%	3.23%	5.57%	7.87%	10.74%	11.84%	7.06%	5.91%	9.81%	16.48%	13.09%

The 289 receptors included in the analysis were defined as one square meter (10.76 square feet) windows located one meter above the ground surface. Each receptor was modeled in "Green House" mode, so that windows are not assumed to face any particular direction but rather face perpendicular to all WTGs. The model applied a minimum sun angle of three degrees to account for the diffusion of light through the atmosphere at lower angles on the horizon. At angles less than three degrees above the horizon, the diffusion of light is sufficient to prevent the formation of a distinct shadow. The height above ground ("eye height") for observers was set at 1.5 meters (5 feet).

[1] NOAA's National Climatic Data. [Online] URL: http://www.ncdc.noaa.gov/oa/climate/online/ccd/pctpos.txt. (Accessed June 2010).

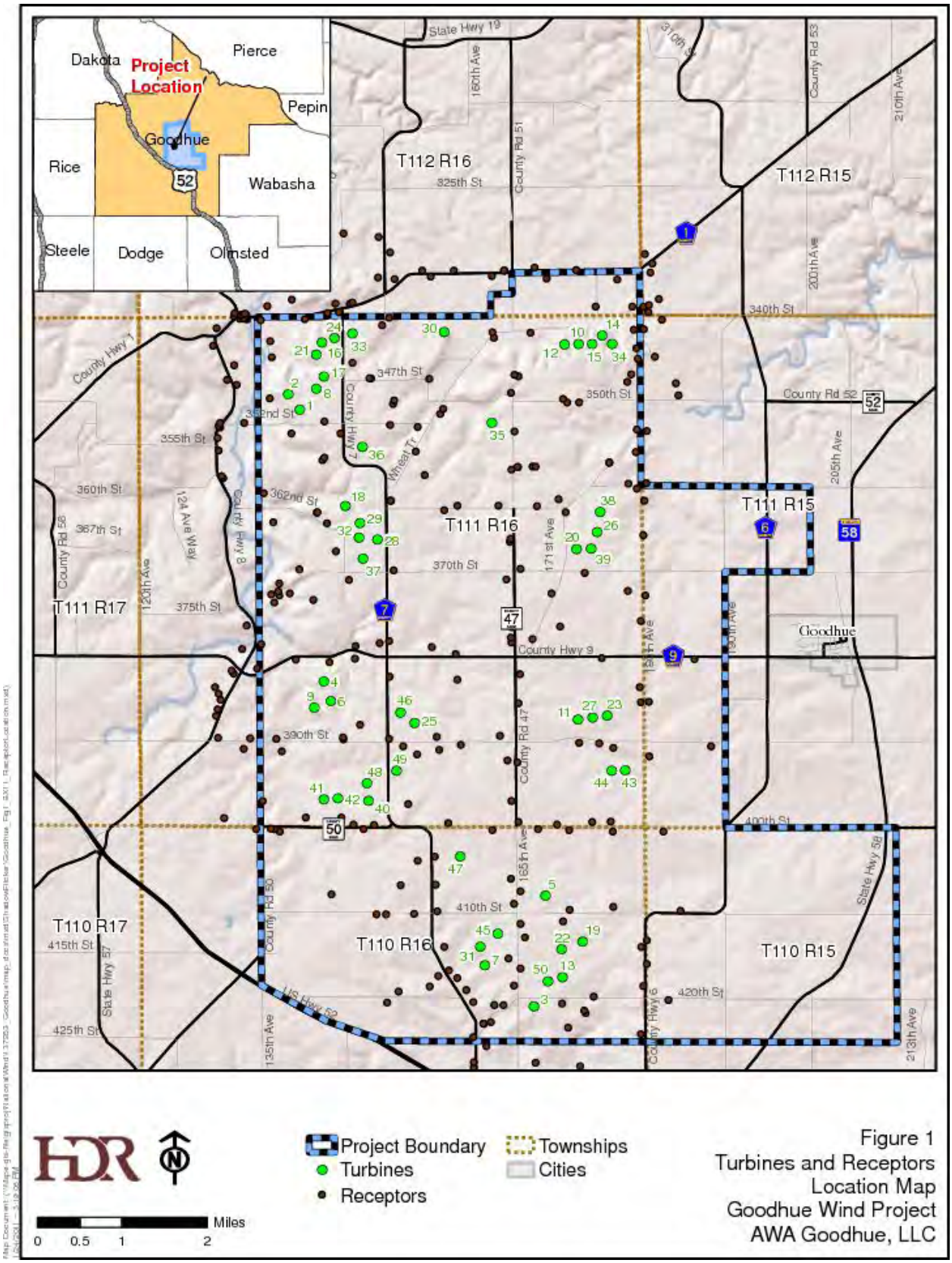

Figure 1
Turbines and Receptors
Location Map
Goodhue Wind Project
AWA Goodhue, LLC

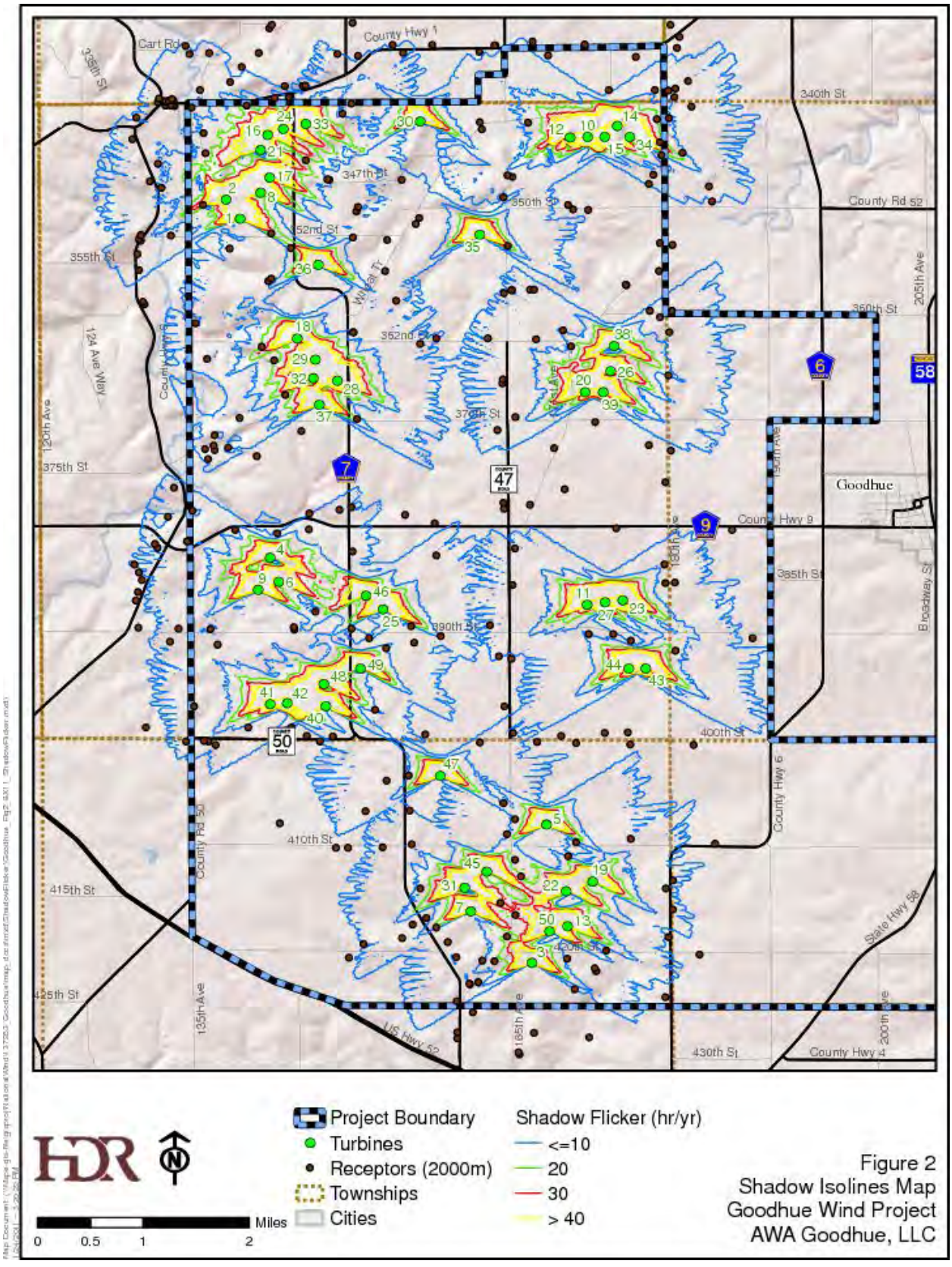

Figure 2
Shadow Isolines Map
Goodhue Wind Project
AWA Goodhue, LLC

Results

Using the 50 potential WTGs and 289 receptors in the Project Area, a shadow flicker analysis was completed. The annual actual expected shadow flicker hours for each receptor is presented in Appendix A of this document. Considering sunshine probabilities and wind direction data, the maximum expected (cumulative) hours of shadow flicker at any receptor is 39 hours, 21 minutes, which is less than one percent of the total available annual sunlight hours. Table 3 below provides a summary of the expected shadow flicker per year for the receptors included in the analysis.

TABLE 3
SUMMARY OF EXPECTED SHADOW HOURS AT RECEPTOR LOCATIONS

Expected Shadow Hours Per Year	Number of Receptors	Percentage of Receptors
0 Hours	69	23.9%
0.01-10 Hours	179	61.9%
10-20 Hours	30	10.4%
20-30 Hours	7	2.4%
30-40 Hours	4	1.4%
>40 Hours	0	0.0%

A review of the expected times of shadow flicker over the course of the year (Appendix B) indicates that some of the shadow flicker at individual receptors is expected to occur during working hours (defined as 8 am through 5 pm). If residents are not at their homes during these (or other) hours when shadow flicker is occurring, the actual experienced shadow flicker hours will be reduced. In addition, the model does not account for mitigation provided by nearby vegetation, or degree of visibility. The model also does not account for specific window locations, but rather, assumes the receptor can be impacted from any direction. Finally, the model assumes WTGs operate 100 percent of the time. If, during a time of potential shadow flicker, wind speeds are outside the range of WTG operation, or if a given WTG is down for maintenance reasons, the actual experienced shadow flicker hours will be reduced.

Conclusions

The actual expected hours of shadow flicker per year were modeled for 289 receptors in the vicinity of the Goodhue Wind Project. The results of the shadow flicker modeling show that the impacts on nearby receptors are expected to be minor, with 248 of the 289 receptors anticipated to experience less than 10 hours of shadow flicker during the year, and 278 of the 289 receptors anticipated to experience less than 20 hours of annual shadow flicker. For some receptors, shadow flicker is expected to occur during working hours when many residents would not be as likely to be at home. It should also be noted that the shadow flicker modeling software package employs several conservative assumptions. The model assumed that all receptors had a direct in-line view of incoming shadow flicker ("Green House") mode, when in reality windows will not always be facing the sun when shadow flicker is projected to occur. The model did not consider the effects of screening (e.g. trees, buildings), degree of visibility, and factors affecting operations that will influence shadow frequency or intensity. As a result, the actual impact of the shadow flicker on the receptors will likely be less than suggested by these results and shadow flicker is not expected to be a significant environmental concern at for this Project.

APPENDIX A
MAXIMUM AND ACTUAL EXPECTED SHADOW HOURS FOR RECEPTORS

Goodhue Wind Project Shadow Flicker Impact by Receptor

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
1	518,179.04	4,920,533.58	299.3	12:05	74	0:15	4:50
2	519,227.97	4,917,193.54	329.2	3:13	28	0:10	1:16
3	526,083.94	4,920,453.69	335.3	0:00	0	0:00	0:00
22	518,267.18	4,919,540.19	298.3	0:00	0	0:00	0:00
28	518,243.11	4,919,578.40	298.7	0:00	0	0:00	0:00
32	518,178.98	4,920,062.02	292.6	8:43	55	0:12	3:30
34	518,082.21	4,922,047.94	303.3	5:13	37	0:12	1:53
39	518,150.25	4,922,374.51	326.1	1:29	20	0:07	0:35
47	518,276.91	4,913,121.40	356.7	0:18	8	0:03	0:07
53	521,427.86	4,923,806.37	315	0:00	0	0:00	0:00
54	521,208.29	4,924,099.42	313.4	0:00	0	0:00	0:00
56	520,548.27	4,924,163.70	313.2	0:00	0	0:00	0:00
58	518,160.88	4,914,639.87	355	0:14	7	0:02	0:05
59	518,129.65	4,915,047.90	353.5	0:14	7	0:02	0:05
61	518,157.54	4,915,175.50	349.4	0:22	8	0:04	0:08
62	518,215.18	4,915,360.07	347.5	0:53	17	0:05	0:21
63	518,172.66	4,915,470.91	340.3	1:04	17	0:05	0:25
67	518,106.28	4,915,595.24	328.9	0:42	10	0:06	0:16
71	526,383.45	4,923,583.86	344	0:00	0	0:00	0:00
72	526,244.48	4,923,764.85	345.1	0:00	0	0:00	0:00
95	518,950.57	4,923,339.32	282.6	6:38	39	0:12	2:11
96	518,892.23	4,923,459.28	282.9	1:09	14	0:06	0:21
116	527,476.40	4,914,460.87	345.4	1:32	18	0:08	0:31
152	526,664.34	4,909,665.96	362.7	0:00	0	0:00	0:00
176	526,900.10	4,911,346.93	356.6	0:10	5	0:02	0:03

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
182	518,476.46	4,922,606.57	297.8	6:11	44	0:12	2:26
183	518,551.58	4,922,620.36	292.7	11:10	81	0:13	4:12
184	518,591.46	4,922,624.00	292.6	12:24	86	0:13	4:39
185	518,487.67	4,922,661.26	297.7	6:20	46	0:12	2:28
191	527,171.99	4,916,104.49	373.7	0:00	0	0:00	0:00
213	523,223.90	4,908,799.69	331.8	0:00	0	0:00	0:00
214	524,770.42	4,909,141.97	349.3	0:00	0	0:00	0:00
215	522,676.84	4,910,086.38	330.5	29:38	92	0:33	12:03
216	523,962.28	4,910,853.30	365.8	56:42	175	0:37	22:13
217	519,160.78	4,912,915.28	359.7	12:08	85	0:14	4:48
218	521,111.54	4,912,979.65	356	15:17	73	0:18	7:36
219	523,839.63	4,913,029.70	365.8	3:30	25	0:13	0:57
220	519,824.31	4,913,124.68	335.2	14:37	83	0:16	5:46
221	526,158.99	4,915,299.39	349.8	20:06	40	0:43	6:55
222	518,905.69	4,915,945.06	338.2	12:13	78	0:15	4:32
223	526,083.76	4,919,335.55	356.6	13:17	42	0:24	3:38
224	522,431.24	4,920,845.46	325.9	9:10	42	0:21	3:30
225	521,503.39	4,921,010.39	344.4	7:26	84	0:12	3:23
226	526,871.83	4,921,090.93	330.4	0:35	17	0:03	0:17
227	526,832.18	4,921,318.72	335.3	4:15	42	0:10	2:05
228	521,069.85	4,921,424.10	347.1	21:42	108	0:21	9:06
229	518,727.63	4,922,544.97	287.3	14:46	93	0:14	5:32
230	518,586.71	4,922,554.47	296.9	10:42	74	0:13	4:03
231	518,700.76	4,922,557.99	289.3	14:17	91	0:14	5:21
232	518,654.41	4,922,561.77	292.7	12:52	85	0:13	4:51
233	518,670.17	4,922,563.60	291.5	13:20	86	0:13	5:00

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
234	518,709.66	4,922,626.70	288.4	15:46	95	0:13	5:45
235	518,639.68	4,922,629.49	291.1	15:02	97	0:13	5:30
236	518,687.00	4,922,649.81	289	15:02	93	0:13	5:28
237	525,309.65	4,922,774.79	326	0:00	0	0:00	0:00
238	526,318.88	4,922,799.49	339	16:27	66	0:29	4:30
239	521,511.35	4,923,301.75	326	0:00	0	0:00	0:00
240	521,198.51	4,923,332.59	332.7	3:00	22	0:10	0:56
241	522,195.17	4,923,345.36	308.9	3:40	32	0:11	0:58
242	520,000.65	4,923,350.36	310.9	0:00	0	0:00	0:00
243	519,252.72	4,923,351.79	285.2	5:11	35	0:12	1:48
244	526,345.64	4,923,414.21	338.5	0:00	0	0:00	0:00
245	522,033.62	4,923,465.97	313.9	0:00	0	0:00	0:00
246	522,634.89	4,923,465.21	310.9	0:00	0	0:00	0:00
247	520,164.40	4,923,721.89	304.8	0:00	0	0:00	0:00
248	520,201.12	4,923,771.80	309.2	0:00	0	0:00	0:00
249	523,851.73	4,921,463.46	359.7	15:33	97	0:16	6:15
250	523,357.50	4,922,294.12	317.7	12:40	47	0:21	5:12
251	524,085.66	4,922,287.03	327.9	31:28	73	0:53	12:51
252	524,737.43	4,918,893.45	359.4	33:27	89	0:30	12:47
253	523,351.71	4,923,355.64	317	0:00	0	0:00	0:00
254	522,441.68	4,918,933.64	356.4	6:08	66	0:13	2:02
255	524,209.31	4,912,897.29	360.3	1:18	14	0:09	0:27
256	522,300.04	4,911,345.72	356.6	16:05	67	0:20	5:37
257	522,155.94	4,909,926.66	352.7	6:59	41	0:18	2:47
258	523,376.25	4,909,577.63	338.2	24:48	93	0:26	10:08
259	523,552.34	4,909,574.04	339.7	39:30	115	0:34	16:10

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
260	525,723.18	4,923,282.73	327.7	0:00	0	0:00	0:00
261	526,227.40	4,919,106.99	348	21:34	103	0:22	6:17
262	526,211.74	4,918,448.12	362.7	29:54	112	0:23	13:14
266	519,003.25	4,913,438.93	352.2	4:07	32	0:16	1:40
267	518,646.00	4,914,423.58	345.6	5:55	74	0:07	2:17
268	518,211.10	4,920,505.56	292.6	17:15	101	0:15	6:56
269	519,035.70	4,919,254.21	303.2	1:57	15	0:10	0:43
270	520,675.03	4,922,843.19	313.9	1:22	12	0:10	0:33
271	523,707.03	4,916,519.83	367.1	0:00	0	0:00	0:00
272	523,708.83	4,916,431.02	365.8	0:00	0	0:00	0:00
273	523,579.32	4,923,460.78	313.9	0:00	0	0:00	0:00
274	524,387.42	4,923,304.06	318.2	0:00	0	0:00	0:00
275	526,036.72	4,922,335.96	341.5	60:53	122	0:42	20:29
276	526,084.17	4,921,982.51	359.3	70:58	149	0:56	33:11
277	526,108.98	4,921,787.20	347.7	17:57	70	0:22	8:22
278	525,988.04	4,921,490.01	345.6	10:20	65	0:14	5:07
279	524,694.02	4,921,036.09	365.8	0:47	12	0:05	0:16
280	523,837.62	4,919,748.13	359.7	1:12	15	0:07	0:25
281	524,201.19	4,919,002.49	362.7	16:45	86	0:16	6:10
282	520,187.10	4,920,614.47	362.7	56:10	128	0:40	25:53
283	520,482.74	4,920,387.58	362.7	41:44	105	0:41	16:45
284	521,436.93	4,919,112.75	362.7	28:22	90	0:29	8:18
285	521,425.99	4,920,547.33	359.7	36:18	124	0:31	9:52
286	521,942.31	4,920,508.78	340	7:18	40	0:18	2:39
287	521,910.92	4,920,039.07	359.7	8:52	78	0:18	3:14
288	522,080.45	4,919,591.42	356.6	9:41	82	0:13	3:42

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289	520,713.61	4,921,724.08	345.7	54:18	166	0:32	18:30
290	522,169.59	4,921,418.47	324.1	9:11	84	0:14	3:36
291	520,754.05	4,916,123.87	343.8	19:49	56	0:28	5:13
292	521,411.49	4,915,786.09	348.4	6:43	42	0:16	2:28
293	520,525.16	4,914,640.95	359.7	14:52	88	0:17	5:42
294	523,493.12	4,914,666.63	365.8	2:27	28	0:10	1:01
295	526,139.00	4,915,581.05	351.2	34:43	102	0:25	8:53
296	525,632.06	4,914,431.39	351.5	0:00	0	0:00	0:00
297	523,872.41	4,911,725.58	361.7	31:49	102	0:40	13:28
298	523,747.51	4,911,493.27	365.8	23:26	70	0:33	9:15
299	524,656.64	4,909,605.05	356.2	22:28	70	0:35	9:04
300	523,873.04	4,910,270.81	363.1	83:17	204	0:38	35:38
301	522,849.82	4,909,864.55	325.6	8:52	58	0:15	3:33
302	522,315.10	4,910,131.00	332.1	10:32	46	0:22	4:13
303	522,978.74	4,909,632.91	333.1	9:05	66	0:17	3:40
304	523,648.05	4,910,455.06	362.7	92:49	227	0:41	39:21
305	526,145.26	4,909,017.42	359.3	0:00	0	0:00	0:00
306	523,180.37	4,909,226.72	317.4	12:36	64	0:21	5:01
309	521,353.04	4,909,628.98	339.1	0:48	12	0:05	0:18
310	521,156.32	4,911,297.98	368.8	0:00	0	0:00	0:00
312	518,474.65	4,921,672.51	295.7	21:13	117	0:17	8:10
313	518,347.44	4,921,403.85	303.4	16:09	102	0:16	6:34
314	518,524.37	4,921,307.70	293.5	24:39	137	0:20	10:08
315	518,667.03	4,920,584.62	289.6	18:18	91	0:18	7:20
316	519,165.38	4,922,134.23	291.8	27:32	94	0:37	10:50
317	519,560.95	4,920,383.83	347.5	2:35	18	0:13	1:01

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
318	519,703.98	4,917,816.09	356.6	17:35	97	0:16	7:02
319	519,526.29	4,917,365.45	323.7	6:49	45	0:14	2:43
320	519,323.58	4,917,328.29	327.2	3:21	24	0:11	1:20
321	519,176.61	4,917,341.33	322	2:27	20	0:11	0:58
322	520,639.30	4,917,617.93	360	0:00	0	0:00	0:00
323	519,110.67	4,922,789.45	286.5	13:05	74	0:17	4:52
324	526,426.99	4,921,824.75	343.6	29:35	104	0:35	13:59
325	525,568.10	4,919,822.58	362.7	0:00	0	0:00	0:00
326	520,045.29	4,918,893.49	342.1	54:14	148	0:36	21:32
327	519,194.75	4,921,829.42	294	38:27	138	0:26	15:14
328	525,581.49	4,913,036.16	365.8	0:00	0	0:00	0:00
329	519,153.24	4,921,048.95	292.8	81:18	125	0:54	34:08
330	525,232.61	4,913,030.90	359.7	0:00	0	0:00	0:00
332	518,980.19	4,922,525.07	285	18:55	107	0:17	7:06
333	519,744.99	4,923,133.30	312.9	0:00	0	0:00	0:00
334	519,570.09	4,922,912.64	308.1	17:30	70	0:20	5:55
335	518,214.31	4,920,588.77	298	11:46	70	0:15	4:44
336	518,162.10	4,920,300.14	293.1	3:25	22	0:12	1:21
337	519,817.45	4,922,549.04	300.5	56:35	135	0:37	20:01
338	520,395.62	4,922,843.48	310.8	0:00	0	0:00	0:00
339	520,243.46	4,922,662.87	306.7	26:16	63	0:33	9:07
341	520,461.22	4,922,678.28	314.8	29:16	54	0:40	9:21
342	520,713.32	4,922,852.92	313.3	1:31	14	0:09	0:37
349	518,418.92	4,915,904.34	343.4	2:24	31	0:07	0:57
350	518,457.56	4,915,847.50	346.5	2:37	35	0:07	1:04
351	521,405.61	4,922,576.47	344.4	21:17	70	0:35	7:28

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
352	521,275.61	4,922,426.84	344.4	26:35	81	0:36	9:24
353	518,883.44	4,912,911.25	357.9	4:18	40	0:11	1:42
354	518,617.38	4,916,315.48	324.8	0:00	0	0:00	0:00
355	518,709.65	4,916,757.16	332.2	4:07	48	0:10	1:25
357	519,211.62	4,918,710.41	335.8	8:27	62	0:14	3:25
358	518,775.34	4,914,620.25	347.5	6:23	56	0:12	2:31
361	519,223.18	4,912,909.50	358.4	8:14	75	0:13	3:15
362	518,985.98	4,916,410.11	309.3	10:20	58	0:15	3:28
363	521,039.39	4,921,429.39	346.3	24:14	113	0:22	10:09
364	519,329.60	4,912,857.76	349	6:42	58	0:11	2:38
365	520,141.61	4,919,885.44	351.8	15:16	47	0:26	6:05
366	520,184.77	4,919,926.61	350.5	16:26	48	0:27	6:32
367	519,323.66	4,917,556.76	318.5	7:55	53	0:12	3:06
368	519,306.32	4,917,397.65	318.3	3:18	22	0:12	1:18
369	523,589.91	4,923,458.09	313.9	0:00	0	0:00	0:00
370	519,261.90	4,914,615.93	332.2	1:12	13	0:08	0:26
371	519,368.67	4,914,376.44	326.4	10:37	67	0:14	3:40
372	520,040.27	4,918,889.95	341.6	54:05	147	0:36	21:30
373	524,156.49	4,923,518.56	318.5	0:00	0	0:00	0:00
375	520,302.65	4,911,670.79	362.7	0:00	0	0:00	0:00
377	519,633.87	4,916,115.41	317	23:15	61	0:30	8:03
378	521,478.90	4,920,942.65	344.4	6:58	68	0:12	3:11
379	521,568.35	4,909,831.88	357.1	3:43	58	0:05	1:28
380	522,987.00	4,908,402.65	307.8	0:00	0	0:00	0:00
381	520,228.97	4,918,687.55	343.2	43:37	112	0:45	17:40
382	522,987.67	4,908,491.21	307.8	0:00	0	0:00	0:00

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
383	519,966.32	4,917,236.27	359.7	0:00	0	0:00	0:00
384	524,946.28	4,923,471.37	323.1	0:00	0	0:00	0:00
385	520,394.76	4,918,161.92	359.7	34:11	86	0:36	13:50
386	523,934.58	4,908,154.97	323.1	0:00	0	0:00	0:00
387	523,919.66	4,908,185.89	324.8	0:00	0	0:00	0:00
388	520,417.87	4,912,894.19	353.9	0:00	0	0:00	0:00
416	523,710.35	4,921,150.24	341.1	1:32	25	0:05	0:35
417	521,215.35	4,916,418.15	345.3	5:42	35	0:15	1:30
418	521,928.14	4,912,309.31	365.8	9:37	32	0:24	3:54
419	523,748.19	4,909,943.62	360.4	46:59	98	0:38	17:08
420	521,402.43	4,916,457.21	341.5	3:14	25	0:13	0:52
421	526,220.78	4,922,350.32	341.4	34:51	89	0:37	12:21
422	522,274.59	4,911,852.24	356.4	4:42	30	0:11	1:31
423	521,398.26	4,914,615.72	362.7	0:46	14	0:04	0:22
424	521,753.72	4,913,382.60	371.5	29:08	103	0:25	13:52
426	522,256.34	4,912,386.19	368	27:55	53	0:40	11:37
427	521,660.53	4,914,471.54	365.8	3:03	39	0:07	0:44
428	525,098.90	4,909,418.26	340.3	6:52	27	0:20	3:02
429	523,777.35	4,920,417.46	353.7	60:35	95	0:44	29:50
430	522,687.83	4,919,018.85	352.9	2:17	30	0:09	0:47
431	525,078.48	4,909,464.41	343.2	6:58	27	0:20	2:58
432	521,923.04	4,914,316.31	371.9	56:08	99	0:49	14:35
433	524,768.89	4,920,966.84	365.8	0:38	10	0:05	0:13
434	525,252.62	4,909,731.50	345.3	15:48	63	0:22	7:05
435	524,996.74	4,920,960.60	363.3	0:12	6	0:02	0:04
436	522,513.30	4,913,014.58	370.8	1:17	26	0:05	0:36

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
437	523,717.15	4,919,700.21	359.6	2:24	42	0:06	0:50
438	525,913.40	4,921,356.22	345.1	2:22	29	0:07	1:10
439	522,209.15	4,916,344.29	357.3	0:00	0	0:00	0:00
440	523,831.99	4,919,748.48	359.7	1:11	15	0:07	0:24
441	523,873.08	4,911,110.87	365.8	50:49	110	0:51	17:10
442	522,299.31	4,914,651.60	367.9	14:40	63	0:21	3:38
443	522,347.15	4,914,402.41	374.5	7:41	50	0:20	2:22
444	523,468.95	4,919,018.44	360.7	3:15	46	0:09	1:12
445	524,113.09	4,919,750.41	359.8	3:16	28	0:11	1:07
446	524,175.80	4,919,750.82	359.7	4:41	40	0:12	1:37
447	523,696.69	4,911,965.58	359.7	25:11	88	0:28	10:55
448	522,663.76	4,916,215.23	347.5	0:00	0	0:00	0:00
449	526,192.13	4,909,930.63	359.7	2:44	38	0:08	1:14
450	522,685.96	4,915,726.23	353.6	4:30	26	0:16	1:15
451	522,753.04	4,914,498.14	368.8	23:58	93	0:23	11:40
452	523,341.58	4,912,885.02	365.8	25:44	67	0:26	6:25
453	524,676.87	4,911,158.32	360.8	31:42	94	0:37	10:27
454	523,696.02	4,918,390.57	365.7	5:13	44	0:15	2:06
455	523,690.85	4,918,334.00	365.2	5:04	44	0:15	2:04
456	526,259.83	4,910,350.81	354.1	5:36	51	0:13	2:29
457	524,800.17	4,911,370.15	359.7	2:41	39	0:09	0:58
458	526,275.62	4,920,424.43	335.4	0:00	0	0:00	0:00
459	523,615.43	4,917,623.18	368.8	4:45	55	0:11	1:53
460	524,609.70	4,919,139.31	353.3	25:51	82	0:24	9:20
461	526,154.01	4,910,670.00	361.2	5:31	46	0:15	2:13
462	525,567.24	4,919,826.46	362.7	0:00	0	0:00	0:00

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
463	523,886.58	4,917,824.22	368.8	10:21	69	0:17	4:05
464	523,710.88	4,913,432.17	365.8	0:10	5	0:02	0:03
465	526,264.06	4,910,788.46	361.2	3:39	38	0:12	1:25
466	523,633.35	4,914,198.16	371.9	3:22	55	0:06	1:20
467	523,723.84	4,916,724.22	368.8	0:00	0	0:00	0:00
468	525,624.78	4,911,425.81	353.6	12:09	61	0:16	3:31
469	523,818.63	4,914,158.65	371.2	1:20	40	0:02	0:31
470	525,928.57	4,919,428.72	353.8	18:35	50	0:27	4:23
471	523,841.17	4,915,276.61	371.9	4:34	38	0:14	1:50
472	523,875.63	4,915,830.73	364.2	8:21	63	0:13	2:47
473	524,569.11	4,912,981.14	352.6	0:29	8	0:05	0:10
474	524,799.01	4,912,875.91	353.2	0:00	0	0:00	0:00
475	524,109.34	4,916,492.08	370	0:00	0	0:00	0:00
476	526,264.55	4,919,432.52	351.8	8:24	34	0:20	2:18
477	524,471.01	4,917,351.53	371.9	0:00	0	0:00	0:00
478	525,094.56	4,917,743.46	368.8	0:00	0	0:00	0:00
479	524,631.37	4,916,726.78	368.8	0:00	0	0:00	0:00
480	525,618.59	4,912,850.78	361	0:00	0	0:00	0:00
481	524,990.85	4,914,525.12	350.9	31:39	93	0:27	10:42
482	525,362.46	4,914,523.83	352.7	9:18	33	0:21	2:57
483	525,912.96	4,917,395.15	368.8	0:00	0	0:00	0:00
484	526,578.69	4,912,845.68	359.4	0:00	0	0:00	0:00
485	525,414.87	4,916,130.48	362.7	0:00	0	0:00	0:00
486	526,246.59	4,917,310.21	368.8	0:00	0	0:00	0:00
487	526,159.31	4,916,830.36	364.2	0:00	0	0:00	0:00
488	526,309.92	4,914,271.03	341.9	45:20	122	0:53	16:11

Receptor No.	Receptor Location (UTM NAD83 Zone 15)[a]		Elevation	Shadow Hours per year	Shadow Days per year	Max Shadow Hours per day	Shadow Hours per year
	X - Coordinate	Y - Coordinate	[m]	[HH:MM/year][b] (Worst Case)	[days/year][c] (Worst Case)	(HH:MM/yr)[d] (Worst Case)	(HH:MM/yr)[e] (Expected)
489	526,302.45	4,915,307.53	356.6	11:47	34	0:30	4:04
491	526,063.71	4,920,029.21	356.6	0:00	0	0:00	0:00
492	526,561.08	4,922,524.46	341.4	14:51	64	0:19	4:57

[a] *The coordinate system is the Universal Transverse Mercator (UTM) system, using North American Datum 1983 (NAD 83), Zone 15.*

[b] *Total hours per year of shadow flicker at this receptor under worst-case conditions.*

[c] *Days per year in which shadow flicker is possible at this receptor under worst-case conditions.*

[d] *The maximum daily hour and minutes of shadow flicker at this receptor, under worst-case conditions. This value is the single day maximum due to the combination of receptor and turbine locations, and sun path across the sky. All other days will be less than this maximum as the sun path changes throughout the year. All days will also be less than this maximum due to real world conditions such as cloud cover, changes in wind direction, and less than 100% wind turbine operation.*

[e] *Expected hours of shadow flicker at this receptor, including sunshine probability and actual wind direction data. Actual hours should be less than this value due to less than 100% wind turbine operation, and other mitigating factors such as screening due to trees or structures.*

APPENDIX B

PREDICTED SHADOW HOURS CALENDAR BY RECEPTOR

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SF_Goodhue_V4_20110121

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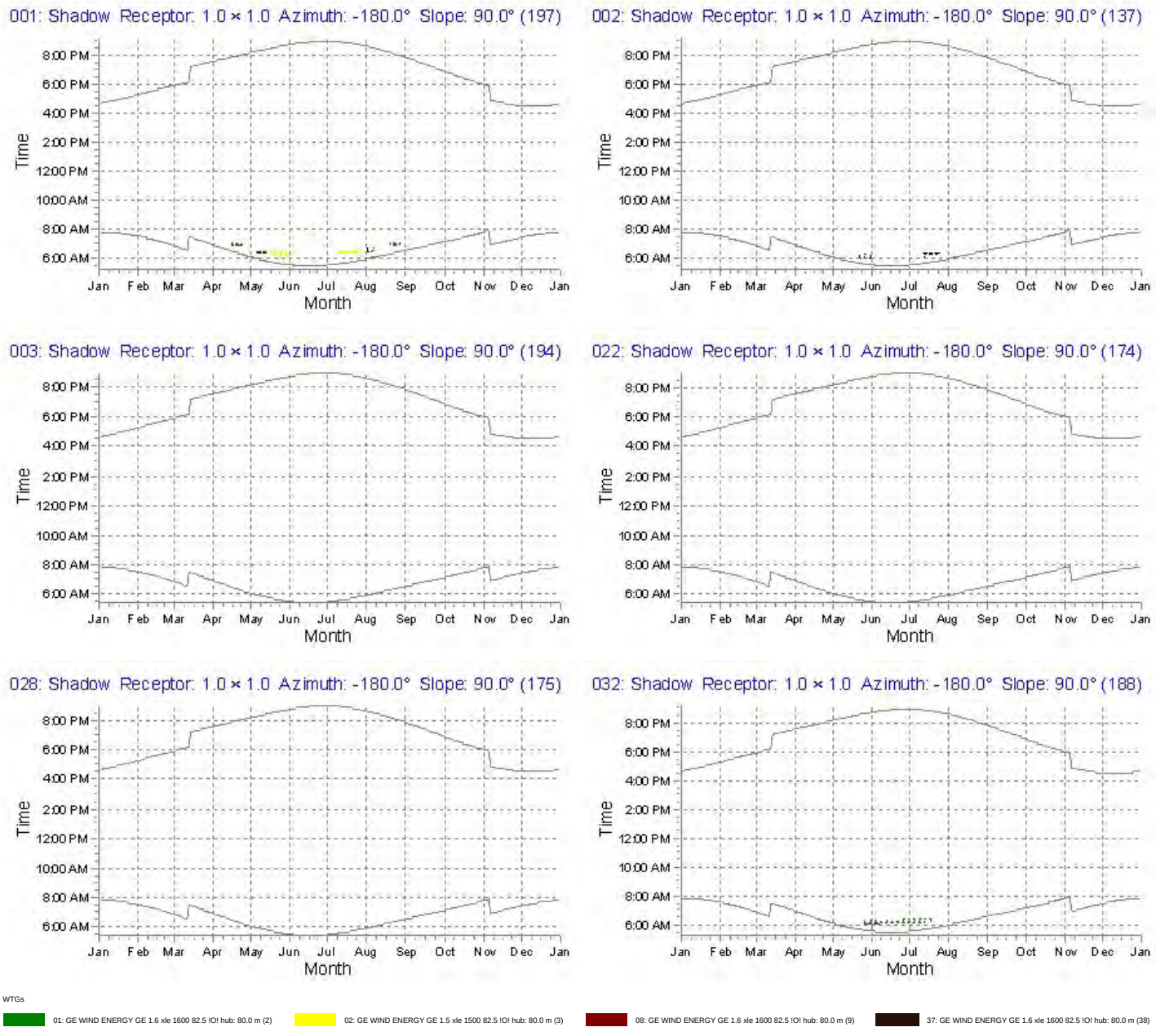
1/21/2011 4:53 PM/2.7.473

SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121



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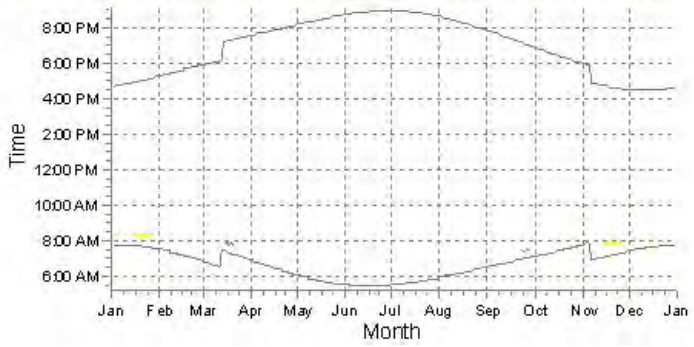
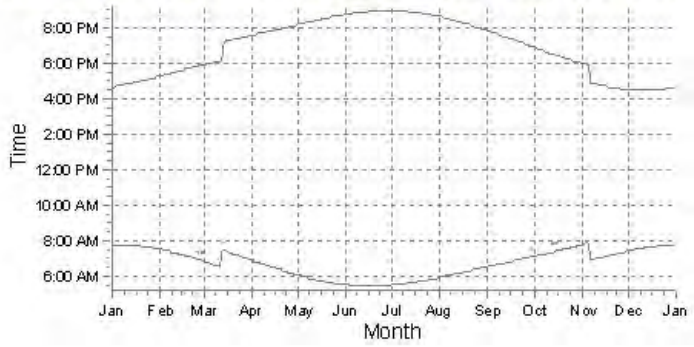
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

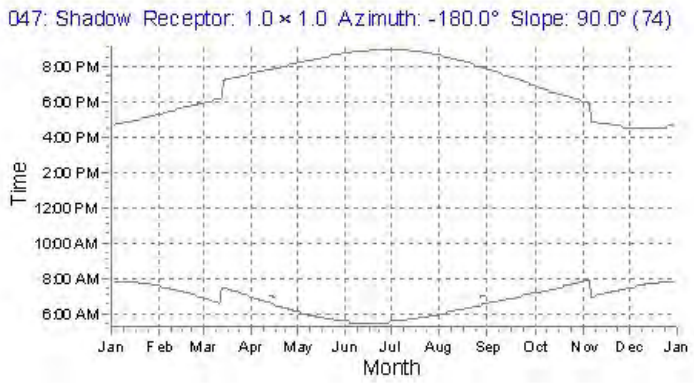
034: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (228)



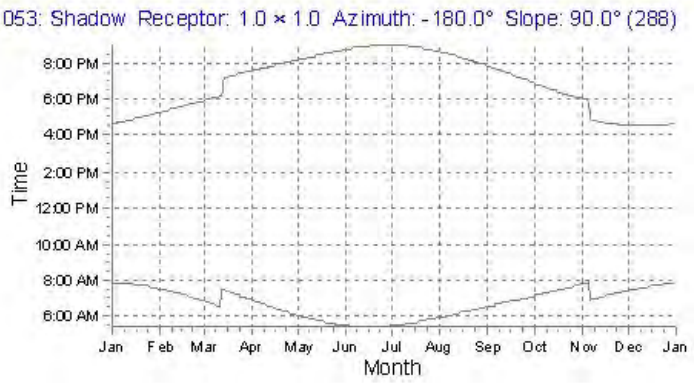
039: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (235)



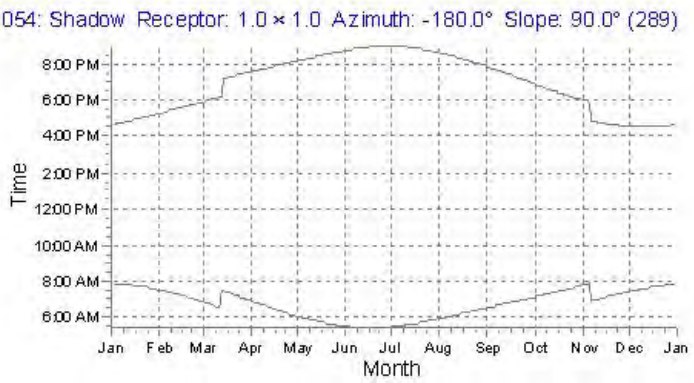
047: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (74)



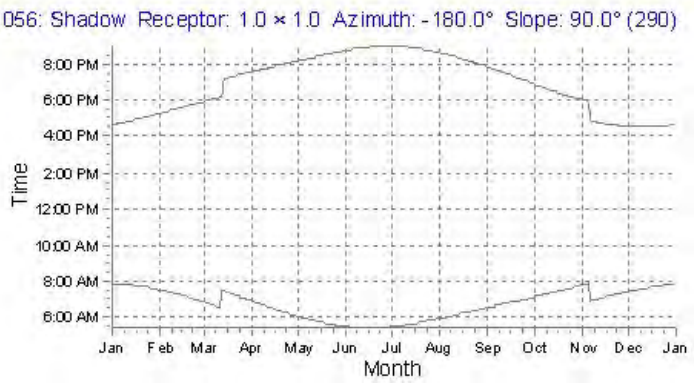
053: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (288)



054: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (289)



056: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (290)



WTGs

02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
41: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (42)

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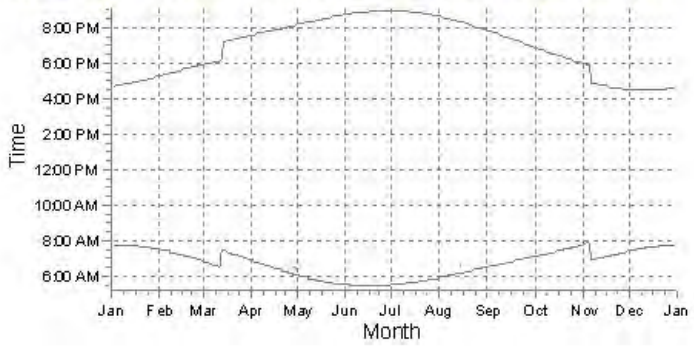
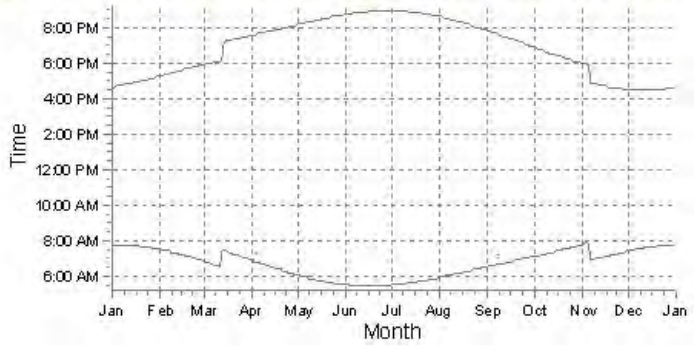
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

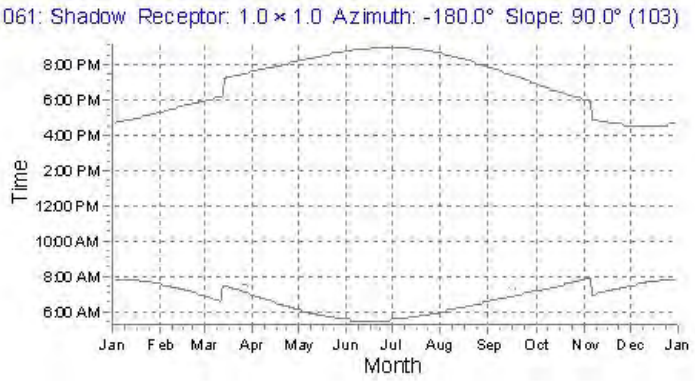
058: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (97)



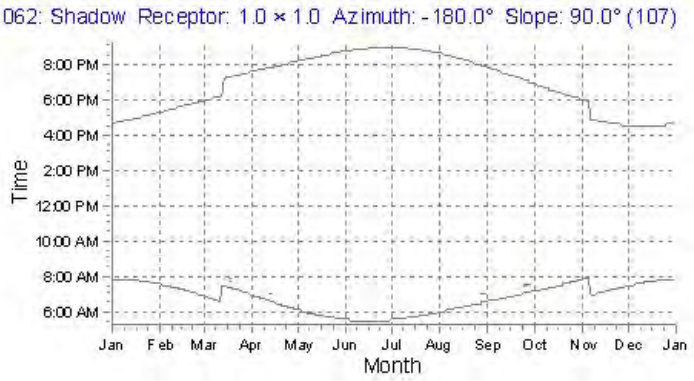
059: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (102)



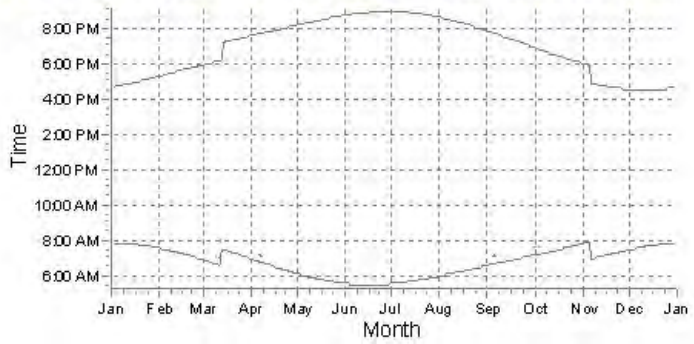
061: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (103)



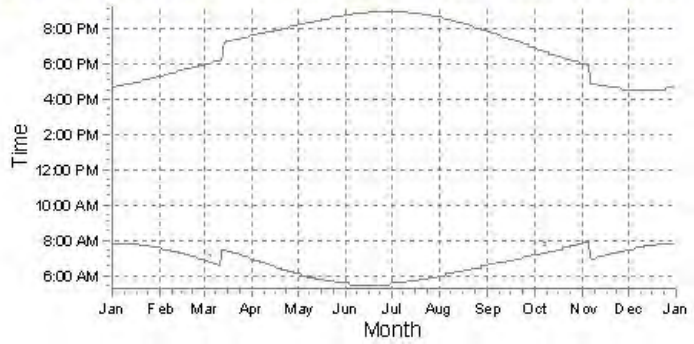
062: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (107)



063: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (108)



067: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (110)



WTGs

04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)

09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)

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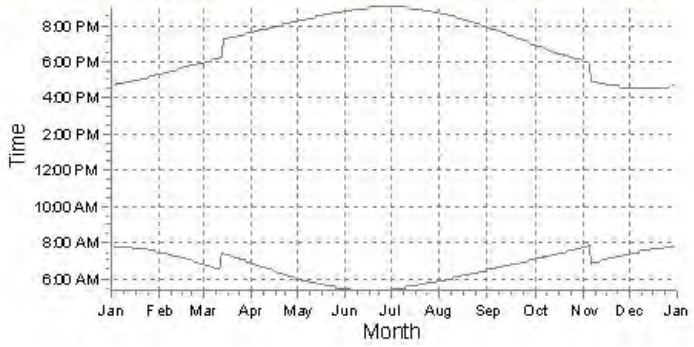
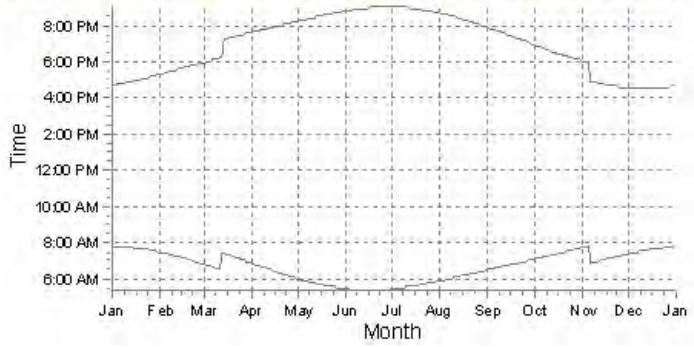
Calculation: SF_Goodhue_20110121

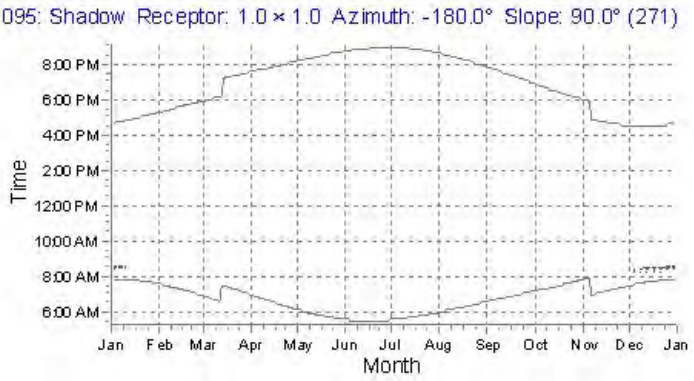
071: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (284)



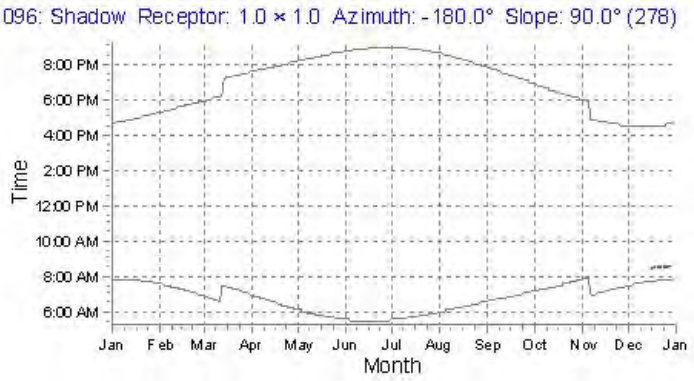
072: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (286)



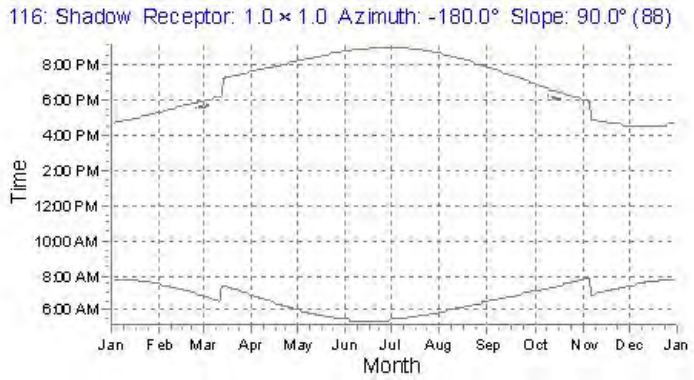
095: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (271)



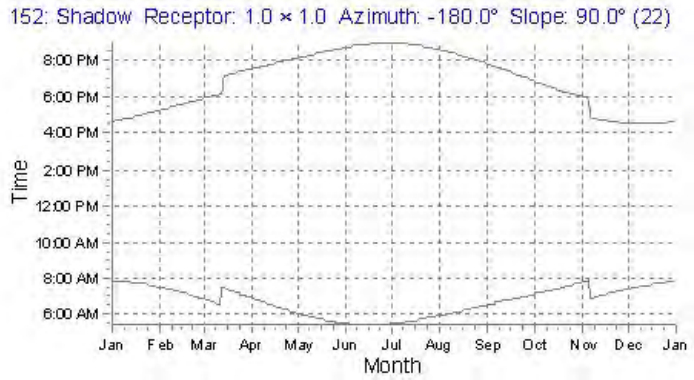
096: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (278)



116: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (88)



152: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (22)



WTGs

24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
43: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (44)
44: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (45)

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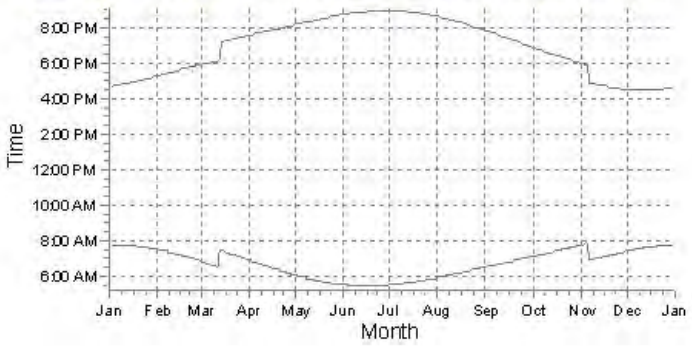
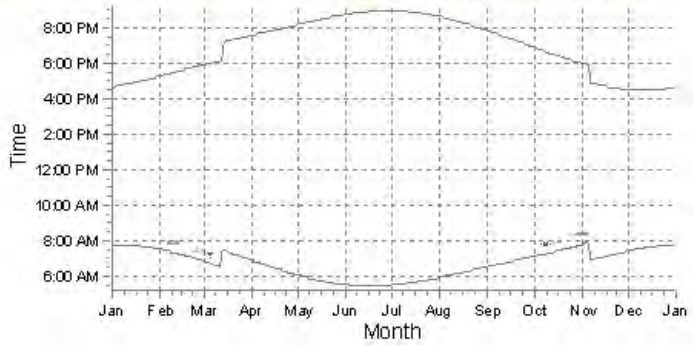
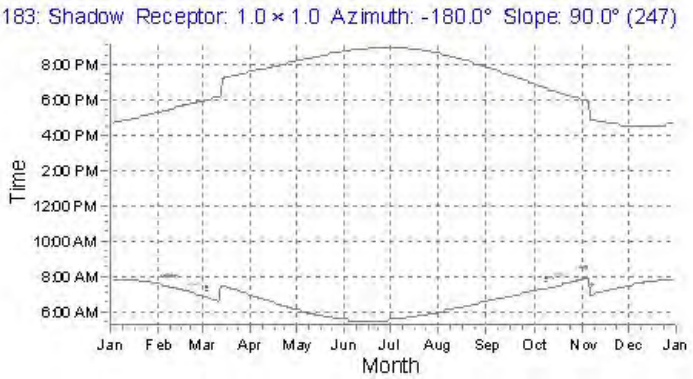
176: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (45)



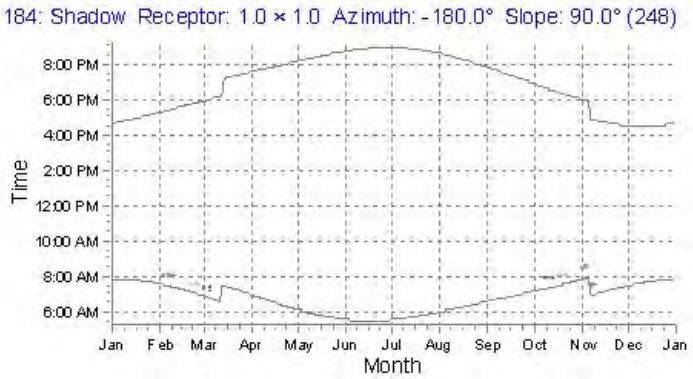
182: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (246)



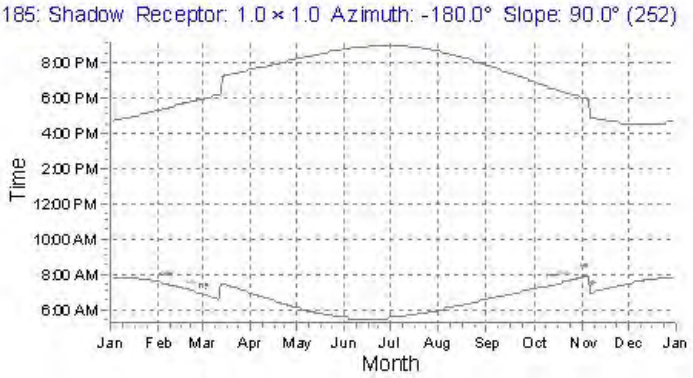
183: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (247)



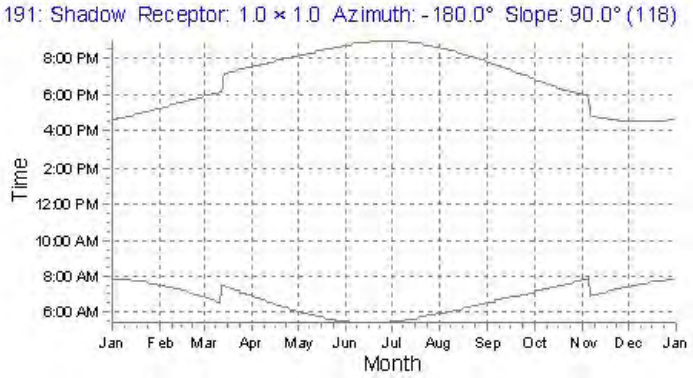
184: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (248)



185: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (252)



191: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (118)



WTGs

16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)

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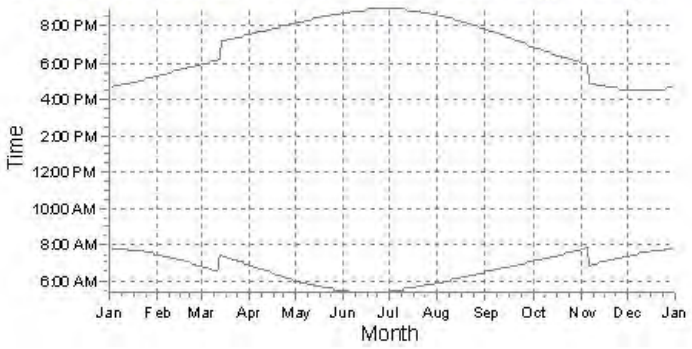
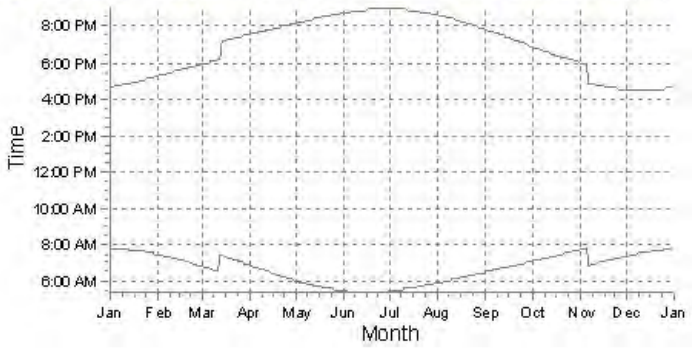
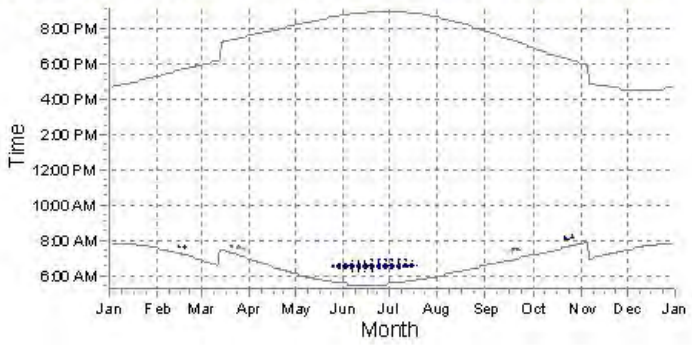
213: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (8)



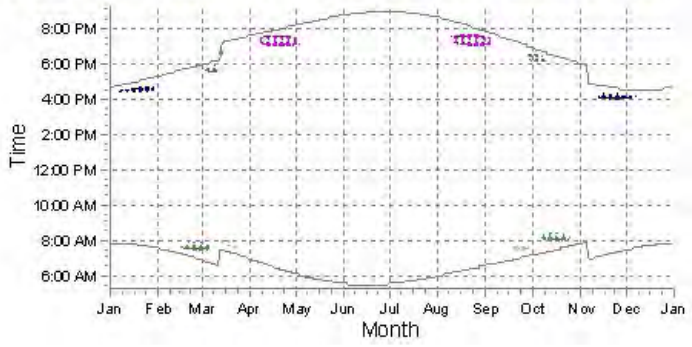
214: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (11)



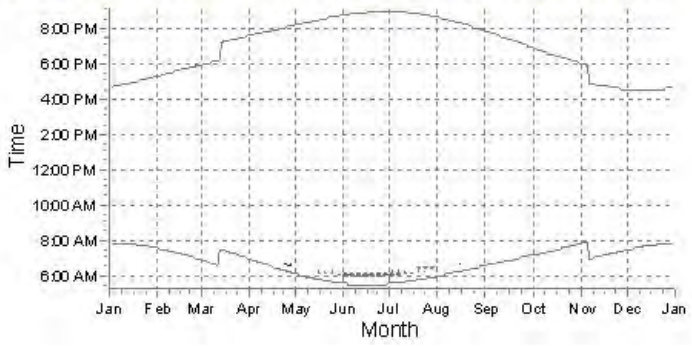
215: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (29)



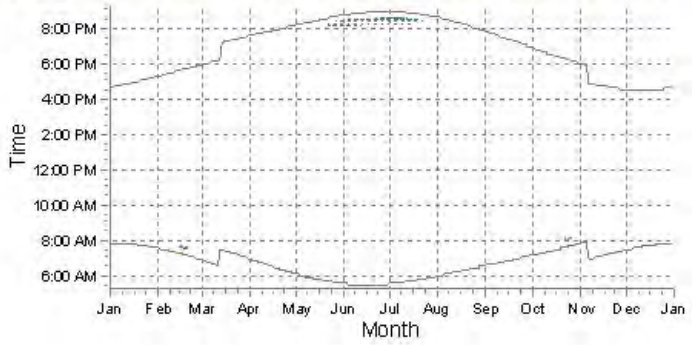
216: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (38)



217: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (66)



218: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (67)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
41: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (42)
42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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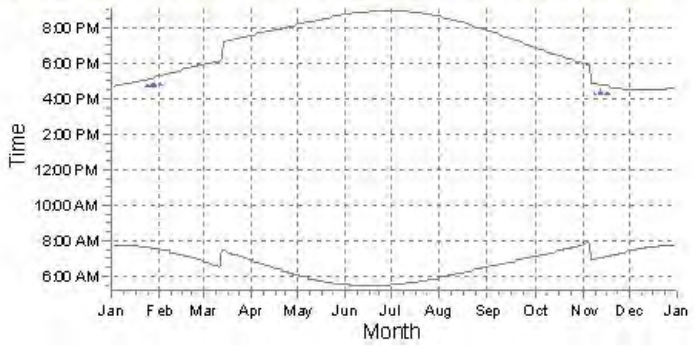
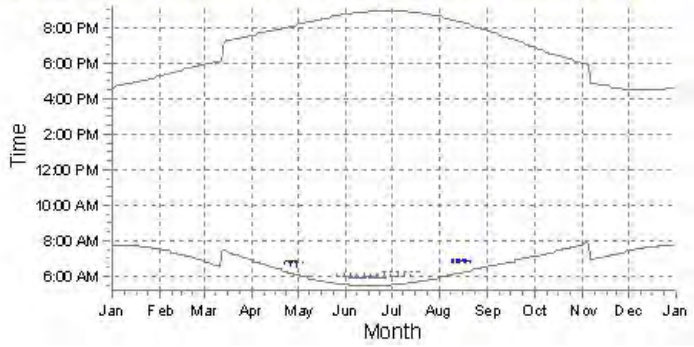
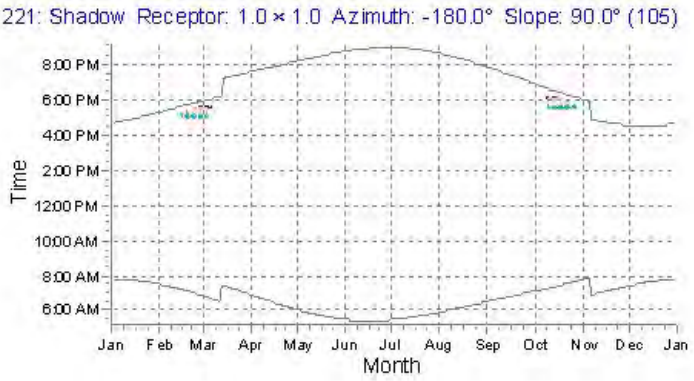
219: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (71)



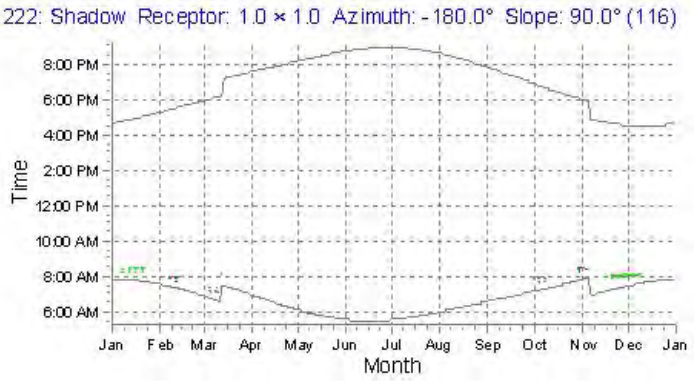
220: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (76)



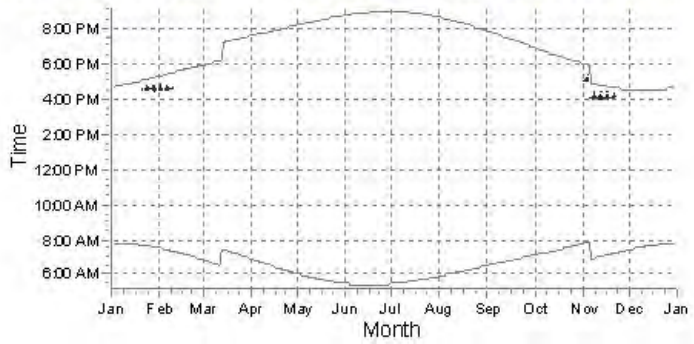
221: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (105)



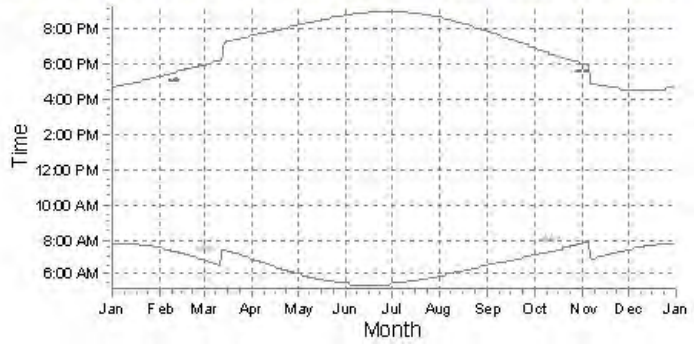
222: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (116)



223: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (171)



224: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (203)



WTGs

04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
11: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (12)
23: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (24)
27: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (28)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)

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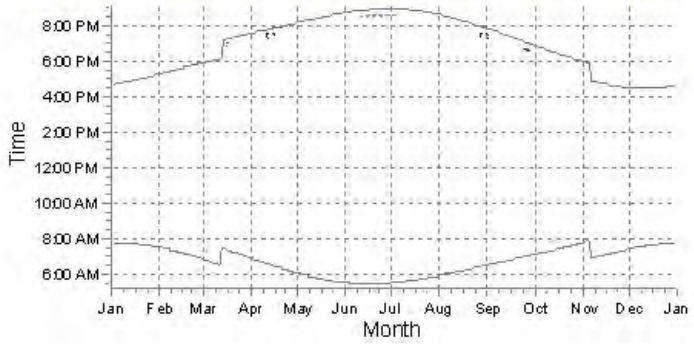
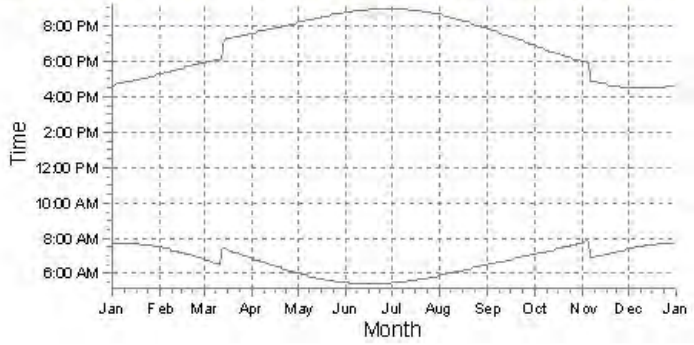
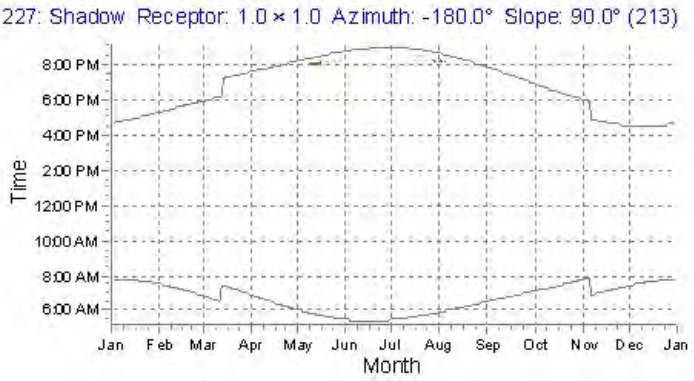
225: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (207)



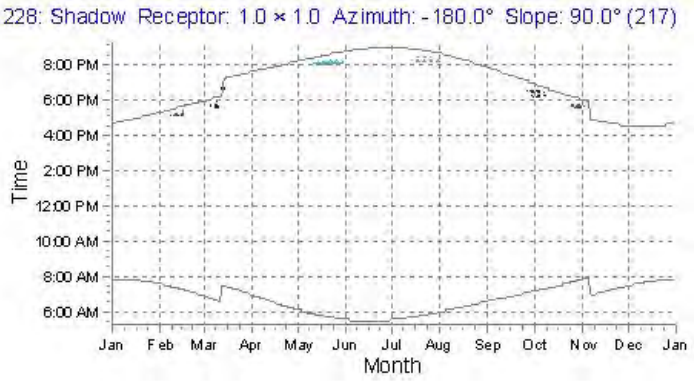
226: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (210)



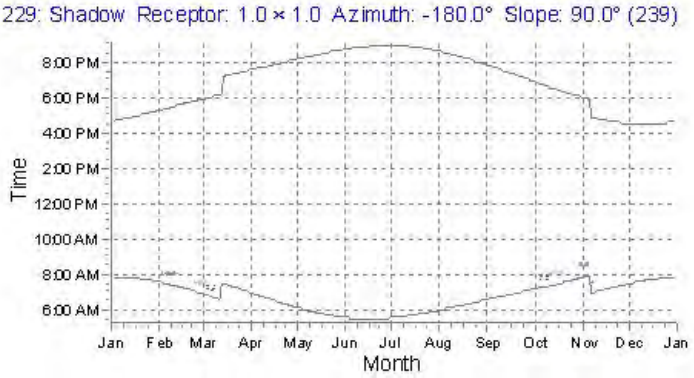
227: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (213)



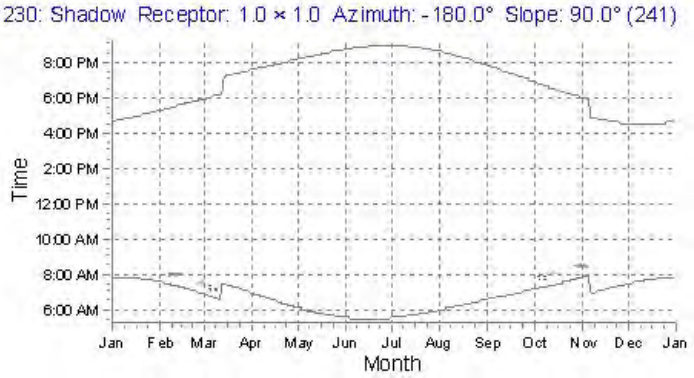
228: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (217)



229: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (239)



230: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (241)



WTGs

- 01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
- 02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
- 08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
- 10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
- 15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
- 16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
- 17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
- 21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
- 24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
- 35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)

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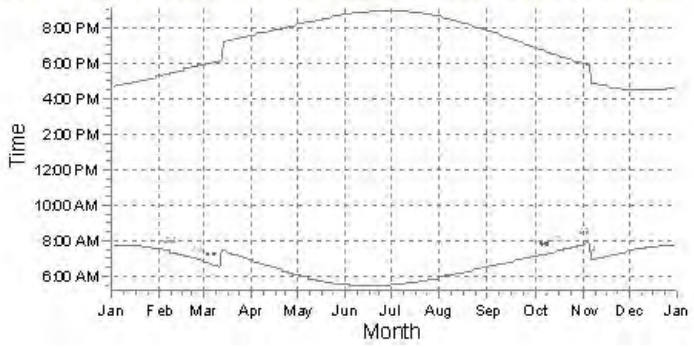
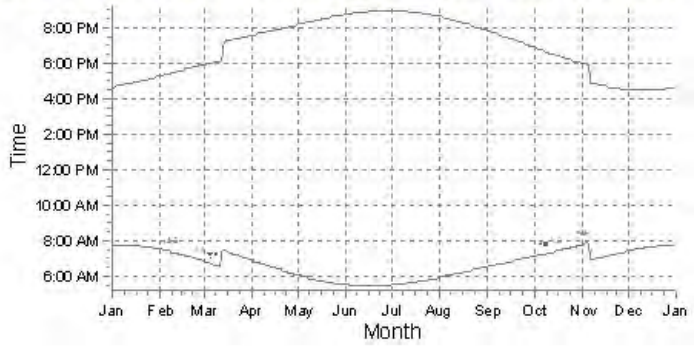
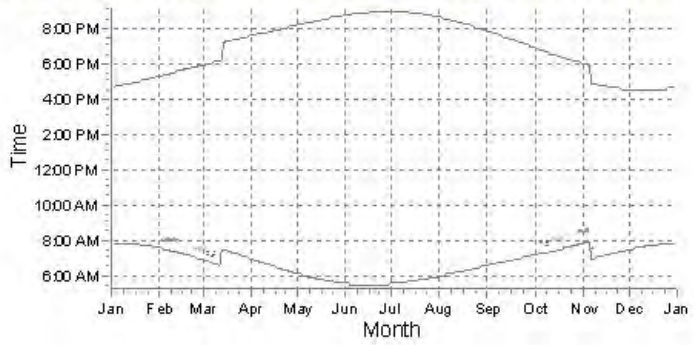
231: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (242)



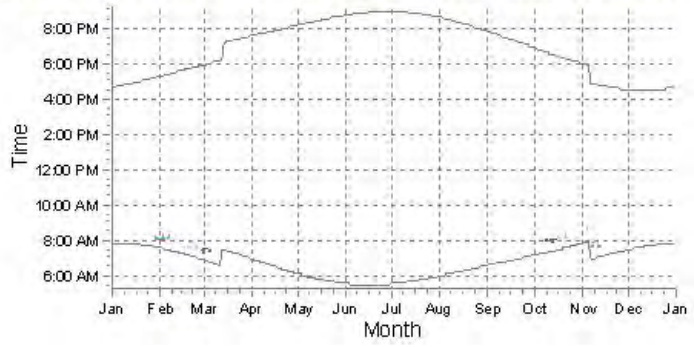
232: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (243)



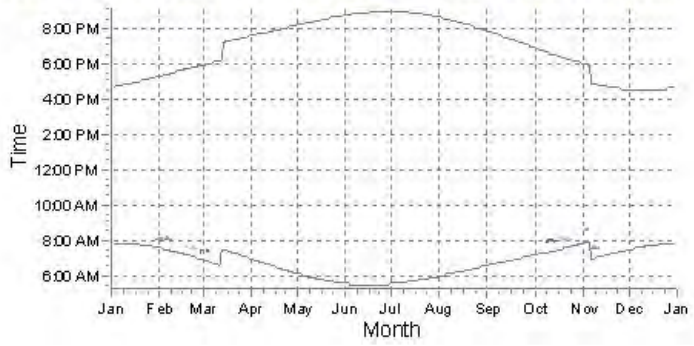
233: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (244)



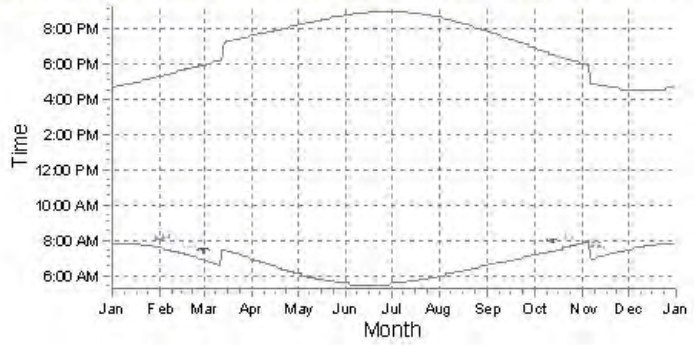
234: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (249)



235: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (250)



236: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (251)



WTGs

16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)

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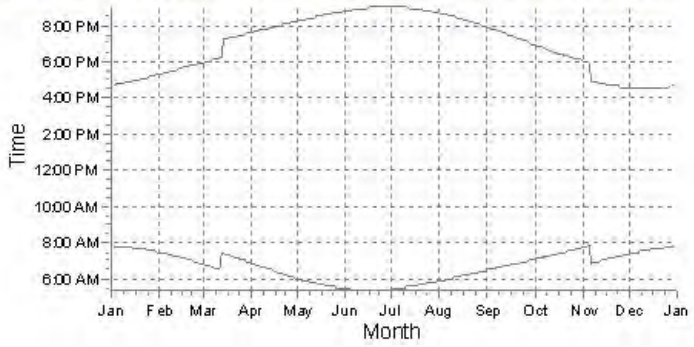
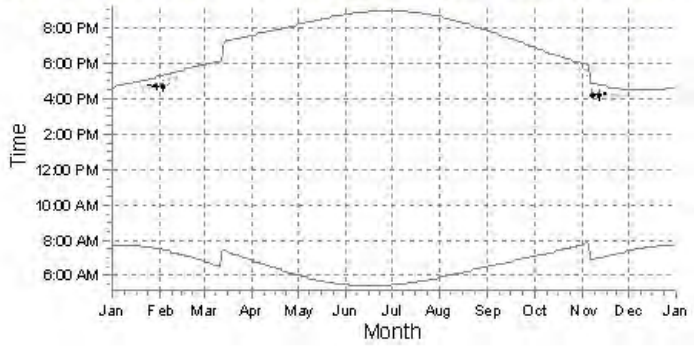
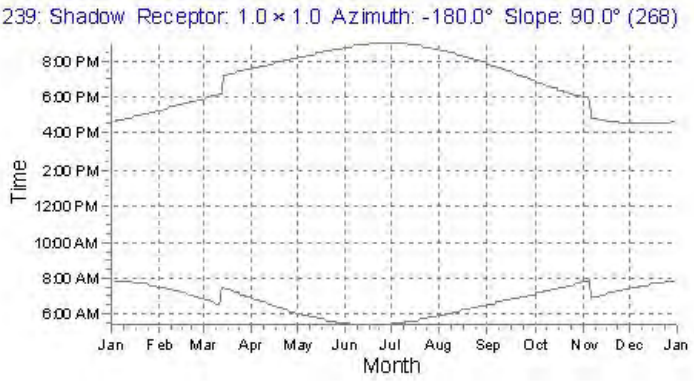
237: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (258)



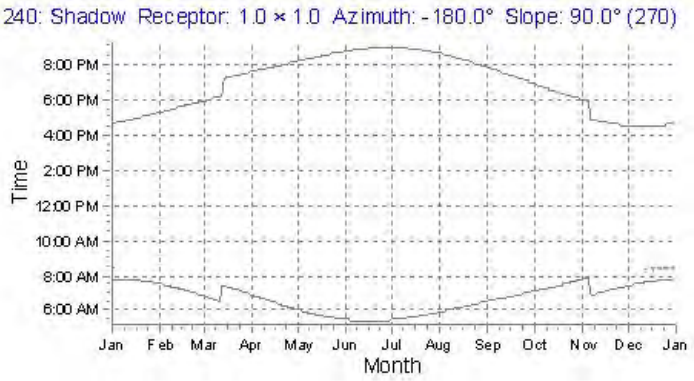
238: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (260)



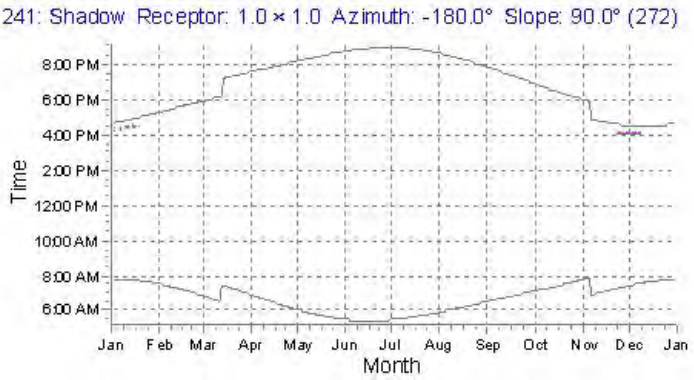
239: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (268)



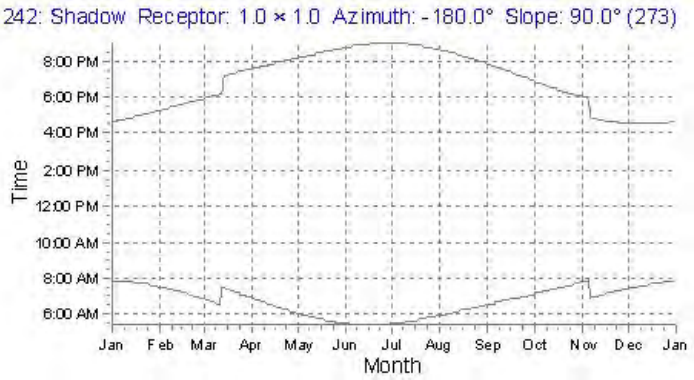
240: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (270)



241: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (272)



242: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (273)



WTGs

10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)

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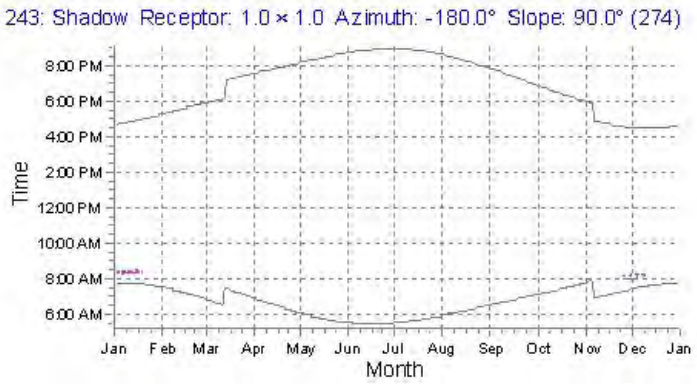

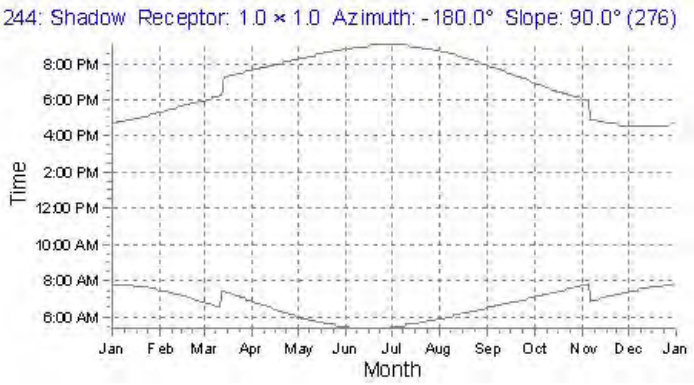

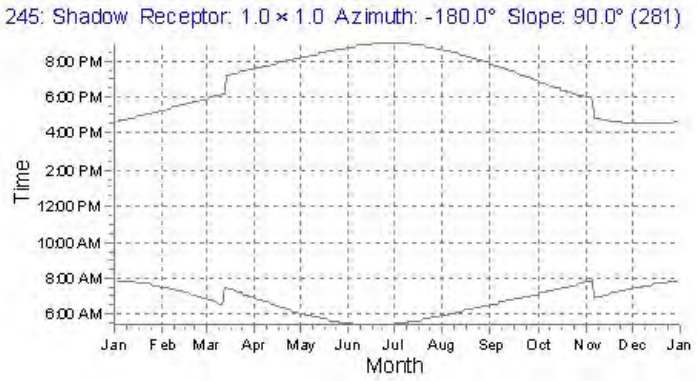

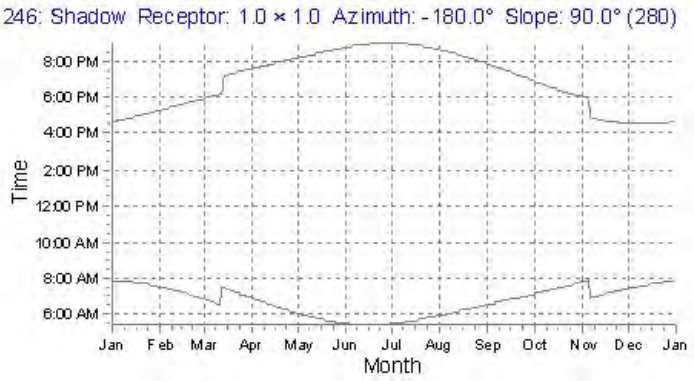

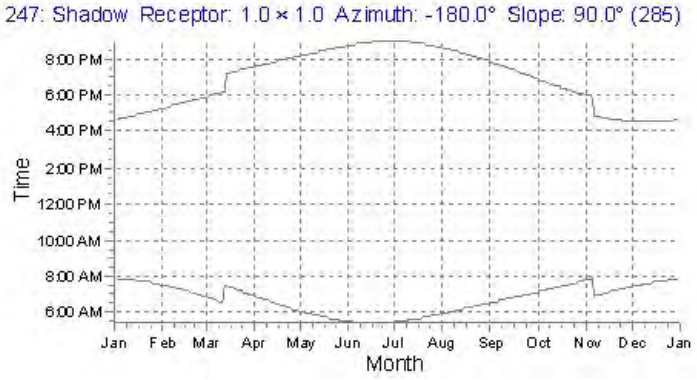

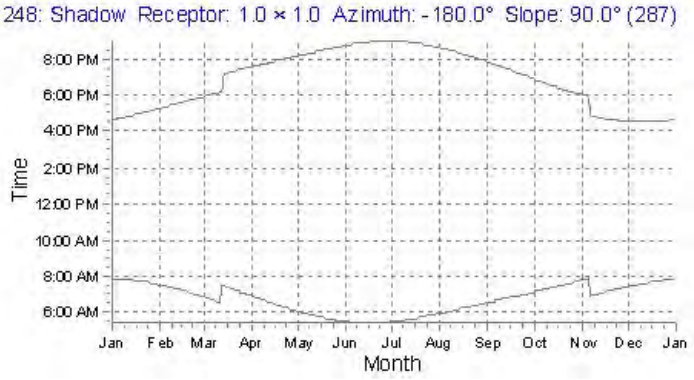

WTGs

33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)

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SHADOW - Calendar, graphical

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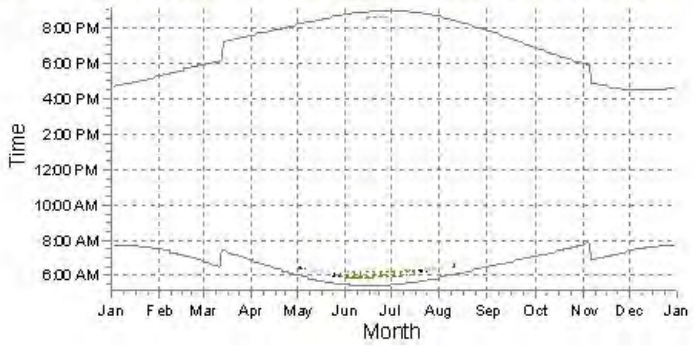
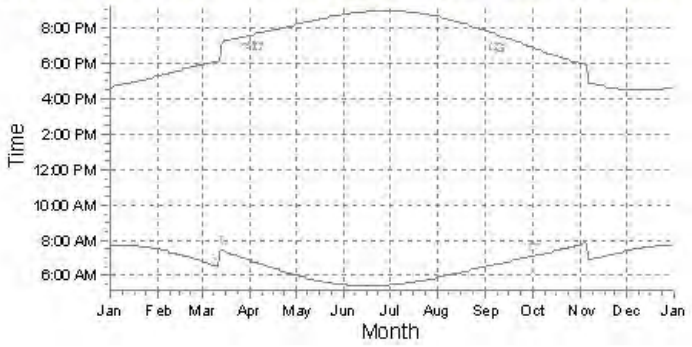
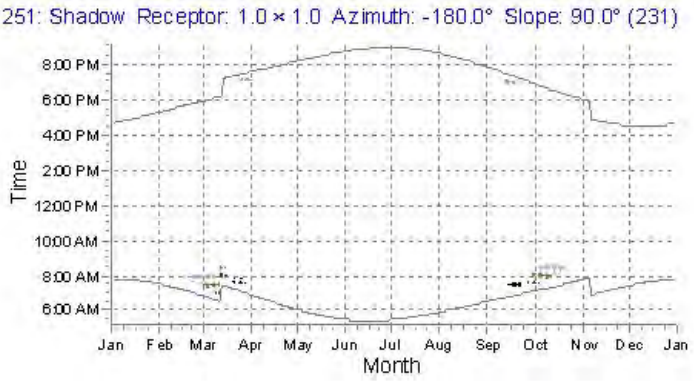
249: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (219)



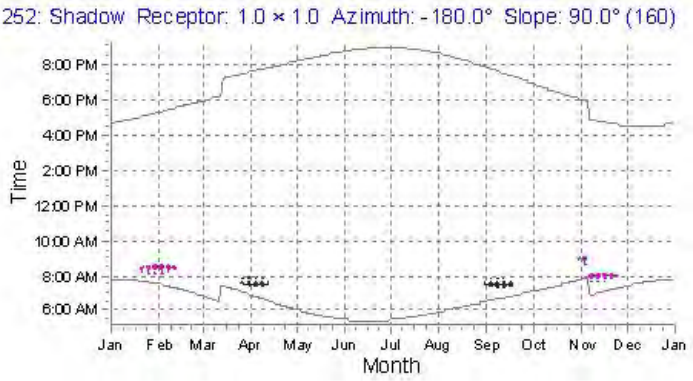
250: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (232)



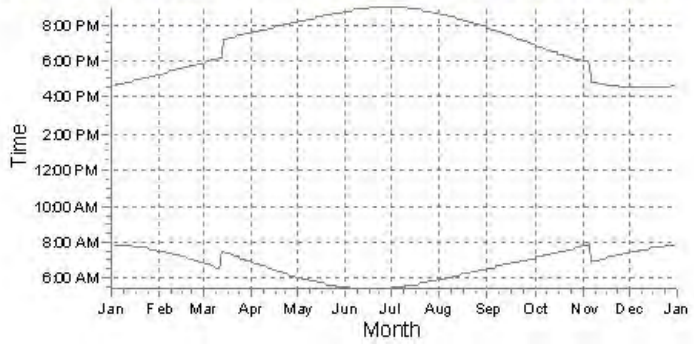
251: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (231)



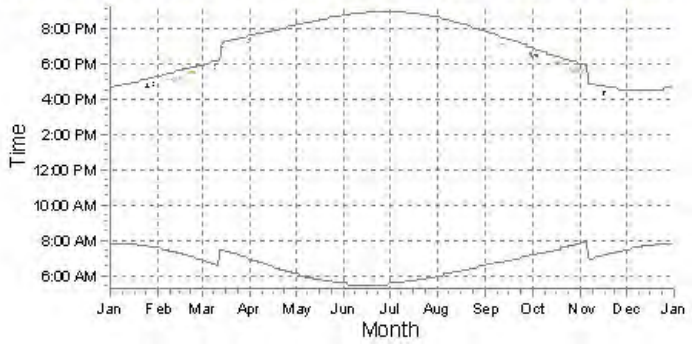
252: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (160)



253: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (275)



254: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (162)



WTGs

- 10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
- 12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
- 14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
- 15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
- 18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
- 26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
- 28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
- 29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
- 30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
- 32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
- 34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
- 37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)
- 38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)

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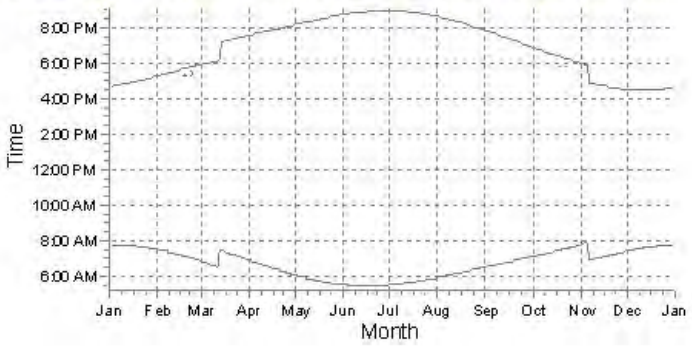
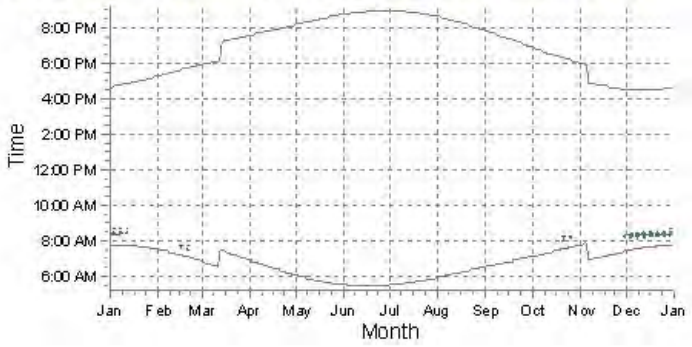
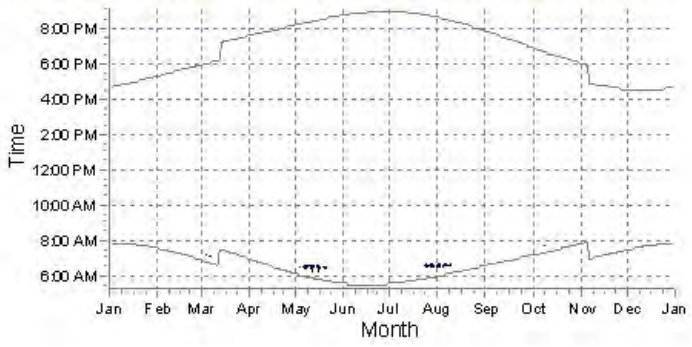
255: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (62)



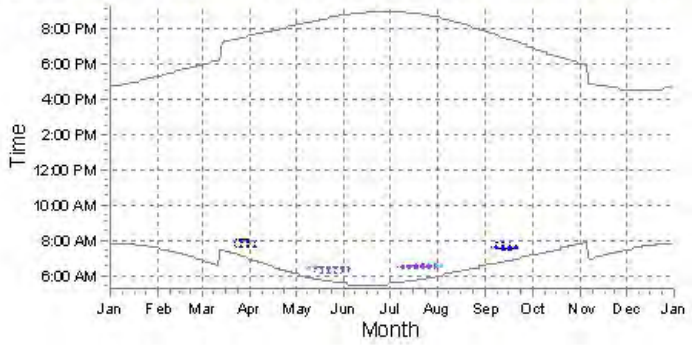
256: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (44)



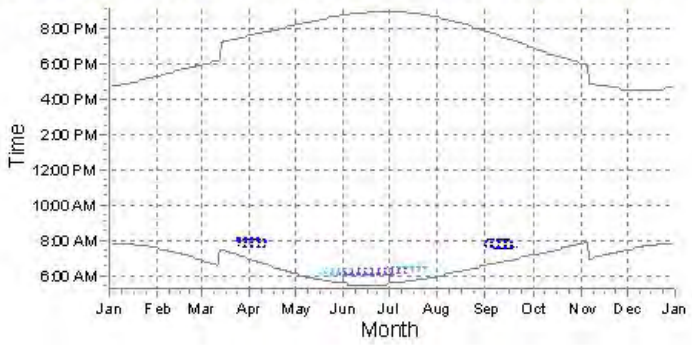
257: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (26)



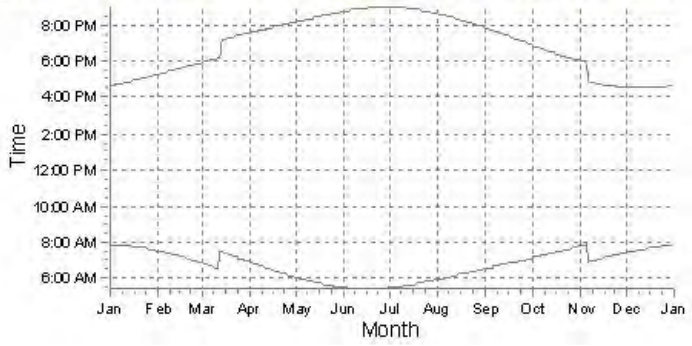
258: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (18)



259: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (17)



260: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (267)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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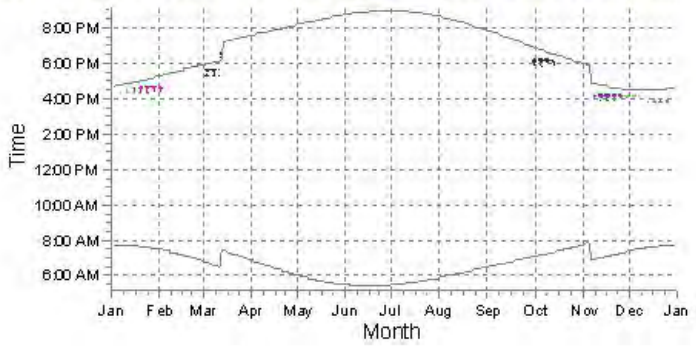
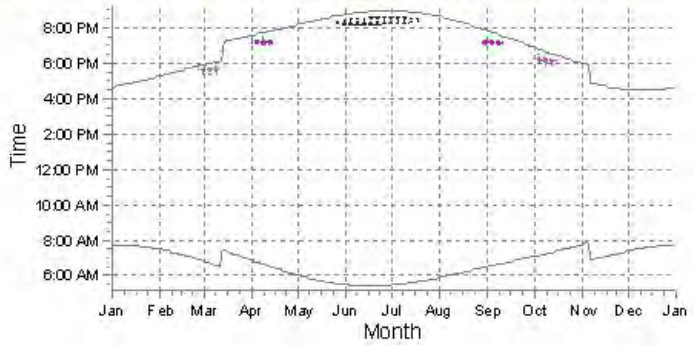
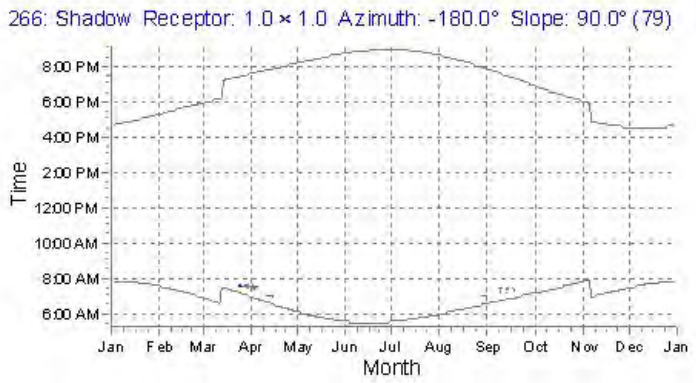
261: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (166)



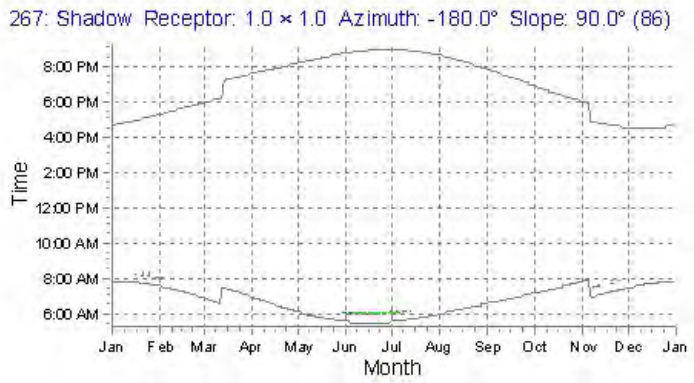
262: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (156)



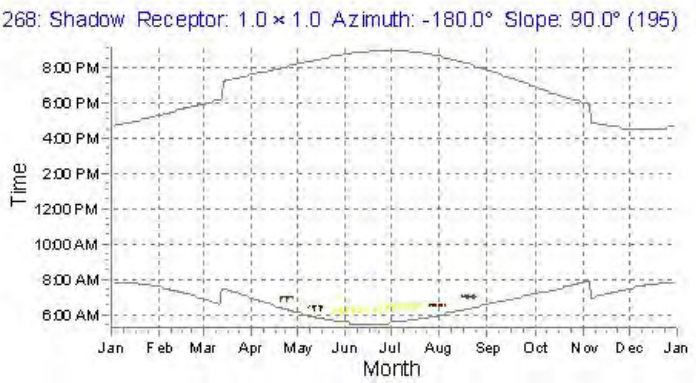
266: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (79)



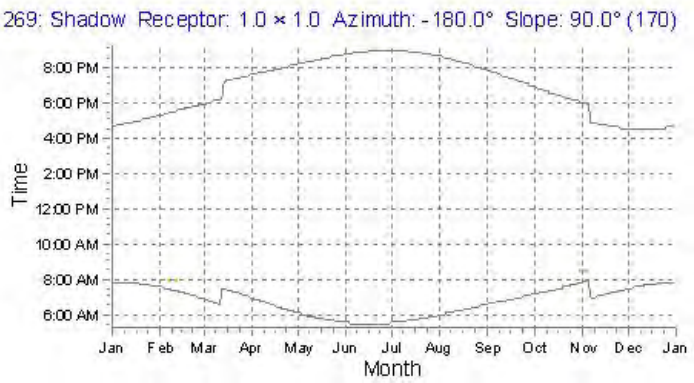
267: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (86)



268: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (195)



269: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (170)



WTGs

- 01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
- 02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
- 06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
- 08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
- 09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
- 20: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (21)
- 26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
- 32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
- 38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
- 39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)
- 40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
- 41: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (42)
- 42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
- 48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)

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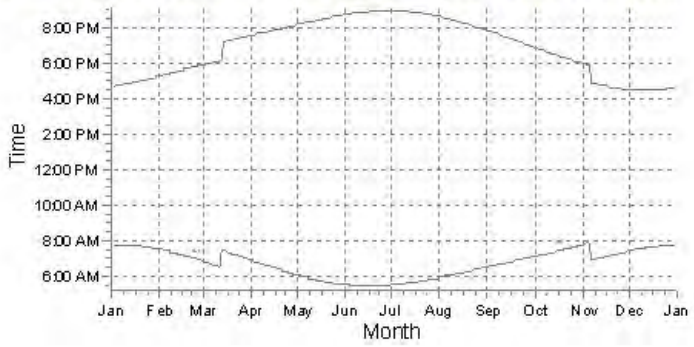
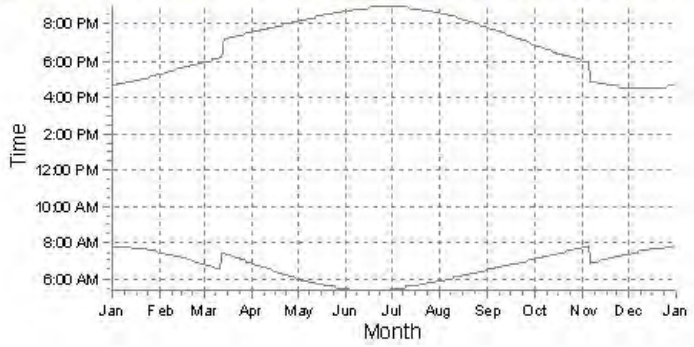
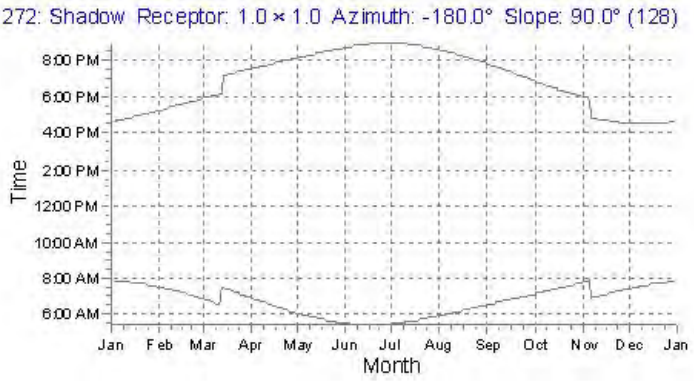
270: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (261)



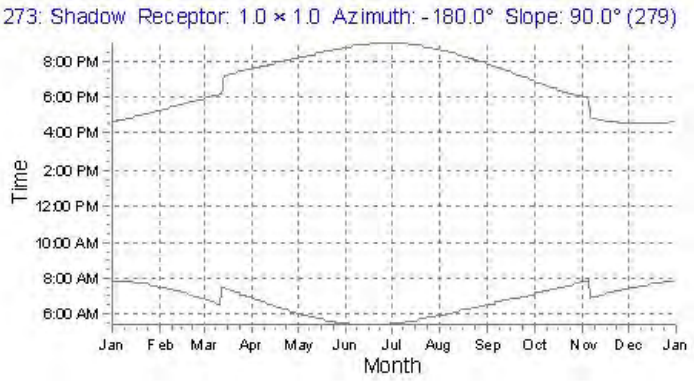
271: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (131)



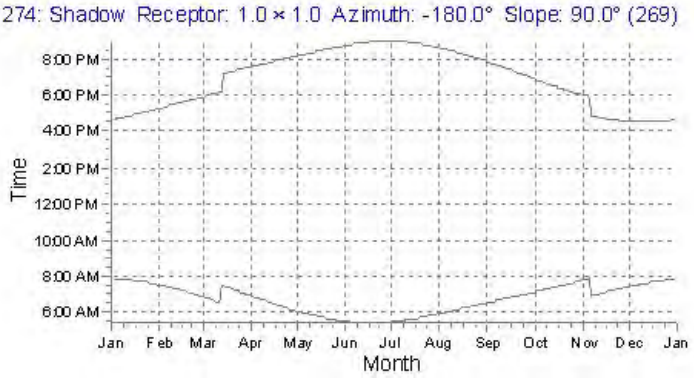
272: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (128)



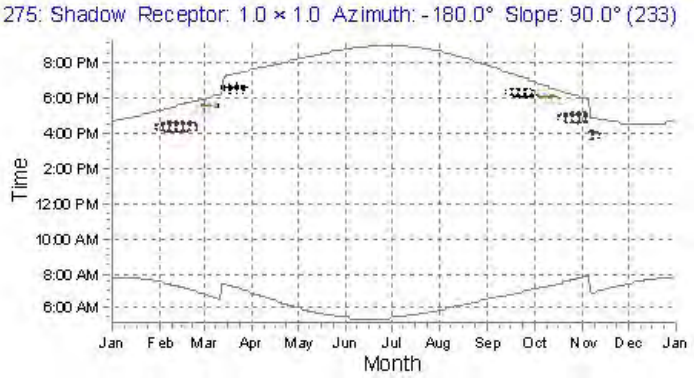
273: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (279)



274: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (269)



275: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (233)



WTGs

10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)

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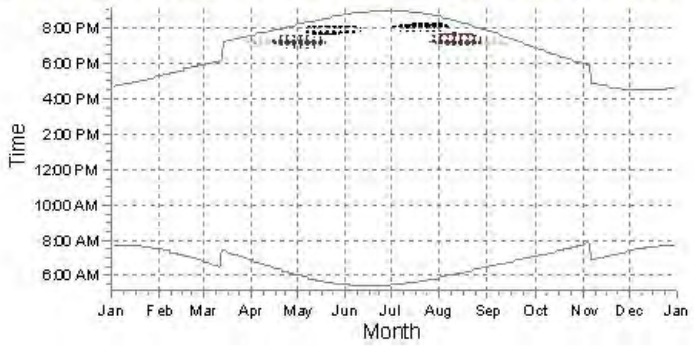
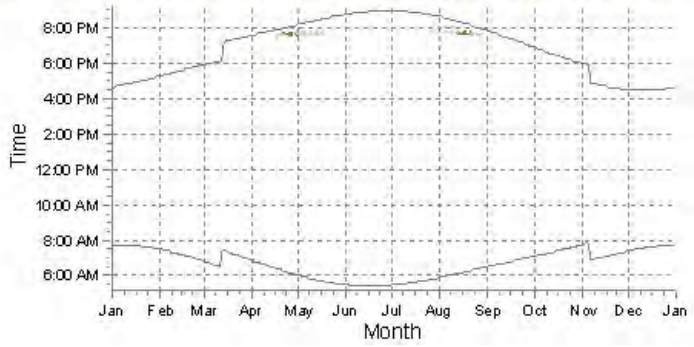
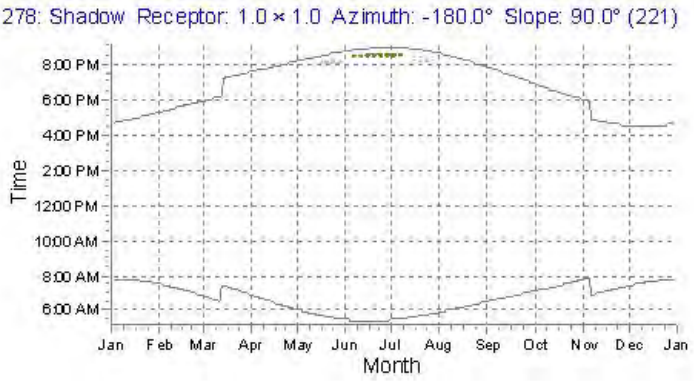
276: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (227)



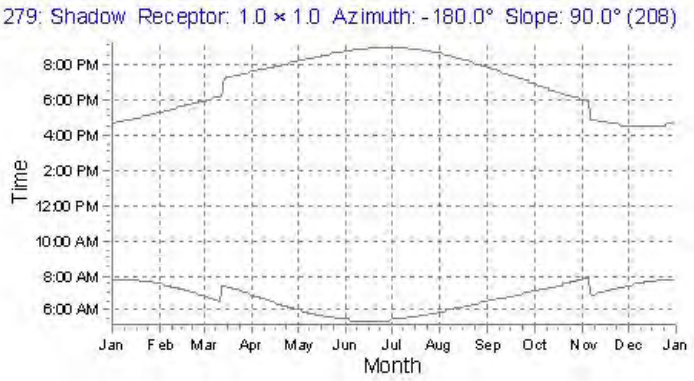
277: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (224)



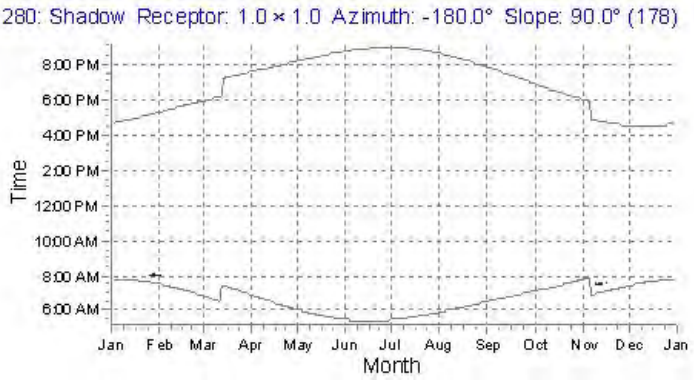
278: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (221)



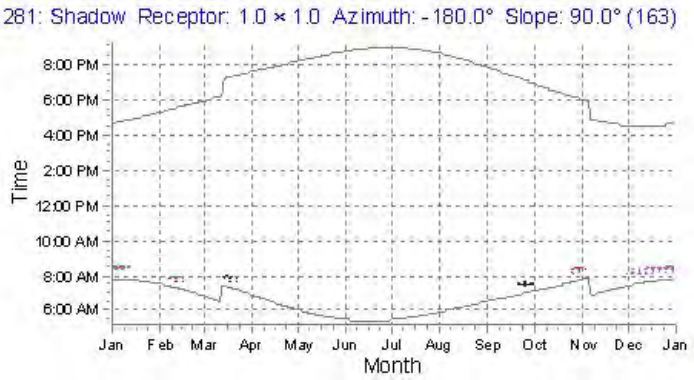
279: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (208)



280: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (178)



281: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (163)



WTGs

- 10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
- 12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
- 14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
- 15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
- 26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
- 34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
- 35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
- 38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
- 39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)

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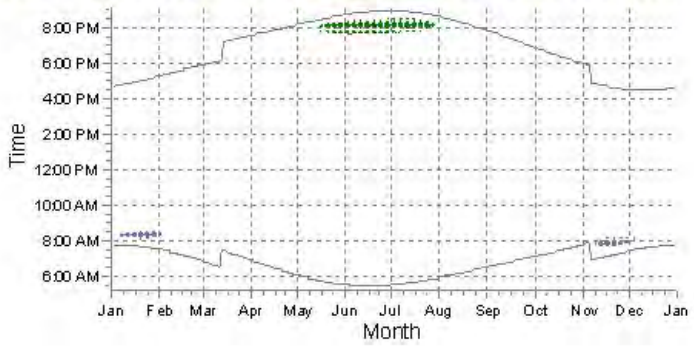
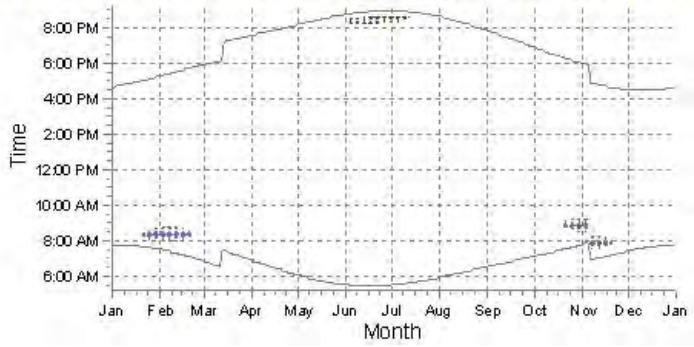
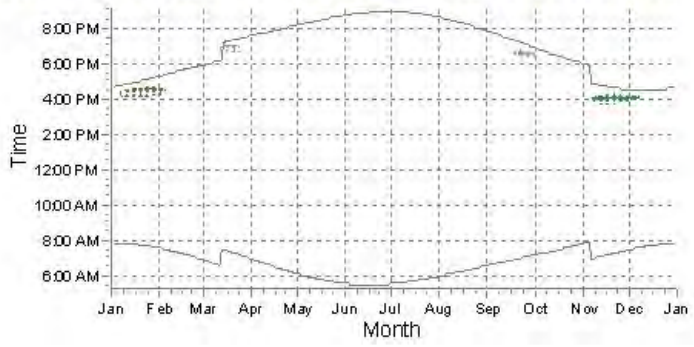
282: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (201)



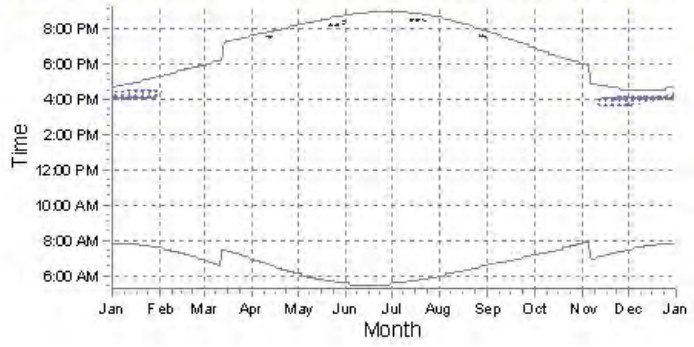
283: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (191)



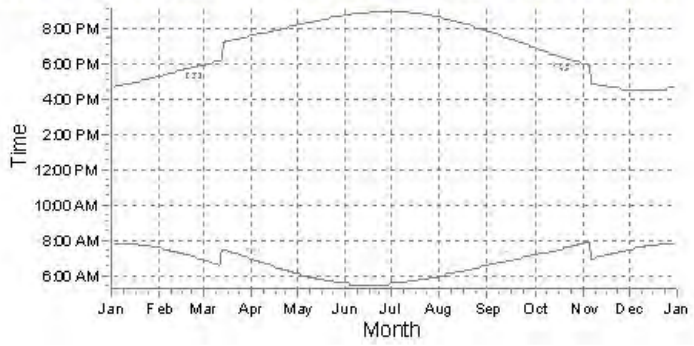
284: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (167)



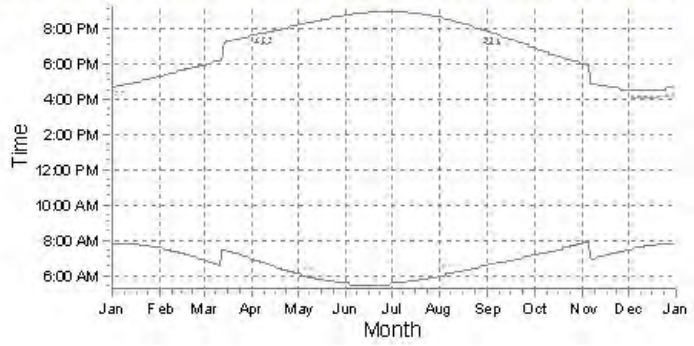
285: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (198)



286: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (196)



287: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (187)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)

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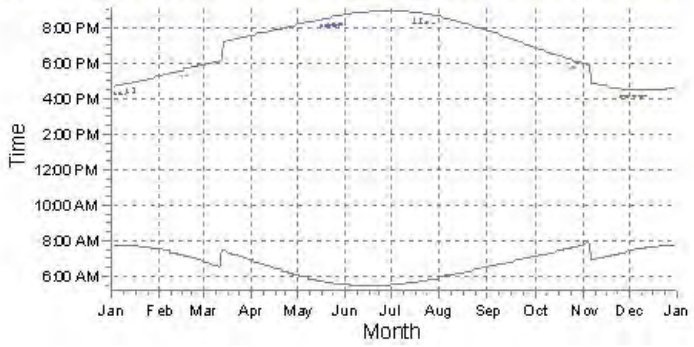
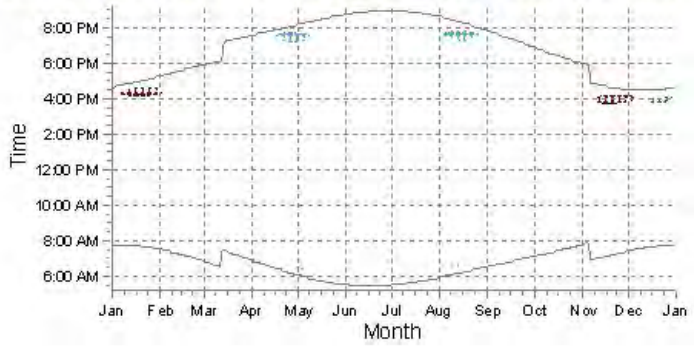
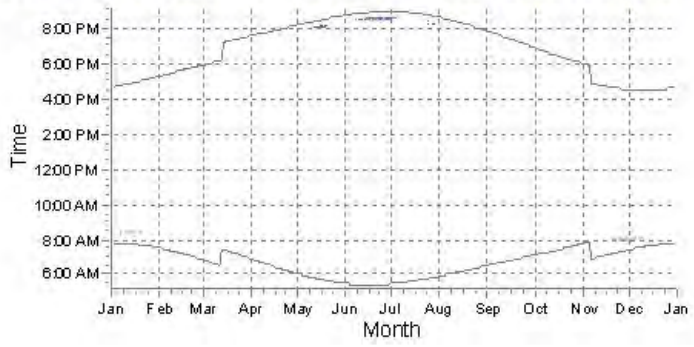
288: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (176)



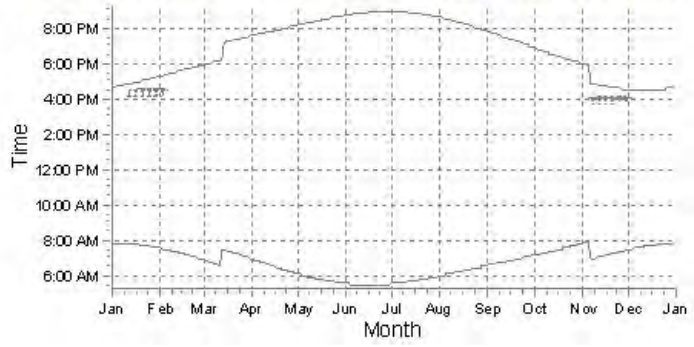
289: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (223)



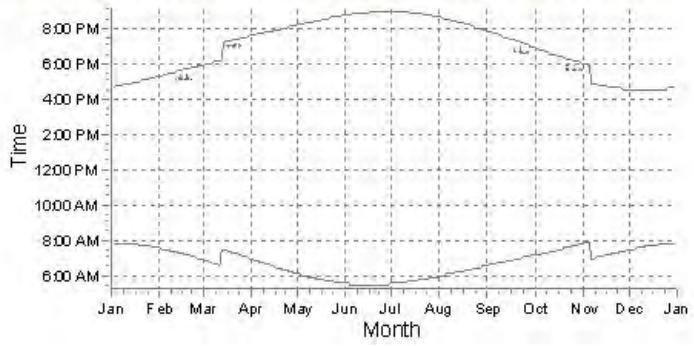
290: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (216)



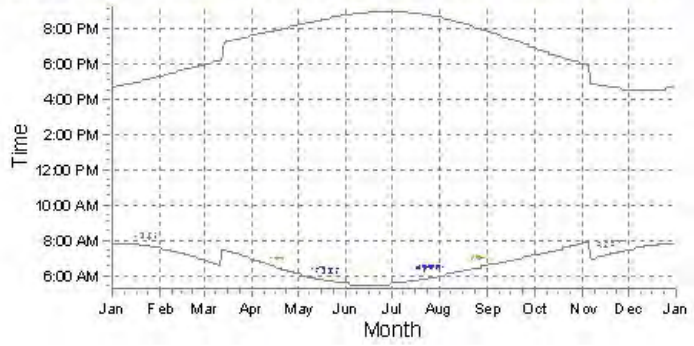
291: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (120)



292: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (112)



293: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (98)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)

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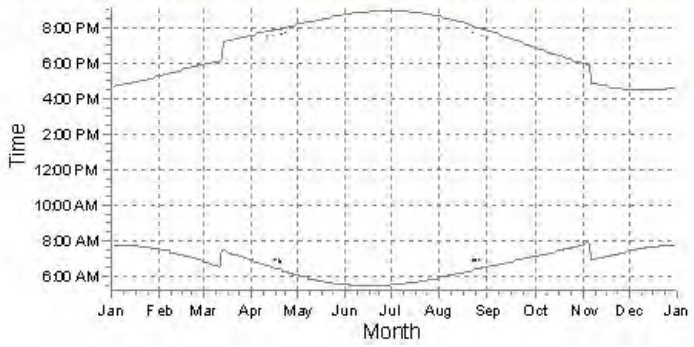
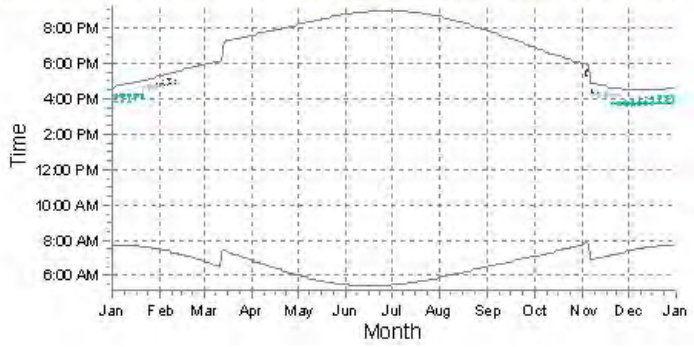
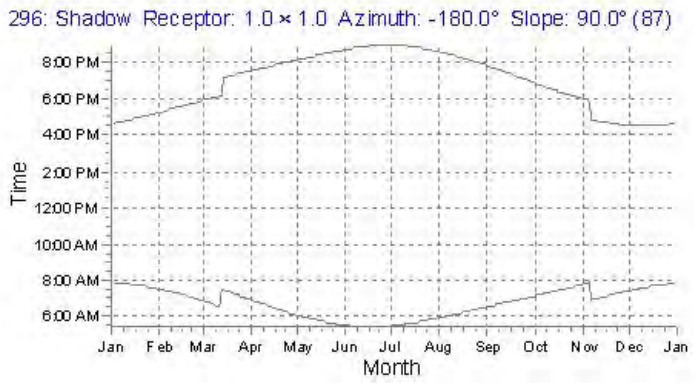
294: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (100)



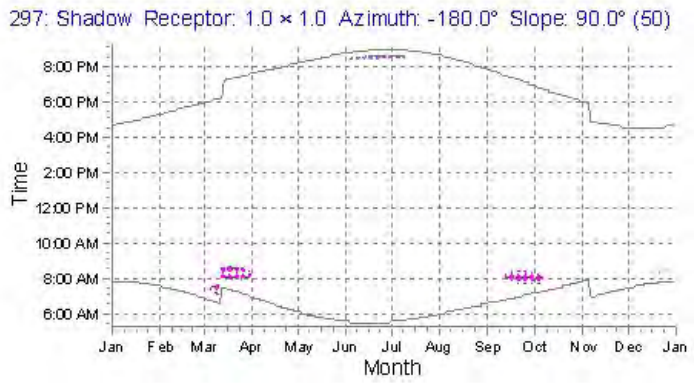
295: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (109)



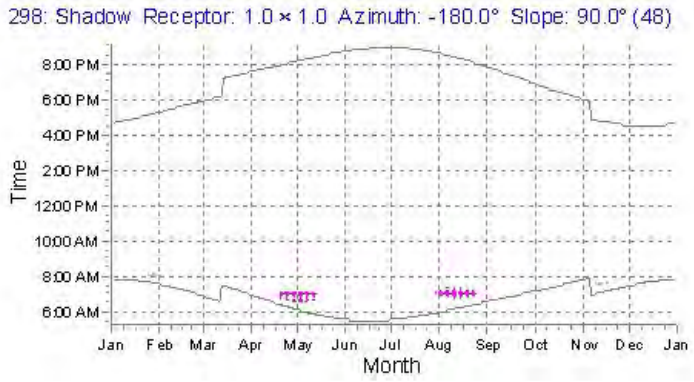
296: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (87)



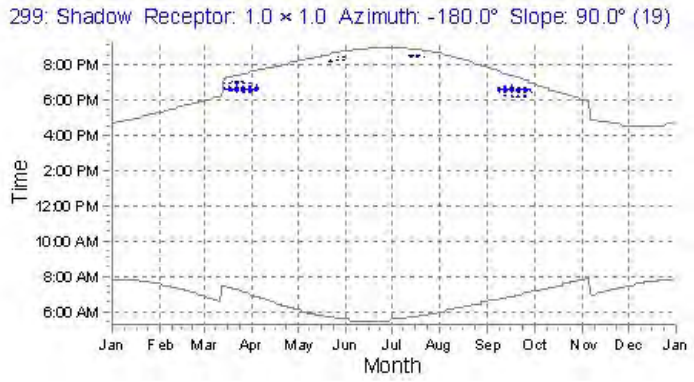
297: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (50)



298: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (48)



299: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (19)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
05: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (6)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
11: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (12)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
23: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (24)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
27: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (28)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)

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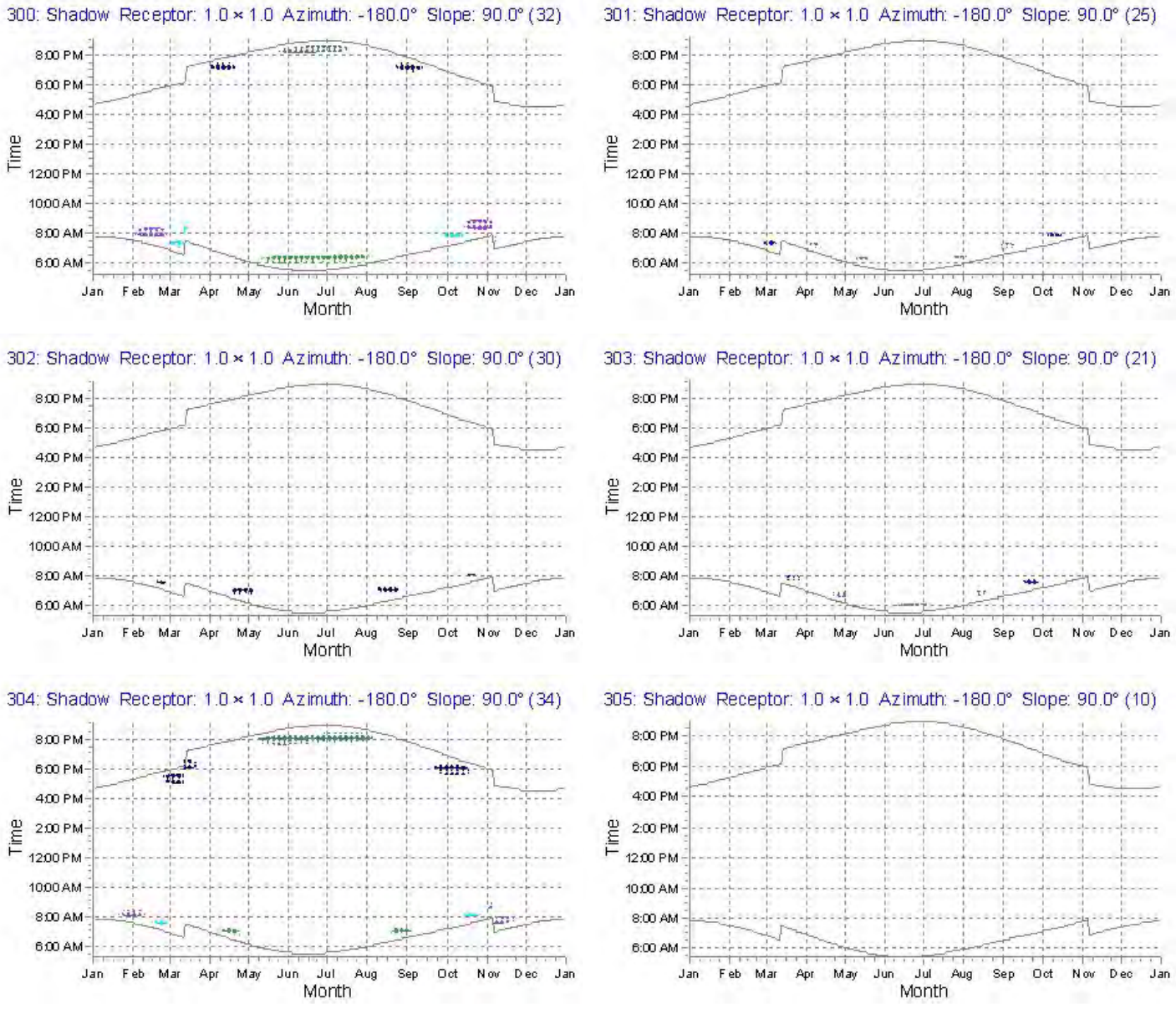

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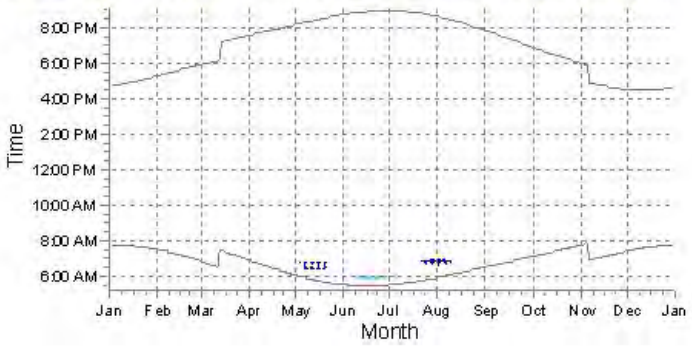
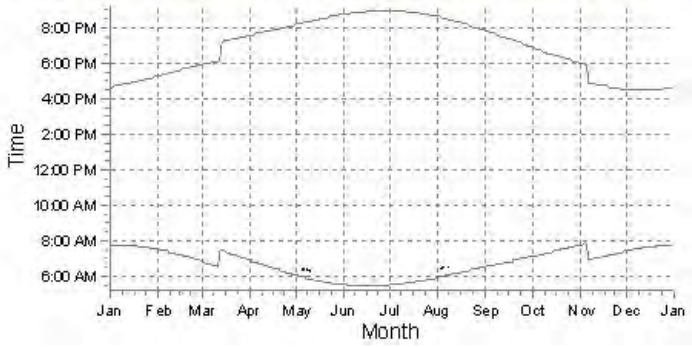
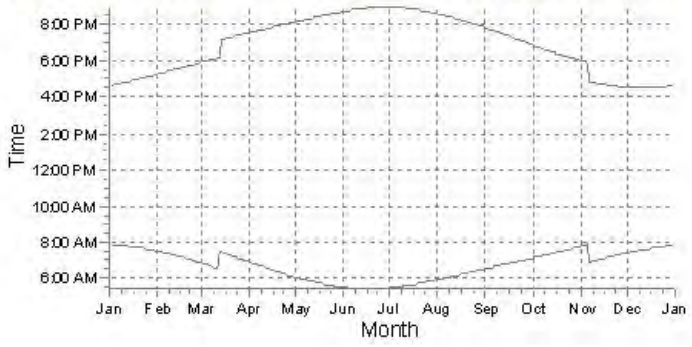
306: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (12)



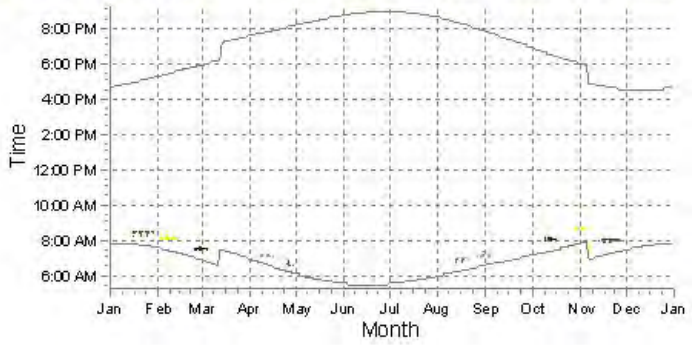
309: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (20)



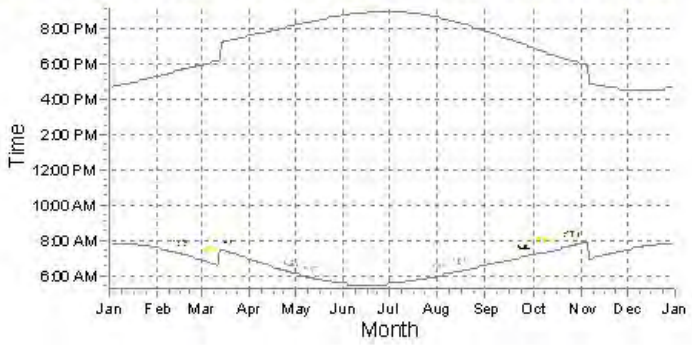
310: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (42)



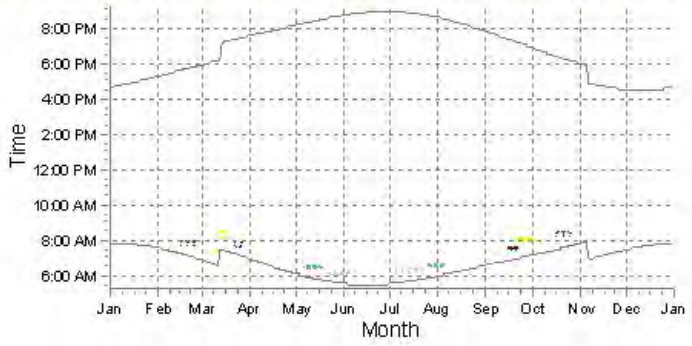
312: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (222)



313: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (215)



314: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (212)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)

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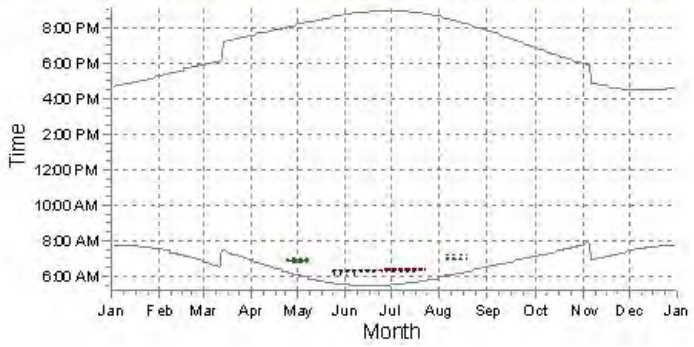
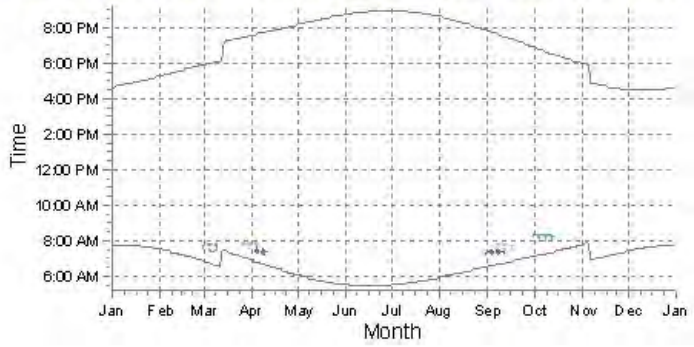
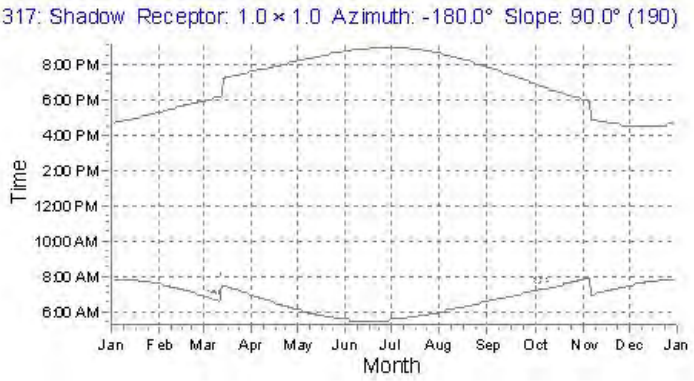
315: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (199)



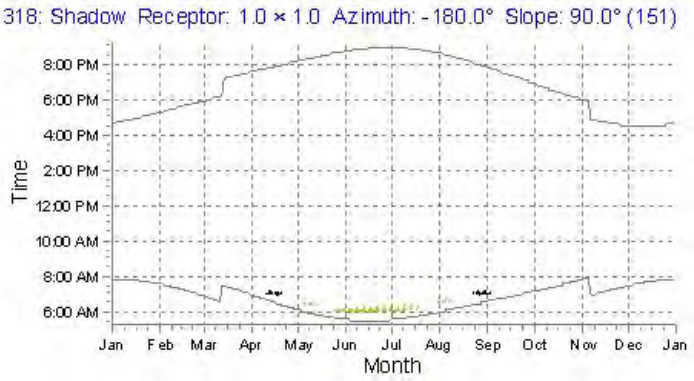
316: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (229)



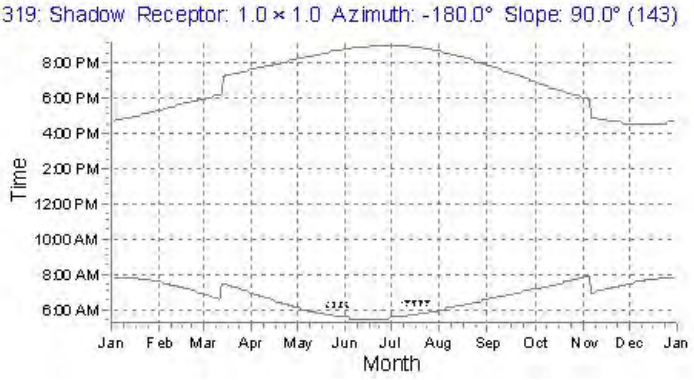
317: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (190)



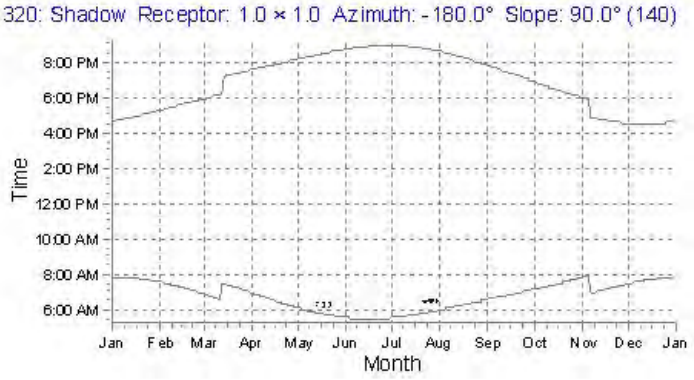
318: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (151)



319: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (143)



320: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (140)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)
36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)
37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)

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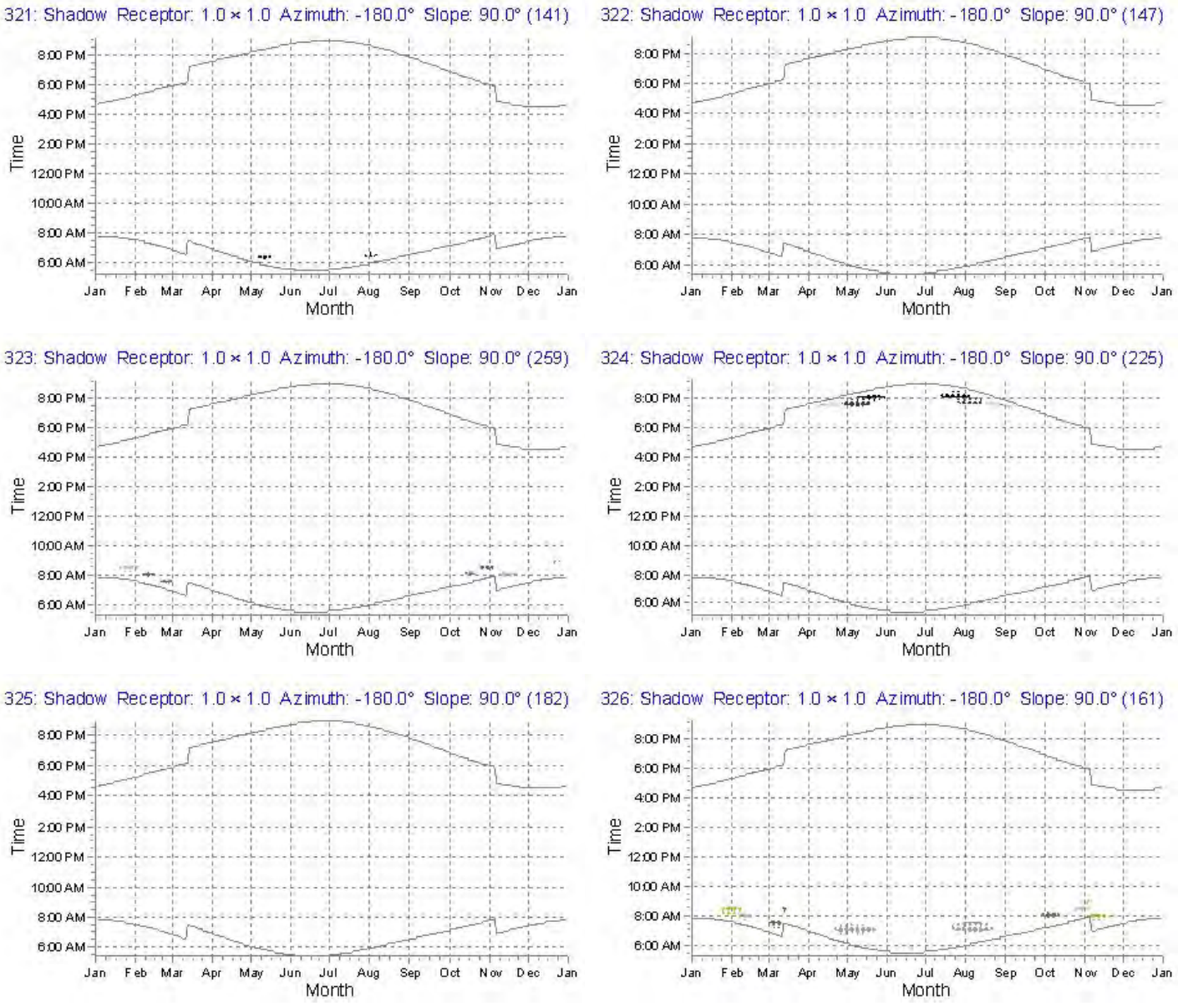
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121



WTGs

- 10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
- 12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
- 14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
- 15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
- 16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
- 18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
- 21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
- 24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
- 28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
- 29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
- 32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
- 33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)
- 34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
- 37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)

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SHADOW - Calendar, graphical

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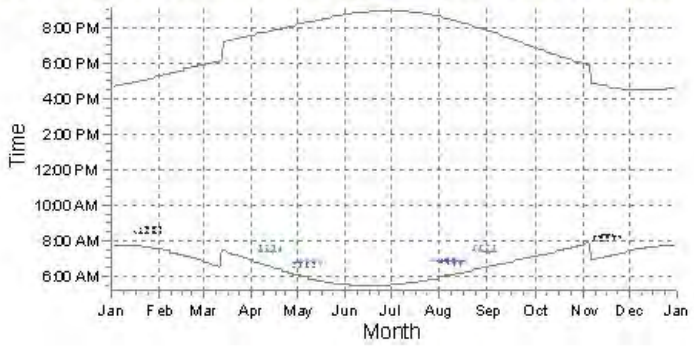
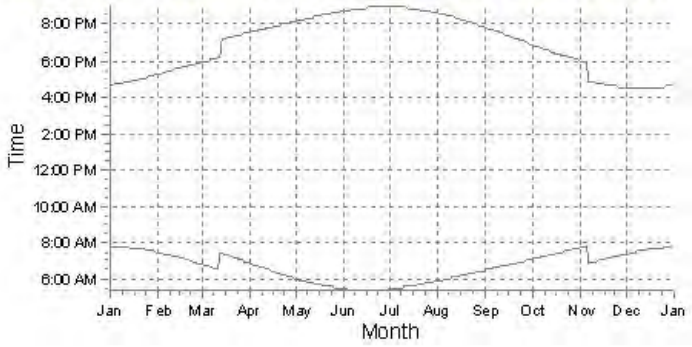
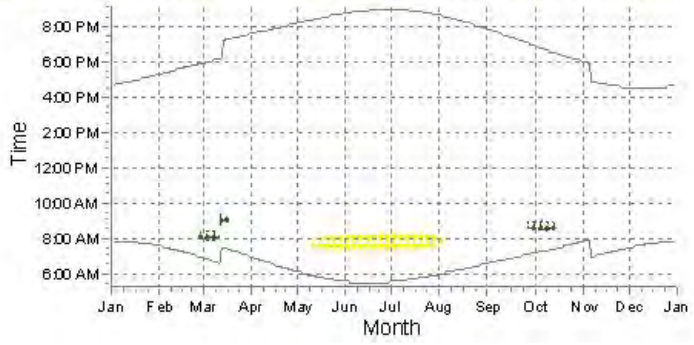
327: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (226)



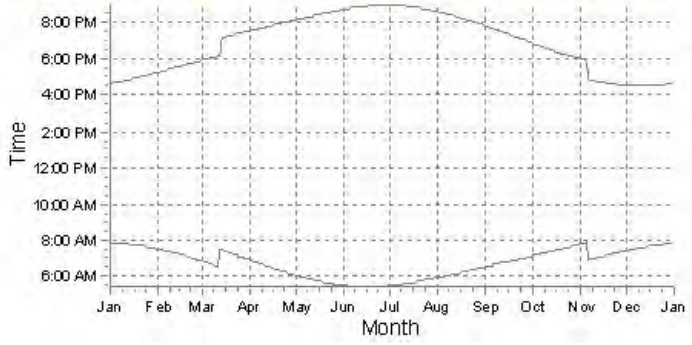
328: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (73)



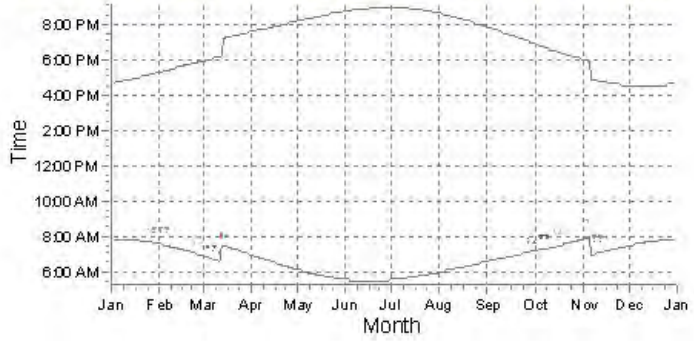
329: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (209)



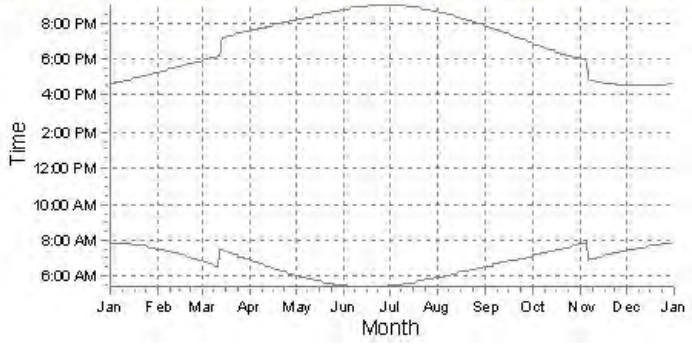
330: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (72)



332: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (238)



333: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (266)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)

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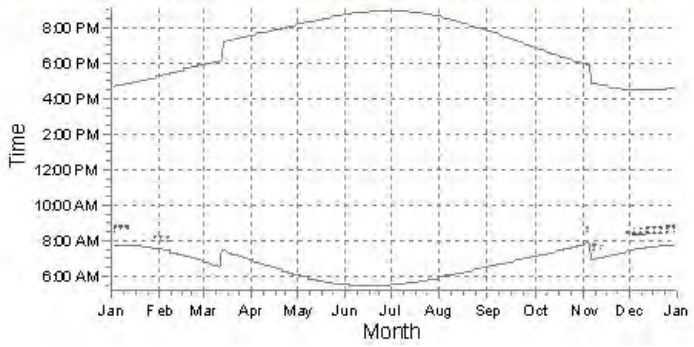
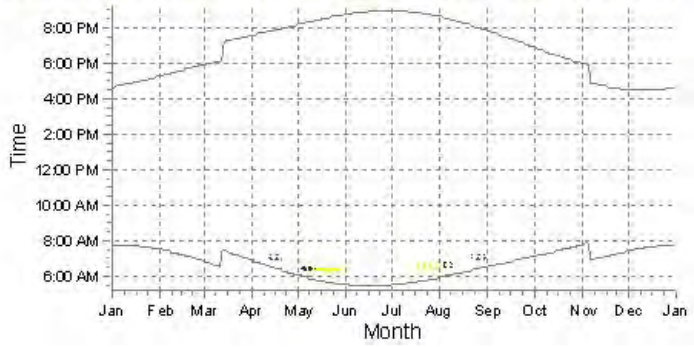
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

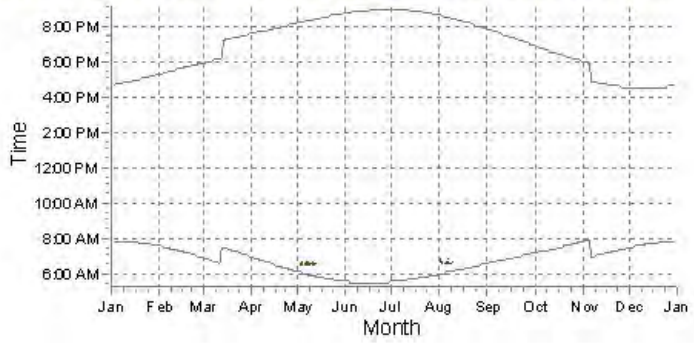
334: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (264)



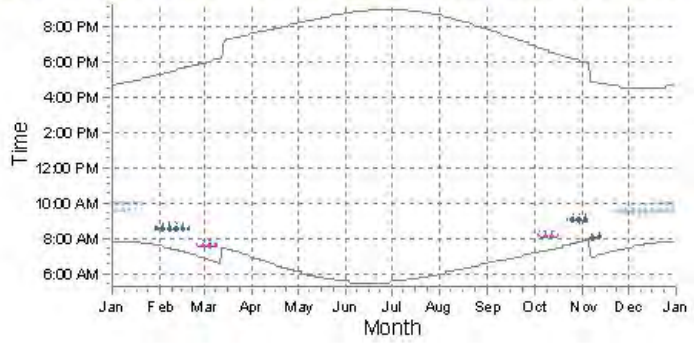
335: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (200)



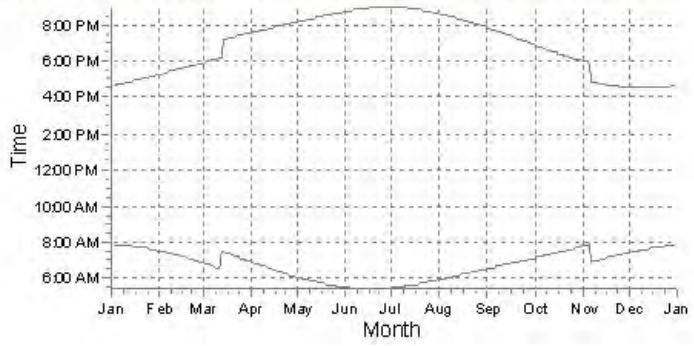
336: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (189)



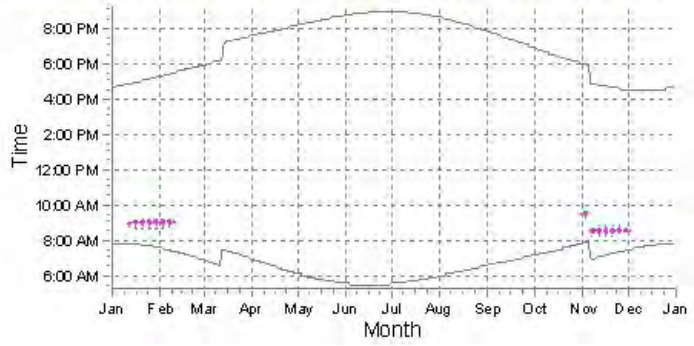
337: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (240)



338: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (262)



339: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (253)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)

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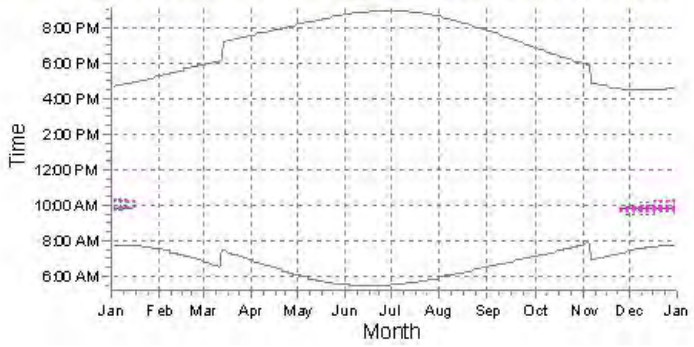
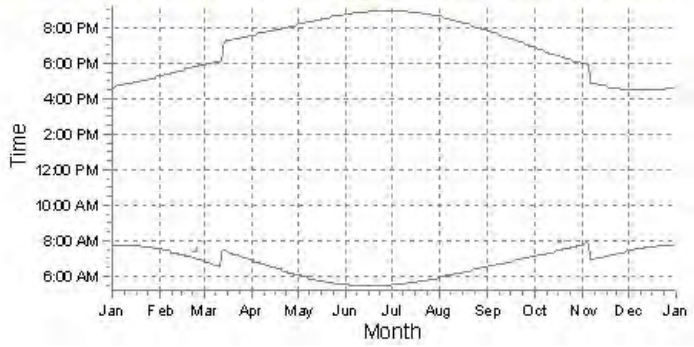
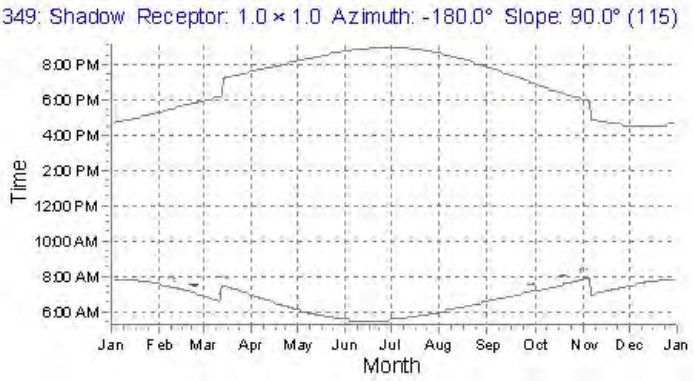
341: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (255)



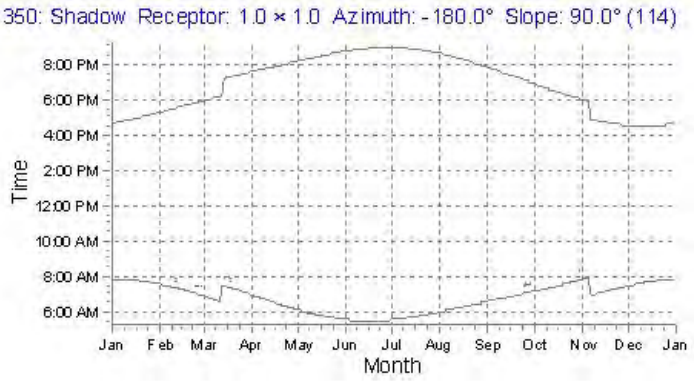
342: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (263)



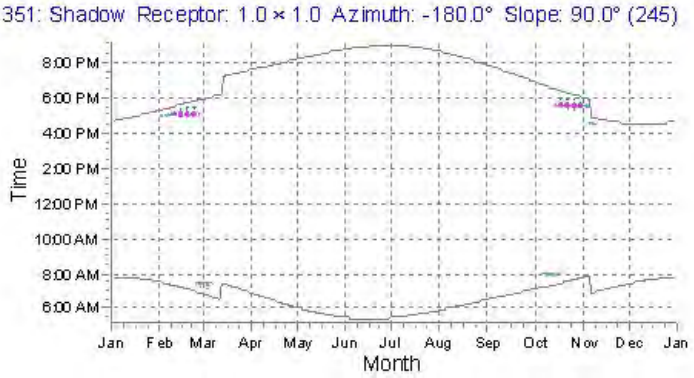
349: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (115)



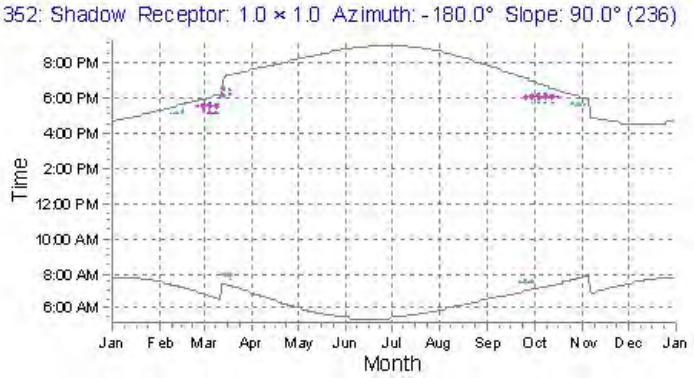
350: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (114)



351: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (245)



352: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (236)



WTGs

04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
16: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (17)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
24: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (25)
30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
33: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (34)

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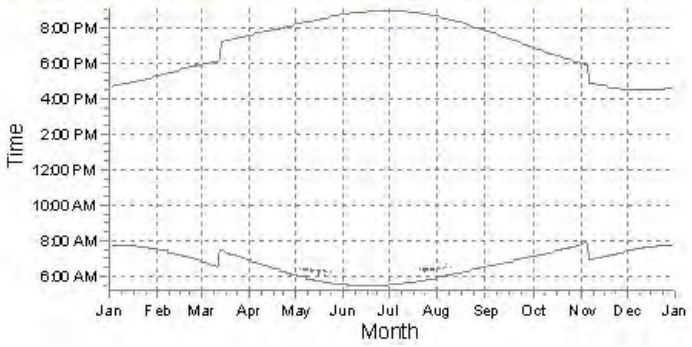
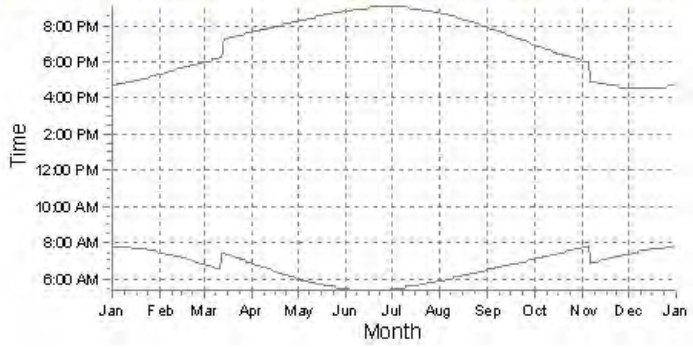
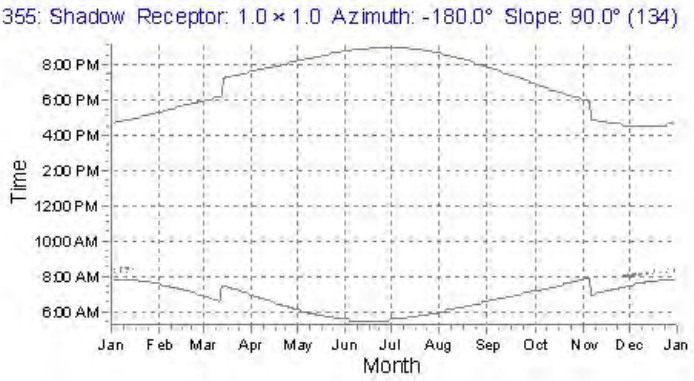
353: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (65)



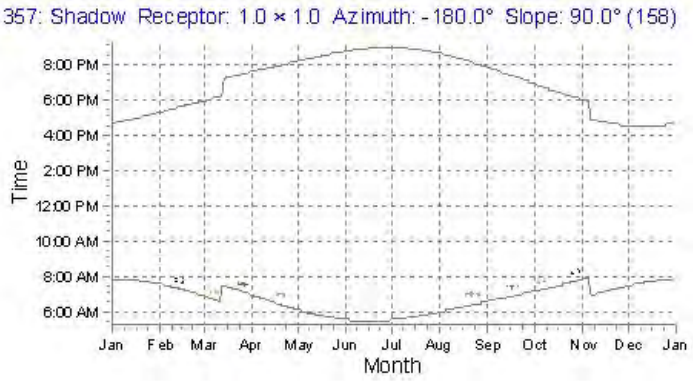
354: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (123)



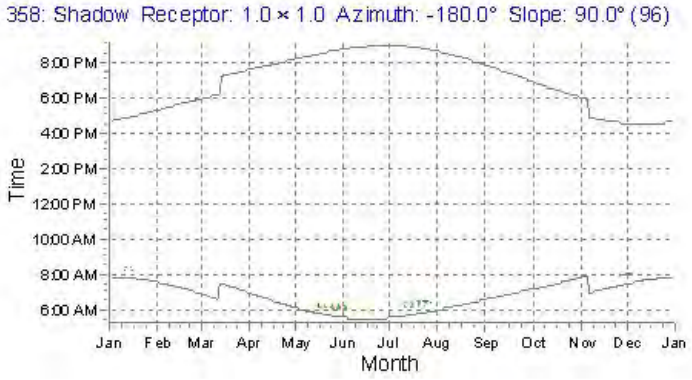
355: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (134)



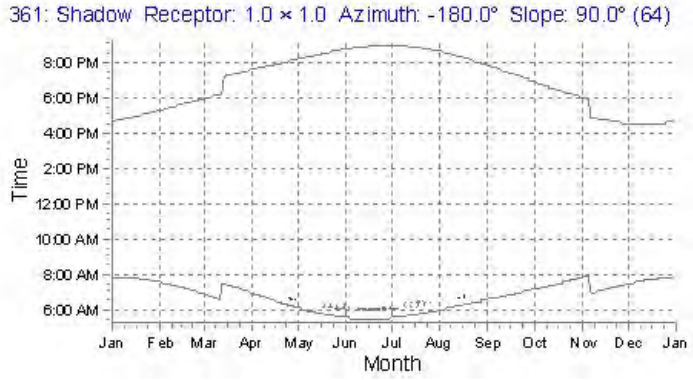
357: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (158)



358: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (96)



361: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (64)



WTGs

04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
41: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (42)
42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)

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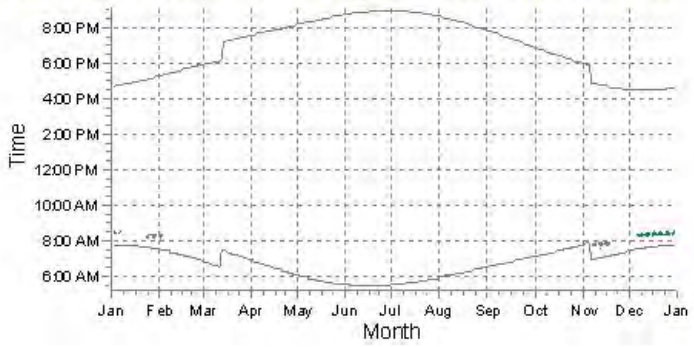
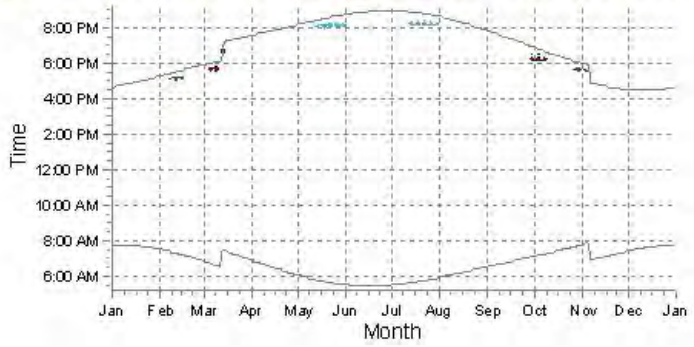
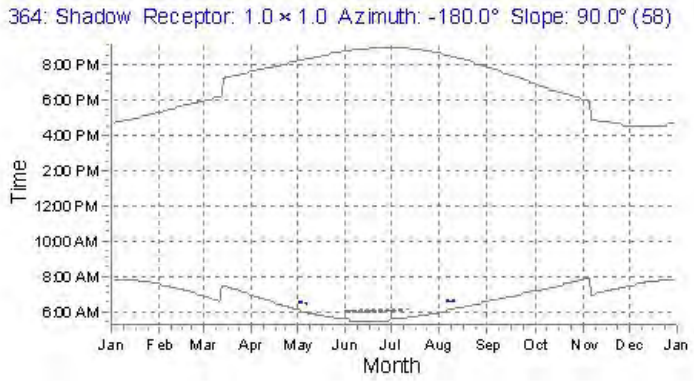
362: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (126)



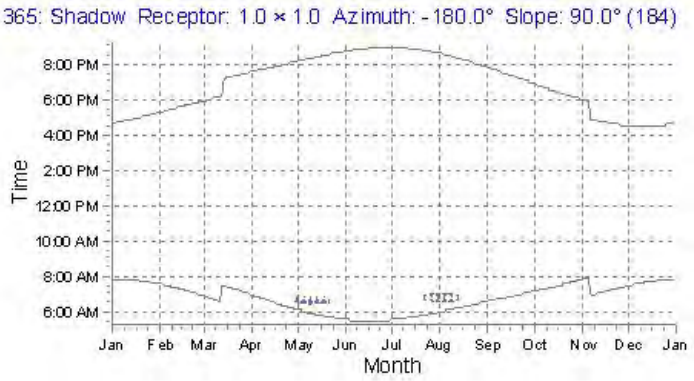
363: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (218)



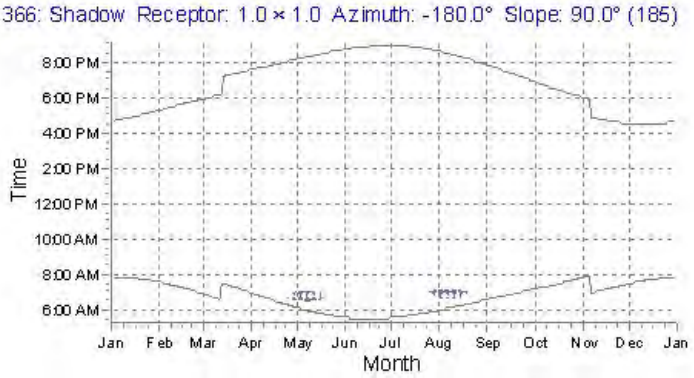
364: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (58)



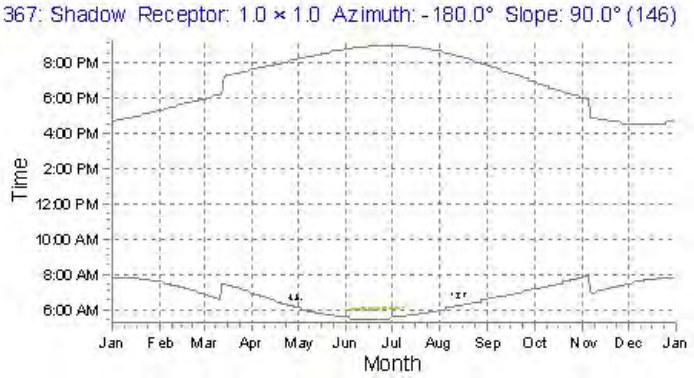
365: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (184)



366: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (185)



367: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (146)



WTGs

- 01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
- 02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
- 04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
- 06: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (7)
- 08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
- 17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
- 21: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (22)
- 32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
- 36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)
- 37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)
- 40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
- 42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
- 48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)

Project:
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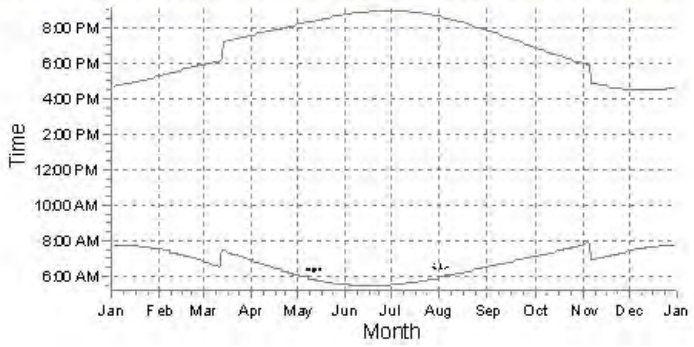
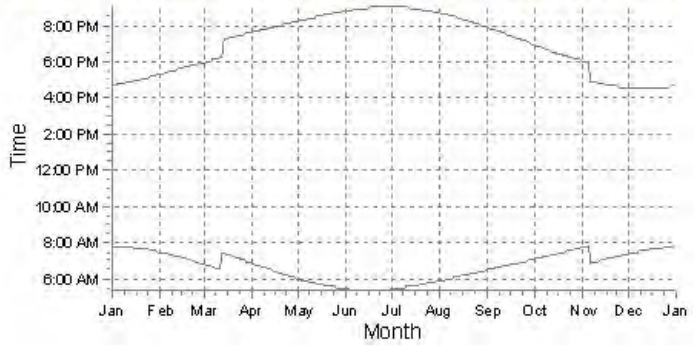
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

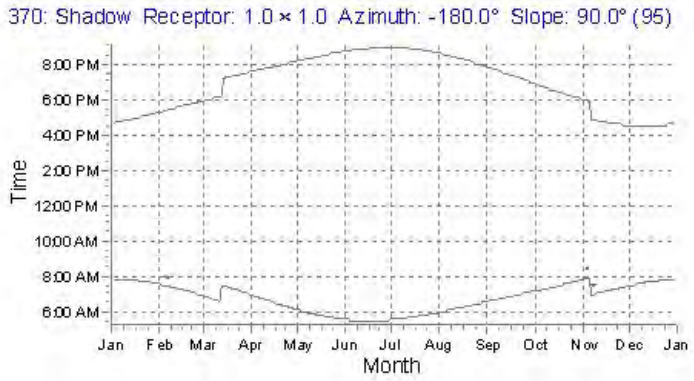
368: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (145)



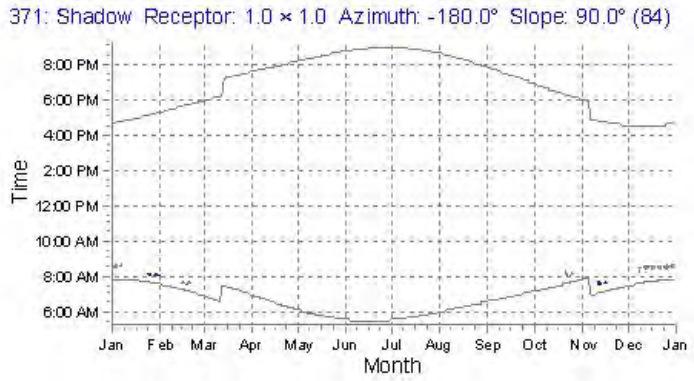
369: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (277)



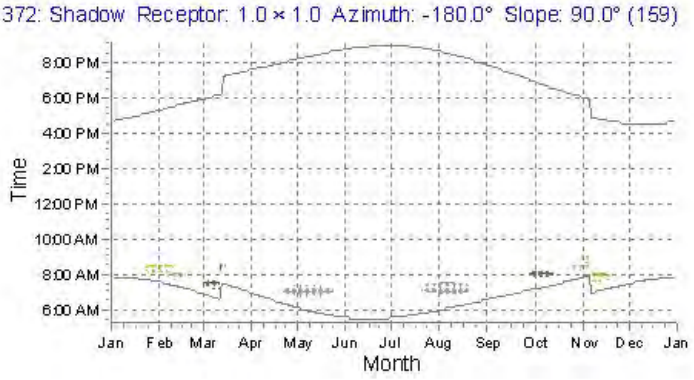
370: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (95)



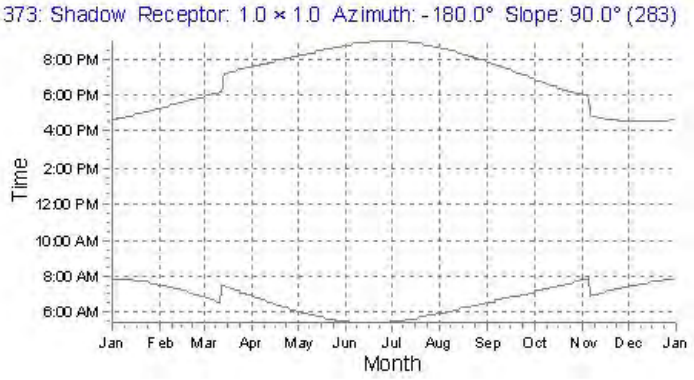
371: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (84)



372: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (159)



373: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (283)



WTGs

18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)

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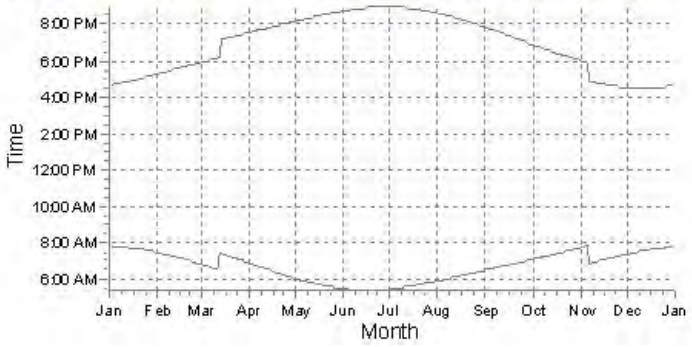
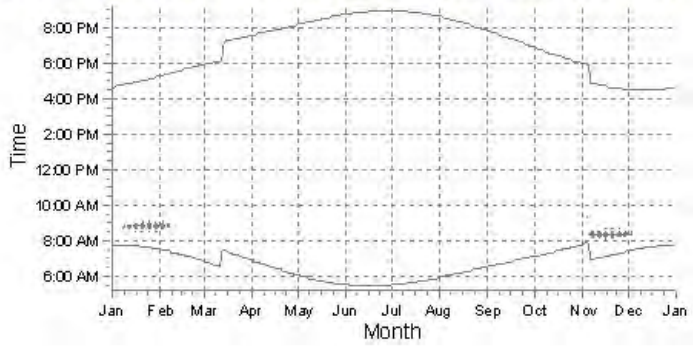
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

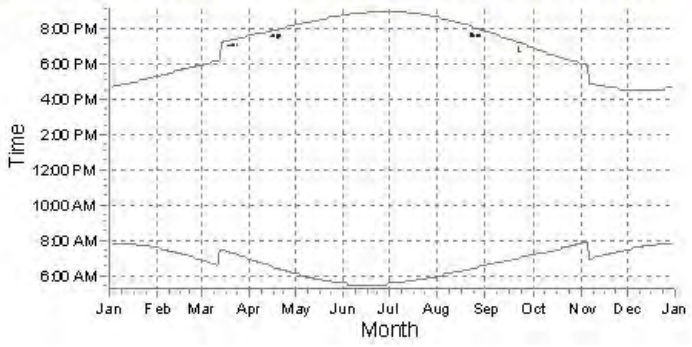
375: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (49)



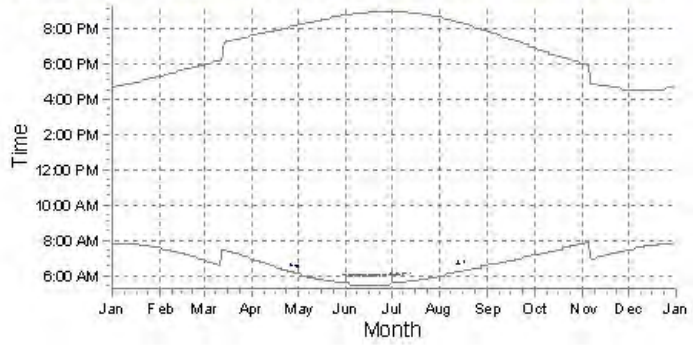
377: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (119)



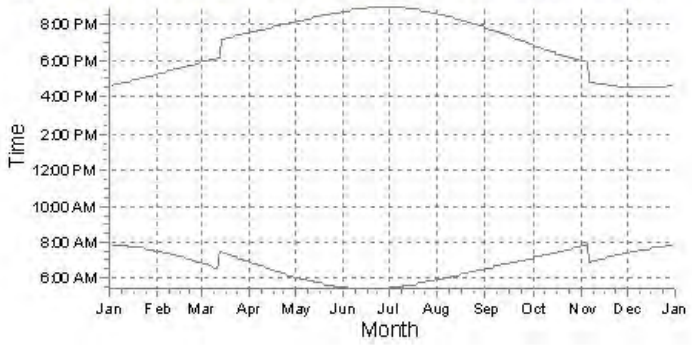
378: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (204)



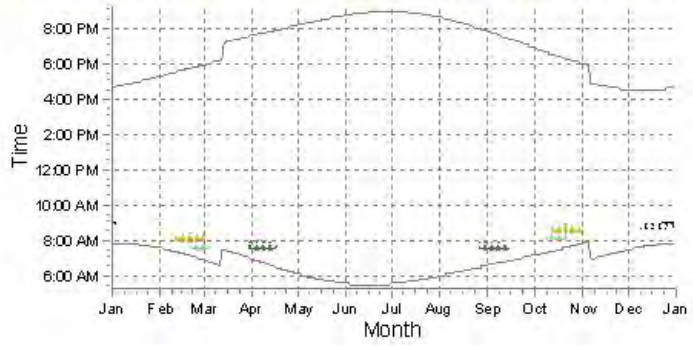
379: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (24)



380: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (4)



381: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (157)



WTGs

01: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (2)
02: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (3)
04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
08: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (9)
17: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (18)
28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)

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SHADOW - Calendar, graphical

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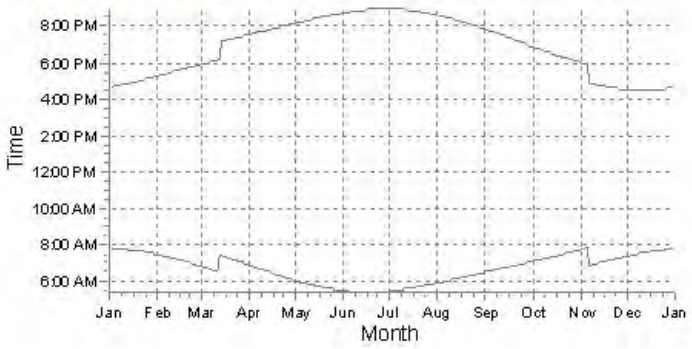
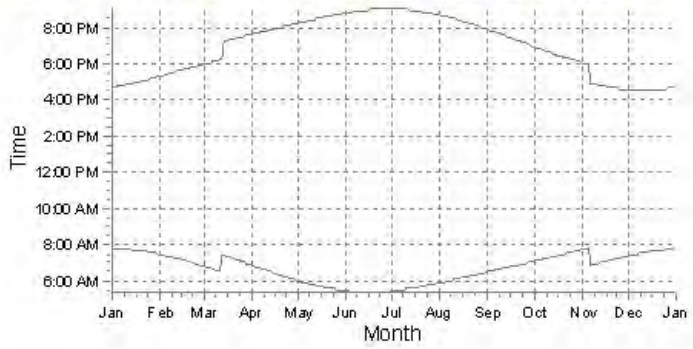
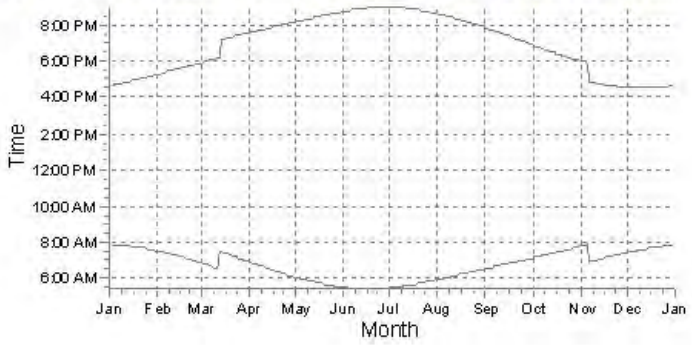
382: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (7)



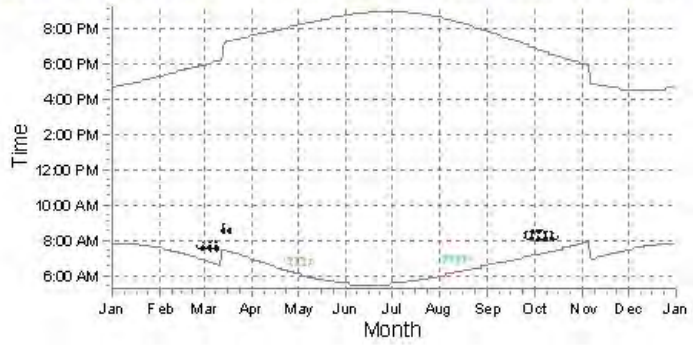
383: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (138)



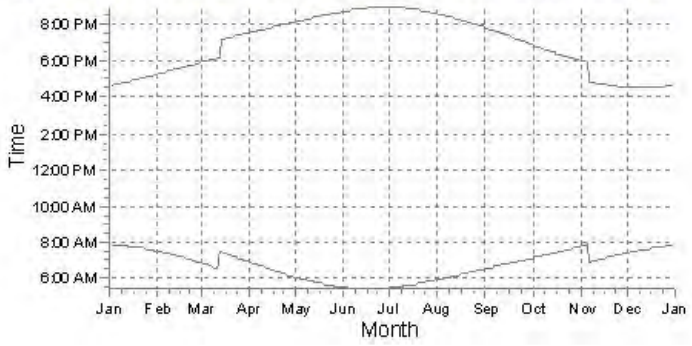
384: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (282)



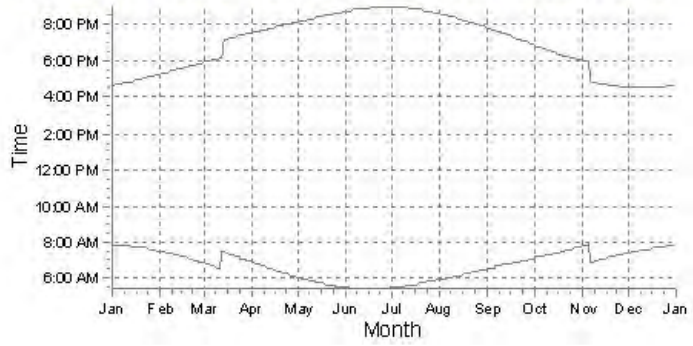
385: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (153)



386: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (2)



387: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (3)



WTGs

28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)

37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)

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SHADOW - Calendar, graphical

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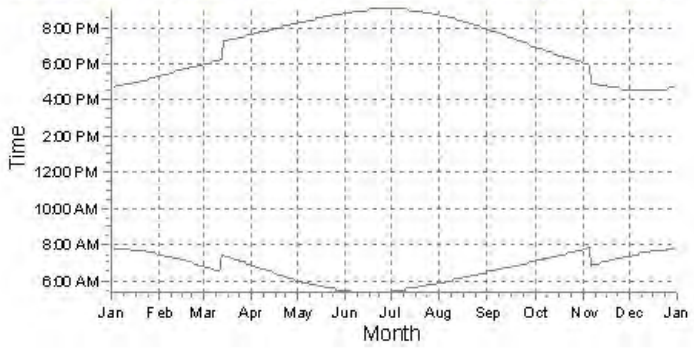
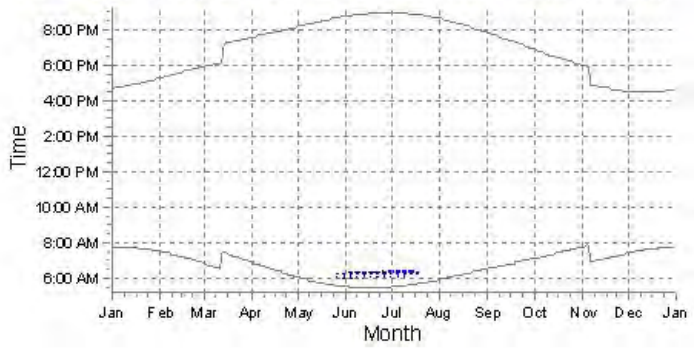
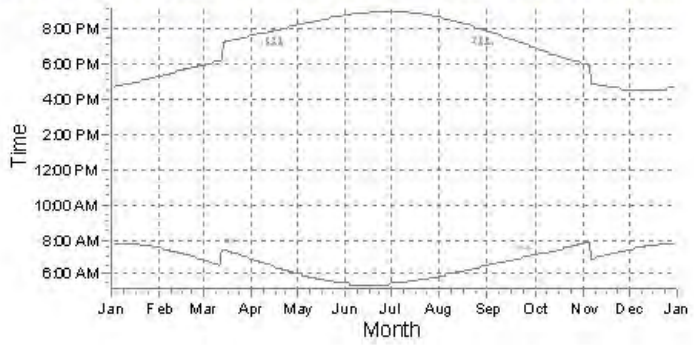
388: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (61)



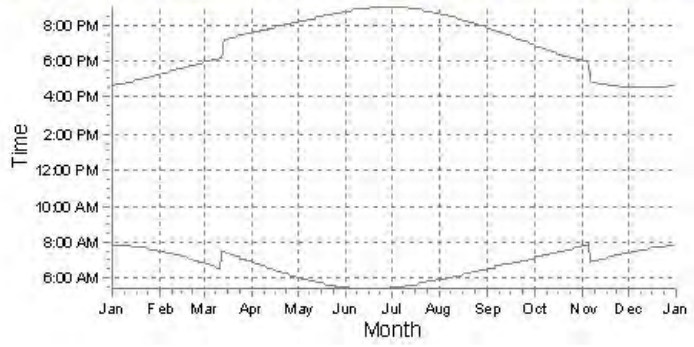
389: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (9)



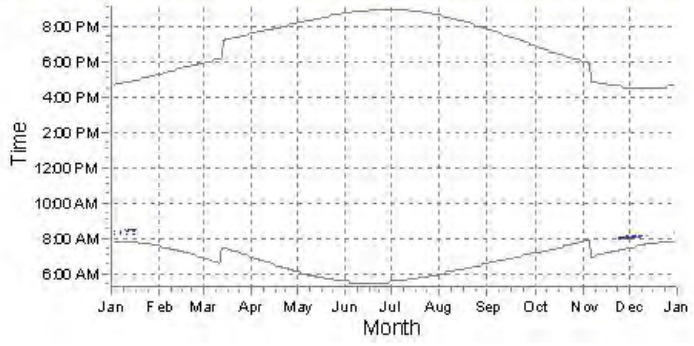
390: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (230)



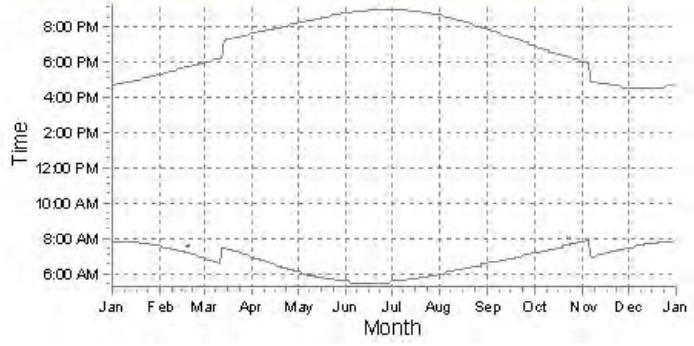
391: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (75)



392: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (117)



393: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (41)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
30: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (31)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)

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SHADOW - Calendar, graphical

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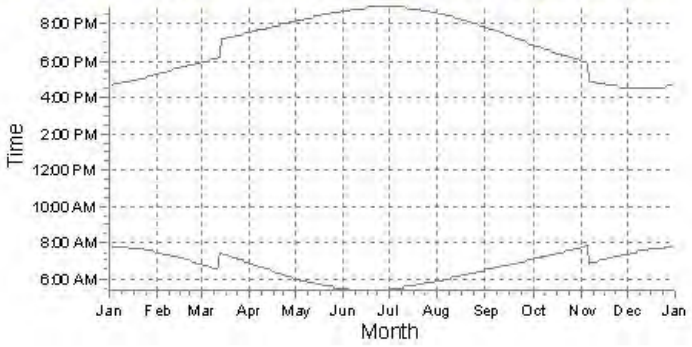
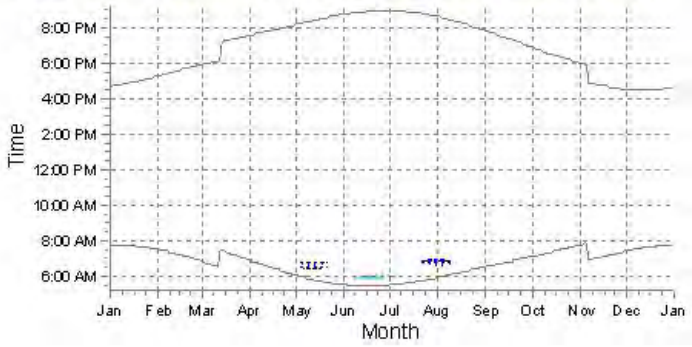
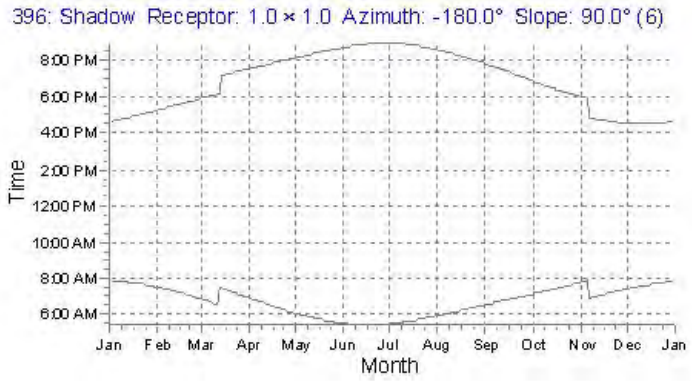
394: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (69)



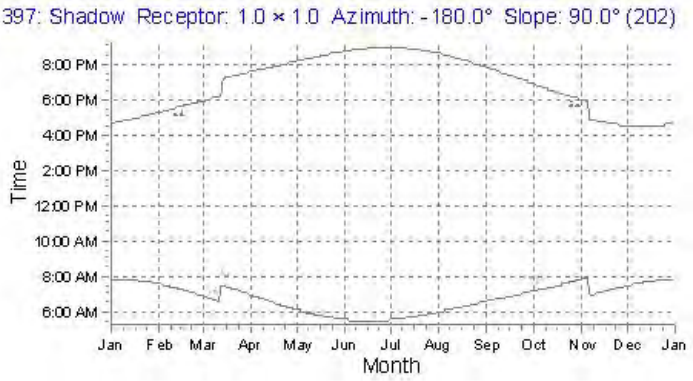
395: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (13)



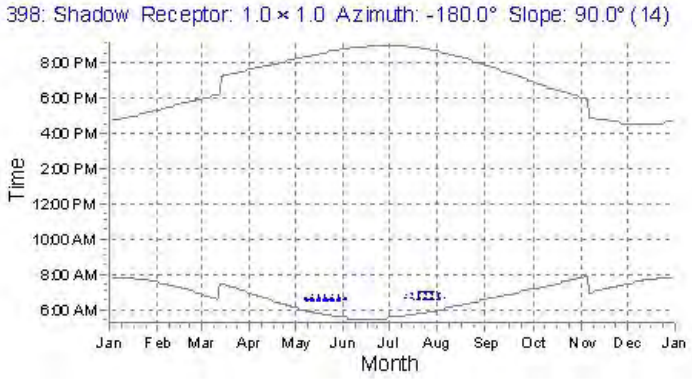
396: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (6)



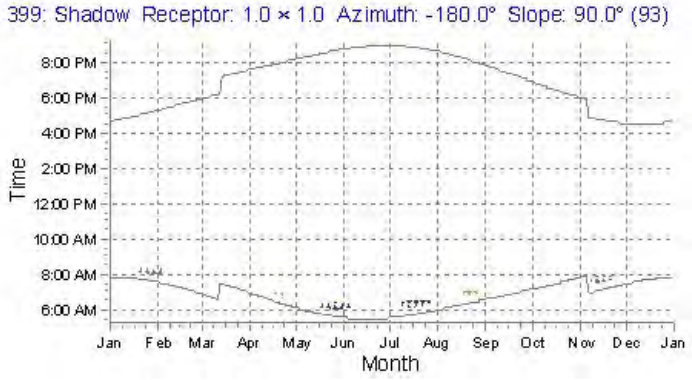
397: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (202)



398: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (14)



399: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (93)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
36: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (37)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)

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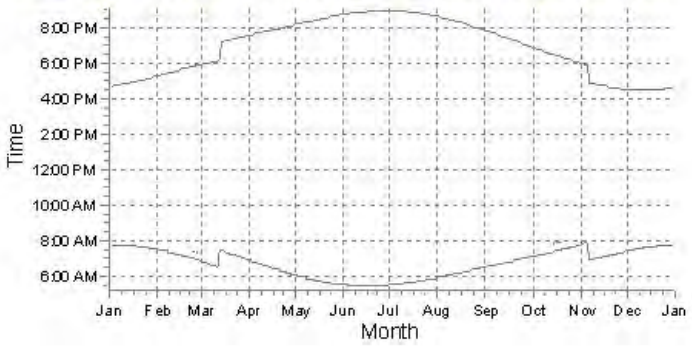
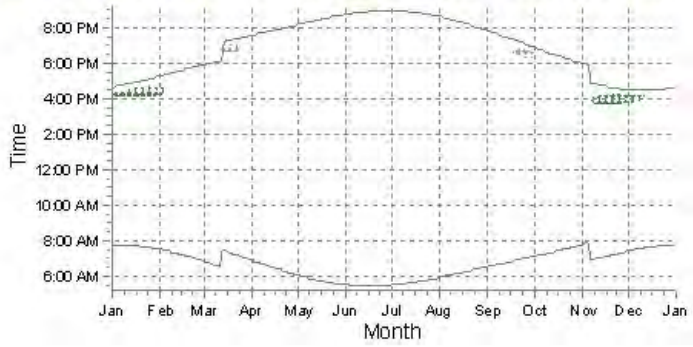
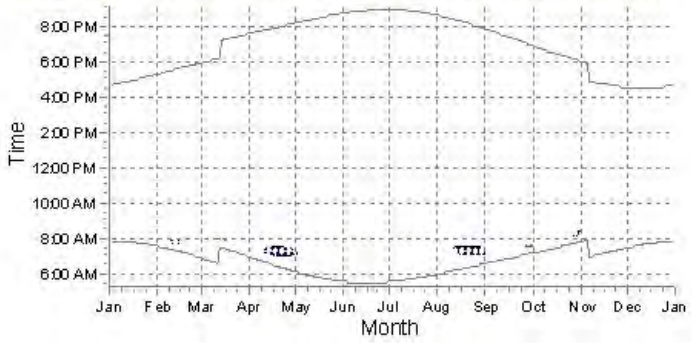
400: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (63)



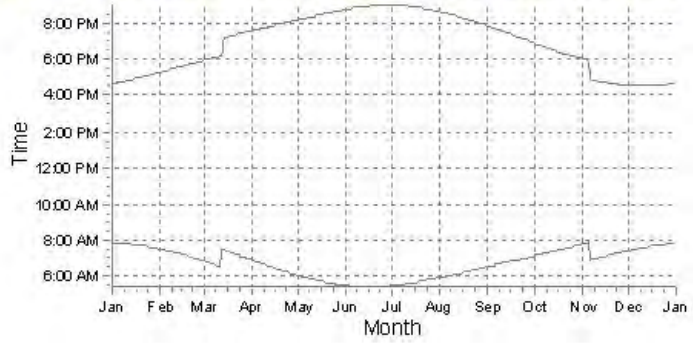
401: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (168)



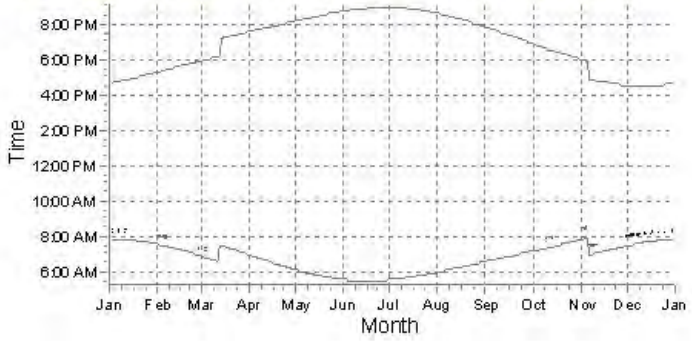
402: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (31)



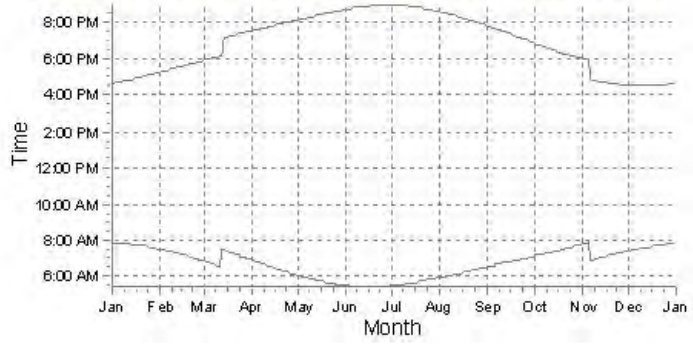
403: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (125)



404: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (43)



405: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (5)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
18: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (19)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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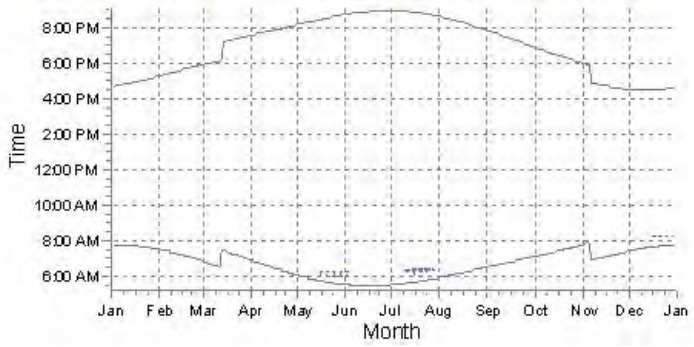
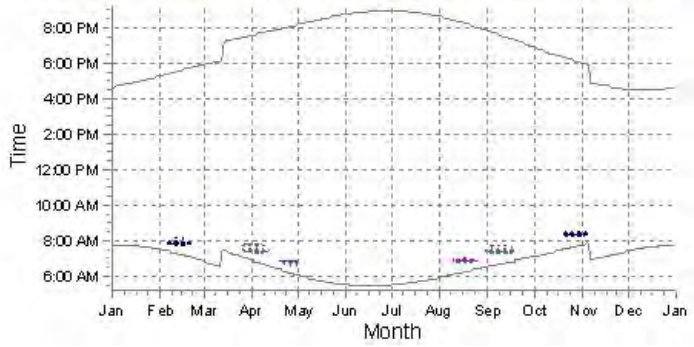
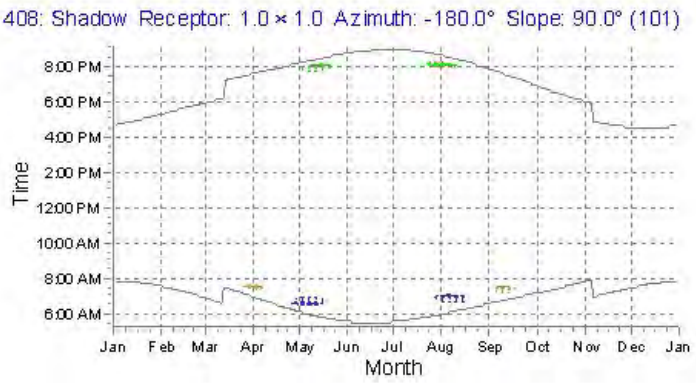
406: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (51)



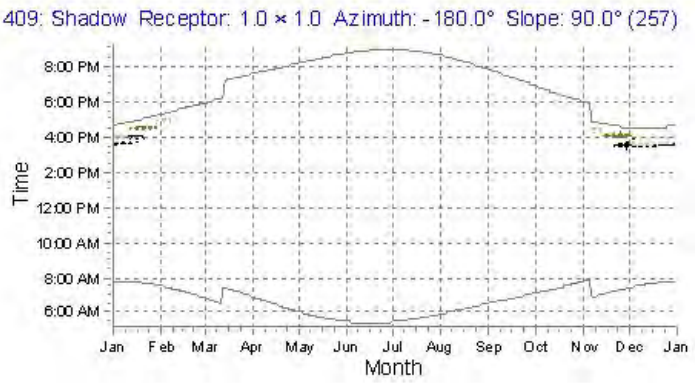
407: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (36)



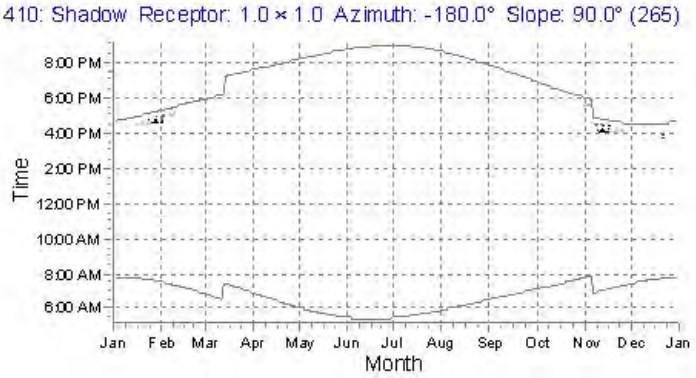
408: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (101)



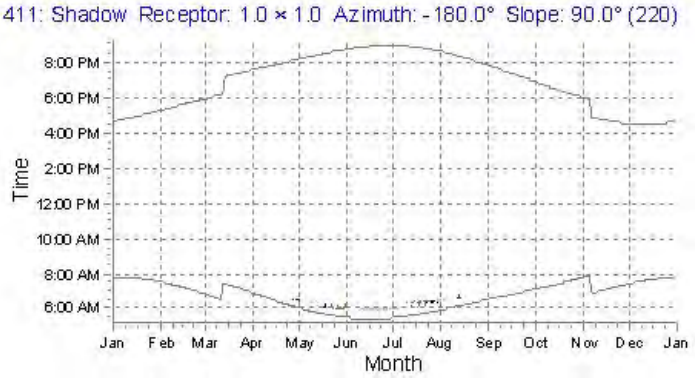
409: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (257)



410: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (265)



411: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (220)



WTGs

07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)

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SF_Goodhue_V4_20110121

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1/21/2011 5:39 PM / 36

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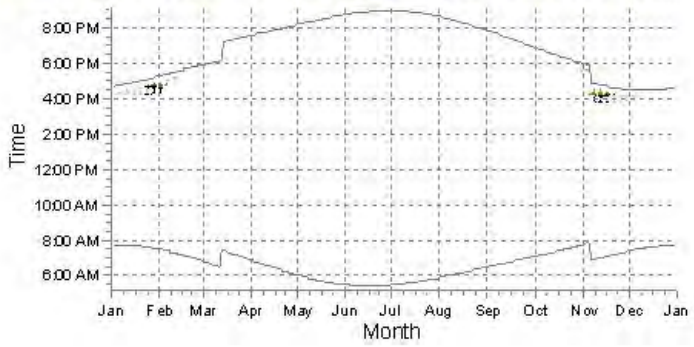
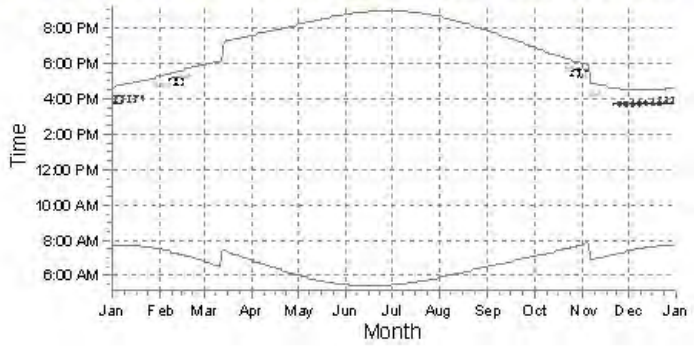
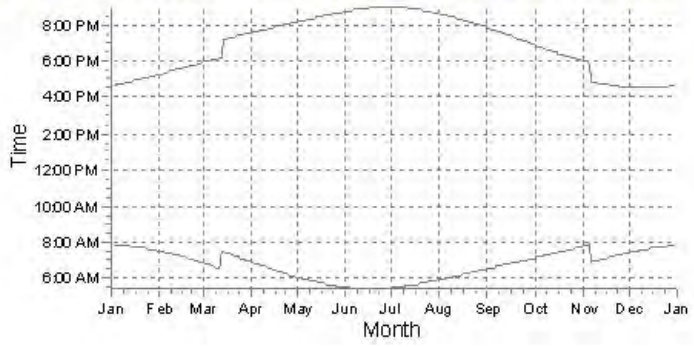
412: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (256)



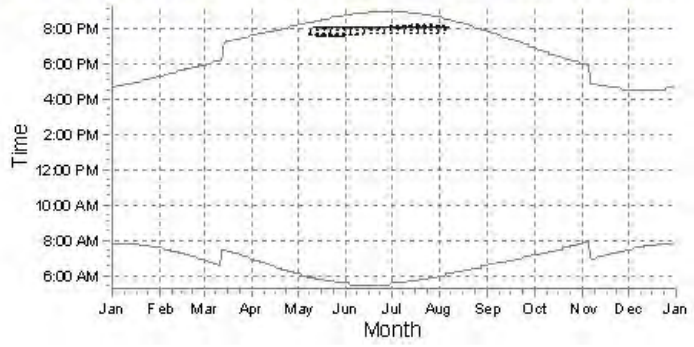
413: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (254)



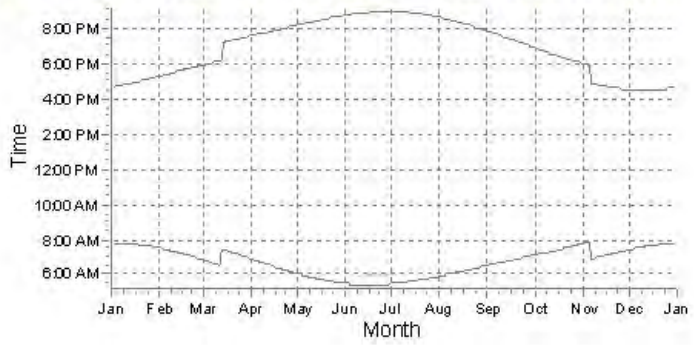
414: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (136)



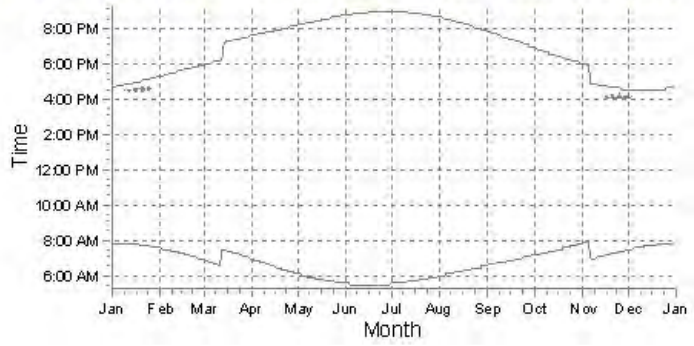
415: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (150)



416: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (211)



417: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (127)



WTGs

04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
37: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (38)

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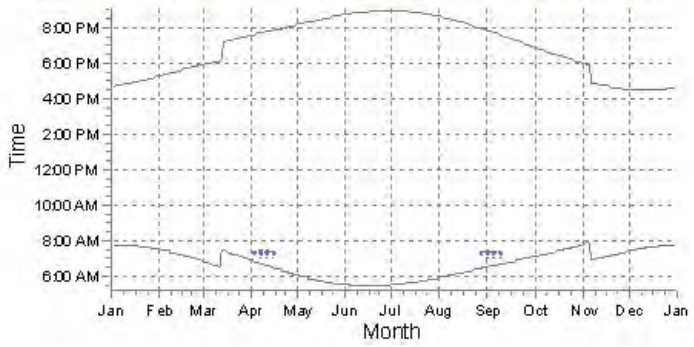
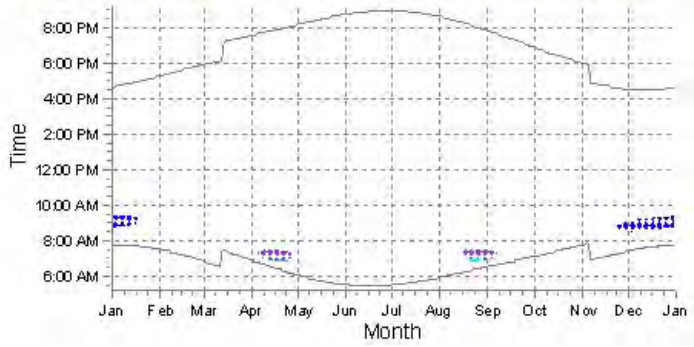
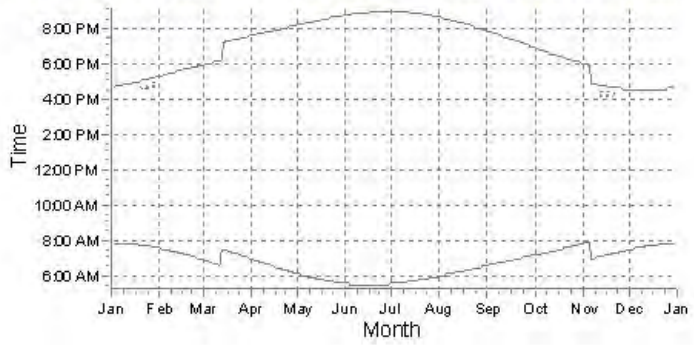
418: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (54)



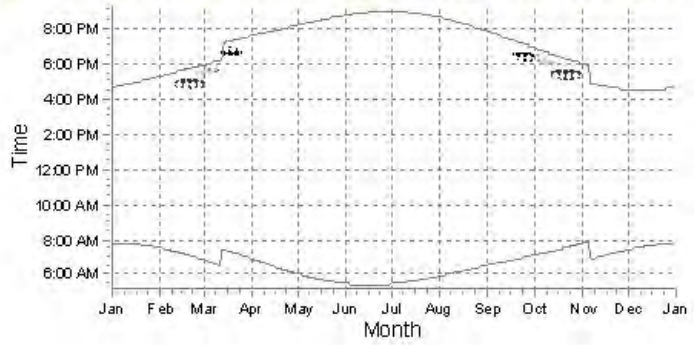
419: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (28)



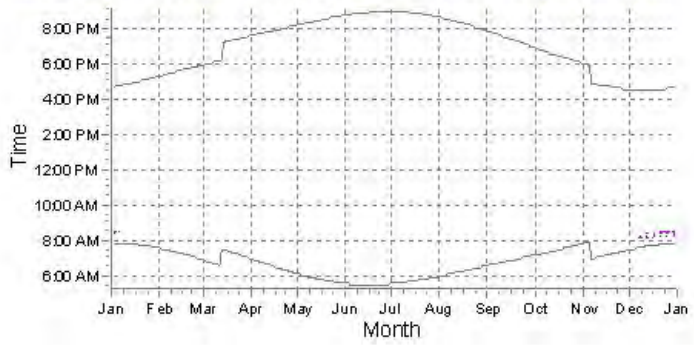
420: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (129)



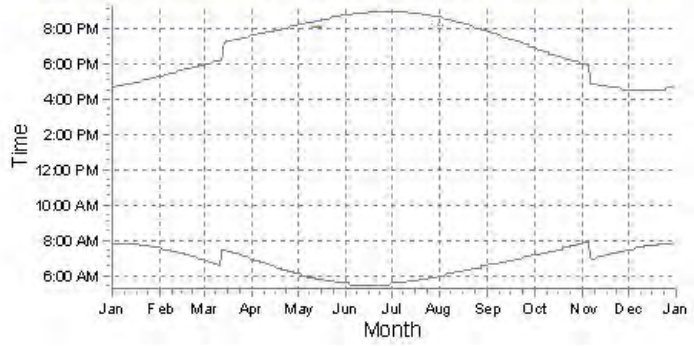
421: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (234)



422: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (52)



423: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (94)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
04: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (5)
09: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (10)
10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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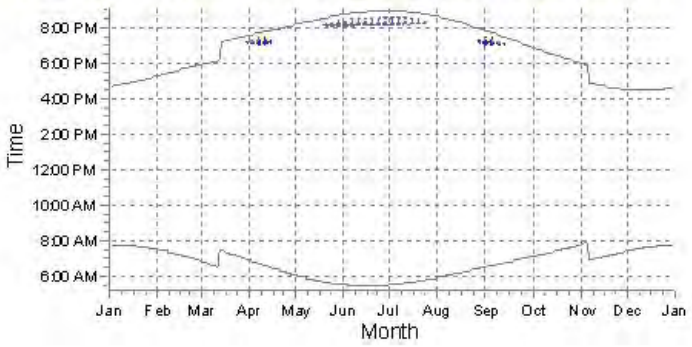
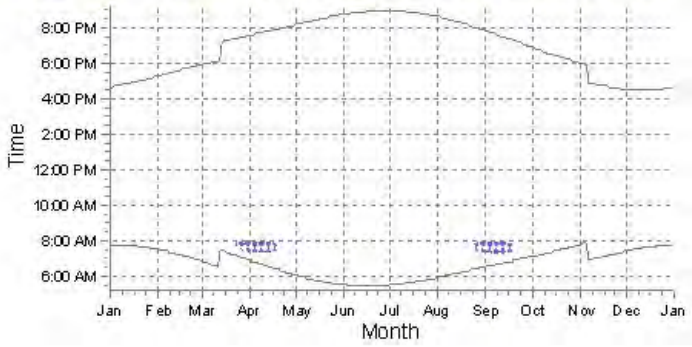
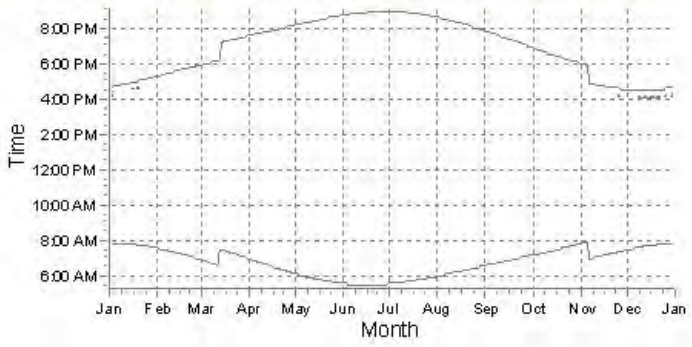
424: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (77)



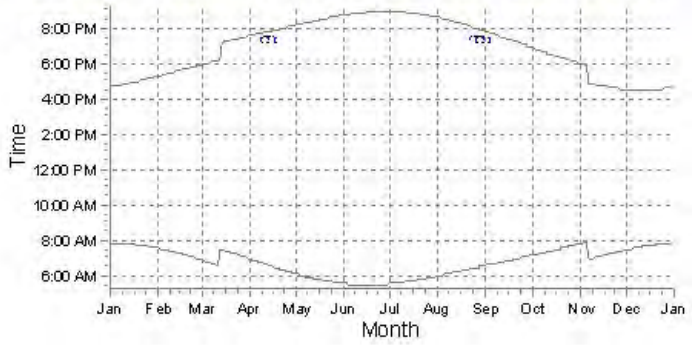
426: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (55)



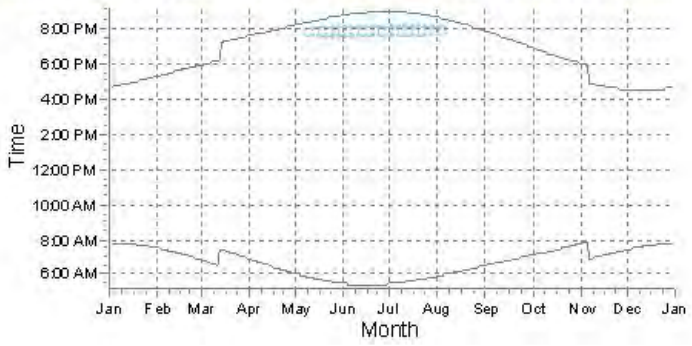
427: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (89)



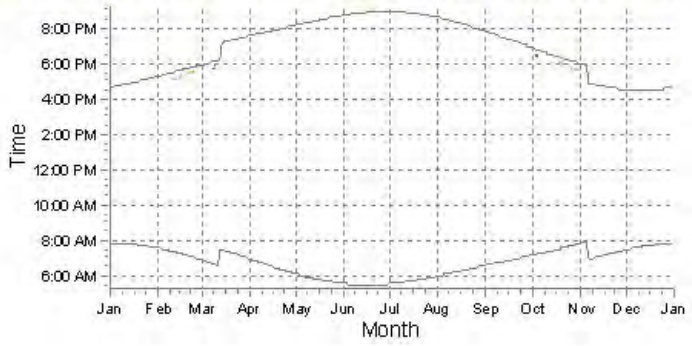
428: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (15)



429: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (192)



430: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (165)



WTGs

03: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (4)
28: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (29)
29: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (30)
32: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (33)
35: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (36)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
41: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (42)
42: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (43)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)

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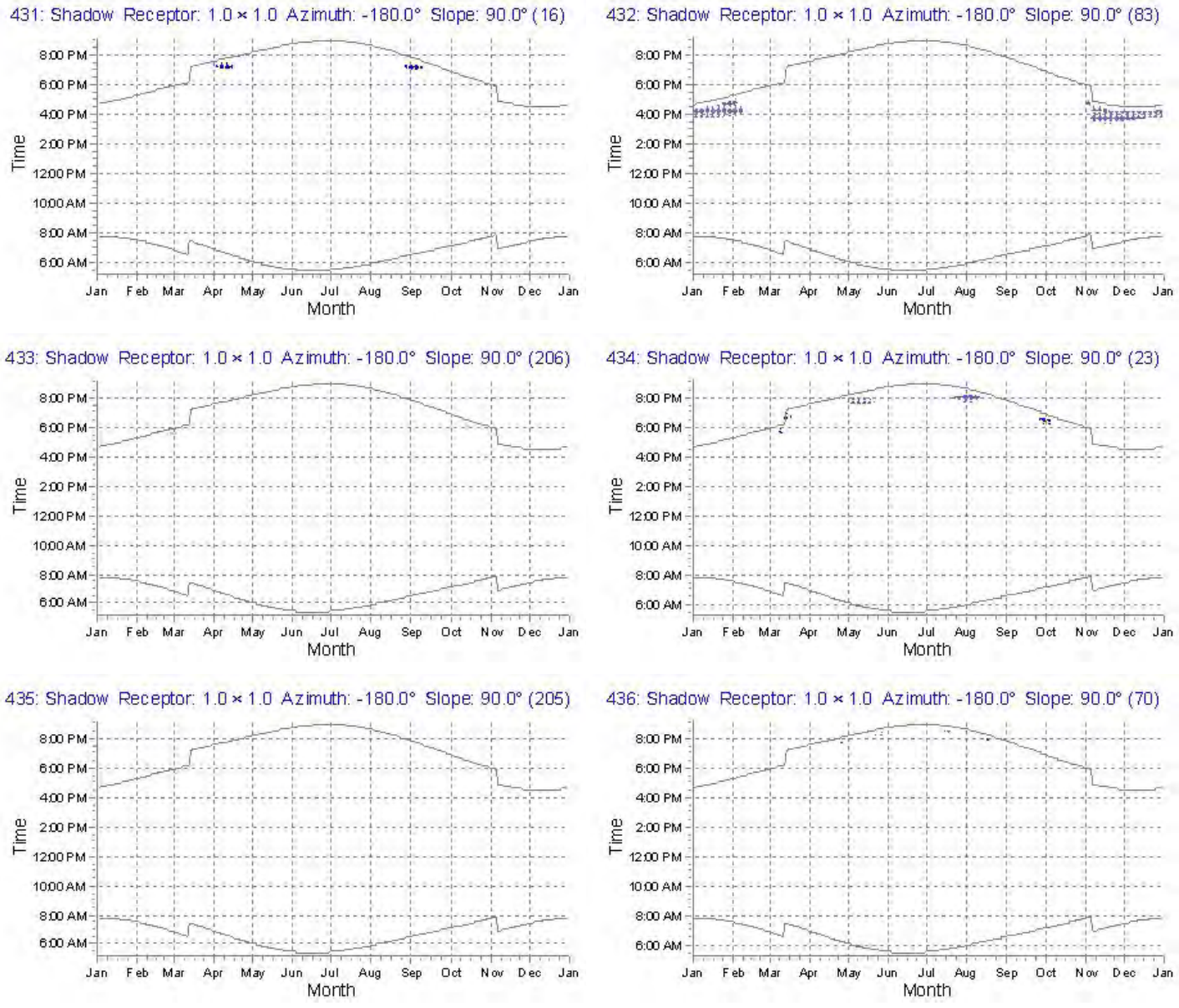

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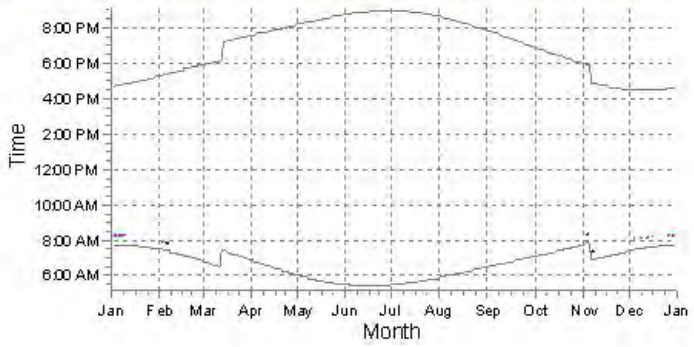
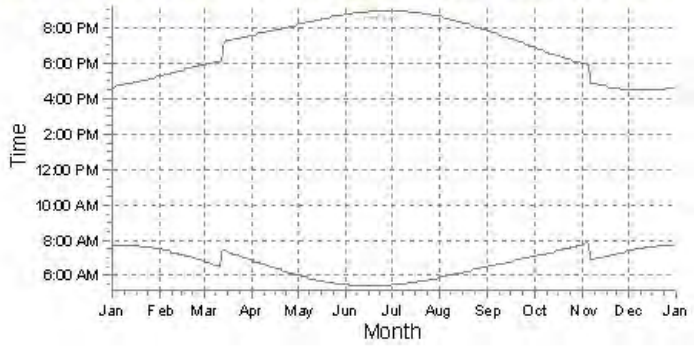
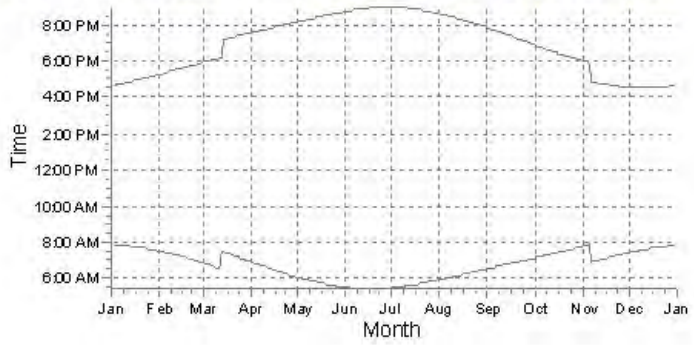
437: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (177)



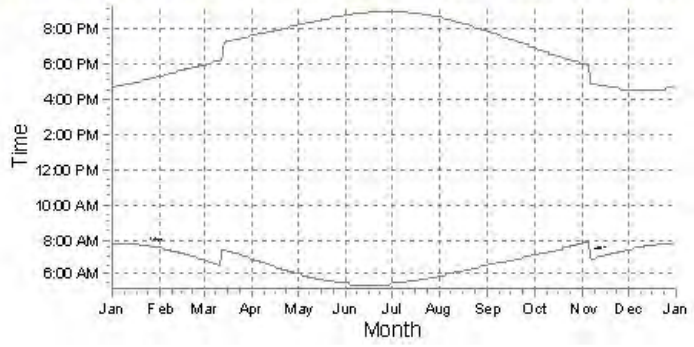
438: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (214)



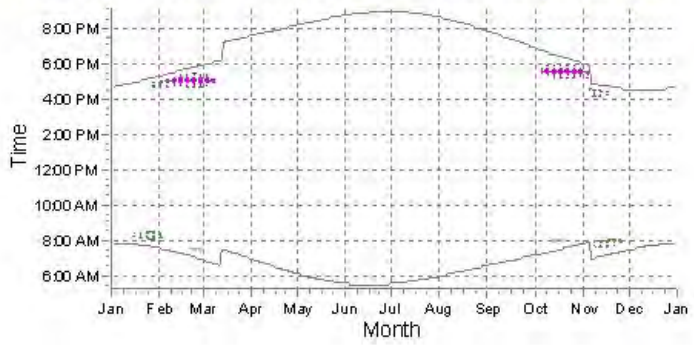
439: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (124)



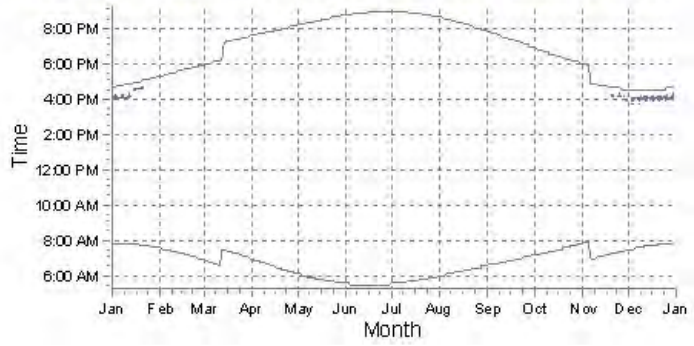
440: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (179)



441: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (39)



442: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (99)



WTGs

12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)

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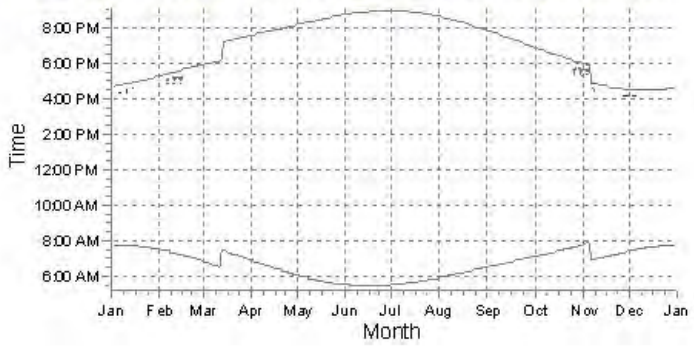
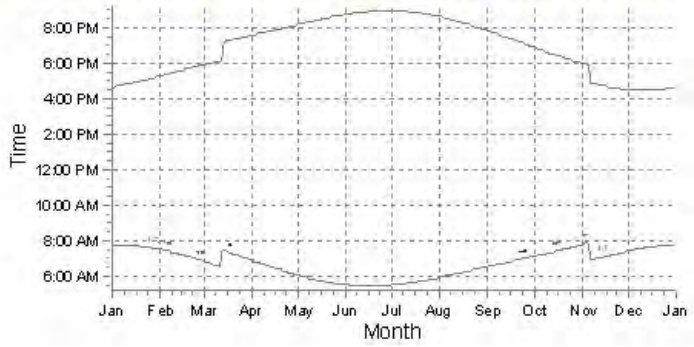
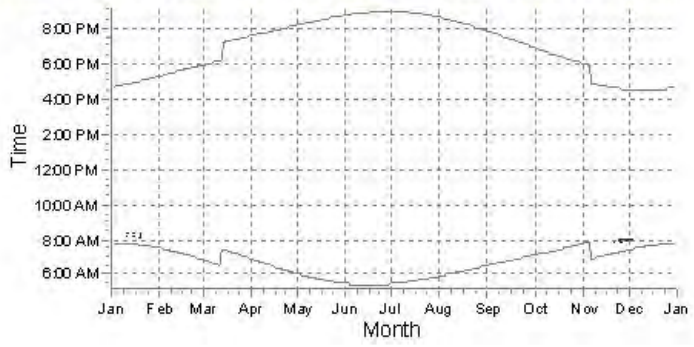
443: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (85)



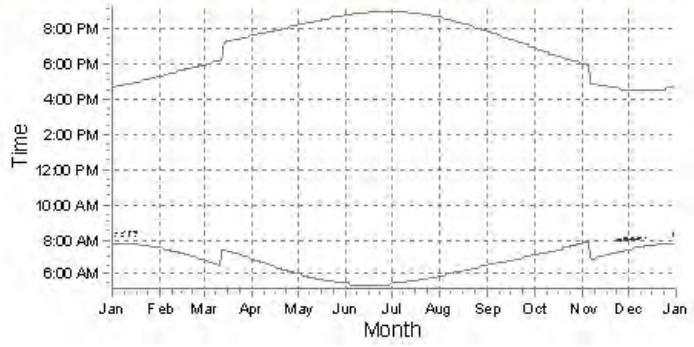
444: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (164)



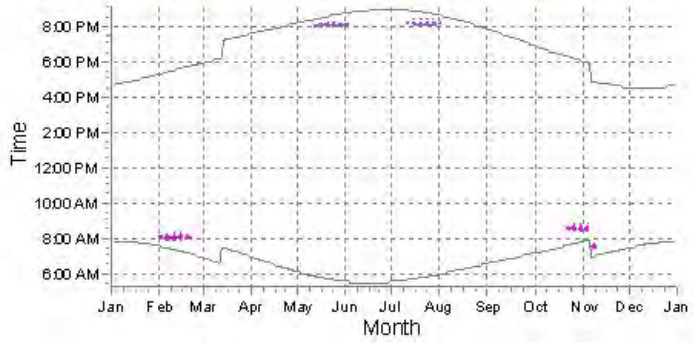
445: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (180)



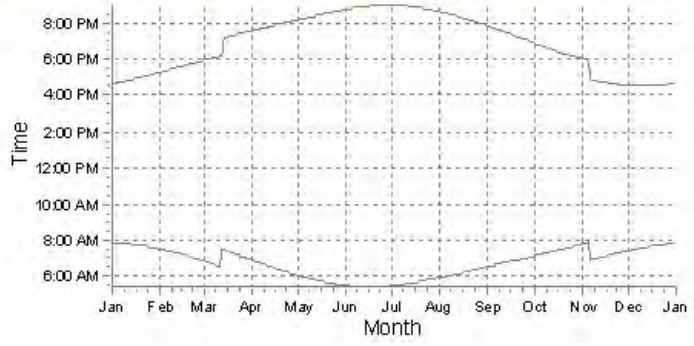
446: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (181)



447: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (53)



448: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (122)



WTGs

05: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (6)
20: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (21)
26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)
40: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (41)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)

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SF_Goodhue_V4_20110121

Printed/Page
1/21/2011 5:39 PM / 42

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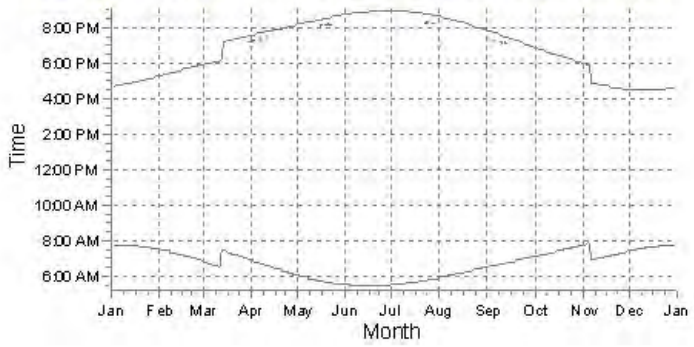
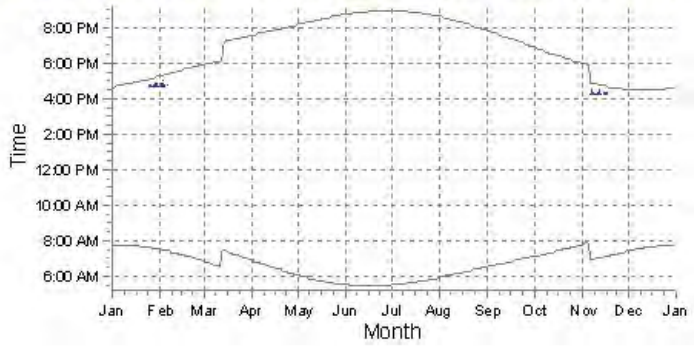
SHADOW - Calendar, graphical

Calculation: SF_Goodhue_20110121

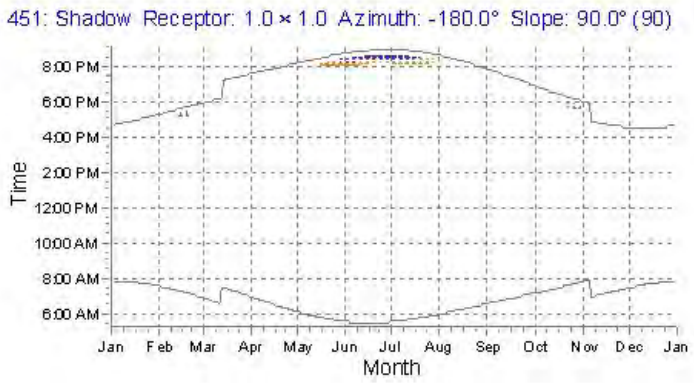
449: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (27)



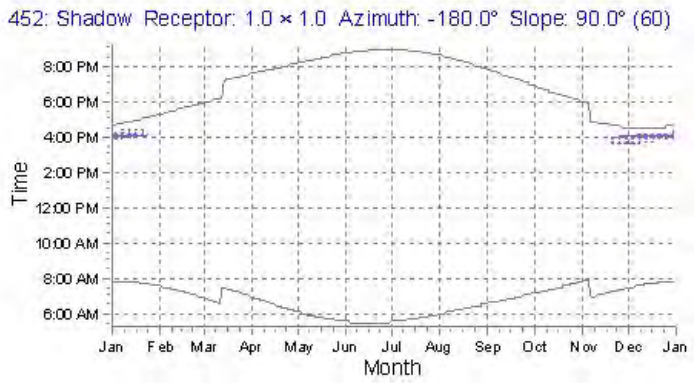
450: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (111)



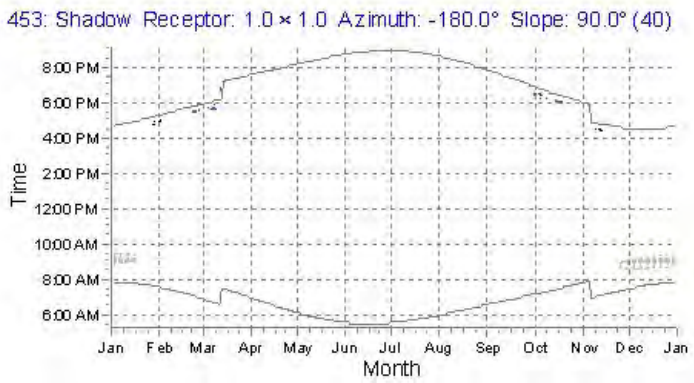
451: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (90)



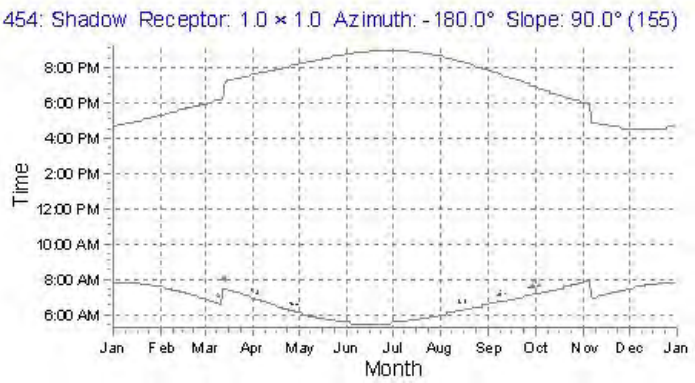
452: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (60)



453: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (40)



454: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (155)



WTGs

07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
20: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (21)
22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
46: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (47)
47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)
48: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (49)
49: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (50)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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SF_Goodhue_V4_20110121

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SHADOW - Calendar, graphical

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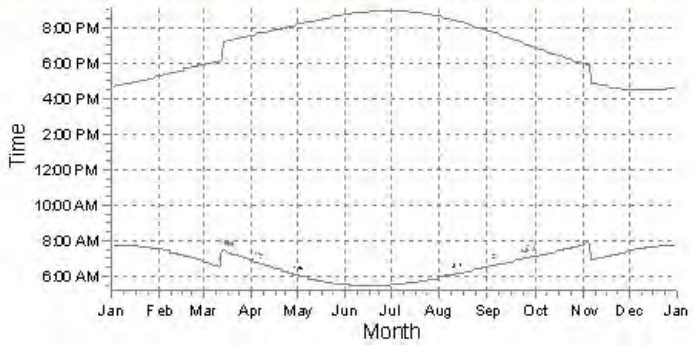
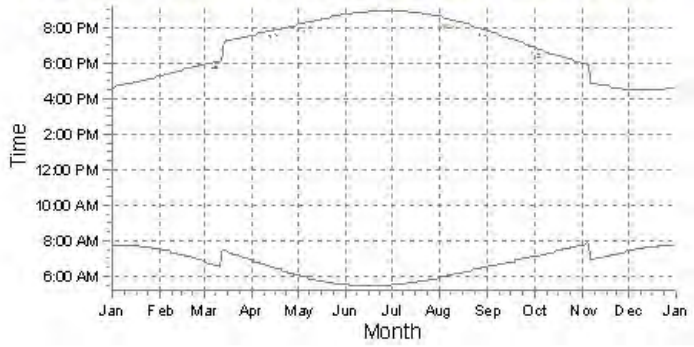
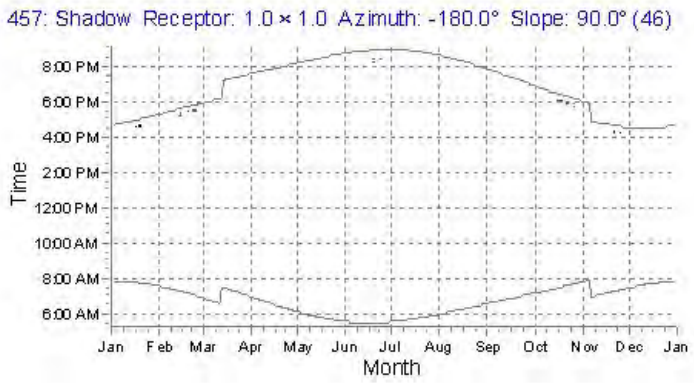
455: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (154)



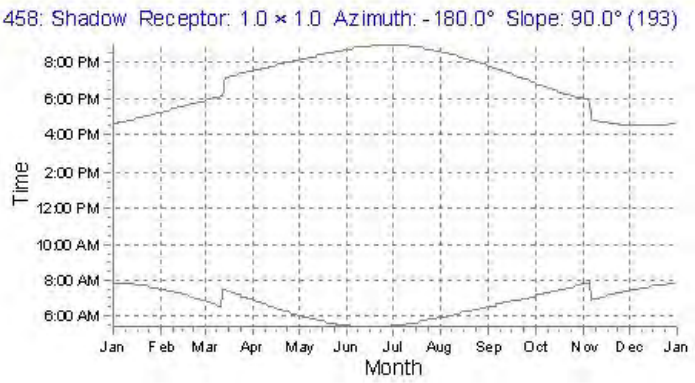
456: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (33)



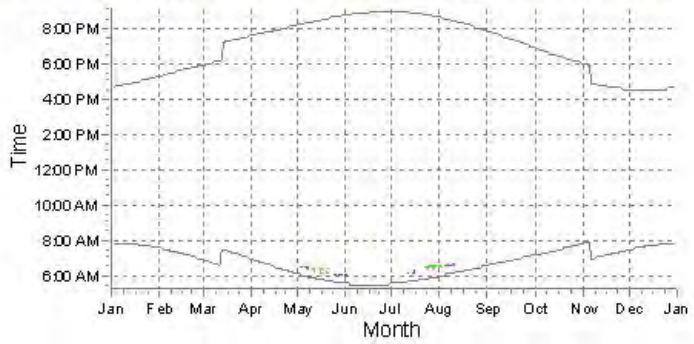
457: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (46)



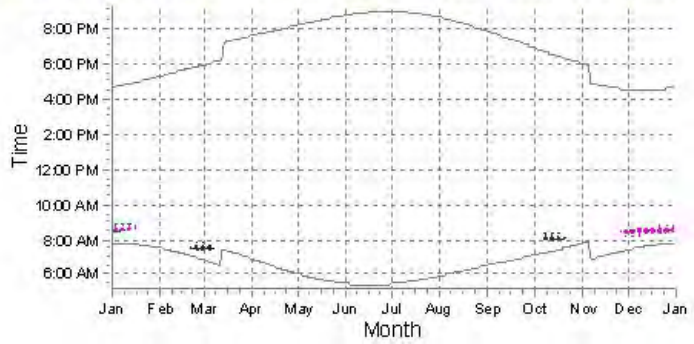
458: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (193)



459: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (148)



460: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (169)



WTGs

05: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (6)
07: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (8)
13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
20: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (21)
22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
31: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (32)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)
45: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (46)
50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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SF_Goodhue_V4_20110121

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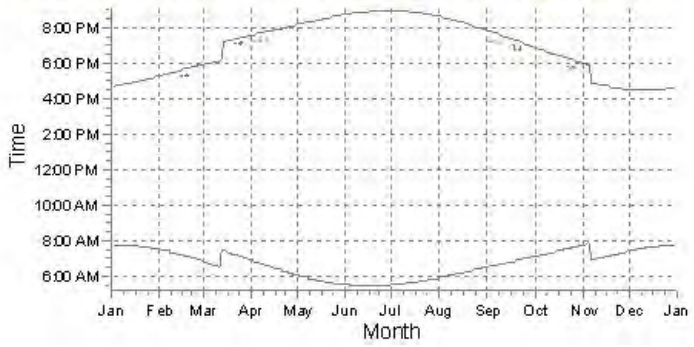
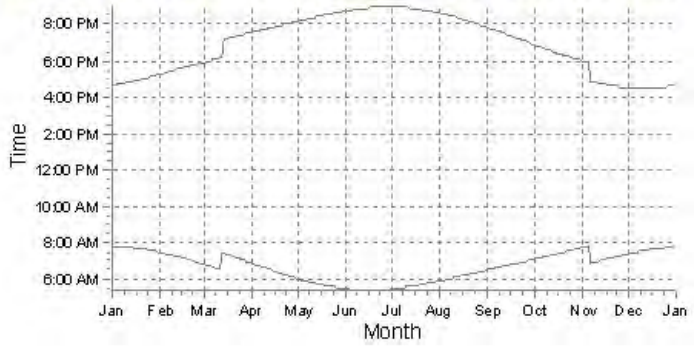
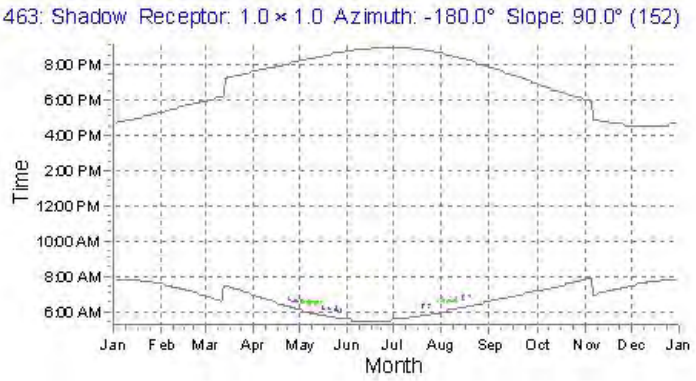
461: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (35)



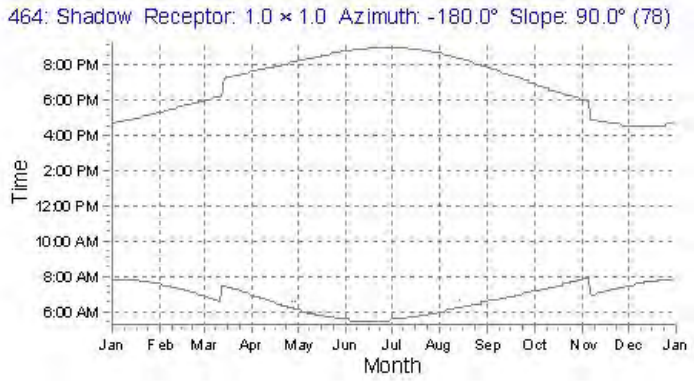
462: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (183)



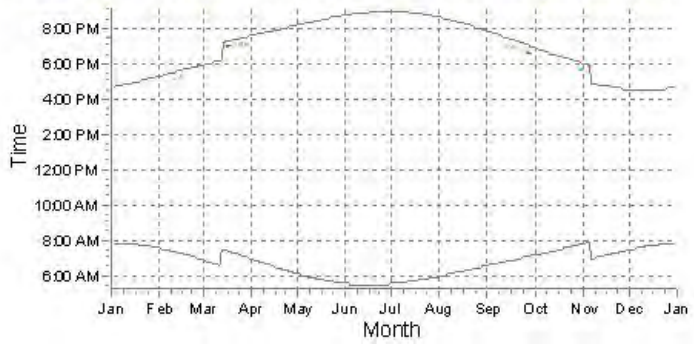
463: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (152)



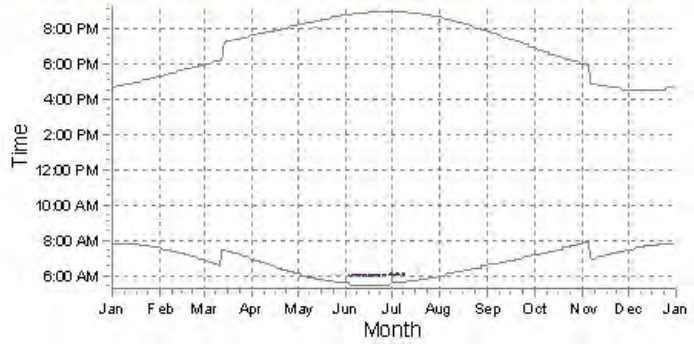
464: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (78)



465: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (37)



466: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (81)



WTGs

- 11: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (12)
- 13: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (14)
- 19: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (20)
- 20: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (21)
- 22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
- 25: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (26)
- 26: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (27)
- 27: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (28)
- 39: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (40)
- 44: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (45)
- 50: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (51)

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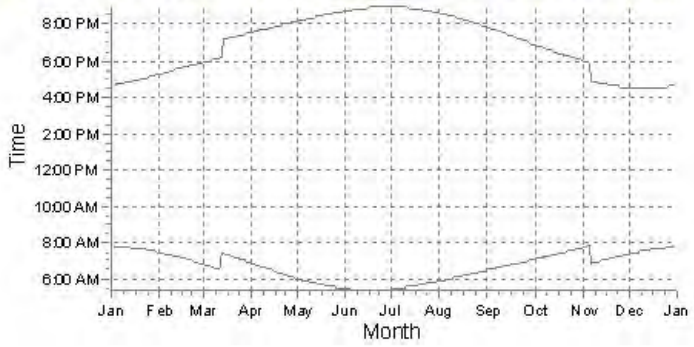
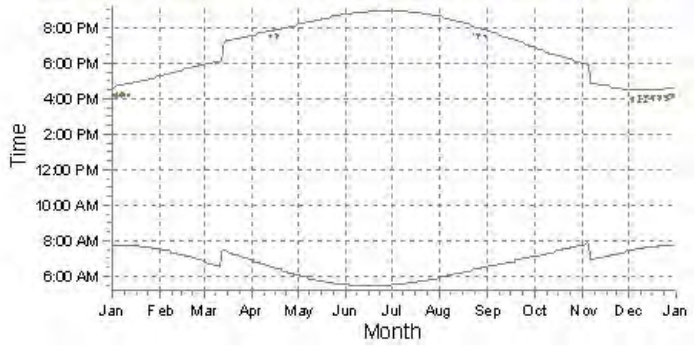
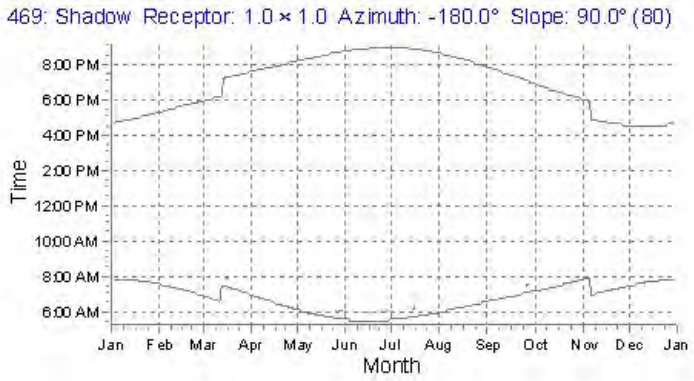
467: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (132)



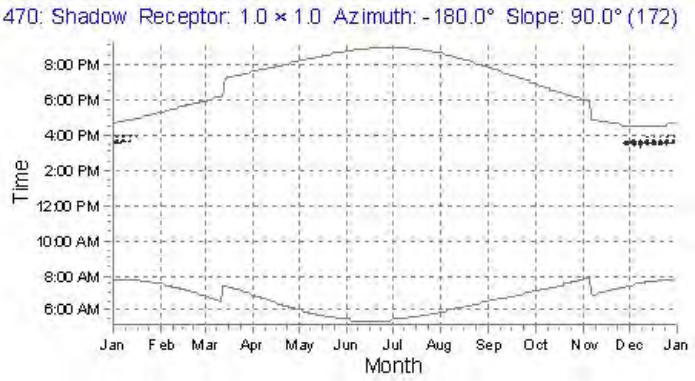
468: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (47)



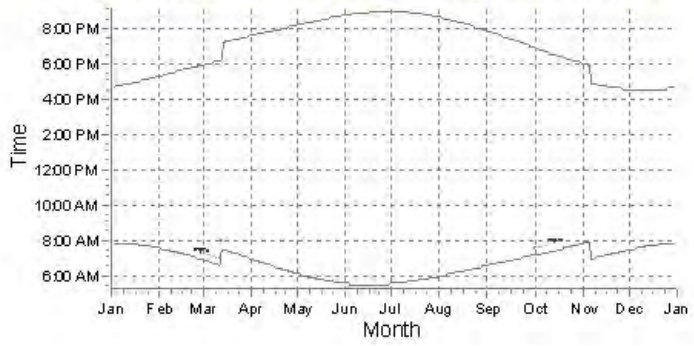
469: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (80)



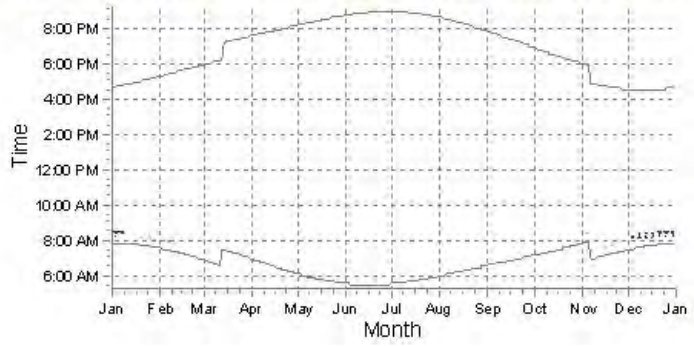
470: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (172)



471: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (104)



472: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (113)



WTGs

05: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (6)
11: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (12)
22: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (23)
23: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (24)
27: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (28)
38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)
44: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (45)

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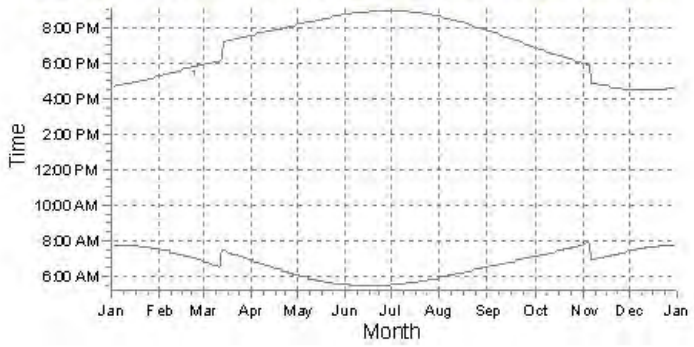
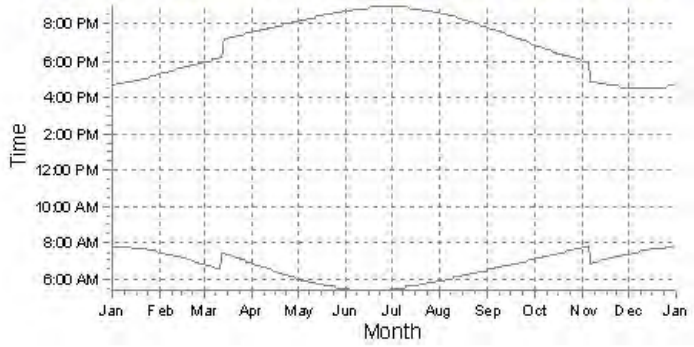
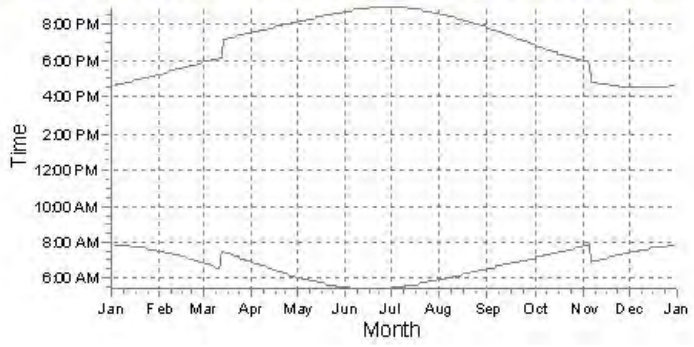
473: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (68)



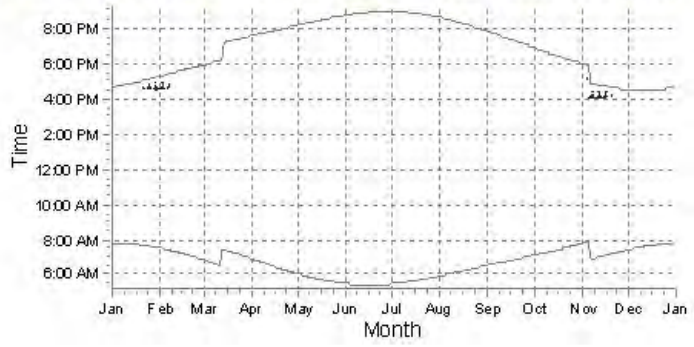
474: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (59)



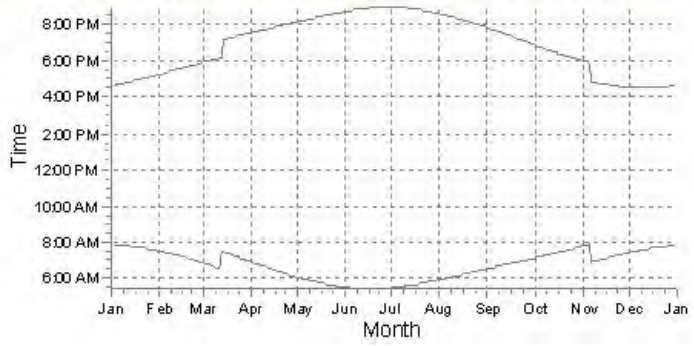
475: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (130)



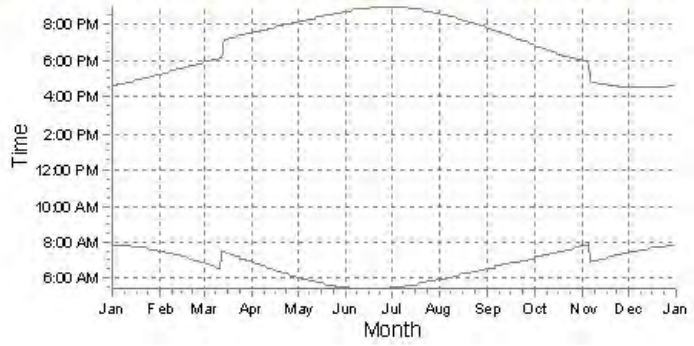
476: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (173)



477: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (142)



478: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (149)



WTGs

38: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (39)

47: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (48)

Project:
SF_Goodhue_V4_20110121

Printed/Page
1/21/2011 5:39 PM / 47

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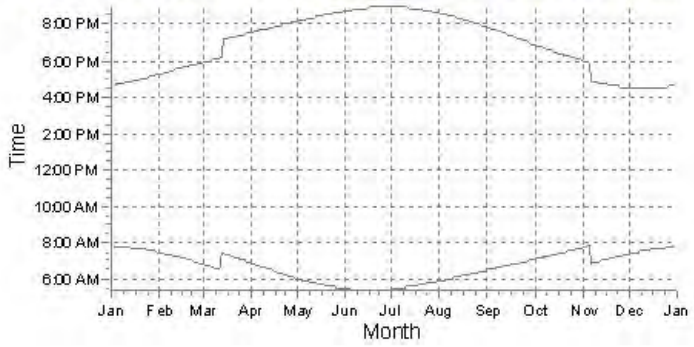
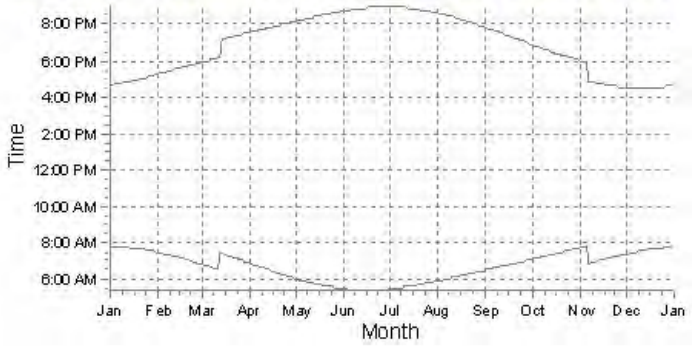
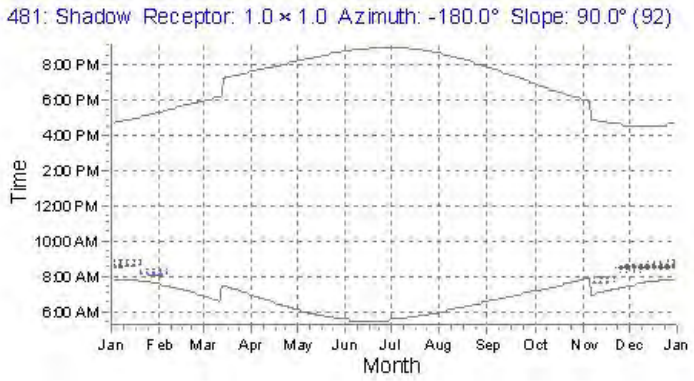
479: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (133)



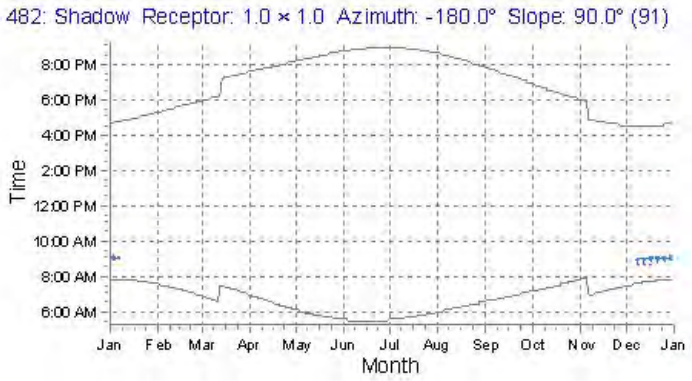
480: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (57)



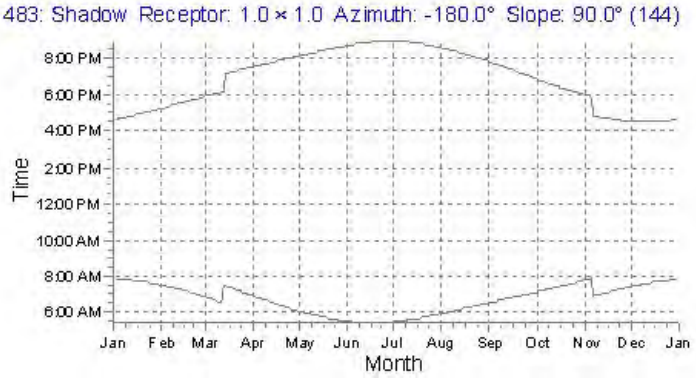
481: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (92)



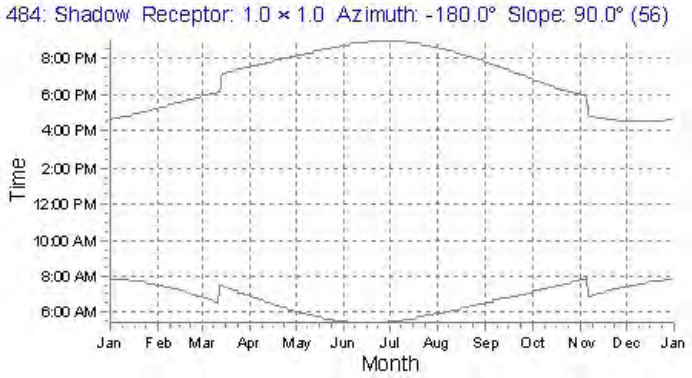
482: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (91)



483: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (144)



484: Shadow Receptor: 1.0 × 1.0 Azimuth: -180.0° Slope: 90.0° (56)



WTGs

43: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (44)

44: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (45)

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SF_Goodhue_V4_20110121

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1/21/2011 5:39 PM / 48

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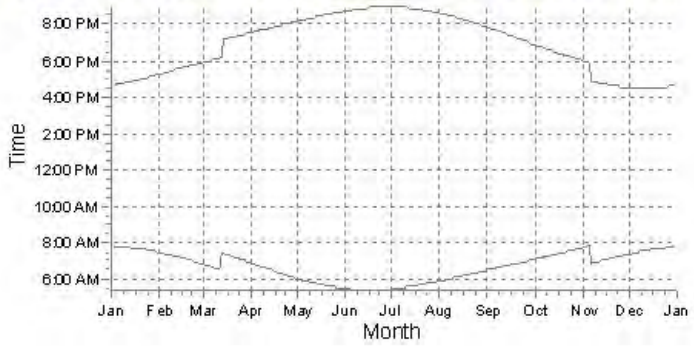
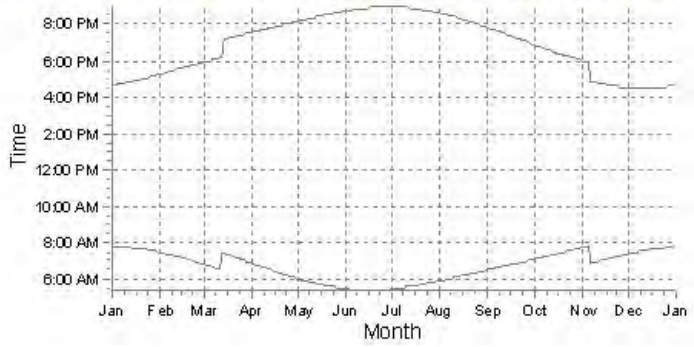
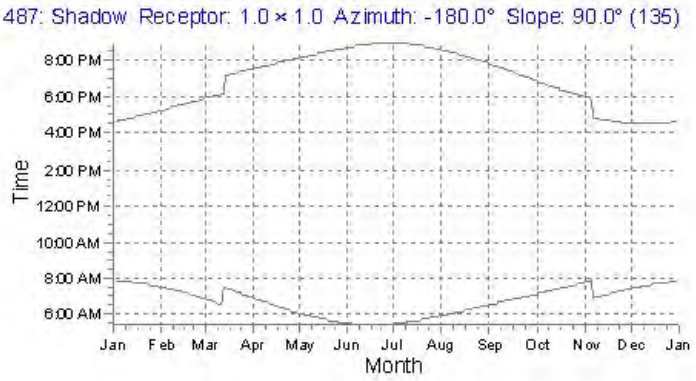
485: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (121)



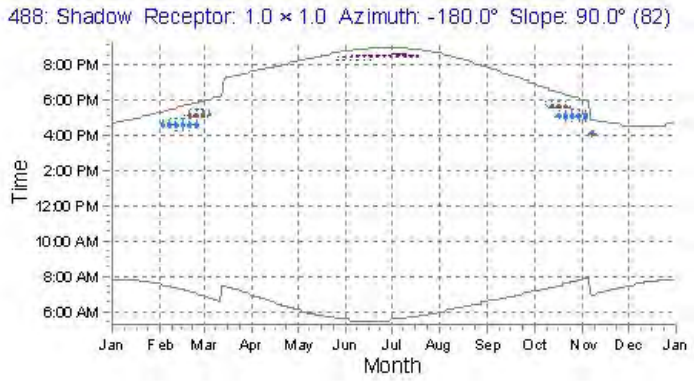
486: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (139)



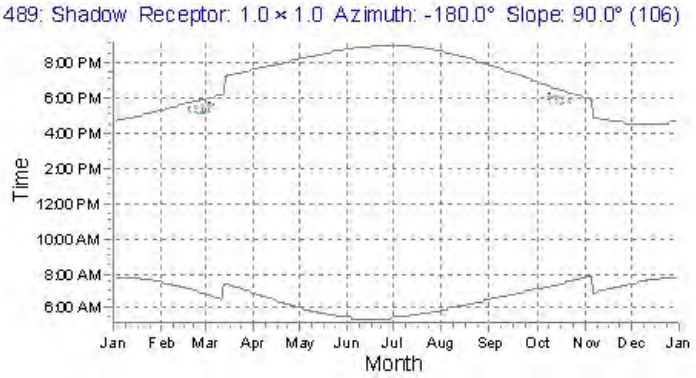
487: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (135)



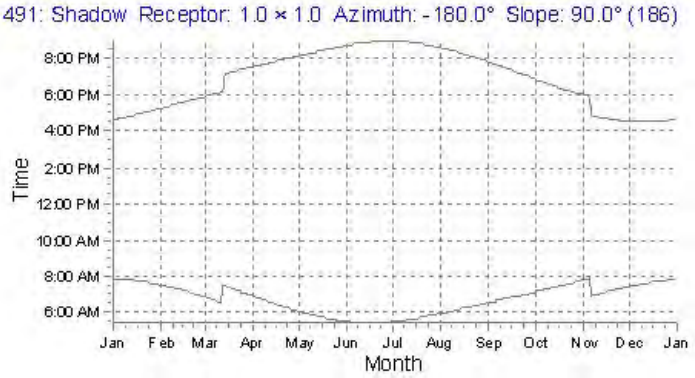
488: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (82)



489: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (106)



491: Shadow Receptor: 1.0 x 1.0 Azimuth: -180.0° Slope: 90.0° (186)



WTGs

11: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (12)
23: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (24)
27: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (28)
43: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (44)
44: GE WIND ENERGY GE 1.5 xle 1500 82.5 !O! hub: 80.0 m (45)

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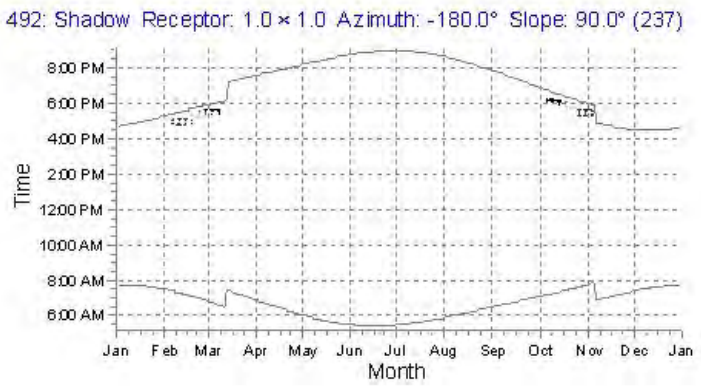

WTGs

10: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (11)
12: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (13)
14: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (15)
15: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (16)
34: GE WIND ENERGY GE 1.6 xle 1600 82.5 !O! hub: 80.0 m (35)