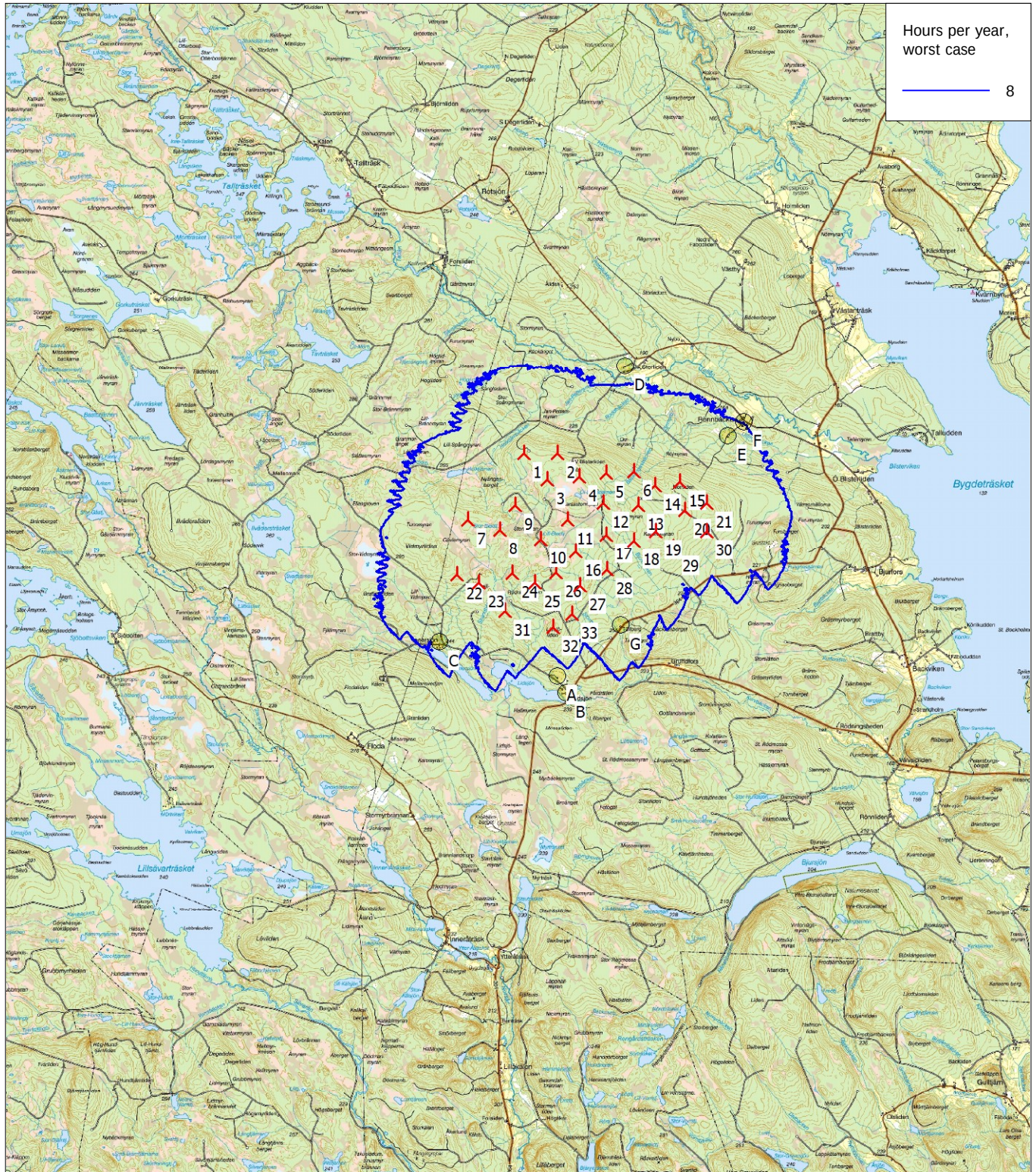


SHADOW - Map

Calculation: Layout 33 WTG V164_190814



Map: Bitmap map: Terrängkarta_EMD.jpg , Print scale 1:125 000, Map center Swedish UTM 33-SWREF99 (SE) East: 753 940 North: 7 153 300
 New WTG Shadow receptor
 Flicker map level: Elevation Grid Data Object: Height_grid_GNIL.wpg (150)

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgratan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Main Result

Calculation: Layout 33 WTG V164_190814

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Elevation Grid Data Object: Height_grid_GNIL.wpg (15

Obstacles used in calculation

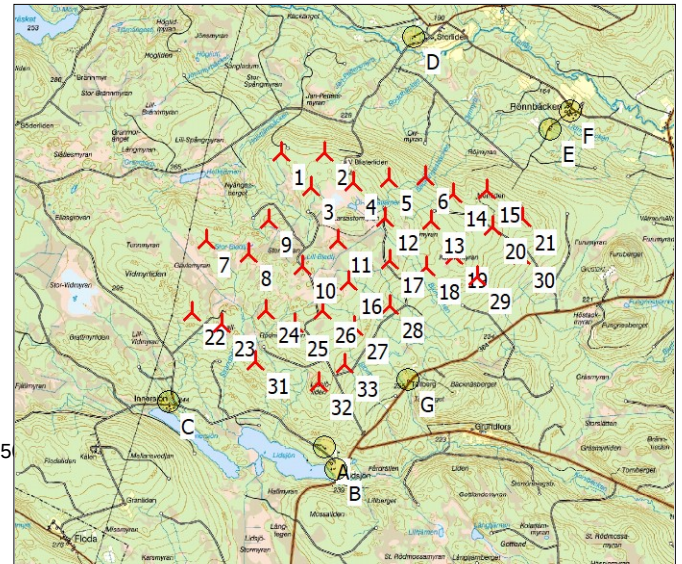
Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

Swedish UTM 33-SWREF99 (SE)

WTGs



New WTG

Scale 1:125 000

Shadow receptor

	Easting	Northing	Z	Row data/Description	WTG type		Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.				Calculation distance [m]	RPM [RPM]
			[m]								
1	756315	7154530	232,7	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
2	754115	7154653	320,6	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
3	753640	7155155	308,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
4	755395	7154029	299,2	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
5	756421	7153925	267,2	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
6	751446	7152512	299,3	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
7	753140	7152331	324,8	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
8	754034	7153017	326,6	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
9	755761	7154463	241,2	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
10	753415	7154580	309,8	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
11	755787	7153453	292,9	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
12	753604	7152555	329,8	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
13	751932	7152329	296,2	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
14	753539	7151355	308,3	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
15	754698	7154725	279,8	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
16	753860	7153708	299,3	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
17	754128	7152272	299,2	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
18	755306	7154756	244,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
19	752661	7152540	320,6	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
20	754707	7153379	299,7	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
21	754640	7154080	319,4	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
22	756889	7153454	249,9	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
23	752382	7153489	295,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
24	752714	7154034	282,3	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
25	754714	7152620	291,7	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
26	752490	7153714	291,4	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
27	756165	7153104	265,1	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
28	753965	7151654	302,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
29	755314	7153254	277,5	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
30	751680	7153714	281,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
31	752914	7155155	288,0	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
32	756900	7154075	260,1	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4
33	753271	7153282	321,9	VESTAS V150-4.2 4200 150.0 !O! ... Yes	Yes	VESTAS	V150-4.2-4200	4200	150,0	175,0	1900 10,4

SHADOW - Main Result

Calculation: Layout 33 WTG V164_190814

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
A	753635	7150289	258,7	5,0	5,0	2,0	90,0	"Green house mode"	7,0
B	753825	7149934	239,6	5,0	5,0	2,0	90,0	"Green house mode"	7,0
C	751059	7151039	236,8	5,0	5,0	2,0	90,0	"Green house mode"	7,0
D	755118	7157063	178,0	5,0	5,0	2,0	90,0	"Green house mode"	7,0
E	757363	7155539	149,4	5,0	5,0	2,0	90,0	"Green house mode"	7,0
F	757700	7155834	141,9	5,0	5,0	2,0	90,0	"Green house mode"	7,0
G	755014	7151401	260,7	5,0	5,0	2,0	90,0	"Green house mode"	7,0

Calculation Results

Shadow receptor

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	0:00	0	0:00
B	0:00	0	0:00
C	11:59	40	0:23
D	0:00	0	0:00
E	27:29	69	0:43
F	0:00	0	0:00
G	50:06	139	0:35

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

No.	Name	Worst case [h/year]
1	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (666)	10:00
2	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (667)	0:00
3	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (668)	0:00
4	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (669)	0:00
5	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (670)	6:56
6	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (671)	0:00
7	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (672)	0:00
8	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (673)	0:00
9	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (674)	0:00
10	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (675)	0:00
11	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (676)	0:00
12	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (677)	10:07
13	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (678)	0:00
14	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (679)	10:29
15	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (680)	0:00
16	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (681)	0:00
17	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (682)	0:00
18	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (683)	0:00
19	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (684)	0:00
20	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (685)	0:00
21	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (686)	0:00
22	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (687)	0:00
23	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (688)	0:00
24	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (689)	0:00
25	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (690)	0:00
26	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (691)	11:59
27	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (692)	0:00
28	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (693)	29:30
29	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (694)	0:00
30	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (695)	0:00
31	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (696)	0:00
32	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (697)	10:33
33	VESTAS V150-4.2 4200 150.0 !O! hub: 175,0 m (TOT: 250,0 m) (698)	0:00

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

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+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: A - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (1)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:36	08:25	06:51	06:01	04:13	02:33	02:10	03:40	05:18	06:46	07:21	08:58
	13:50	15:22	16:54	19:29	21:02	22:44	23:15	21:49	20:00	18:12	15:24	13:58
2	09:35	08:22	06:48	05:57	04:10	02:30	02:12	03:44	05:21	06:49	07:24	09:01
	13:52	15:26	16:57	19:32	21:06	22:47	23:14	21:45	19:56	18:08	15:21	13:56
3	09:34	08:18	06:44	05:53	04:06	02:27	02:14	03:47	05:24	06:52	07:28	09:04
	13:54	15:29	17:01	19:35	21:09	22:50	23:12	21:42	19:52	18:04	15:17	13:54
4	09:33	08:15	06:41	05:50	04:03	02:25	02:16	03:50	05:27	06:54	07:31	09:07
	13:56	15:33	17:04	19:38	21:12	22:53	23:10	21:38	19:49	18:01	15:14	13:52
5	09:31	08:12	06:37	05:46	03:59	02:22	02:18	03:54	05:30	06:57	07:34	09:09
	13:58	15:36	17:07	19:41	21:16	22:55	23:08	21:35	19:45	17:57	15:11	13:50
6	09:30	08:09	06:34	05:43	03:56	02:20	02:20	03:57	05:33	07:00	07:37	09:12
	14:01	15:39	17:10	19:44	21:19	22:58	23:06	21:32	19:42	17:54	15:08	13:48
7	09:28	08:06	06:30	05:39	03:52	02:18	02:23	04:00	05:36	07:03	07:41	09:14
	14:03	15:43	17:13	19:47	21:22	23:01	23:03	21:28	19:38	17:50	15:05	13:46
8	09:26	08:02	06:26	05:35	03:49	02:16	02:25	04:03	05:39	07:06	07:44	09:17
	14:06	15:46	17:16	19:50	21:25	23:03	23:01	21:25	19:34	17:47	15:01	13:45
9	09:25	07:59	06:23	05:32	03:46	02:14	02:28	04:07	05:42	07:09	07:47	09:19
	14:09	15:49	17:19	19:53	21:29	23:05	22:59	21:21	19:31	17:43	14:58	13:43
10	09:23	07:56	06:19	05:28	03:42	02:12	02:31	04:10	05:45	07:12	07:51	09:21
	14:11	15:53	17:22	19:56	21:32	23:08	22:56	21:18	19:27	17:40	14:55	13:42
11	09:21	07:53	06:16	05:25	03:39	02:10	02:34	04:13	05:47	07:15	07:54	09:24
	14:14	15:56	17:25	19:59	21:36	23:10	22:54	21:14	19:23	17:36	14:52	13:41
12	09:19	07:49	06:12	05:21	03:35	02:08	02:37	04:16	05:50	07:18	07:57	09:26
	14:17	15:59	17:28	20:02	21:39	23:12	22:51	21:11	19:20	17:33	14:49	13:40
13	09:16	07:46	06:09	05:17	03:32	02:07	02:40	04:19	05:53	07:21	08:01	09:27
	14:20	16:03	17:31	20:05	21:42	23:14	22:48	21:07	19:16	17:29	14:46	13:39
14	09:14	07:43	06:05	05:14	03:29	02:05	02:43	04:23	05:56	07:24	08:04	09:29
	14:23	16:06	17:34	20:08	21:46	23:15	22:45	21:04	19:13	17:26	14:43	13:38
15	09:12	07:39	06:02	05:10	03:25	02:04	02:46	04:26	05:59	07:27	08:07	09:31
	14:26	16:09	17:37	20:11	21:49	23:17	22:43	21:00	19:09	17:22	14:40	13:37
16	09:09	07:36	05:58	05:07	03:22	02:03	02:49	04:29	06:02	07:31	08:11	09:32
	14:29	16:13	17:40	20:14	21:52	23:18	22:40	20:57	19:05	17:19	14:37	13:37
17	09:07	07:33	05:54	05:03	03:19	02:02	02:52	04:32	06:05	07:34	08:14	09:34
	14:32	16:16	17:43	20:18	21:56	23:19	22:37	20:53	19:02	17:15	14:34	13:37
18	09:05	07:29	05:51	04:59	03:15	02:01	02:55	04:35	06:08	07:37	08:17	09:35
	14:36	16:19	17:46	20:21	21:59	23:20	22:34	20:50	18:58	17:12	14:31	13:36
19	09:02	07:26	05:47	04:56	03:12	02:01	02:58	04:38	06:11	07:40	08:21	09:36
	14:39	16:22	17:49	20:24	22:02	23:21	22:31	20:46	18:55	17:08	14:28	13:36
20	08:59	07:22	05:44	04:52	03:09	02:00	03:01	04:41	06:14	07:43	08:24	09:37
	14:42	16:26	17:52	20:27	22:06	23:22	22:28	20:42	18:51	17:05	14:25	13:36
21	08:57	07:19	05:40	04:49	03:06	02:00	03:04	04:44	06:17	07:46	08:27	09:38
	14:45	16:29	17:55	20:30	22:09	23:22	22:25	20:39	18:47	17:01	14:22	13:37
22	08:54	07:15	05:37	04:45	03:02	02:00	03:08	04:48	06:19	07:49	08:30	09:38
	14:49	16:32	17:58	20:33	22:12	23:22	22:21	20:35	18:44	16:58	14:20	13:37
23	08:51	07:12	05:33	04:42	02:59	02:01	03:11	04:51	06:22	07:52	08:34	09:39
	14:52	16:35	18:01	20:37	22:16	23:22	22:18	20:32	18:40	16:54	14:17	13:38
24	08:48	07:09	05:29	04:38	02:56	02:01	03:14	04:54	06:25	07:55	08:37	09:39
	14:55	16:39	18:04	20:40	22:19	23:22	22:15	20:28	18:37	16:51	14:14	13:38
25	08:46	07:05	05:26	04:35	02:53	02:02	03:17	04:57	06:28	06:59	08:40	09:39
	14:59	16:42	18:07	20:43	22:22	23:22	22:12	20:25	18:33	15:48	14:12	13:39
26	08:43	07:02	05:22	04:31	02:50	02:03	03:21	05:00	06:31	07:02	08:43	09:39
	15:02	16:45	18:10	20:46	22:25	23:21	22:09	20:21	18:30	15:44	14:09	13:40
27	08:40	06:58	05:19	04:27	02:47	02:04	03:24	05:03	06:34	07:05	08:46	09:39
	15:05	16:48	18:13	20:49	22:28	23:20	22:05	20:17	18:26	15:41	14:07	13:41
28	08:37	06:55	05:15	04:24	02:44	02:05	03:27	05:06	06:37	07:08	08:49	09:39
	15:09	16:51	18:17	20:53	22:32	23:19	22:02	20:14	18:22	15:37	14:04	13:43
29	08:34		06:11	04:20	02:41	02:06	03:31	05:09	06:40	07:11	08:52	09:38
	15:12		19:20	20:56	22:35	23:18	21:59	20:10	18:19	15:34	14:02	13:44
30	08:31		06:08	04:17	02:38	02:08	03:34	05:12	06:43	07:15	08:55	09:38
	15:16		19:23	20:59	22:38	23:17	21:55	20:07	18:15	15:31	14:00	13:46
31	08:28		06:04		02:36		03:37	05:15		07:18		09:37
	15:19		19:26		22:41		21:52	20:03		15:27		13:47
Potential sun hours	168	237	363	452	573	631	613	510	393	304	195	132
Total, worst case												

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

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgatan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: B - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (2)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:36	08:25	06:51	06:01	04:13	02:33	02:10	03:40	05:18	06:46	07:21	08:58
	13:50	15:22	16:54	19:29	21:02	22:44	23:15	21:49	19:59	18:12	15:24	13:58
2	09:35	08:22	06:48	05:57	04:10	02:30	02:12	03:44	05:21	06:49	07:24	09:01
	13:52	15:26	16:57	19:32	21:06	22:47	23:13	21:45	19:56	18:08	15:21	13:56
3	09:34	08:18	06:44	05:53	04:06	02:28	02:14	03:47	05:24	06:52	07:28	09:04
	13:54	15:29	17:01	19:35	21:09	22:50	23:12	21:42	19:52	18:04	15:17	13:54
4	09:33	08:15	06:41	05:50	04:03	02:25	02:16	03:50	05:27	06:54	07:31	09:07
	13:56	15:33	17:04	19:38	21:12	22:52	23:10	21:38	19:49	18:01	15:14	13:52
5	09:31	08:12	06:37	05:46	03:59	02:23	02:18	03:54	05:30	06:57	07:34	09:09
	13:58	15:36	17:07	19:41	21:15	22:55	23:08	21:35	19:45	17:57	15:11	13:50
6	09:30	08:09	06:34	05:43	03:56	02:20	02:20	03:57	05:33	07:00	07:37	09:12
	14:01	15:39	17:10	19:44	21:19	22:58	23:06	21:32	19:41	17:54	15:08	13:48
7	09:28	08:06	06:30	05:39	03:52	02:18	02:23	04:00	05:36	07:03	07:41	09:14
	14:03	15:43	17:13	19:47	21:22	23:00	23:03	21:28	19:38	17:50	15:05	13:46
8	09:26	08:02	06:26	05:35	03:49	02:16	02:26	04:03	05:39	07:06	07:44	09:17
	14:06	15:46	17:16	19:50	21:25	23:03	23:01	21:25	19:34	17:47	15:01	13:45
9	09:24	07:59	06:23	05:32	03:46	02:14	02:28	04:07	05:42	07:09	07:47	09:19
	14:09	15:49	17:19	19:53	21:29	23:05	22:59	21:21	19:31	17:43	14:58	13:43
10	09:23	07:56	06:19	05:28	03:42	02:12	02:31	04:10	05:45	07:12	07:51	09:21
	14:11	15:53	17:22	19:56	21:32	23:08	22:56	21:18	19:27	17:40	14:55	13:42
11	09:21	07:53	06:16	05:25	03:39	02:10	02:34	04:13	05:47	07:15	07:54	09:23
	14:14	15:56	17:25	19:59	21:35	23:10	22:54	21:14	19:23	17:36	14:52	13:41
12	09:19	07:49	06:12	05:21	03:35	02:08	02:37	04:16	05:50	07:18	07:57	09:25
	14:17	15:59	17:28	20:02	21:39	23:12	22:51	21:11	19:20	17:33	14:49	13:40
13	09:16	07:46	06:09	05:17	03:32	02:07	02:40	04:19	05:53	07:21	08:01	09:27
	14:20	16:03	17:31	20:05	21:42	23:13	22:48	21:07	19:16	17:29	14:46	13:39
14	09:14	07:43	06:05	05:14	03:29	02:05	02:43	04:23	05:56	07:24	08:04	09:29
	14:23	16:06	17:34	20:08	21:45	23:15	22:45	21:04	19:13	17:26	14:43	13:38
15	09:12	07:39	06:02	05:10	03:25	02:04	02:46	04:26	05:59	07:27	08:07	09:31
	14:26	16:09	17:37	20:11	21:49	23:17	22:43	21:00	19:09	17:22	14:40	13:37
16	09:09	07:36	05:58	05:07	03:22	02:03	02:49	04:29	06:02	07:30	08:11	09:32
	14:29	16:13	17:40	20:14	21:52	23:18	22:40	20:57	19:05	17:19	14:37	13:37
17	09:07	07:32	05:54	05:03	03:19	02:02	02:52	04:32	06:05	07:34	08:14	09:34
	14:32	16:16	17:43	20:18	21:56	23:19	22:37	20:53	19:02	17:15	14:34	13:37
18	09:04	07:29	05:51	04:59	03:15	02:01	02:55	04:35	06:08	07:37	08:17	09:35
	14:36	16:19	17:46	20:21	21:59	23:20	22:34	20:50	18:58	17:12	14:31	13:36
19	09:02	07:26	05:47	04:56	03:12	02:01	02:58	04:38	06:11	07:40	08:20	09:36
	14:39	16:22	17:49	20:24	22:02	23:21	22:31	20:46	18:55	17:08	14:28	13:36
20	08:59	07:22	05:44	04:52	03:09	02:00	03:01	04:41	06:14	07:43	08:24	09:37
	14:42	16:26	17:52	20:27	22:06	23:22	22:28	20:42	18:51	17:05	14:25	13:36
21	08:57	07:19	05:40	04:49	03:06	02:00	03:04	04:44	06:16	07:46	08:27	09:38
	14:45	16:29	17:55	20:30	22:09	23:22	22:25	20:39	18:47	17:01	14:23	13:37
22	08:54	07:15	05:37	04:45	03:03	02:00	03:08	04:48	06:19	07:49	08:30	09:38
	14:49	16:32	17:58	20:33	22:12	23:22	22:21	20:35	18:44	16:58	14:20	13:37
23	08:51	07:12	05:33	04:42	02:59	02:01	03:11	04:51	06:22	07:52	08:34	09:39
	14:52	16:35	18:01	20:36	22:15	23:22	22:18	20:32	18:40	16:54	14:17	13:38
24	08:48	07:09	05:29	04:38	02:56	02:01	03:14	04:54	06:25	07:55	08:37	09:39
	14:55	16:39	18:04	20:40	22:19	23:22	22:15	20:28	18:37	16:51	14:14	13:38
25	08:46	07:05	05:26	04:35	02:53	02:02	03:17	04:57	06:28	06:59	08:40	09:39
	14:59	16:42	18:07	20:43	22:22	23:21	22:12	20:25	18:33	15:48	14:12	13:39
26	08:43	07:02	05:22	04:31	02:50	02:03	03:21	05:00	06:31	07:02	08:43	09:39
	15:02	16:45	18:10	20:46	22:25	23:21	22:09	20:21	18:29	15:44	14:09	13:40
27	08:40	06:58	05:19	04:27	02:47	02:04	03:24	05:03	06:34	07:05	08:46	09:39
	15:05	16:48	18:13	20:49	22:28	23:20	22:05	20:17	18:26	15:41	14:07	13:41
28	08:37	06:55	05:15	04:24	02:44	02:05	03:27	05:06	06:37	07:08	08:49	09:39
	15:09	16:51	18:16	20:53	22:32	23:19	22:02	20:14	18:22	15:37	14:05	13:43
29	08:34		06:11	04:20	02:41	02:06	03:31	05:09	06:40	07:11	08:52	09:38
	15:12		19:19	20:56	22:35	23:18	21:59	20:10	18:19	15:34	14:02	13:44
30	08:31		06:08	04:17	02:38	02:08	03:34	05:12	06:43	07:15	08:55	09:38
	15:16		19:22	20:59	22:38	23:17	21:55	20:07	18:15	15:31	14:00	13:46
31	08:28		06:04		02:36		03:37	05:15		07:18		09:37
	15:19		19:26		22:41		21:52	20:03		15:27		13:47
Potential sun hours	168	237	363	452	573	631	613	510	393	304	195	132
Total, worst case												

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

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgatan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: C - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (3)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09:36 13:50	08:25 15:22	06:51 16:55	06:01 19:29	04:14 21:03	05:24 (26) 05:45 (26)	02:33 22:44	02:10 23:16	03:41 21:49	05:36 (26) 05:52 (26)	05:18 20:00	06:46 18:12	07:21 15:24	08:59 13:58
2	09:35 13:52	08:22 15:26	06:48 16:58	05:57 19:32	04:10 21:06	05:23 (26) 05:46 (26)	02:30 22:47	02:12 23:14	03:44 21:46	05:35 (26) 05:54 (26)	05:21 19:56	06:49 18:08	07:25 15:21	09:01 13:56
3	09:34 13:54	08:19 15:29	06:44 17:01	05:54 19:35	04:07 21:09	05:23 (26) 05:46 (26)	02:28 22:50	02:14 23:12	03:47 21:42	05:35 (26) 05:55 (26)	05:24 19:53	06:52 18:05	07:28 15:18	09:04 13:54
4	09:33 13:56	08:16 15:33	06:41 17:04	05:50 19:38	04:03 21:12	05:23 (26) 05:46 (26)	02:25 22:53	02:16 23:10	03:50 21:39	05:33 (26) 05:54 (26)	05:27 19:49	06:55 18:01	07:31 15:14	09:07 13:52
5	09:32 13:58	08:12 15:36	06:37 17:07	05:46 19:41	04:00 21:16	05:23 (26) 05:46 (26)	02:22 22:56	02:18 23:08	03:54 21:35	05:33 (26) 05:55 (26)	05:30 19:45	06:58 17:58	07:34 15:11	09:10 13:50
6	09:30 14:01	08:09 15:39	06:34 17:10	05:43 19:44	03:56 21:19	05:23 (26) 05:46 (26)	02:20 22:58	02:20 23:06	03:57 21:32	05:33 (26) 05:56 (26)	05:33 19:42	07:01 17:54	07:38 15:08	09:12 13:48
7	09:28 14:03	08:06 15:43	06:30 17:13	05:39 19:47	03:53 21:22	05:23 (26) 05:45 (26)	02:18 23:01	02:23 23:04	04:00 21:28	05:33 (26) 05:56 (26)	05:36 19:38	07:04 17:50	07:41 15:05	09:15 13:46
8	09:27 14:06	08:03 15:46	06:27 17:16	05:36 19:50	03:49 21:26	05:23 (26) 05:45 (26)	02:16 23:03	02:26 23:02	04:03 21:25	05:32 (26) 05:55 (26)	05:39 19:35	07:07 17:47	07:44 15:01	09:17 13:45
9	09:25 14:09	07:59 15:50	06:23 17:19	05:32 19:53	03:46 21:29	05:23 (26) 05:44 (26)	02:14 23:06	02:28 22:59	04:07 21:22	05:32 (26) 05:55 (26)	05:42 19:31	07:10 17:43	07:48 14:58	09:20 13:43
10	09:23 14:11	07:56 15:53	06:20 17:22	05:28 19:56	03:42 21:32	05:24 (26) 05:43 (26)	02:12 23:08	02:31 22:57	04:10 21:18	05:32 (26) 05:55 (26)	05:45 19:27	07:13 17:40	07:51 14:55	09:22 13:42
11	09:21 14:14	07:53 15:56	06:16 17:25	05:25 19:59	03:39 21:36	05:25 (26) 05:43 (26)	02:10 23:10	02:34 22:54	04:13 21:15	05:33 (26) 05:55 (26)	05:48 19:24	07:16 17:36	07:54 14:52	09:24 13:41
12	09:19 14:17	07:50 16:00	06:13 17:28	05:21 20:02	03:35 21:39	05:26 (26) 05:42 (26)	02:08 23:12	02:37 22:51	04:16 21:11	05:32 (26) 05:53 (26)	05:51 19:20	07:19 17:33	07:58 14:49	09:26 13:40
13	09:17 14:20	07:46 16:03	06:09 17:32	05:18 20:05	03:32 21:42	05:27 (26) 05:40 (26)	02:07 23:14	02:40 22:49	04:19 21:07	05:33 (26) 05:53 (26)	05:53 19:16	07:22 17:29	08:01 14:46	09:28 13:39
14	09:14 14:23	07:43 16:06	06:05 17:35	05:14 20:09	03:29 21:46	05:28 (26) 05:38 (26)	02:05 23:16	02:43 22:46	04:23 21:04	05:34 (26) 05:52 (26)	05:56 19:13	07:25 17:26	08:04 14:43	09:30 13:38
15	09:12 14:26	07:40 16:10	06:02 17:38	05:10 20:12	03:25 21:49	05:33 (26) 05:35 (26)	02:04 23:17	02:46 22:43	04:26 21:00	05:35 (26) 05:51 (26)	05:59 19:09	07:28 17:22	08:08 14:40	09:31 13:37
16	09:10 14:29	07:36 16:13	05:58 17:41	05:07 20:15	03:22 21:53	05:35 (26)	02:03	02:49 22:40	04:29 20:57	05:37 (26) 05:49 (26)	06:02 19:06	07:31 17:19	08:11 14:37	09:33 13:37
17	09:07 14:33	07:33 16:16	05:55 17:44	05:03 20:18	03:19 21:56	05:35 (26)	02:02	02:52 22:37	04:32 20:53	05:39 (26) 05:46 (26)	06:05 19:02	07:34 17:15	08:14 14:34	09:34 13:37
18	09:05 14:36	07:29 16:19	05:51 17:47	05:00 20:21	03:15 21:59	05:35 (26)	02:01	02:55 22:34	04:35 20:50	05:46 (26)	06:08 18:58	07:37 17:12	08:18 14:31	09:35 13:36
19	09:02 14:39	07:26 16:23	05:47 17:50	04:56 20:24	03:12 22:03	05:35 (26)	02:01	02:58 22:31	04:38 20:46	05:46 (26)	06:11 18:55	07:40 17:08	08:21 14:28	09:36 13:36
20	09:00 14:42	07:23 16:26	05:44 17:53	04:53 20:27	03:09 22:06	05:35 (26)	02:00	03:01 22:28	04:42 20:43	05:46 (26)	06:14 18:51	07:43 17:05	08:24 14:25	09:37 13:36
21	08:57 14:45	07:19 16:29	05:40 17:56	04:49 20:30	03:06 22:09	05:35 (26)	02:00	03:05 22:25	04:45 20:39	05:46 (26)	06:17 18:48	07:46 17:01	08:27 14:23	09:38 13:37
22	08:54 14:49	07:16 16:32	05:37 17:59	04:45 20:34	03:03 22:13	05:35 (26)	02:00	03:08 22:22	04:48 20:36	05:46 (26)	06:20 18:44	07:49 16:58	08:31 14:20	09:39 13:37
23	08:52 14:52	07:12 16:35	05:33 18:02	04:42 20:37	02:59 22:16	05:35 (26)	02:01	03:11 22:19	04:51 20:32	05:46 (26)	06:23 18:40	07:52 16:55	08:34 14:17	09:39 13:38
24	08:49 14:55	07:09 16:39	05:30 18:05	04:38 20:40	02:56 22:19	05:35 (26)	02:01	03:14 22:15	04:54 20:28	05:46 (26)	06:25 18:37	07:56 16:51	08:37 14:15	09:40 13:38
25	08:46 14:59	07:05 16:42	05:26 18:08	04:35 20:43	02:53 22:22	05:35 (26)	02:02	03:18 22:12	04:57 20:25	05:46 (26)	06:28 18:33	07:59 15:48	08:40 14:12	09:40 13:39
26	08:43 15:02	07:02 16:45	05:22 18:11	04:31 20:46	02:50 22:26	05:35 (26)	02:03	03:21 22:09	05:00 20:21	05:46 (26)	06:31 18:30	07:02 15:44	08:43 14:09	09:40 13:40
27	08:40 15:06	06:58 16:48	05:19 18:14	04:28 20:50	02:47 22:29	05:35 (26)	02:04	03:24 22:06	05:03 20:18	05:46 (26)	06:34 18:26	07:05 15:41	08:47 14:07	09:40 13:41
28	08:37 15:09	06:55 16:51	05:15 18:17	04:24 20:53	02:44 22:32	05:35 (26)	02:05	03:27 22:02	05:06 20:14	05:46 (26)	06:37 18:23	07:08 15:38	08:50 14:05	09:39 13:43
29	08:34 15:12	06:52 17:20	05:12 18:20	04:21 20:56	02:41 22:35	05:35 (26)	02:06	03:31 22:18	05:09 21:59	05:47 (26)	06:40 18:19	07:12 15:34	08:53 14:02	09:39 13:44
30	08:31 15:16	06:48 17:23	05:08 18:23	04:17 20:59	02:38 22:38	05:35 (26)	02:08	03:34 23:17	05:09 21:56	05:46 (26)	06:43 18:15	07:15 15:31	08:56 14:00	09:38 13:46
31	08:28 15:19	06:04 19:26	05:04 18:26	04:17 20:59	02:36 22:41	05:35 (26)	02:08	03:37 21:52	05:15 20:03	05:46 (26)	06:43 18:15	07:18 15:28	08:59 13:47	09:37 13:47
Potential sun hours	167	236	363	452	573	631	614	511	329	393	304	195	132	
Total, worst case				79	279		32							

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

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgatan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: D - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (4)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:37	08:25	06:51	06:00	04:13	02:32	02:08	03:40	05:18	06:46	07:21	08:59
	13:49	15:22	16:54	19:28	21:03	22:45	23:16	21:49	20:00	18:11	15:24	13:57
2	09:36	08:22	06:48	05:57	04:09	02:29	02:10	03:43	05:21	06:48	07:25	09:02
	13:51	15:25	16:57	19:32	21:06	22:48	23:15	21:46	19:56	18:08	15:20	13:55
3	09:35	08:19	06:44	05:53	04:06	02:26	02:12	03:46	05:24	06:51	07:28	09:05
	13:53	15:29	17:00	19:35	21:09	22:51	23:13	21:42	19:52	18:04	15:17	13:53
4	09:33	08:16	06:41	05:49	04:02	02:24	02:14	03:50	05:27	06:54	07:31	09:07
	13:55	15:32	17:03	19:38	21:13	22:54	23:11	21:39	19:49	18:01	15:14	13:51
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	13:57	15:35	17:07	19:41	21:16	22:56	23:09	21:35	19:45	17:57	15:10	13:49
6	09:30	08:09	06:34	05:42	03:55	02:19	02:19	03:56	05:32	07:00	07:38	09:13
	14:00	15:39	17:10	19:44	21:19	22:59	23:07	21:32	19:42	17:54	15:07	13:47
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	14:02	15:42	17:13	19:47	21:23	23:02	23:05	21:29	19:38	17:50	15:04	13:45
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	14:10	15:52	17:22	19:56	21:33	23:09	22:57	21:18	19:27	17:39	14:54	13:41
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15	09:12	07:39	06:01	05:10	03:24	02:02	02:44	04:25	05:59	07:27	08:08	09:32
	14:25	16:09	17:37	20:11	21:49	23:18	22:44	21:00	19:09	17:22	14:39	13:36
16	09:10	07:36	05:58	05:06	03:21	02:01	02:47	04:28	06:02	07:31	08:11	09:33
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17	09:08	07:33	05:54	05:03	03:18	02:00	02:51	04:31	06:05	07:34	08:14	09:35
	14:32	16:15	17:43	20:18	21:56	23:21	22:38	20:53	19:02	17:15	14:33	13:35
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	14:35	16:19	17:46	20:21	22:00	23:22	22:35	20:50	18:58	17:11	14:30	13:35
19	09:02	07:26	05:47	04:55	03:11	01:58	02:57	04:38	06:10	07:40	08:21	09:37
	14:38	16:22	17:49	20:24	22:03	23:23	22:32	20:46	18:55	17:08	14:27	13:35
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	14:41	16:25	17:52	20:27	22:06	23:23	22:28	20:43	18:51	17:04	14:24	13:35
21	08:57	07:19	05:40	04:48	03:05	01:58	03:03	04:44	06:16	07:46	08:28	09:39
	14:45	16:28	17:55	20:30	22:10	23:24	22:25	20:39	18:47	17:01	14:22	13:35
22	08:54	07:16	05:36	04:45	03:01	01:59	03:07	04:47	06:19	07:49	08:31	09:39
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23	08:52	07:12	05:33	04:41	02:58	01:59	03:10	04:50	06:22	07:52	08:34	09:40
	14:51	16:35	18:01	20:37	22:16	23:24	22:19	20:32	18:40	16:54	14:16	13:36
24	08:49	07:09	05:29	04:38	02:55	02:00	03:13	04:53	06:25	07:55	08:37	09:40
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	14:58	16:41	18:07	20:43	22:23	23:23	22:12	20:25	18:33	15:47	14:11	13:38
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	15:01	16:45	18:10	20:46	22:26	23:22	22:09	20:21	18:29	15:44	14:08	13:39
27	08:40	06:58	05:18	04:27	02:46	02:02	03:23	05:02	06:34	07:05	08:47	09:40
	15:05	16:48	18:13	20:50	22:29	23:22	22:06	20:18	18:26	15:40	14:06	13:40
28	08:37	06:55	05:15	04:23	02:43	02:03	03:26	05:05	06:37	07:08	08:50	09:40
	15:08	16:51	18:16	20:53	22:32	23:21	22:03	20:14	18:22	15:37	14:04	13:41
29	08:34		06:11	04:20	02:40	02:05	03:30	05:08	06:40	07:12	08:53	09:39
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31	08:28		06:04		02:34		03:36	05:15		07:18		09:38
	15:18		19:25		22:42		21:53	20:03		15:27		13:46
Potential sun hours	167	236	363	453	574	632	615	511	393	304	195	131
Total, worst case												

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

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

Project:

Blisterliden

Licensed user:

SWECO Energiguide AB

Gjörwellsgratan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: E - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (5)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:36 13:49	08:25 15:22	06:51 16:54	15:01 (1) 15:24 (1)	06:00 19:28	04:13 21:02	02:32 22:44	02:08 23:16	03:40 21:49	05:17 19:59	06:45 18:11	07:21 15:23
2	09:35 13:51	08:22 15:25	06:47 16:57	15:00 (1) 15:24 (1)	05:57 19:31	04:09 21:06	02:29 22:47	02:10 23:14	03:43 21:45	05:20 19:56	06:48 18:08	15:47 (1) 15:20
3	09:34 13:53	08:18 15:28	06:44 17:00	15:00 (1) 15:24 (1)	05:53 19:34	04:06 21:09	02:26 22:50	02:12 23:12	03:46 21:42	05:23 19:52	06:51 18:04	15:43 (1) 15:17
4	09:33 13:55	08:15 15:32	06:40 17:03	14:59 (1) 15:24 (1)	05:49 19:37	04:02 21:12	02:24 22:53	02:14 23:11	03:49 21:39	05:26 19:49	06:54 18:01	15:40 (1) 15:14
5	09:32 13:57	08:12 15:35	06:37 17:06	15:00 (1) 15:24 (1)	05:46 19:40	03:59 21:16	02:21 22:56	02:17 23:09	03:53 21:35	05:29 19:45	06:57 17:57	15:38 (1) 15:10
6	09:30 14:00	08:09 15:39	06:33 17:09	15:00 (1) 15:23 (1)	05:42 19:43	03:55 21:19	02:19 22:59	02:19 23:06	03:56 21:32	05:32 19:41	07:00 17:53	15:37 (1) 15:07
7	09:28 14:02	08:06 15:42	06:30 17:13	15:00 (1) 15:22 (1)	05:39 19:47	03:52 21:22	02:16 23:01	02:22 23:04	03:59 21:28	05:35 19:38	07:03 17:50	15:36 (1) 15:04
8	09:27 14:05	08:02 15:45	06:26 17:16	15:01 (1) 15:22 (1)	05:35 19:50	03:48 21:26	02:14 23:04	02:24 23:02	04:03 21:25	05:38 19:34	07:06 17:46	15:35 (1) 15:01
9	09:25 14:08	07:59 15:49	06:23 17:19	15:02 (1) 15:20 (1)	05:31 19:53	03:45 21:29	02:12 23:06	02:27 22:59	04:06 21:21	05:41 19:30	07:09 17:43	15:34 (1) 14:57
10	09:23 14:10	07:56 15:52	06:19 17:22	15:03 (1) 15:18 (1)	05:28 19:56	03:41 21:32	02:10 23:08	02:30 22:57	04:09 21:18	05:44 19:27	07:12 17:39	15:34 (1) 14:54
11	09:21 14:13	07:53 15:55	06:16 17:25	15:07 (1) 15:15 (1)	05:24 19:59	03:38 21:36	02:08 23:11	02:33 22:54	04:12 21:14	05:47 19:23	07:15 17:36	15:34 (1) 14:51
12	09:19 14:16	07:49 15:59	06:12 17:28	05:21 20:02	03:35 21:39	02:07 23:13	02:35 22:51	02:35 21:11	04:15 19:20	05:50 17:32	07:18 17:32	15:34 (1) 14:48
13	09:17 14:19	07:46 16:02	06:08 17:31	05:17 20:05	03:31 21:42	02:05 23:14	02:38 22:49	02:38 21:07	04:19 19:16	05:53 17:16	07:21 17:29	15:34 (1) 14:45
14	09:14 14:22	07:43 16:05	06:05 17:34	05:13 20:08	03:28 21:46	02:04 23:16	02:41 22:46	04:22 21:04	05:56 19:12	07:24 17:25	07:24 17:25	15:35 (1) 14:42
15	09:12 14:25	07:39 16:09	06:01 17:37	05:10 20:11	03:24 21:49	02:02 23:18	02:44 22:43	04:25 21:00	05:59 19:09	07:27 17:22	07:27 17:22	15:36 (1) 14:39
16	09:10 14:28	07:36 16:12	05:58 17:40	05:06 20:14	03:21 21:52	02:01 23:19	02:48 22:40	04:28 20:57	06:02 19:05	07:30 17:18	07:30 17:18	15:37 (1) 14:36
17	09:07 14:32	07:32 16:15	05:54 17:43	05:03 20:17	03:18 21:56	02:00 23:20	02:51 22:37	04:31 20:53	06:05 19:02	07:33 17:15	07:33 17:15	15:40 (1) 14:33
18	09:05 14:35	07:29 16:19	05:51 17:46	04:59 20:21	03:14 21:59	02:00 23:21	02:54 22:34	04:35 20:49	06:07 18:58	07:36 17:11	07:36 17:11	15:40 (1) 14:30
19	09:02 14:38	07:26 16:22	05:47 17:49	04:55 20:24	03:11 22:02	01:59 23:22	02:57 22:31	04:38 20:46	06:10 18:54	07:40 17:08	07:40 17:08	14:43 (5) 14:27
20	09:00 14:41	07:22 16:25	05:43 17:52	04:52 20:27	03:08 22:06	01:59 23:23	03:00 22:28	04:41 20:42	06:13 18:51	07:43 17:04	07:43 17:04	14:40 (5) 14:24
21	08:57 14:45	07:19 16:28	05:40 17:55	04:48 20:30	03:05 22:09	01:59 23:23	03:03 22:25	04:44 20:39	06:16 18:47	07:46 17:01	07:46 17:01	13:49 (32) 14:22
22	08:54 14:48	07:15 16:32	05:36 17:58	04:45 20:33	03:02 22:12	01:59 23:23	03:07 22:22	04:47 20:35	06:19 18:44	07:49 16:57	07:49 16:57	13:46 (32) 14:19
23	08:51 14:51	07:12 16:35	05:33 18:01	04:41 20:36	02:58 22:16	01:59 23:23	03:10 22:19	04:50 20:32	06:22 18:40	07:52 16:54	07:52 16:54	13:44 (32) 14:16
24	08:49 14:55	07:08 16:38	05:29 18:04	04:37 20:40	02:55 22:19	02:00 23:23	03:13 22:15	04:53 20:28	06:25 18:36	07:55 16:50	07:55 16:50	13:43 (32) 14:14
25	08:46 14:58	07:05 16:41	05:25 18:07	04:34 20:43	02:52 22:22	02:00 23:22	03:17 22:12	04:56 20:24	06:28 18:33	06:58 15:47	06:58 15:47	12:42 (32) 14:11
26	08:43 15:01	07:01 16:44	05:22 18:10	04:30 20:46	02:49 22:26	02:01 23:22	03:20 22:09	04:59 20:21	06:31 18:29	07:02 15:44	07:02 15:44	12:41 (32) 14:08
27	08:40 15:05	06:58 16:48	05:18 18:13	04:27 20:49	02:46 22:29	02:02 23:21	03:23 22:06	05:02 20:17	06:34 18:26	07:05 15:40	07:05 15:40	12:41 (32) 14:06
28	08:37 15:08	06:54 16:51	05:15 18:16	04:23 20:53	02:43 22:32	02:03 23:20	03:26 22:02	05:05 20:14	06:37 18:22	07:08 15:37	07:08 15:37	12:40 (32) 14:04
29	08:34 15:11	06:51 16:58	05:11 18:19	04:20 20:56	02:40 22:35	02:05 23:19	03:30 21:59	05:08 20:10	06:39 18:18	07:11 15:33	07:11 15:33	12:40 (32) 14:01
30	08:31 15:15	06:48 16:55	05:07 18:22	04:16 20:59	02:37 22:38	02:06 23:17	03:33 21:56	05:11 20:07	06:42 18:15	07:14 15:30	07:14 15:30	12:41 (32) 13:59
31	08:28 15:18	06:44 16:52	05:04 18:25	04:13 22:41	02:34 22:41	02:03 21:52	03:36 21:52	05:14 20:03	06:42 15:27	07:18 15:27	07:18 15:27	12:41 (32) 13:50
Potential sun hours	167	236	363	453	574	632	614	511	393	304	195	131
Total, worst case		591	227							726	105	

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

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgatan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: F - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (6)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:36	08:25	06:51	06:00	04:13	02:32	02:08	03:40	05:17	06:45	07:21	08:58
	13:49	15:22	16:54	19:28	21:02	22:44	23:16	21:49	19:59	18:11	15:23	13:57
2	09:35	08:22	06:47	05:57	04:09	02:29	02:10	03:43	05:20	06:48	07:24	09:01
	13:51	15:25	16:57	19:31	21:06	22:47	23:14	21:45	19:56	18:08	15:20	13:55
3	09:34	08:18	06:44	05:53	04:06	02:26	02:12	03:46	05:23	06:51	07:28	09:04
	13:53	15:28	17:00	19:34	21:09	22:50	23:13	21:42	19:52	18:04	15:17	13:53
4	09:33	08:15	06:40	05:49	04:02	02:24	02:14	03:49	05:26	06:54	07:31	09:07
	13:55	15:32	17:03	19:37	21:12	22:53	23:11	21:39	19:48	18:00	15:14	13:51
5	09:32	08:12	06:37	05:46	03:59	02:21	02:17	03:53	05:29	06:57	07:34	09:10
	13:57	15:35	17:06	19:40	21:16	22:56	23:09	21:35	19:45	17:57	15:10	13:49
6	09:30	08:09	06:33	05:42	03:55	02:19	02:19	03:56	05:32	07:00	07:37	09:12
	14:00	15:39	17:09	19:43	21:19	22:59	23:06	21:32	19:41	17:53	15:07	13:47
7	09:28	08:06	06:30	05:38	03:52	02:16	02:21	03:59	05:35	07:03	07:41	09:15
	14:02	15:42	17:13	19:47	21:22	23:01	23:04	21:28	19:38	17:50	15:04	13:45
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	14:05	15:45	17:16	19:50	21:26	23:04	23:02	21:25	19:34	17:46	15:01	13:44
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	14:08	15:49	17:19	19:53	21:29	23:06	22:59	21:21	19:30	17:43	14:57	13:42
10	09:23	07:56	06:19	05:28	03:41	02:10	02:30	04:09	05:44	07:12	07:51	09:22
	14:10	15:52	17:22	19:56	21:32	23:08	22:57	21:18	19:27	17:39	14:54	13:41
11	09:21	07:53	06:16	05:24	03:38	02:08	02:32	04:12	05:47	07:15	07:54	09:24
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12	09:19	07:49	06:12	05:20	03:35	02:07	02:35	04:15	05:50	07:18	07:57	09:26
	14:16	15:59	17:28	20:02	21:39	23:13	22:51	21:11	19:20	17:32	14:48	13:39
13	09:17	07:46	06:08	05:17	03:31	02:05	02:38	04:19	05:53	07:21	08:01	09:28
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14	09:14	07:43	06:05	05:13	03:28	02:04	02:41	04:22	05:56	07:24	08:04	09:30
	14:22	16:05	17:34	20:08	21:46	23:16	22:46	21:04	19:12	17:25	14:42	13:37
15	09:12	07:39	06:01	05:10	03:24	02:02	02:44	04:25	05:59	07:27	08:07	09:31
	14:25	16:09	17:37	20:11	21:49	23:18	22:43	21:00	19:09	17:22	14:39	13:36
16	09:10	07:36	05:58	05:06	03:21	02:01	02:47	04:28	06:02	07:30	08:11	09:33
	14:28	16:12	17:40	20:14	21:52	23:19	22:40	20:57	19:05	17:18	14:36	13:36
17	09:07	07:32	05:54	05:02	03:18	02:00	02:51	04:31	06:04	07:33	08:14	09:34
	14:31	16:15	17:43	20:17	21:56	23:20	22:37	20:53	19:02	17:15	14:33	13:35
18	09:05	07:29	05:51	04:59	03:14	02:00	02:54	04:34	06:07	07:36	08:17	09:35
	14:35	16:19	17:46	20:21	21:59	23:21	22:34	20:49	18:58	17:11	14:30	13:35
19	09:02	07:26	05:47	04:55	03:11	01:59	02:57	04:38	06:10	07:40	08:21	09:36
	14:38	16:22	17:49	20:24	22:02	23:22	22:31	20:46	18:54	17:08	14:27	13:35
20	08:59	07:22	05:43	04:52	03:08	01:59	03:00	04:41	06:13	07:43	08:24	09:37
	14:41	16:25	17:52	20:27	22:06	23:23	22:28	20:42	18:51	17:04	14:24	13:35
21	08:57	07:19	05:40	04:48	03:05	01:59	03:03	04:44	06:16	07:46	08:27	09:38
	14:44	16:28	17:55	20:30	22:09	23:23	22:25	20:39	18:47	17:01	14:22	13:35
22	08:54	07:15	05:36	04:45	03:01	01:59	03:07	04:47	06:19	07:49	08:30	09:39
	14:48	16:32	17:58	20:33	22:12	23:23	22:22	20:35	18:44	16:57	14:19	13:36
23	08:51	07:12	05:33	04:41	02:58	01:59	03:10	04:50	06:22	07:52	08:34	09:39
	14:51	16:35	18:01	20:36	22:16	23:23	22:19	20:32	18:40	16:54	14:16	13:36
24	08:49	07:08	05:29	04:37	02:55	02:00	03:13	04:53	06:25	07:55	08:37	09:40
	14:54	16:38	18:04	20:40	22:19	23:23	22:15	20:28	18:36	16:50	14:14	13:37
25	08:46	07:05	05:25	04:34	02:52	02:00	03:16	04:56	06:28	06:58	08:40	09:40
	14:58	16:41	18:07	20:43	22:22	23:22	22:12	20:24	18:33	15:47	14:11	13:38
26	08:43	07:01	05:22	04:30	02:49	02:01	03:20	04:59	06:31	07:02	08:43	09:40
	15:01	16:44	18:10	20:46	22:26	23:22	22:09	20:21	18:29	15:44	14:08	13:39
27	08:40	06:58	05:18	04:27	02:46	02:02	03:23	05:02	06:34	07:05	08:46	09:40
	15:05	16:48	18:13	20:49	22:29	23:21	22:06	20:17	18:26	15:40	14:06	13:40
28	08:37	06:54	05:15	04:23	02:43	02:03	03:26	05:05	06:37	07:08	08:49	09:39
	15:08	16:51	18:16	20:53	22:32	23:20	22:02	20:14	18:22	15:37	14:04	13:41
29	08:34		06:11	04:20	02:40	02:05	03:30	05:08	06:39	07:11	08:53	09:39
	15:11		19:19	20:56	22:35	23:19	21:59	20:10	18:18	15:33	14:01	13:43
30	08:31		06:07	04:16	02:37	02:06	03:33	05:11	06:42	07:14	08:56	09:38
	15:15		19:22	20:59	22:38	23:17	21:56	20:07	18:15	15:30	13:59	13:44
31	08:28		06:04		02:34		03:36	05:14		07:18		09:38
	15:18		19:25		22:41		21:52	20:03		15:27		13:46
Potential sun hours	167	236	363	453	574	632	614	511	393	304	195	131
Total, worst case												

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

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

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: G - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (7)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	January	February	March	April		May		June	
1	09:36	08:25	06:51	06:00		04:13		19:11 (28)	02:32
	13:49	15:22	16:54	19:28		21:02	24	19:35 (28)	22:44
2	09:35	08:22	06:48	05:57		04:10		19:10 (28)	02:30
	13:51	15:26	16:57	19:31		21:06	26	19:36 (28)	22:47
3	09:34	08:18	06:44	05:53		04:06		19:09 (28)	02:27
	13:54	15:29	17:00	19:34		21:09	28	19:37 (28)	22:50
4	09:33	08:15	06:41	05:50		04:03		19:08 (28)	02:25
	13:56	15:32	17:04	19:38		21:12	30	19:38 (28)	22:53
5	09:31	08:12	06:37	05:46		18:34 (14)	03:59	19:07 (28)	02:22
	13:58	15:36	17:07	19:41	8	18:42 (14)	21:15	19:38 (28)	22:55
6	09:30	08:09	06:33	05:42		18:30 (14)	03:56	19:07 (28)	02:20
	14:01	15:39	17:10	19:44	14	18:44 (14)	21:19	19:39 (28)	22:58
7	09:28	08:06	06:30	05:39		18:29 (14)	03:52	19:06 (28)	02:17
	14:03	15:42	17:13	19:47	17	18:46 (14)	21:22	19:39 (28)	23:01
8	09:26	08:02	06:26	05:35		18:27 (14)	03:49	19:06 (28)	02:15
	14:06	15:46	17:16	19:50	20	18:47 (14)	21:25	19:39 (28)	23:03
9	09:25	07:59	06:23	05:32		18:26 (14)	03:45	19:05 (28)	02:13
	14:08	15:49	17:19	19:53	22	18:48 (14)	21:29	19:39 (28)	23:05
10	09:23	07:56	06:19	05:28		18:24 (14)	03:42	19:05 (28)	02:11
	14:11	15:53	17:22	19:56	24	18:48 (14)	21:32	19:39 (28)	23:08
11	09:21	07:53	06:16	05:24		18:24 (14)	03:39	19:05 (28)	02:09
	14:14	15:56	17:25	19:59	24	18:48 (14)	21:35	19:39 (28)	23:10
12	09:19	07:49	06:12	05:21		18:23 (14)	03:35	19:04 (28)	02:08
	14:17	15:59	17:28	20:02	24	18:47 (14)	21:39	19:39 (28)	23:12
13	09:16	07:46	06:09	05:17		18:23 (14)	03:32	19:05 (28)	02:06
	14:20	16:03	17:31	20:05	25	18:48 (14)	21:42	19:39 (28)	23:14
14	09:14	07:43	06:05	05:14		18:23 (14)	03:28	19:05 (28)	02:05
	14:23	16:06	17:34	20:08	24	18:47 (14)	21:46	19:39 (28)	23:15
15	09:12	07:39	06:01	05:10		18:23 (14)	03:25	19:05 (28)	02:04
	14:26	16:09	17:37	20:11	23	18:46 (14)	21:49	19:38 (28)	23:17
16	09:09	07:36	05:58	05:06		18:24 (14)	03:22	19:06 (28)	02:02
	14:29	16:12	17:40	20:14	22	18:46 (14)	21:52	19:39 (28)	23:18
17	09:07	07:32	05:54	05:03		18:24 (14)	03:18	19:06 (28)	02:02
	14:32	16:16	17:43	20:18	20	18:44 (14)	21:56	19:38 (28)	23:19
18	09:05	07:29	05:51	04:59		18:25 (14)	03:15	19:06 (28)	02:01
	14:35	16:19	17:46	20:21	18	18:43 (14)	21:59	19:37 (28)	23:20
19	09:02	07:26	05:47	04:56		18:27 (14)	03:12	19:07 (28)	02:00
	14:39	16:22	17:49	20:24	15	18:42 (14)	22:02	19:37 (28)	23:21
20	08:59	07:22	05:44	04:52		18:28 (14)	03:09	19:07 (28)	02:00
	14:42	16:26	17:52	20:27	11	18:39 (14)	22:06	19:36 (28)	23:22
21	08:57	07:19	05:40	04:49			03:05	19:08 (28)	02:00
	14:45	16:29	17:55	20:30			22:09	19:36 (28)	23:22
22	08:54	07:15	05:36	04:45			03:02	19:09 (28)	02:00
	14:48	16:32	17:58	20:33			22:12	19:36 (28)	23:22
23	08:51	07:12	05:33	04:41			02:59	19:09 (28)	02:00
	14:52	16:35	18:01	20:36			22:16	19:35 (28)	23:22
24	08:48	07:08	05:29	04:38			02:56	19:11 (28)	02:01
	14:55	16:38	18:04	20:40			22:19	19:34 (28)	23:22
25	08:46	07:05	05:26	04:34			02:53	19:12 (28)	02:01
	14:58	16:42	18:07	20:43			22:22	19:34 (28)	23:22
26	08:43	07:02	05:22	04:31			02:50	19:13 (28)	02:02
	15:02	16:45	18:10	20:46			22:25	19:33 (28)	23:21
27	08:40	06:58	05:18	04:27			02:47	19:14 (28)	02:03
	15:05	16:48	18:13	20:49			22:28	19:32 (28)	23:20
28	08:37	06:55	05:15	04:24		19:16 (28)	02:44	19:16 (28)	02:05
	15:09	16:51	18:16	20:53	13	19:29 (28)	22:32	19:31 (28)	23:19
29	08:34		06:11	04:20		19:14 (28)	02:41	19:18 (28)	02:06
	15:12		19:19	20:56	18	19:32 (28)	22:35	19:30 (28)	23:18
30	08:31		06:08	04:17		19:12 (28)	02:38	19:20 (28)	02:08
	15:15		19:22	20:59	21	19:33 (28)	22:38	19:28 (28)	23:17
31	08:28		06:04				02:35		
	15:19		19:25				22:41		
Potential sun hours	167	236	363	452		573		631	
Total, worst case				363		829		473	

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

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

Project:

Blisterliden

Licensed user:

SWECO Energuide AB

Gjörwellsgatan 22, Box 34004

SE-100 26 Stockholm

+46 8 695 60 00

Gabriella Nilsson / gabriella.nilsson@sweco.se

Calculated:

2019-08-27 14:42/3.3.261

SHADOW - Calendar

Calculation: Layout 33 WTG V164_190814Shadow receptor: G - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (7)
Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

	July			August			September			October	November	December
1	02:09		21:07 (12)	03:40		19:15 (28)	05:18		18:23 (14)	06:46	07:21	08:58
	23:15	17	21:24 (12)	21:49	34	19:49 (28)	19:59	24	18:47 (14)	18:11	15:24	13:57
2	02:11		21:08 (12)	03:44		19:16 (28)	05:21		18:23 (14)	06:48	07:24	09:01
	23:14	17	21:25 (12)	21:45	34	19:50 (28)	19:56	23	18:46 (14)	18:08	15:21	13:55
3	02:13		21:08 (12)	03:47		19:15 (28)	05:24		18:23 (14)	06:51	07:28	09:04
	23:12	16	21:24 (12)	21:42	34	19:49 (28)	19:52	22	18:45 (14)	18:04	15:17	13:53
4	02:15		21:08 (12)	03:50		19:15 (28)	05:27		18:24 (14)	06:54	07:31	09:07
	23:10	16	21:24 (12)	21:38	34	19:49 (28)	19:49	20	18:44 (14)	18:01	15:14	13:51
5	02:18		21:09 (12)	03:53		19:16 (28)	05:30		18:25 (14)	06:57	07:34	09:09
	23:08	15	21:24 (12)	21:35	33	19:49 (28)	19:45	17	18:42 (14)	17:57	15:11	13:50
6	02:20		21:09 (12)	03:57		19:16 (28)	05:33		18:26 (14)	07:00	07:37	09:12
	23:06	14	21:23 (12)	21:32	33	19:49 (28)	19:41	14	18:40 (14)	17:54	15:08	13:48
7	02:23		21:10 (12)	04:00		19:16 (28)	05:36		18:29 (14)	07:03	07:41	09:14
	23:04	13	21:23 (12)	21:28	31	19:47 (28)	19:38	8	18:37 (14)	17:50	15:04	13:46
8	02:25		21:12 (12)	04:03		19:16 (28)	05:39			07:06	07:44	09:17
	23:01	11	21:23 (12)	21:25	31	19:47 (28)	19:34			17:47	15:01	13:45
9	02:28		21:13 (12)	04:06		19:17 (28)	05:41			07:09	07:47	09:19
	22:59	9	21:22 (12)	21:21	30	19:47 (28)	19:31			17:43	14:58	13:43
10	02:31		21:14 (12)	04:10		19:18 (28)	05:44			07:12	07:51	09:21
	22:56	6	21:20 (12)	21:18	28	19:46 (28)	19:27			17:40	14:55	13:42
11	02:33			04:13		19:18 (28)	05:47			07:15	07:54	09:24
	22:54			21:14	26	19:44 (28)	19:23			17:36	14:52	13:41
12	02:36			04:16		19:19 (28)	05:50			07:18	07:57	09:26
	22:51			21:11	24	19:43 (28)	19:20			17:32	14:49	13:40
13	02:39		19:29 (28)	04:19		19:21 (28)	05:53			07:21	08:01	09:27
	22:48	5	19:34 (28)	21:07	20	19:41 (28)	19:16			17:29	14:46	13:39
14	02:42		19:27 (28)	04:22		19:23 (28)	05:56			07:24	08:04	09:29
	22:46	10	19:37 (28)	21:04	16	19:39 (28)	19:13			17:25	14:43	13:38
15	02:45		19:26 (28)	04:26		19:24 (28)	05:59			07:27	08:07	09:31
	22:43	13	19:39 (28)	21:00	11	19:35 (28)	19:09			17:22	14:40	13:37
16	02:48		19:24 (28)	04:29			06:02			07:30	08:11	09:32
	22:40	17	19:41 (28)	20:57			19:05			17:18	14:37	13:37
17	02:51		19:23 (28)	04:32			06:05			07:33	08:14	09:34
	22:37	19	19:42 (28)	20:53			19:02			17:15	14:34	13:36
18	02:55		19:21 (28)	04:35			06:08			07:37	08:17	09:35
	22:34	21	19:42 (28)	20:49			18:58			17:11	14:31	13:36
19	02:58		19:21 (28)	04:38			06:11			07:40	08:20	09:36
	22:31	23	19:44 (28)	20:46			18:55			17:08	14:28	13:36
20	03:01		19:20 (28)	04:41			06:13			07:43	08:24	09:37
	22:28	25	19:45 (28)	20:42			18:51			17:05	14:25	13:36
21	03:04		19:19 (28)	04:44			06:16			07:46	08:27	09:38
	22:25	26	19:45 (28)	20:39			18:47			17:01	14:22	13:36
22	03:07		19:19 (28)	04:47		18:36 (14)	06:19			07:49	08:30	09:38
	22:21	27	19:46 (28)	20:35	4	18:40 (14)	18:44			16:58	14:20	13:37
23	03:11		19:18 (28)	04:50		18:32 (14)	06:22			07:52	08:34	09:39
	22:18	28	19:46 (28)	20:32	12	18:44 (14)	18:40			16:54	14:17	13:37
24	03:14		19:18 (28)	04:54		18:30 (14)	06:25			07:55	08:37	09:39
	22:15	29	19:47 (28)	20:28	16	18:46 (14)	18:37			16:51	14:14	13:38
25	03:17		19:17 (28)	04:57		18:27 (14)	06:28			06:58	08:40	09:39
	22:12	30	19:47 (28)	20:25	19	18:46 (14)	18:33			15:47	14:12	13:39
26	03:20		19:17 (28)	05:00		18:26 (14)	06:31			07:02	08:43	09:39
	22:09	31	19:48 (28)	20:21	21	18:47 (14)	18:29			15:44	14:09	13:40
27	03:24		19:17 (28)	05:03		18:25 (14)	06:34			07:05	08:46	09:39
	22:05	32	19:49 (28)	20:17	23	18:48 (14)	18:26			15:41	14:07	13:41
28	03:27		19:16 (28)	05:06		18:25 (14)	06:37			07:08	08:49	09:39
	22:02	33	19:49 (28)	20:14	23	18:48 (14)	18:22			15:37	14:04	13:42
29	03:30		19:16 (28)	05:09		18:23 (14)	06:40			07:11	08:52	09:38
	21:59	33	19:49 (28)	20:10	24	18:47 (14)	18:19			15:34	14:02	13:44
30	03:34		19:16 (28)	05:12		18:23 (14)	06:43			07:15	08:55	09:38
	21:55	34	19:50 (28)	20:07	24	18:47 (14)	18:15			15:31	14:00	13:45
31	03:37		19:15 (28)	05:15		18:23 (14)				07:18		09:37
	21:52	34	19:49 (28)	20:03	24	18:47 (14)				15:27		13:47
Potential sun hours	614			511			393			304	195	132
Total, worst case		604			609			128				

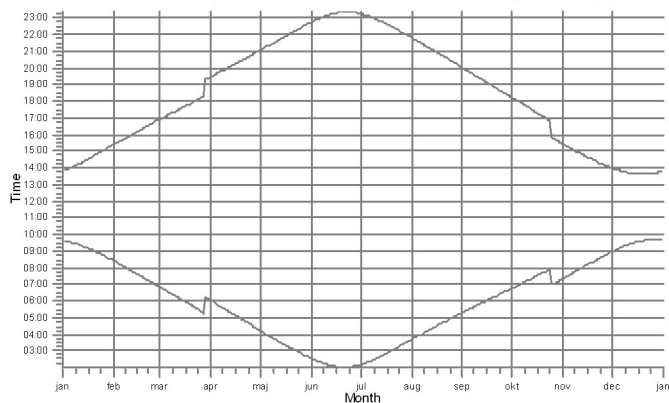
Table layout: For each day in each month the following matrix apply

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

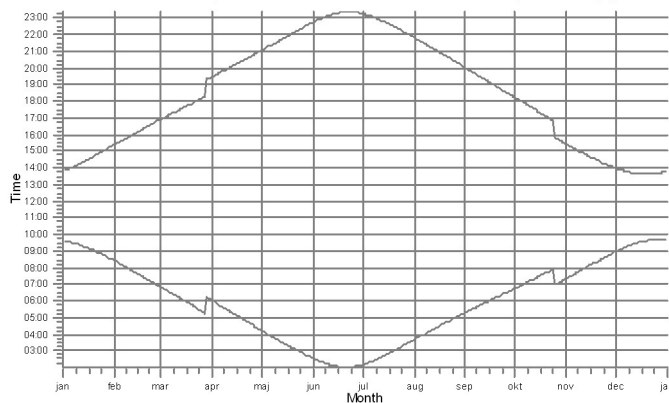
SHADOW - Calendar, graphical

Calculation: Layout 33 WTG V164_190814

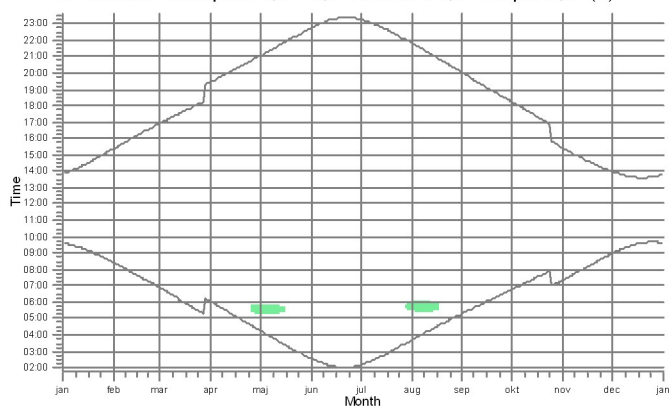
A: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (1)



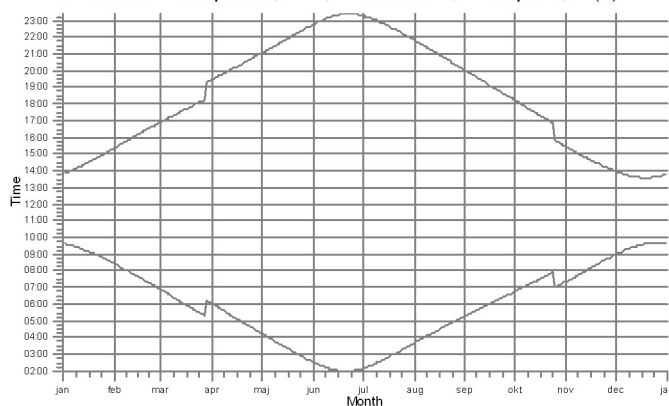
B: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (2)



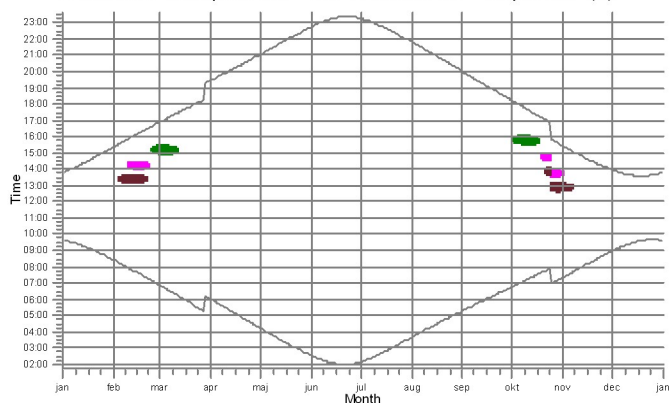
C: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (3)



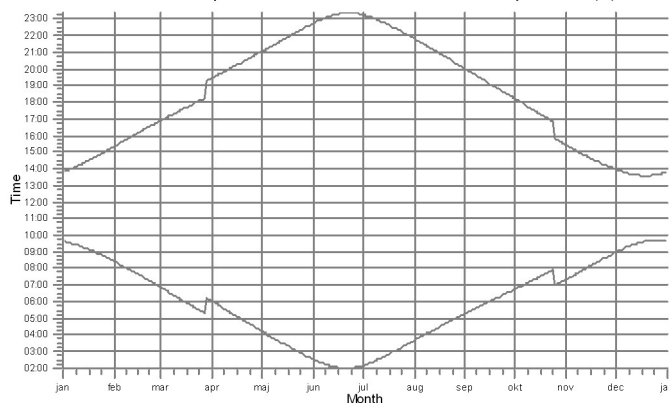
D: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (4)



E: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (5)



F: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (6)



WTGs

1: VESTAS V150-4.2 4200 150.0 !OI hub: 175,0 m (TOT: 250,0 m) (691)
 5: VESTAS V150-4.2 4200 150.0 !OI hub: 175,0 m (TOT: 250,0 m) (697)

Blisterliden

SWECO Energuide AB

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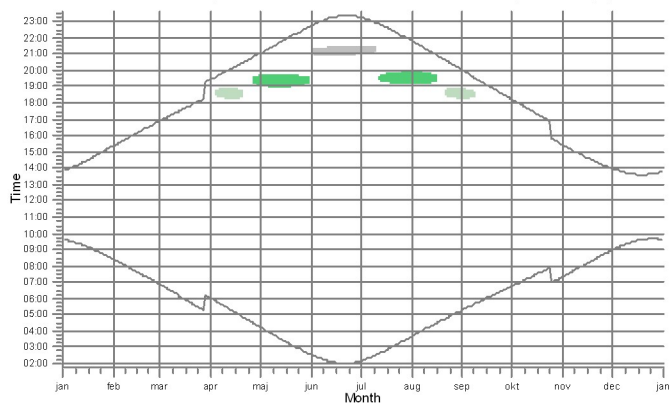
+46 8 695 60 00

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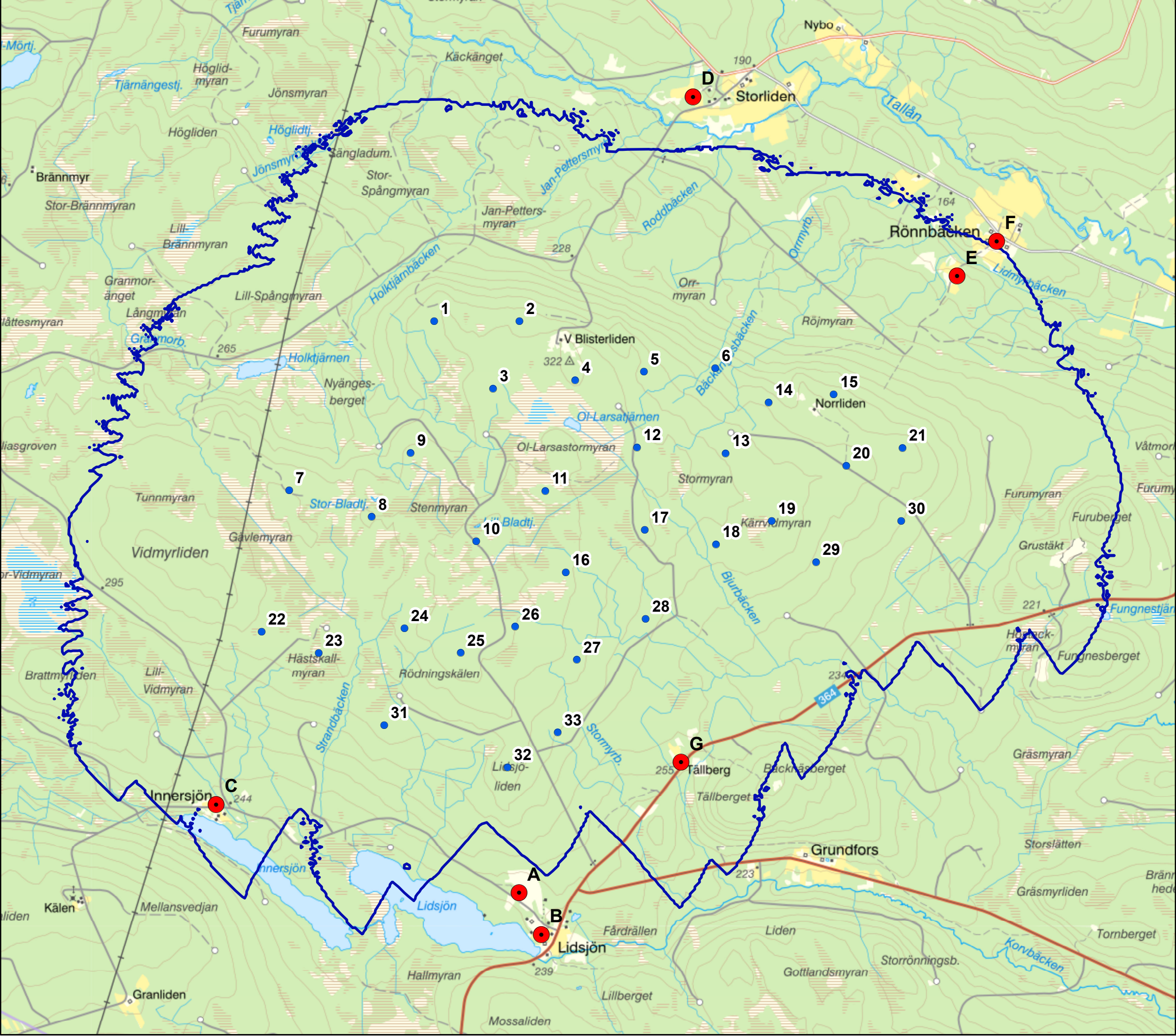
Calculated:

2019-08-27 14:42/3.3.261

Calculation: Layout 33 WTG V164_190814



12: VESTAS V150-4.2 4200 150.0 !C [REDACTED] m14: VESTAS V150-4.2 4200 150.0 !C [REDACTED] m28: VESTAS V150-4.2 4200 150.0 !C hub: 175.0 m (TOT: 250.0 m) (693)



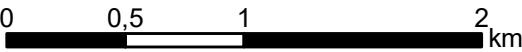
Bilaga 6 Skugga

Exempel på verksplacering

Skugga 8h/år, värsta fall

8

A Lidsjön 1 (oregistrerad)	0:00
B Lidsjön 2 (fritidshus)	0:00
C Innersjön (oregistrerad)	11:59
D Storlien (fritidshus)	0:00
E Rönnbäcken 1 (fritidshus)	27:29
F Rönnbäcken 2 (fritidshus)	0:00
G Tällberg (fritidshus)	50:06



Sweco Energy AB/seoro
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