Ramström Vind

2016-04-26

Begäran om komplettering av anmälan gällande uppförande av ett vindkraftverk på fastighet Örum 24:1, Ystad kommun

Dnr: 2016 0097.15

1. **Tillfartvägen/Ramström Vind AB**
   Strandskyddsdispens kommer sökas för den befintliga tillfartsvägen samt för sista biten, till vindkraftverket, ny väg. Se vidare dokumenten, bilagd.

   El-dragning/EON
   Eon har områdeskoncession och ansvar för el-dragningen, EON kommer söka tillstånd för el-dragningen hos kommunen i enlighet med gällande regelverk. OBS: Detta är ett separat ärende.

2. Utökad fågel-och fladdermusutredning är på gång, rapporterna är klara i höst och kommer delges till miljöförbundet.

3. Se kartan bilagd för tillfartsvägen. (Skala 1:5000)

4. Inväntar svar från Teracom.

5. Avveckling av vindkraftverket kommer ske i enlighet med regelverket.

   Övriga punkter se vidare bifogat.

Med vänliga hälsningar

Fr Ramström Vind AB

Fredrik Tavitian

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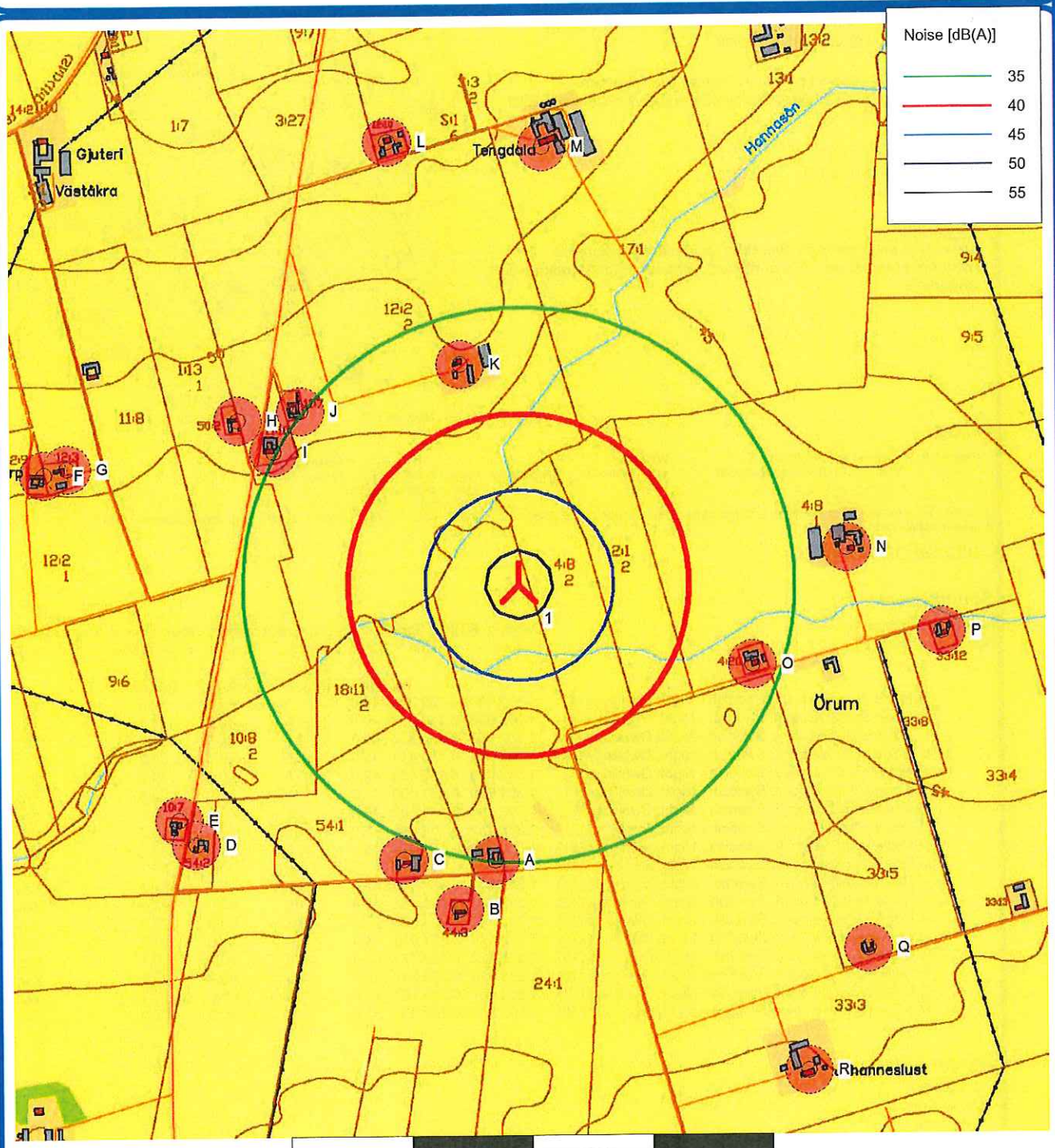
DECIBEL - Map 8,0 m/s



Map: Örum eko , Print scale 1:12 000, Map center Swedish RT90 2.5gonV 0:-15-RT90 (SE) East: 1 392 736 North: 6 150 945

New WTG

Noise sensitive area

Noise calculation model: Swedish, Jan 2002, Land. Wind speed: 8,0 m/s

Height above sea level: 0,0 m

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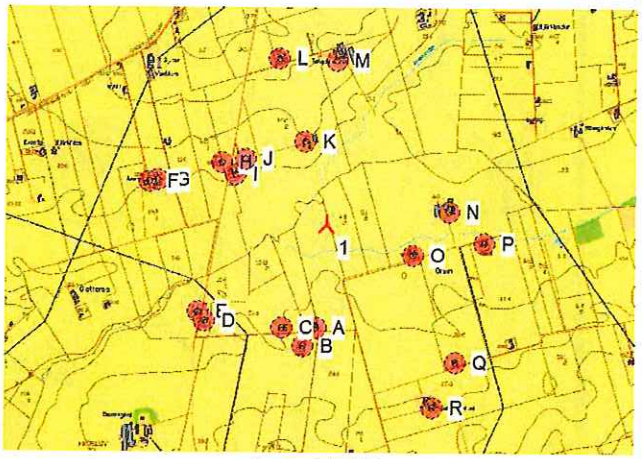
DECIBEL - Main Result

SVENSKA BESTÄMMELSER FÖR EXTERNT BULLER FRÅN LANDBASERADE VINDKRAFTVERK

Beräkningen är baserad på den av Statens Naturvårdsverk rekommenderad metod "Ljud från landbaserade vindkraftverk", 2001 (ISBN 91-620-6249-2)

Roughness class: 1,0
Roughness length: 0,030
K: 1.0 dB/(m/s)

OBSERVERA
Oktavdata saknas för ett eller flera av vindkraftverken där avståndet överstiger 1 000 m till beräkningspunkten (Ljudkänsligt område).



Scale 1:40 000
New WTG
Noise sensitive area

WTGs

	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones
1	1 392 736	6 150 945	43,0	ENERCON E-53 800 53.0 I-I...	Yes	ENERCON	E-53-800	800	53,0	73,3	EMD	Level 0 - man.spec. - Enercon - 05/2010	8,0	101,5	No h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area No.	Name	Swedish RT90 2.5gonV 0:-15-RT90 (SE) East	North	Z	Imission height	Demands Noise	Sound Level From WTGs	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	
A	Noise sensitive point: Swedish - Night; Dwellings (1)	1 392 683	6 150 373	46,0	1,5	40,0	35,2	Yes
B	Noise sensitive point: Swedish - Night; Dwellings (2)	1 392 608	6 150 273	46,0	1,5	40,0	33,1	Yes
C	Noise sensitive point: Swedish - Night; Dwellings (3)	1 392 492	6 150 377	45,0	1,5	40,0	34,3	Yes
D	Noise sensitive point: Swedish - Night; Dwellings (4)	1 392 058	6 150 411	43,0	1,5	40,0	30,2	Yes
E	Noise sensitive point: Swedish - Night; Dwellings (5)	1 392 023	6 150 461	42,0	1,5	40,0	30,3	Yes
F	Noise sensitive point: Swedish - Night; Dwellings (6)	1 391 746	6 151 180	46,0	1,5	40,0	28,8	Yes
G	Noise sensitive point: Swedish - Night; Dwellings (7)	1 391 794	6 151 193	46,0	1,5	40,0	28,6	Yes
H	Noise sensitive point: Swedish - Night; Dwellings (8)	1 392 152	6 151 290	47,0	1,5	40,0	33,2	Yes
I	Noise sensitive point: Swedish - Night; Dwellings (9)	1 392 227	6 151 224	46,0	1,5	40,0	35,1	Yes
J	Noise sensitive point: Swedish - Night; Dwellings (10)	1 392 283	6 151 308	47,0	1,5	40,0	35,1	Yes
K	Noise sensitive point: Swedish - Night; Dwellings (11)	1 392 616	6 151 403	49,0	1,5	40,0	37,3	Yes
L	Noise sensitive point: Swedish - Night; Dwellings (12)	1 392 468	6 151 865	57,0	1,5	40,0	28,9	Yes
M	Noise sensitive point: Swedish - Night; Dwellings (13)	1 392 788	6 151 853	53,0	1,5	40,0	29,6	Yes
N	Noise sensitive point: Swedish - Night; Dwellings (14)	1 393 421	6 151 016	44,0	1,5	40,0	33,0	Yes
O	Noise sensitive point: Swedish - Night; Dwellings (15)	1 393 222	6 150 777	44,0	1,5	40,0	36,4	Yes
P	Noise sensitive point: Swedish - Night; Dwellings (16)	1 393 618	6 150 842	44,0	1,5	40,0	29,9	Yes
Q	Noise sensitive point: Swedish - Night; Dwellings (17)	1 393 461	6 150 187	47,0	1,5	40,0	28,4	Yes
R	Noise sensitive point: Swedish - Night; Dwellings (18)	1 393 335	6 149 935	51,0	1,5	40,0	27,3	Yes

Distances (m)

	WTG
NSA	1
A	574
B	683
C	618
D	862
E	861
F	1017

To be continued on next page...

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DECIBEL - Main Result

...continued from previous page

	WTG
NSA	1
G	974
H	678
I	580
J	580
K	473
L	958
M	909
N	688
O	514
P	887
Q	1048
R	1174

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DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
(when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Noise sensitive point: Swedish - Night; Dwellings (1)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	574	578	**35,18**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,18

- *Data undefined due to calculation with octave data*

Noise sensitive area: B Noise sensitive point: Swedish - Night; Dwellings (2)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	683	687	**33,13**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 33,13

- *Data undefined due to calculation with octave data*

Noise sensitive area: C Noise sensitive point: Swedish - Night; Dwellings (3)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	618	622	**34,33**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 34,33

- *Data undefined due to calculation with octave data*

Noise sensitive area: D Noise sensitive point: Swedish - Night; Dwellings (4)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	862	865	**30,24**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 30,24

- *Data undefined due to calculation with octave data*

Noise sensitive area: E Noise sensitive point: Swedish - Night; Dwellings (5)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	861	864	**30,25**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 30,25

- *Data undefined due to calculation with octave data*

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DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Noise sensitive area: F Noise sensitive point: Swedish - Night; Dwellings (6)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 017	1 020	**28,76**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 28,76

- *Data undefined due to calculation with octave data*

Noise sensitive area: G Noise sensitive point: Swedish - Night; Dwellings (7)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	974	976	**28,64**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 28,64

- *Data undefined due to calculation with octave data*

Noise sensitive area: H Noise sensitive point: Swedish - Night; Dwellings (8)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	678	682	**33,23**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 33,23

- *Data undefined due to calculation with octave data*

Noise sensitive area: I Noise sensitive point: Swedish - Night; Dwellings (9)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	580	584	**35,06**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,06

- *Data undefined due to calculation with octave data*

Noise sensitive area: J Noise sensitive point: Swedish - Night; Dwellings (10)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	580	584	**35,06**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,06

- *Data undefined due to calculation with octave data*

Noise sensitive area: K Noise sensitive point: Swedish - Night; Dwellings (11)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	473	478	**37,33**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 37,33

- *Data undefined due to calculation with octave data*

Noise sensitive area: L Noise sensitive point: Swedish - Night; Dwellings (12)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	958	960	**28,87**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 28,87

- *Data undefined due to calculation with octave data*

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DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Noise sensitive area: M Noise sensitive point: Swedish - Night; Dwellings (13)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	909	911	**29,56**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 29,56

- Data undefined due to calculation with octave data

Noise sensitive area: N Noise sensitive point: Swedish - Night; Dwellings (14)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	688	692	**33,04**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 33,04

- Data undefined due to calculation with octave data

Noise sensitive area: O Noise sensitive point: Swedish - Night; Dwellings (15)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	514	519	**36,41**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 36,41

- Data undefined due to calculation with octave data

Noise sensitive area: P Noise sensitive point: Swedish - Night; Dwellings (16)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	887	890	**29,87**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 29,87

- Data undefined due to calculation with octave data

Noise sensitive area: Q Noise sensitive point: Swedish - Night; Dwellings (17)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 048	1 050	**28,45**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 28,45

- Data undefined due to calculation with octave data

Noise sensitive area: R Noise sensitive point: Swedish - Night; Dwellings (18)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 174	1 175	**27,26**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 27,26

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DECIBEL - Assumptions for noise calculation

Noise calculation model:
Swedish, Jan 2002, Land
Wind speed:
8,0 m/s
Ground attenuation:
None
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Rough. Class %d:
1,0 m/s
Pure tones:
Pure tone penalty are added to demand: 5,0 dB(A)
Height above ground level, when no value in NSA object:
1,5 m Don't allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)
Octave data required
Air absorption

63 [db/km]	125 [db/km]	250 [db/km]	500 [db/km]	1 000 [db/km]	2 000 [db/km]	4 000 [db/km]	8 000 [db/km]
0,1	0,3	0,6	1,4	3,2	7,9	22,0	50,0

WTG: ENERCON E-53 800 53.0 !-!
Noise: Level 0 - man.spec. - Enercon - 05/2010

Source	Source/Date	Creator	Edited
Enercon	2010-05-01	EMD	2012-07-13 16:49

According to specification SIAS-04-SPL E-53 OM I Rev1_0-ger-ger.doc

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		Octave data 63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	73,3	8,0	101,5	No	Generic data	83,1	90,1	93,5	96,1	95,9	93,0	88,2	78,7

NSA: Noise sensitive point: Swedish - Night; Dwellings (1)-A
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (2)-B
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (3)-C
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (4)-D
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

NSA: Noise sensitive point: Swedish - Night; Dwellings (5)-E
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (6)-F
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (7)-G
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (8)-H
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (9)-I
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (10)-J
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (11)-K
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (12)-L
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (13)-M
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

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DECIBEL - Assumptions for noise calculation

NSA: Noise sensitive point: Swedish - Night; Dwellings (14)-N
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (15)-O
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (16)-P
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (17)-Q
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (18)-R
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

Ramström Vind

RÖRLIGA SKUGGOR

Vindkraftverket på Örum 24:1 kan teoretiskt orsaka problem med rörliga skuggor vid bostadsh8usen på fastigheterna Örum 10:7 (tidig morgon juni- början av juli), Hannas 11:7 (på morgonen i början av febr och månadsskiftet okt/nov), Hannas 12:2 (vid 11-tiden dec till början av jan) samt Örum 4:20 (vid 20-tiden i början av maj och augusti). Skymmande vegetation eller hus i vägen kan dock påverka utfallet liksom tidpunkten för skuggornas uppträdande. Vindkraftverket kommer dock att utrustas med automatik för skuggurkoppling som kommer att trimmas in så att inga olägenheter uppstår vid de berörda fastigheterna.

Skuggberäkningarna visar också att vindkraftverket på Örum 24:1 tillsammans med det befintliga vindkraftverket på Örum 41:1 teoretiskt kan orsaka problem med rörliga skuggor för bostadshusen på fastigheterna Örum 4:8 och Örum 33:12 spridda tider under året. Här är det emellertid troligt att befintliga ekonomibyggnaderhelt kommer att eliminera påverkan från Örum 24:1. Frågan kommer dock att beaktas i samband med programmeringen av skuggurkopplingen.

Fastigheterna Örum 44:1, Örum 33:3 och Örum 33:5 Kan också enligt skuggberäkningen påverkas av störningar. Dock inte från vindkraftverket på Örum 24:1.

REFLEXER

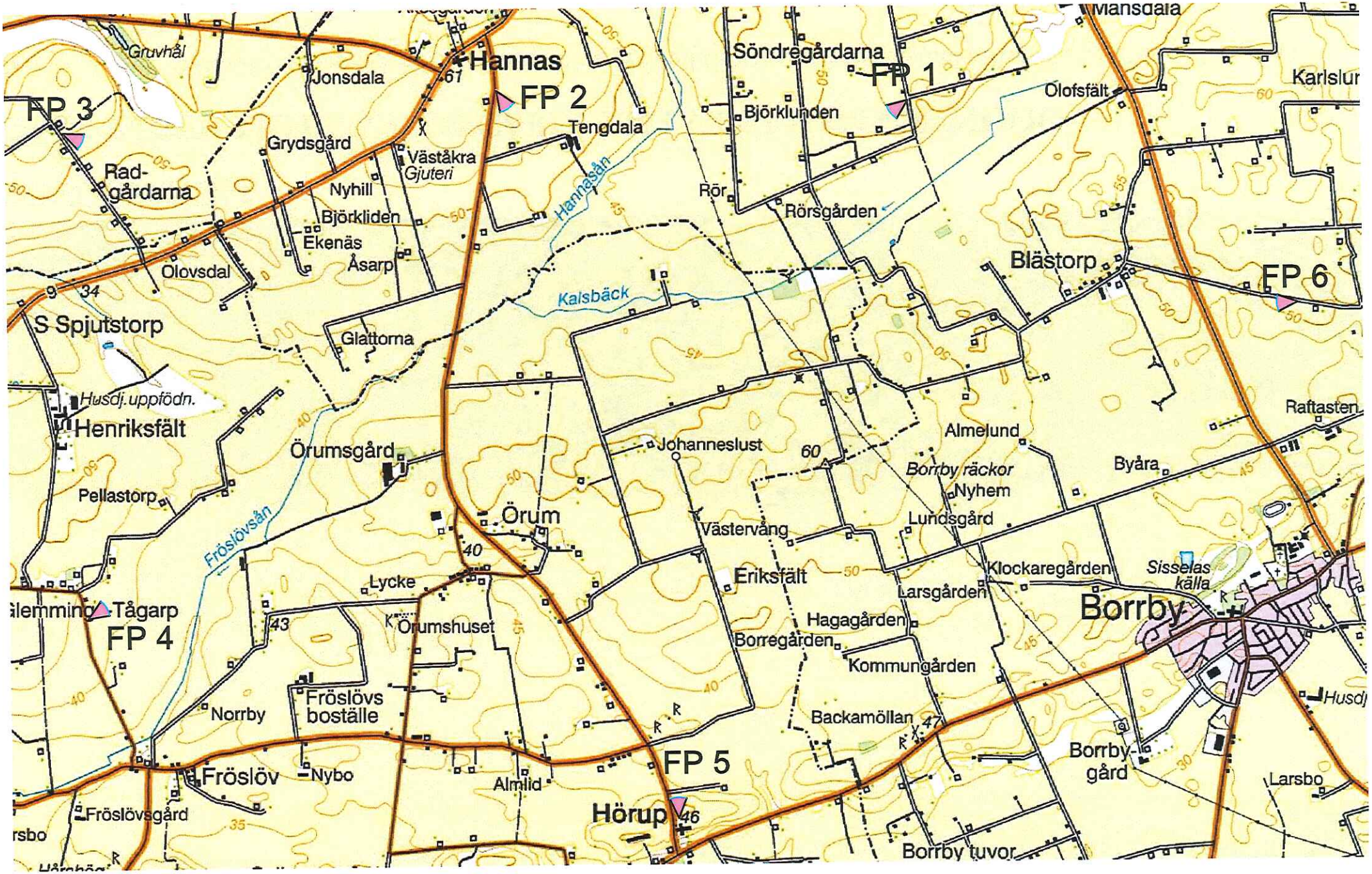
Alla moderna vindkraftverk har sedan många år en antireflex-behandlad yta som eliminerar problem med reflexer. Det vindkraftverk som är aktuellt för denna etablering kommer således inte att orsaka ljuskastningar eller reflexer.

REDUCERING AV LJUD

Bifogad ljudberäkning visar att ljudnivåerna kommer att ligga långt under rekommenderade gränsvärden. I händelse störande ljud som visar att det rekommenderade värdet 40dB(A) stadigvarande överskrids kommer åtgärder vidtas. En första åtgärd är att utreda om vindkraftverkets ljudavgivning är abnorm på grund av fel i vindkraftverket. Om olägenheter av ljudimmission från vindkraftverkets drift fastställs kan driften justeras så att störningen upphör. Det aktuella vindkraftverket har sådan teknisk lösning som kan aktiveras.

VINDKRAFTVERK ÖRUM 24:1- FOTOPUNKTER

SKALA 1 : 30 000



FOTOPUNKT 1

FRÅN VÄGEN MOT SÖNDREGÅRDARNA V OM HAMMNENHÖG

Det föreslagna vindkraftverket på Örum 24:1 syns till höger i bilden. Det befintliga vindkraftverket på Örum 41:1 syns till vänster i bilden

FOTOPUNKT 2 FRÅN VÄGEN MOT ÖRUM S OM HANNAS

Den övre bilden visar det föreslagna vindkraftverket på Örum 24:1samt befintliga vindkraftverk på Eriksfält. På den undre bilden syns två av de tre blivande vindkraftverken på Eriksfält.

FOTOPUNKT 3

FRÅN RADGÅRDARNA S OM BOLLERUP

Det föreslagna vindkraftverket på Örum 24:1 syns något till vänster i bilderna. Det befintliga vindkraftverket på Örum 41:1 syns till vänster om detta. Den övre bilden visar de befintliga vindkraftverk på Eriksfält. På den undre bilden syns de tre blivande vindkraftverken på Eriksfält.

FOTOPUNKT 4

FRÅN VÄGEN MOT SÖNDREGÅRDARNA V OM HAMMNENHÖG

Det föreslagna vindkraftverket på Örum 24:1 syns mitt i bilden. Det befintliga vindkraftverket på Örum 41:1 syns bakom Örumsgården till höger i bilden. Vindkraftverken vid Valterslund och Gårstad skymtar iden vänstra delen av bilden.

FOTOPUNKT 5

FRÅN PARKERINGSPLATSEN VID HÖRUPS KYRKA

Det föreslagna vindkraftverket på Örum 24:1 syns mitt i bilden. Det befintliga vindkraftverket på Örum 41:1 syns till vänster i bilden. . Vindkraftverken vid Valterslund och Gårstad skymtar i bakgrunden. De befintliga vindkraftverken på Eriksfält syns till vänster i bilden.

FOTOPUNKT 6 FRÅN ENSKILDA VÄGEN V OM BLÄSTORP

Det föreslagna vindkraftverket på Örum 24:1 syns till höger i bilden liksom det befintliga vindkraftverket på Örum 41:1 ytterligare något till höger. Till vänster på den övre bilden syns ett av de befintliga Eriksfältverken och på den nedre bilden syns två av de planerade verken. Vingspetsen på ett av blästorpsverken skymtar i övre vänstra hörnet.

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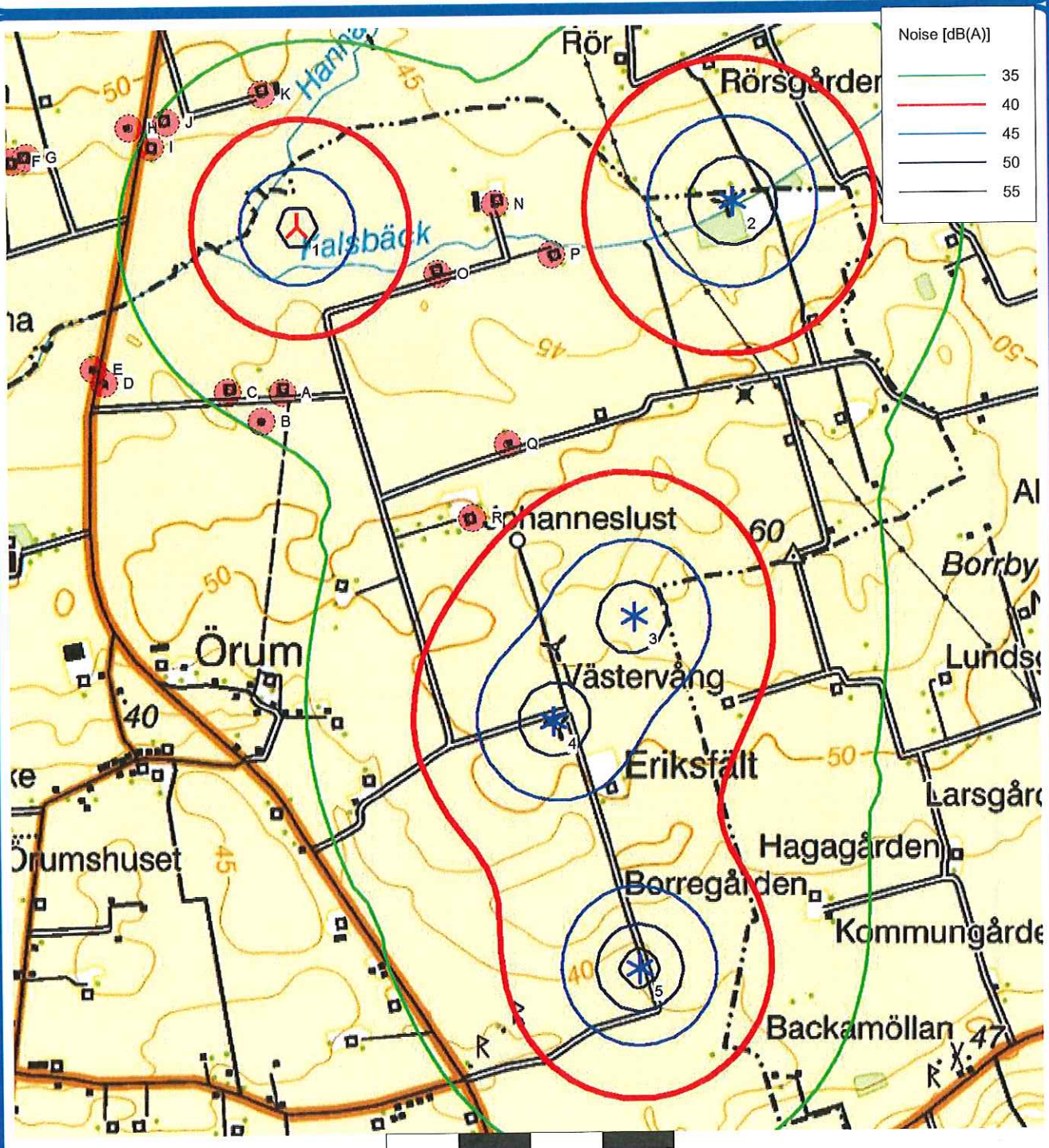
DECIBEL - Map 8,0 m/s



0 250 500 750 1000m

Map: Bitmap map: 956102_Terrängkartan.jpg , Print scale 1:20 000, Map center Swedish RT90 2.5gonV 0:-15-RT90 (SE) East: 1 393 492 North: 6 149 699

New WTG Existing WTG Noise sensitive area

Noise calculation model: Swedish, Jan 2002, Land. Wind speed: 8,0 m/s
Height above sea level: 0,0 m

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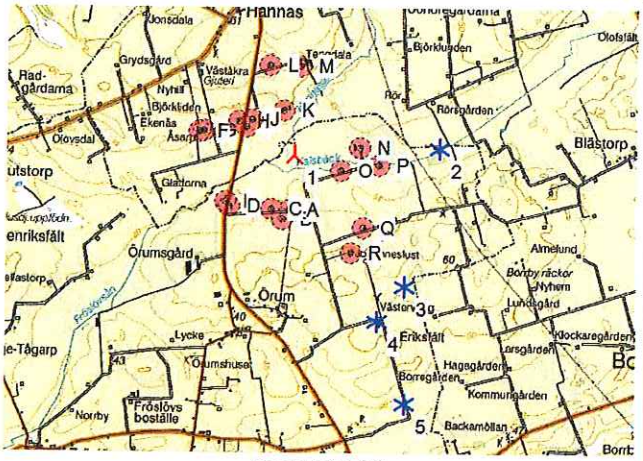
DECIBEL - Main Result

SVENSKA BESTÄMMELSER FÖR EXTERNT BULLER FRÅN LANDBASERADE VINDKRAFTVERK

Beräkningen är baserad på den av Statens Naturvårdsverk rekommenderad metod "Ljud från landbaserade vindkraftverk", 2001 (ISBN 91-620-6249-2)

Roughness class: 1,0
Roughness length: 0,030
K: 1.0 dB/(m/s)

OBSERVERA
Oktavdata saknas för ett eller flera av vindkraftverken där avståndet överstiger 1 000 m till beräkningspunkten (Ljudkänsligt område).



WTGs

	Swedish RT90 2.5gonV 0:-15-RT90 (SE) East	North	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data Creator	Name	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones
1	1 392 736	6 150 945	43,0	ENERCON E-53 800 53.0 !-I h...	Yes	ENERCON	E-53-800	800	53,0	73,3	EMD	Level 0 - man.spec. - Enercon - 05/2010	8,0	101,5	No h
2	1 394 248	6 151 021	45,0	VESTAS V52 850 52.0 !O! hub...	Yes	VESTAS	V52-850	850	52,0	65,0	EMD	Level 0 - - 104.2 dB(A) - 07-2006	8,0	104,5	No h
3	1 393 893	6 149 591	53,0	ENERCON E-70 E4 2,3 MW 2...	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	EMD	Level 0 - man.spec. - OM II/Rev.1.2 - 04/2012	8,0	103,1	No h
4	1 393 609	6 149 231	50,0	ENERCON E-70 E4 2,3 MW 2...	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	EMD	Level 0 - man.spec. - OM II/Rev.1.2 - 04/2012	8,0	103,1	No h
5	1 393 902	6 148 376	0,0	ENERCON E-70 E4 2,3 MW 2...	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	EMD	Level 0 - man.spec. - OM II/Rev.1.2 - 04/2012	8,0	103,1	No h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area No.	Name	Swedish RT90 2.5gonV 0:-15-RT90 (SE) East	North	Z [m]	Imission height [m]	Demands Noise [dB(A)]	Sound Level From WTGs [dB(A)]	Demands fulfilled ? Noise
A	Noise sensitive point: Swedish - Night; Dwellings (1)	1 392 683	6 150 373	46,0	1,5	40,0	36,8	Yes
B	Noise sensitive point: Swedish - Night; Dwellings (2)	1 392 608	6 150 273	46,0	1,5	40,0	35,4	Yes
C	Noise sensitive point: Swedish - Night; Dwellings (3)	1 392 492	6 150 377	45,0	1,5	40,0	35,9	Yes
D	Noise sensitive point: Swedish - Night; Dwellings (4)	1 392 058	6 150 411	43,0	1,5	40,0	32,5	Yes
E	Noise sensitive point: Swedish - Night; Dwellings (5)	1 392 023	6 150 461	42,0	1,5	40,0	32,4	Yes
F	Noise sensitive point: Swedish - Night; Dwellings (6)	1 391 746	6 151 180	46,0	1,5	40,0	30,6	Yes
G	Noise sensitive point: Swedish - Night; Dwellings (7)	1 391 794	6 151 193	46,0	1,5	40,0	30,5	Yes
H	Noise sensitive point: Swedish - Night; Dwellings (8)	1 392 152	6 151 290	47,0	1,5	40,0	34,2	Yes
I	Noise sensitive point: Swedish - Night; Dwellings (9)	1 392 227	6 151 224	46,0	1,5	40,0	35,8	Yes
J	Noise sensitive point: Swedish - Night; Dwellings (10)	1 392 283	6 151 308	47,0	1,5	40,0	35,8	Yes
K	Noise sensitive point: Swedish - Night; Dwellings (11)	1 392 616	6 151 403	49,0	1,5	40,0	37,9	Yes
L	Noise sensitive point: Swedish - Night; Dwellings (12)	1 392 468	6 151 865	57,0	1,5	40,0	31,0	Yes
M	Noise sensitive point: Swedish - Night; Dwellings (13)	1 392 788	6 151 853	53,0	1,5	40,0	32,0	Yes
N	Noise sensitive point: Swedish - Night; Dwellings (14)	1 393 421	6 151 016	44,0	1,5	40,0	37,2	Yes
O	Noise sensitive point: Swedish - Night; Dwellings (15)	1 393 222	6 150 777	44,0	1,5	40,0	38,3	Yes
P	Noise sensitive point: Swedish - Night; Dwellings (16)	1 393 618	6 150 842	44,0	1,5	40,0	38,3	Yes
Q	Noise sensitive point: Swedish - Night; Dwellings (17)	1 393 461	6 150 187	47,0	1,5	40,0	37,5	Yes
R	Noise sensitive point: Swedish - Night; Dwellings (18)	1 393 335	6 149 935	51,0	1,5	40,0	38,5	Yes

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DECIBEL - Main Result

Distances (m)

	WTG				
NSA	1	2	3	4	5
A	574	1693	1441	1470	2339
B	683	1802	1454	1445	2296
C	618	1869	1605	1599	2446
D	862	2272	2009	1948	2745
E	861	2293	2061	2006	2805
F	1017	2506	2670	2695	3535
G	974	2459	2639	2671	3517
H	678	2112	2432	2521	3398
I	580	2030	2331	2424	3302
J	580	1985	2353	2463	3348
K	473	1675	2216	2387	3287
L	958	1969	2683	2869	3771
M	909	1680	2516	2746	3650
N	688	826	1500	1794	2682
O	514	1054	1362	1593	2494
P	887	655	1280	1610	2481
Q	1048	1146	736	967	1863
R	1174	1419	655	755	1658

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DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
(when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Noise sensitive point: Swedish - Night; Dwellings (1)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	574	578	**35,18**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 693	1 694	**26,32**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 441	1 442	**26,68**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 470	1 472	**26,46**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 339	2 339	**21,29**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 36,78

- *Data undefined due to calculation with octave data*

Noise sensitive area: B Noise sensitive point: Swedish - Night; Dwellings (2)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	683	687	**33,13**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 802	1 803	**25,63**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 454	1 456	**26,58**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 445	1 446	**26,65**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 296	2 296	**21,50**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,42

- *Data undefined due to calculation with octave data*

Noise sensitive area: C Noise sensitive point: Swedish - Night; Dwellings (3)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	618	622	**34,33**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 869	1 870	**25,22**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 605	1 607	**25,50**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 599	1 601	**25,55**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 446	2 446	**20,77**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,88

- *Data undefined due to calculation with octave data*

Noise sensitive area: D Noise sensitive point: Swedish - Night; Dwellings (4)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	862	865	**30,24**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 272	2 273	**23,02**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 009	2 010	**23,01**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

To be continued on next page...

DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

...continued from previous page

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
4	1 948	1 949	**23,36**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 745	2 745	**19,43**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 32,46

- Data undefined due to calculation with octave data

Noise sensitive area: E Noise sensitive point: Swedish - Night; Dwellings (5)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	861	864	**30,25**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 293	2 294	**22,91**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 061	2 063	**22,72**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 006	2 007	**23,03**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 805	2 805	**19,17**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 32,37

- Data undefined due to calculation with octave data

Noise sensitive area: F Noise sensitive point: Swedish - Night; Dwellings (6)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 017	1 020	**28,76**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 506	2 507	**21,89**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 670	2 671	**19,75**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 695	2 696	**19,64**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 535	3 535	**16,41**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 30,55

- Data undefined due to calculation with octave data

Noise sensitive area: G Noise sensitive point: Swedish - Night; Dwellings (7)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	974	976	**28,64**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 459	2 460	**22,11**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 639	2 640	**19,89**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 671	2 672	**19,74**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 517	3 517	**16,48**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 30,53

- Data undefined due to calculation with octave data

Noise sensitive area: H Noise sensitive point: Swedish - Night; Dwellings (8)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	678	682	**33,23**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 112	2 113	**23,85**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 432	2 433	**20,84**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 521	2 522	**20,42**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 398	3 398	**16,89**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 34,19

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Calculated:
2016-04-24 18:02/2.8.579

DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Noise sensitive area: I Noise sensitive point: Swedish - Night; Dwellings (9)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	580	584	**35,06**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	2 030	2 031	**24,30**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 331	2 332	**21,32**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 424	2 425	**20,87**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 302	3 302	**17,24**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,78

- *Data undefined due to calculation with octave data*

Noise sensitive area: J Noise sensitive point: Swedish - Night; Dwellings (10)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	580	584	**35,06**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 985	1 986	**24,55**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 353	2 354	**21,22**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 463	2 464	**20,69**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 348	3 348	**17,07**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 35,78

- *Data undefined due to calculation with octave data*

Noise sensitive area: K Noise sensitive point: Swedish - Night; Dwellings (11)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	473	478	**37,33**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 675	1 676	**26,44**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 216	2 217	**21,90**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 387	2 388	**21,05**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 287	3 287	**17,29**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 37,92

- *Data undefined due to calculation with octave data*

Noise sensitive area: L Noise sensitive point: Swedish - Night; Dwellings (12)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	958	960	**28,87**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 969	1 970	**24,64**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 683	2 683	**19,70**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 869	2 870	**18,91**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 771	3 771	**15,63**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 31,03

- *Data undefined due to calculation with octave data*

Noise sensitive area: M Noise sensitive point: Swedish - Night; Dwellings (13)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	909	911	**29,56**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 680	1 681	**26,41**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	2 516	2 517	**20,44**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	2 746	2 747	**19,42**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	3 650	3 650	**16,03**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 31,98

- *Data undefined due to calculation with octave data*

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2016-04-24 18:02/2.8.579

DECIBEL - Detailed results

Noise calculation model: Swedish, Jan 2002, Land 8,0 m/s

Noise sensitive area: N Noise sensitive point: Swedish - Night; Dwellings (14)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	688	692	**33,04**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	826	829	**33,80**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 500	1 502	**26,24**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 794	1 795	**24,28**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 682	2 682	**19,70**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 37,16

- *Data undefined due to calculation with octave data*

Noise sensitive area: O Noise sensitive point: Swedish - Night; Dwellings (15)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	514	519	**36,41**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 054	1 056	**31,40**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 362	1 364	**27,29**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 593	1 594	**25,59**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 494	2 494	**20,55**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 38,30

- *Data undefined due to calculation with octave data*

Noise sensitive area: P Noise sensitive point: Swedish - Night; Dwellings (16)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	887	890	**29,87**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	655	658	**36,66**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	1 280	1 282	**27,95**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	1 610	1 611	**25,47**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	2 481	2 481	**20,61**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 38,26

- *Data undefined due to calculation with octave data*

Noise sensitive area: Q Noise sensitive point: Swedish - Night; Dwellings (17)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 048	1 050	**28,45**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 146	1 148	**30,52**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	736	739	**33,85**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	967	969	**30,34**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	1 863	1 863	**23,86**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 37,46

- *Data undefined due to calculation with octave data*

Noise sensitive area: R Noise sensitive point: Swedish - Night; Dwellings (18)

Wind speed: 8,0 m/s

WTG No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 174	1 175	**27,26**	101,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
2	1 419	1 420	**28,25**	104,5	0,00	0,00	-	0,00	0,00	0,00	-	0,00
3	655	659	**35,25**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
4	755	757	**33,54**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00
5	1 658	1 658	**25,16**	103,1	0,00	0,00	-	0,00	0,00	0,00	-	0,00

Sum 38,54

- *Data undefined due to calculation with octave data*

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2016-04-24 18:02/2.8.579

DECIBEL - Assumptions for noise calculation

Noise calculation model:
Swedish, Jan 2002, Land
Wind speed:
8,0 m/s
Ground attenuation:
None
Meteorological coefficient, C0:
0,0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Rough. Class %d:
1,0 m/s
Pure tones:
Pure tone penalty are added to demand: 5,0 dB(A)
Height above ground level, when no value in NSA object:
1,5 m Don't allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0,0 dB(A)
Octave data required
Air absorption

63 [db/km]	125 [db/km]	250 [db/km]	500 [db/km]	1 000 [db/km]	2 000 [db/km]	4 000 [db/km]	8 000 [db/km]
0,1	0,3	0,6	1,4	3,2	7,9	22,0	50,0

WTG: ENERCON E-53 800 53.0 !-!
Noise: Level 0 - man.spec. - Enercon - 05/2010

Source	Source/Date	Creator	Edited
Enercon	2010-05-01	EMD	2012-07-13 16:49

According to specification SIAS-04-SPL E-53 OM I Rev1_0-ger-ger.doc

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		Octave data 63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	73,3	8,0	101,5	No	Generic data	83,1	90,1	93,5	96,1	95,9	93,0	88,2	78,7

WTG: VESTAS V52 850 52.0 !O!
Noise: Level 0 - - 104.2 dB(A) - 07-2006

Source	Source/Date	Creator	Edited
Manufacturer	2006-07-20	EMD	2010-09-14 13:48

Data based on document 946506.R9 2006-07-20.
Measurement standard IEC 61400-11 ed. 2 2002
Max. turbulence at 10 meter height: 16%
Inflow angle (vertical): 0 ± 2°
Air density: 1.225 kg/m3.
Please note that the sound power level may differ marginally at other hub heights.

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		Octave data 63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	65,0	8,0	104,5	No	Generic data	86,1	93,1	96,5	99,1	98,9	96,0	91,2	81,7
From Windcat	65,0	8,0	104,5	No	Generic data	86,1	93,1	96,5	99,1	98,9	96,0	91,2	81,7

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Calculated:
2016-04-24 18:02/2.8.579

DECIBEL - Assumptions for noise calculation

WTG: ENERCON E-70 E4 2,3 MW 2300 71.0 !O!
Noise: Level 0 - man.spec. - OM II/Rev.1.2 - 04/2012

Source	Source/Date	Creator	Edited
ENERCON GmbH	2012-04-23	EMD	2012-04-26 16:45

According to manufacturer specification document SIAS-04-SPL E-70 E4 OM II 2_3MW Rev1_2-ger-ger.pdf

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		Octave data 63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	64,0	8,0	103,1	No	Generic data	84,7	91,7	95,1	97,7	97,5	94,6	89,8	80,3

NSA: Noise sensitive point: Swedish - Night; Dwellings (1)-A
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (2)-B
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (3)-C
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (4)-D
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (5)-E
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (6)-F
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (7)-G
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (8)-H
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

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DECIBEL - Assumptions for noise calculation

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (9)-I
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (10)-J
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (11)-K
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (12)-L
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (13)-M
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (14)-N
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (15)-O
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (16)-P
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

NSA: Noise sensitive point: Swedish - Night; Dwellings (17)-Q
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

Project:
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DECIBEL - Assumptions for noise calculation

NSA: Noise sensitive point: Swedish - Night; Dwellings (18)-R
Predefined calculation standard: Night; Dwellings
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 40,0 dB(A)
Distance demand:

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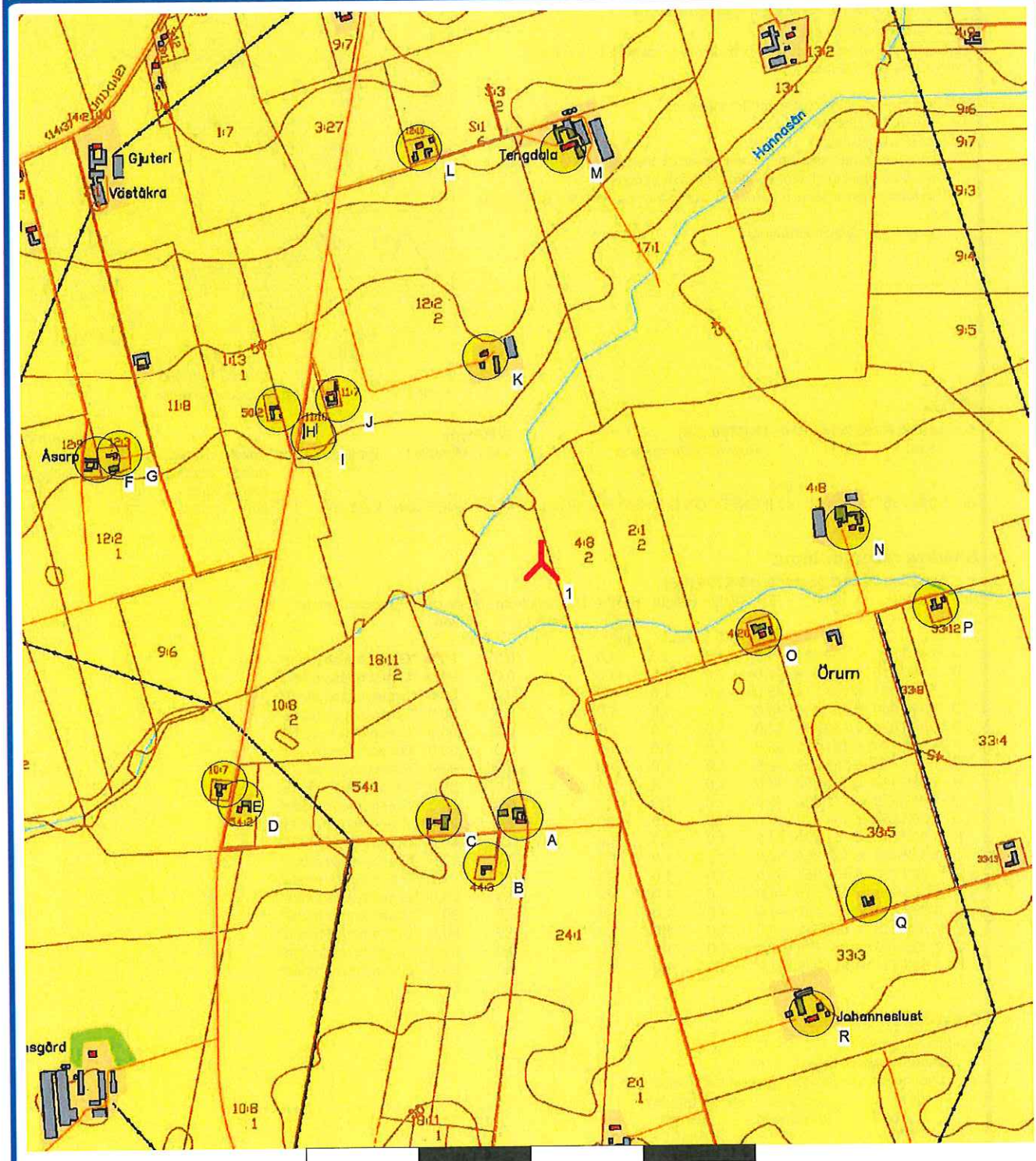
SHADOW - Map



Map: Örum eko , Print scale 1:12 500, Map center Swedish RT90 2.5gonV 0:-15-RT90 (SE) East: 1 392 680 North: 6 150 902

New WTG Shadow receptor

Flicker map level:

Project:
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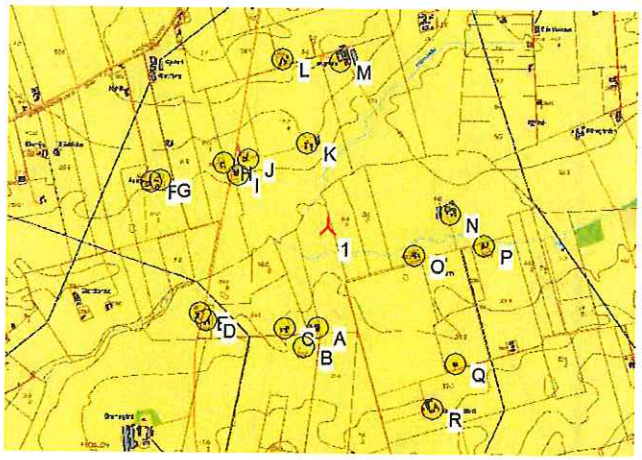
SHADOW - Main Result

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



Scale 1:40 000
New WTG
Shadow receptor

WTGs

Swedish RT90 2.5gonV 0:-15-RT90 (SE)

	East	North	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	1 392 736	6 150 945	43,0	ENERCON E-53 800 53.0 !-! hub: ...	Yes	ENERCON	E-53-800	800	53,0	73,3	996	29,0

Shadow receptor-Input

Swedish RT90 2.5gonV 0:-15-RT90 (SE)

No.	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
A	1 392 683	6 150 380	46,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
B	1 392 606	6 150 274	46,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
C	1 392 501	6 150 378	45,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
D	1 392 060	6 150 416	43,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
E	1 392 024	6 150 460	42,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
F	1 391 744	6 151 181	46,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
G	1 391 794	6 151 194	46,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
H	1 392 149	6 151 290	47,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
I	1 392 229	6 151 226	46,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
J	1 392 284	6 151 310	47,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
K	1 392 613	6 151 401	49,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
L	1 392 468	6 151 864	57,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
M	1 392 790	6 151 857	53,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
N	1 393 418	6 151 016	44,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
O	1 393 219	6 150 782	44,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
P	1 393 615	6 150 841	44,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
Q	1 393 460	6 150 189	47,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"
R	1 393 331	6 149 939	51,0	1,0	1,0	1,0	0,0	90,0	"Green house mode"

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	0:00	0	0:00
D	0:00	0	0:00

To be continued on next page...

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SHADOW - Main Result

...continued from previous page

Shadow, worst case

No.	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
E	10:20	45	0:16
F	0:00	0	0:00
G	2:25	16	0:13
H	6:10	25	0:19
I	8:10	29	0:22
J	9:30	33	0:22
K	13:12	40	0:25
L	0:00	0	0:00
M	0:00	0	0:00
N	5:23	22	0:19
O	14:04	43	0:26
P	3:21	18	0:14
Q	0:00	0	0:00
R	0:00	0	0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)	68:44	

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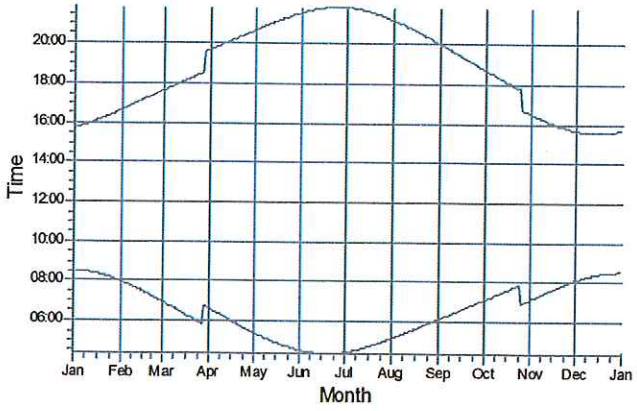
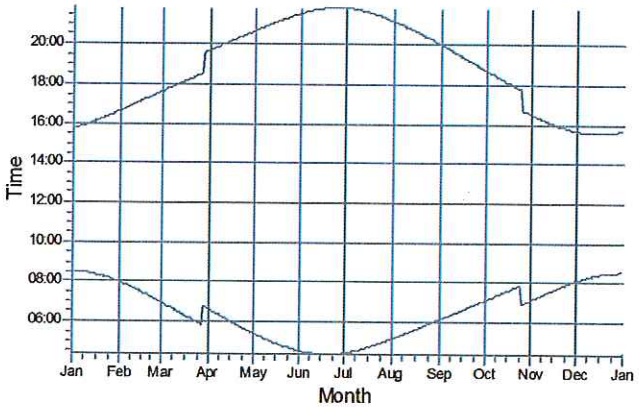
SHADOW - Calendar, graphical

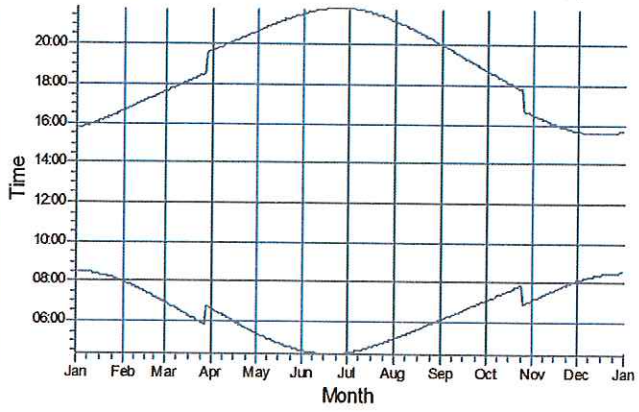
A: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (1)



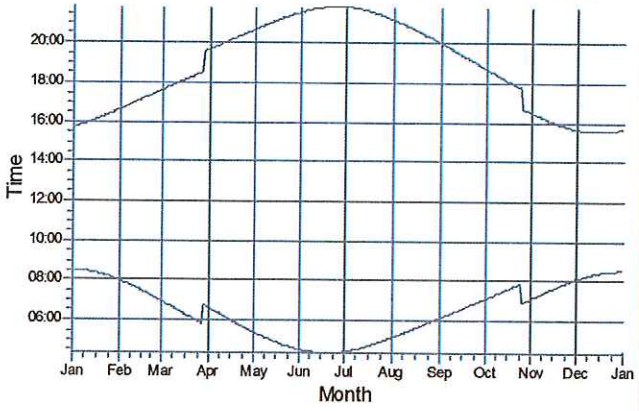
B: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (2)



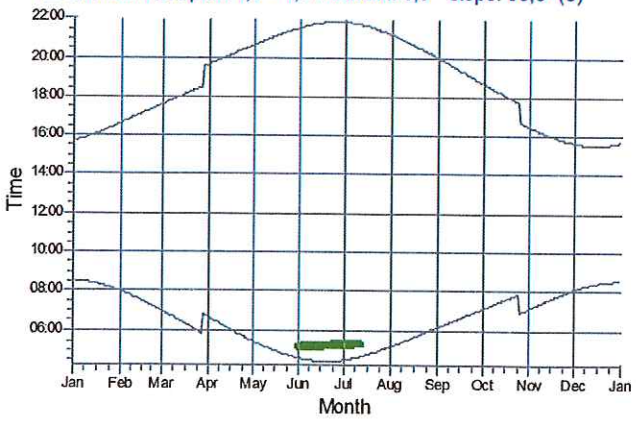
C: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (3)



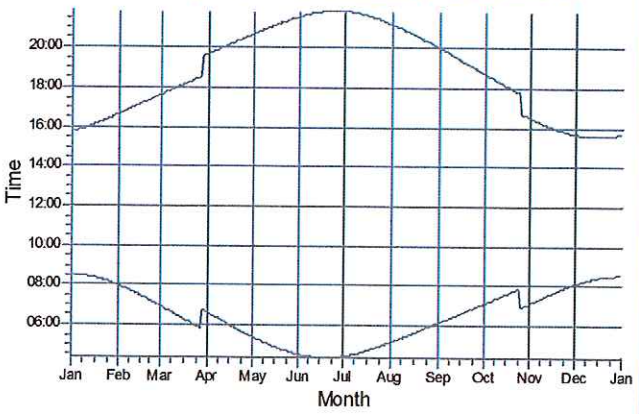
D: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (4)



E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)



F: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (6)



WTGs

1: ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)

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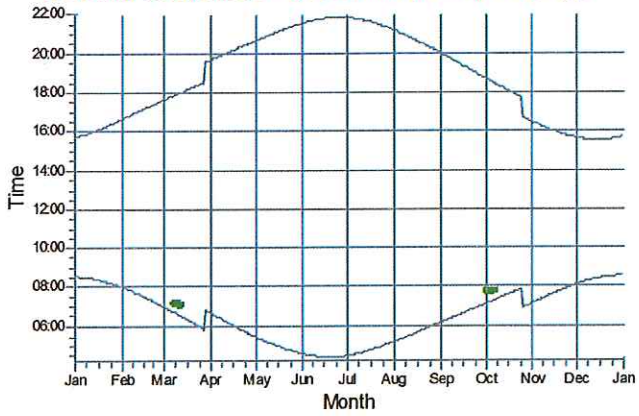
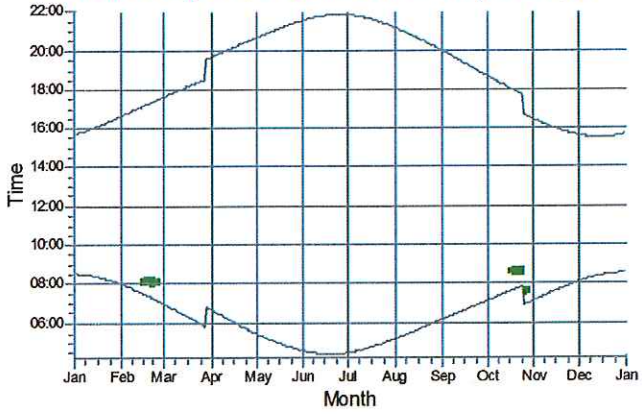
SHADOW - Calendar, graphical

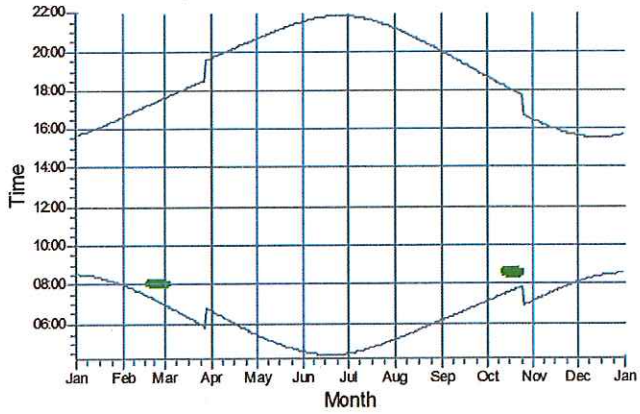
G: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)



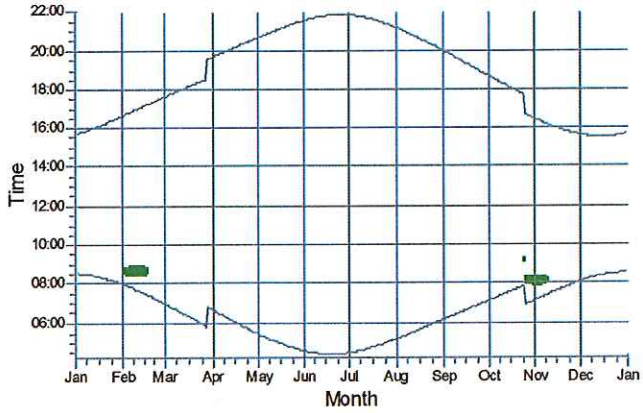
H: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)



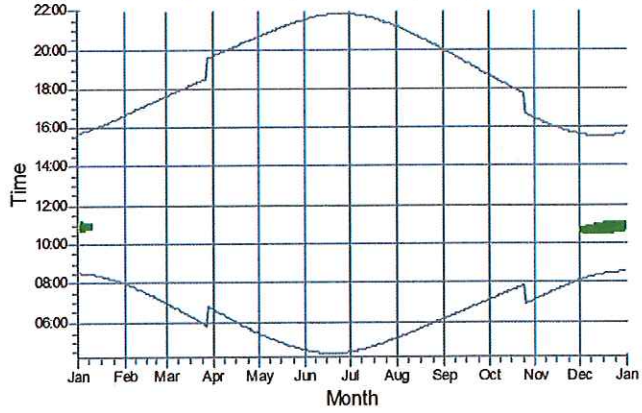
I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)



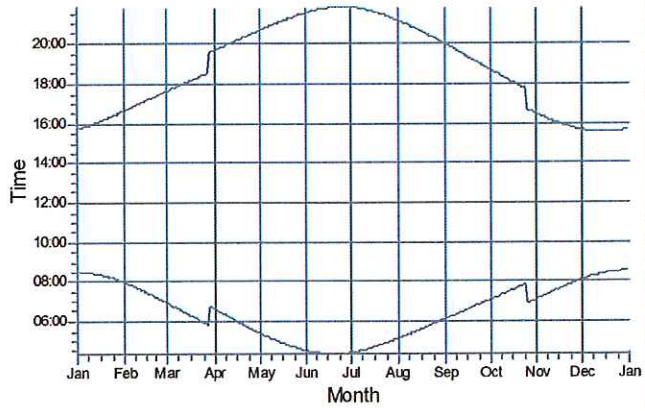
J: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)



K: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)



L: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (12)



WTGs

1: ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)

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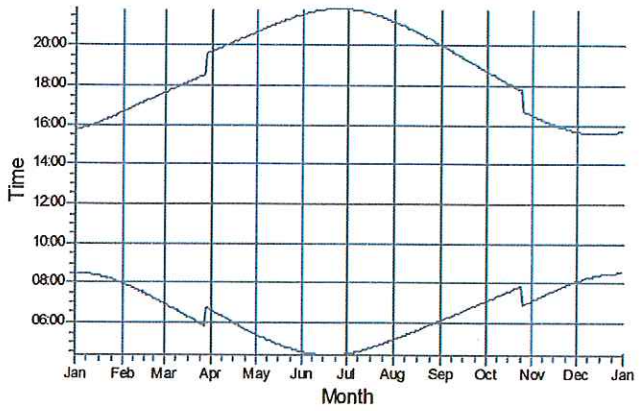
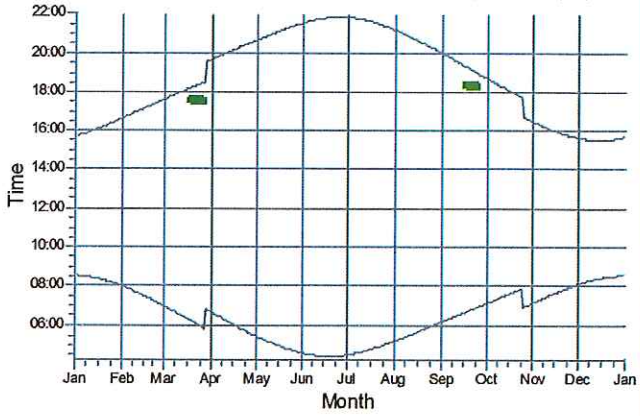
SHADOW - Calendar, graphical

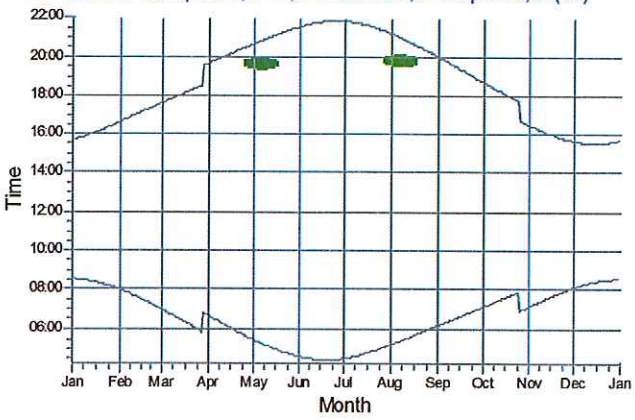
M: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (13)



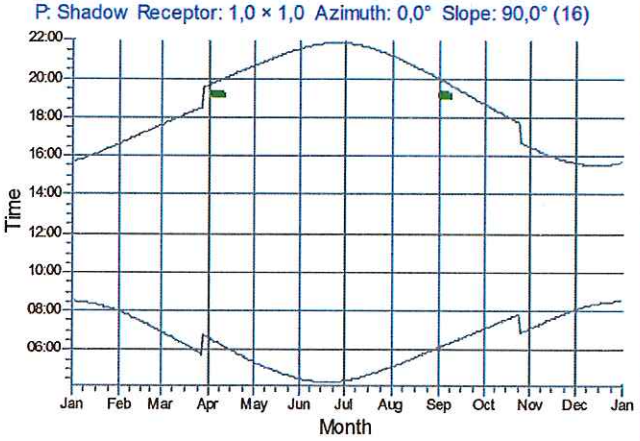
N: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (14)



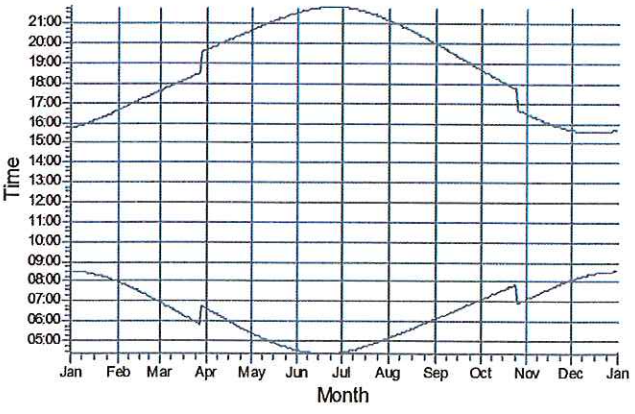
O: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)



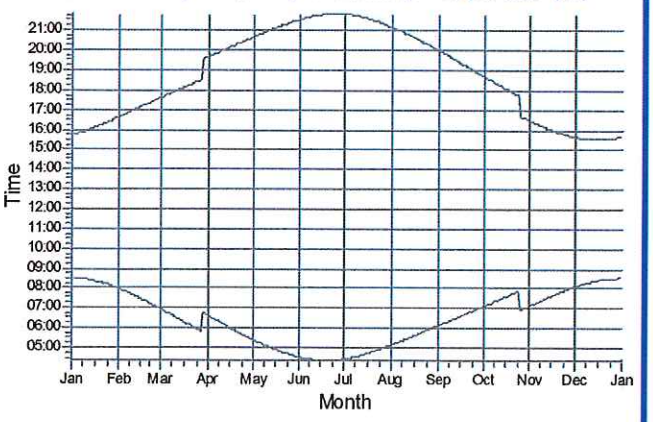
P: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)



Q: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (17)



R: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (18)



WTGs

1: ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)

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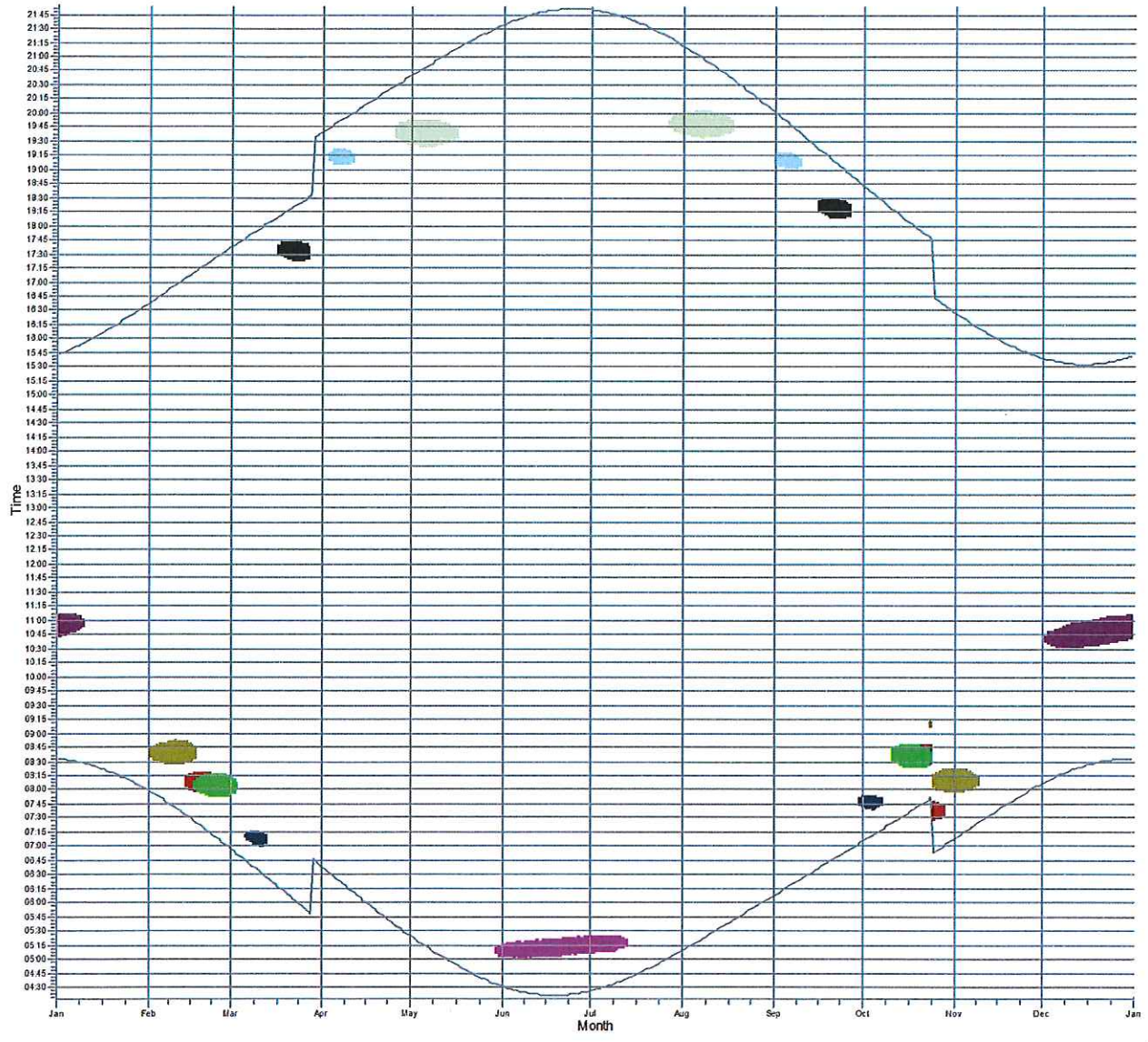
SHADOW - Calendar per WTG, graphical

WTG: 1 - ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)

1: ENERCON E-53 800 53.0 !-! hub: 73,3 m (TOT: 99,8 m) (1)



Shadow receptors

- E: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (5)
- G: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (7)
- H: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (8)
- I: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (9)
- J: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (10)
- K: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (11)
- N: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (14)
- O: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (15)
- P: Shadow Receptor: 1,0 × 1,0 Azimuth: 0,0° Slope: 90,0° (16)