

Project:

**Frostnäs**

IC16091PO

Ramström

Vind AB

Description:

Please notice, that the sound power level of the ENERCON turbine demonstrates the official value by ENERCON GmbH. The adjusted octave band sound power levels are scaled to fit the declared sum level. The applied calculation method considers the Swedish guidelines for a wind speed of 8 m/s. Only the sum level at 8 m/s is the official value, not the individual octave band levels! This calculation was made without visiting the site and is based on information provided by the customer. In case of discrepancies of site coordinates, ENERCON does not take any responsibility for calculated sound pressure values at considered noise sensitive areas (NSA). The calculation did not include an elevation model. The results represent a calculation for the customer only and are not meant to be submitted to planning authorities.

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**ENERCON GmbH Aurich**

Dreerkamp 5

DE-26605 Aurich

04941/927-0

Eric Merfels / Site Assessment

Calculated:

18.05.2016 14:01/3.0.651

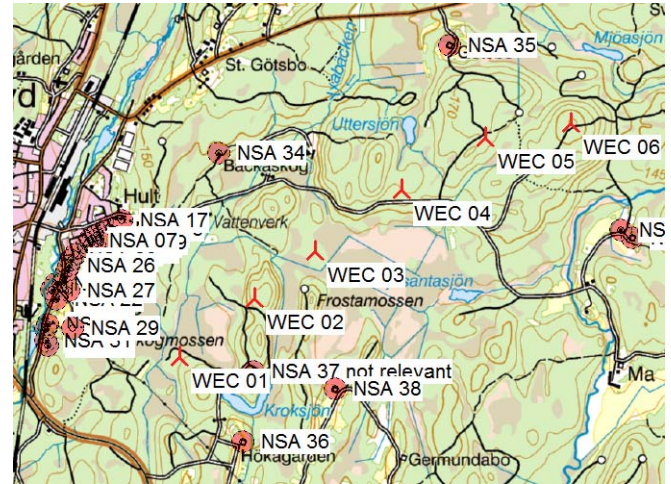
## DECIBEL - Main Result

**Calculation:** Additional/total noise impact: C01 (without NSA 37)

SVENSKA BESTÄMMELSER FÖR EXTERNT BULLER FRÅN  
LANDBASERADE VINDKRAFTVERK

Beräkningen är baserad på den av Statens Naturvårdsverk  
rekommenderad metod "Ljud från vindkraftverk", 2010 (NV dnr  
382-6897-07 Rv)

All coordinates are in  
SWE99TM



Scale 1:50.000  
New WTG Noise sensitive area

## WTGs

WEC	X(East)	Y(North)	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data		Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones
					Valid	Manufact.	Type-generator				Creator	Name			
WEC 01	397.306	6.340.061	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	
WEC 02	397.802	6.340.450	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	
WEC 03	398.199	6.340.760	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	
WEC 04	398.774	6.341.168	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	
WEC 05	399.325	6.341.512	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	
WEC 06	399.890	6.341.608	0,0	ENERCON GmbH E-92 2350 92.0 ... Yes	ENERCON GmbH	E-92-2.350	2.350	92,0	103,9	USER	Octave data OM 0s Rev. 1.1 (2.350 kW) + 1 dB safety margin	8,0	105,4	No	

## Calculation Results

### Sound Level

#### Noise sensitive area

No.	Name	X(East)	Y(North)	Z	Imission height [m]	Demands Noise [dB(A)]	Sound Level From WTGs [dB(A)]	Demands fulfilled ? Noise
NSA 01	Noise sensitive point: Swedish - Night; Dwellings (166)	396.619	6.340.739	0,0	1,5	40,0	35,6	Yes
NSA 02	Noise sensitive point: Swedish - Night; Dwellings (167)	396.724	6.340.761	0,0	1,5	40,0	36,4	Yes
NSA 03	Noise sensitive point: Swedish - Night; Dwellings (168)	396.705	6.340.787	0,0	1,5	40,0	36,1	Yes
NSA 04	Noise sensitive point: Swedish - Night; Dwellings (169)	396.694	6.340.810	0,0	1,5	40,0	35,8	Yes
NSA 05	Noise sensitive point: Swedish - Night; Dwellings (170)	396.748	6.340.798	0,0	1,5	40,0	36,4	Yes
NSA 06	Noise sensitive point: Swedish - Night; Dwellings (171)	396.726	6.340.815	0,0	1,5	40,0	36,1	Yes
NSA 07	Noise sensitive point: Swedish - Night; Dwellings (172)	396.719	6.340.828	0,0	1,5	40,0	35,9	Yes
NSA 08	Noise sensitive point: Swedish - Night; Dwellings (173)	396.714	6.340.839	0,0	1,5	40,0	35,8	Yes
NSA 09	Noise sensitive point: Swedish - Night; Dwellings (174)	396.782	6.340.818	0,0	1,5	40,0	36,5	Yes
NSA 10	Noise sensitive point: Swedish - Night; Dwellings (175)	396.771	6.340.843	0,0	1,5	40,0	36,3	Yes
NSA 11	Noise sensitive point: Swedish - Night; Dwellings (176)	396.756	6.340.866	0,0	1,5	40,0	36,0	Yes
NSA 12	Noise sensitive point: Swedish - Night; Dwellings (177)	396.798	6.340.861	0,0	1,5	40,0	36,3	Yes
NSA 13	Noise sensitive point: Swedish - Night; Dwellings (178)	396.785	6.340.882	0,0	1,5	40,0	36,1	Yes
NSA 14	Noise sensitive point: Swedish - Night; Dwellings (179)	396.838	6.340.917	0,0	1,5	40,0	36,3	Yes
NSA 15	Noise sensitive point: Swedish - Night; Dwellings (180)	396.890	6.340.904	0,0	1,5	40,0	36,8	Yes
NSA 16	Noise sensitive point: Swedish - Night; Dwellings (181)	396.890	6.340.907	0,0	1,5	40,0	36,8	Yes
NSA 17	Noise sensitive point: Swedish - Night; Dwellings (182)	396.925	6.340.961	0,0	1,5	40,0	36,6	Yes
NSA 18	Noise sensitive point: Swedish - Night; Dwellings (183)	396.422	6.340.244	0,0	1,5	40,0	35,5	Yes
NSA 19	Noise sensitive point: Swedish - Night; Dwellings (184)	396.433	6.340.279	0,0	1,5	40,0	35,5	Yes
NSA 20	Noise sensitive point: Swedish - Night; Dwellings (185)	396.460	6.340.505	0,0	1,5	40,0	35,2	Yes
NSA 21	Noise sensitive point: Swedish - Night; Dwellings (186)	396.484	6.340.547	0,0	1,5	40,0	35,2	Yes
NSA 22	Noise sensitive point: Swedish - Night; Dwellings (187)	396.493	6.340.443	0,0	1,5	40,0	35,7	Yes
NSA 23	Noise sensitive point: Swedish - Night; Dwellings (188)	396.540	6.340.559	0,0	1,5	40,0	35,8	Yes
NSA 24	Noise sensitive point: Swedish - Night; Dwellings (189)	396.548	6.340.593	0,0	1,5	40,0	35,7	Yes
NSA 25	Noise sensitive point: Swedish - Night; Dwellings (190)	396.561	6.340.633	0,0	1,5	40,0	35,6	Yes
NSA 26	Noise sensitive point: Swedish - Night; Dwellings (191)	396.572	6.340.664	0,0	1,5	40,0	35,6	Yes
NSA 27	Noise sensitive point: Swedish - Night; Dwellings (192)	396.573	6.340.501	0,0	1,5	40,0	36,4	Yes
NSA 28	Noise sensitive point: Swedish - Night; Dwellings (193)	396.585	6.340.702	0,0	1,5	40,0	35,5	Yes
NSA 29	Noise sensitive point: Swedish - Night; Dwellings (194)	396.600	6.340.254	0,0	1,5	40,0	37,7	Yes
NSA 30	Noise sensitive point: Swedish - Night; Dwellings (195)	396.433	6.340.136	0,0	1,5	40,0	35,7	Yes
NSA 31	Noise sensitive point: Swedish - Night; Dwellings (196)	396.424	6.340.167	0,0	1,5	40,0	35,6	Yes

To be continued on next page...

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04941/927-0

Eric Merfels / Site Assessment

Calculated:

18.05.2016 14:01/3.0.651

## DECIBEL - Main Result

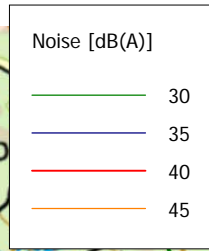
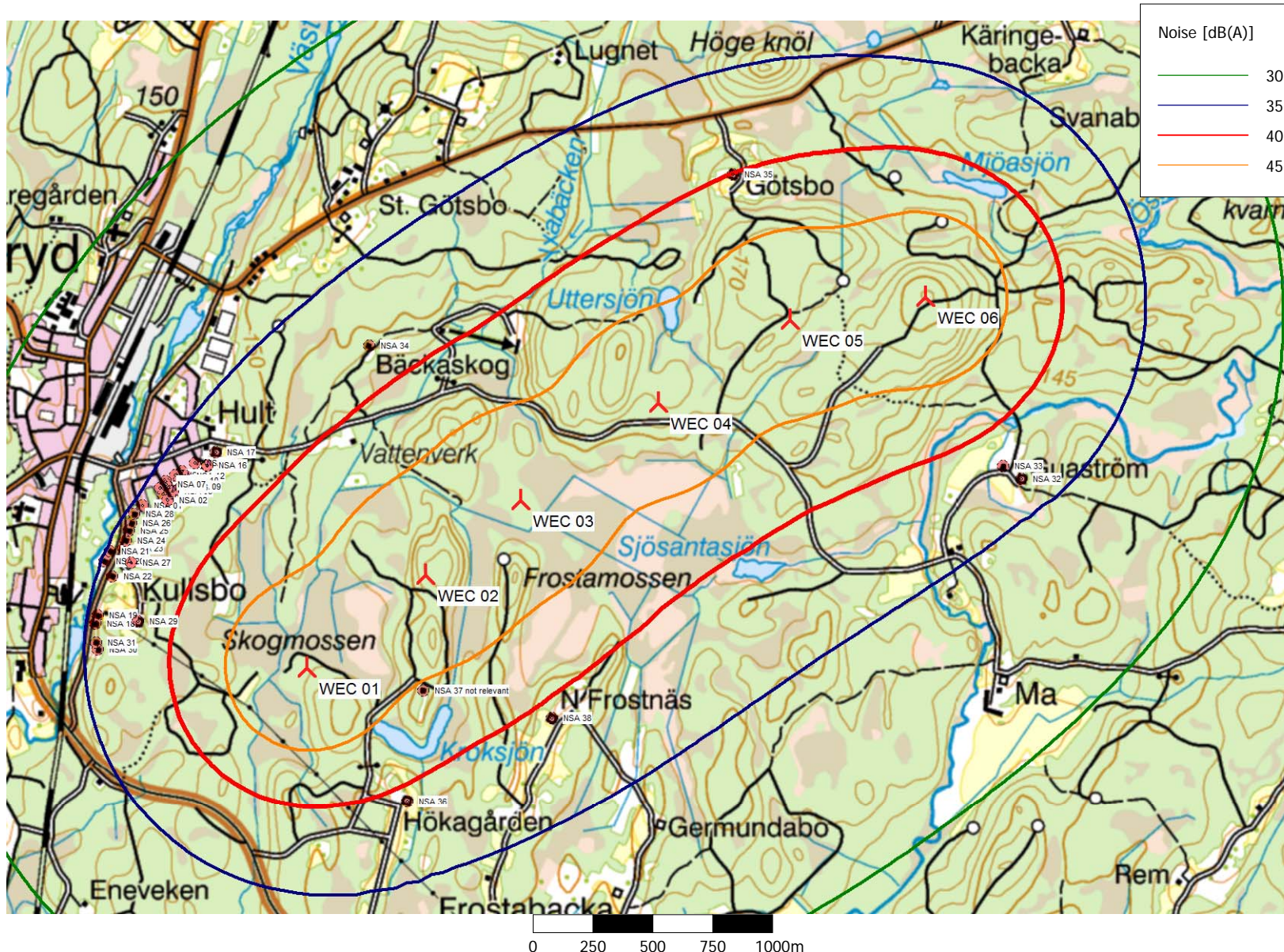
**Calculation:** Additional/total noise impact: C01 (without NSA 37)

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Noise sensitive area No.	Name	X(East)	Y(North)	Z	Imission height [m]	Demands Noise [dB(A)]	Sound Level From WTGs [dB(A)]	Demands fulfilled ? Noise
NSA 32	Noise sensitive point: Swedish - Night; Dwellings (197)	400.293	6.340.850	0,0	1,5	40,0	36,6	Yes
NSA 33	Noise sensitive point: Swedish - Night; Dwellings (198)	400.216	6.340.902	0,0	1,5	40,0	37,7	Yes
NSA 34	Noise sensitive point: Swedish - Night; Dwellings (199)	397.566	6.341.406	0,0	1,5	40,0	37,9	Yes
NSA 35	Noise sensitive point: Swedish - Night; Dwellings (200)	399.088	6.342.120	0,0	1,5	40,0	40,0	Yes
NSA 36	Noise sensitive point: Swedish - Night; Dwellings (201)	397.725	6.339.501	0,0	1,5	40,0	39,0	Yes
NSA 37	not relevant Noise sensitive point: Swedish - Night; Dwellings (202)	397.794	6.339.967	0,0	1,5	40,0	44,4	No
NSA 38	Noise sensitive point: Swedish - Night; Dwellings (203)	398.331	6.339.850	0,0	1,5	40,0	39,0	Yes

## Distances (m)

NSA	WTG					
	WEC 01	WEC 02	WEC 03	WEC 04	WEC 05	WEC 06
NSA 01	965	1218	1580	2197	2814	3385
NSA 02	910	1122	1475	2090	2707	3278
NSA 03	942	1148	1494	2104	2718	3289
NSA 04	967	1165	1506	2111	2723	3294
NSA 05	924	1110	1452	2060	2674	3245
NSA 06	951	1136	1474	2078	2691	3262
NSA 07	965	1147	1482	2083	2694	3266
NSA 08	977	1155	1487	2086	2696	3268
NSA 09	920	1084	1418	2023	2636	3207
NSA 10	947	1103	1431	2029	2640	3212
NSA 11	975	1126	1447	2040	2649	3221
NSA 12	947	1085	1405	2000	2609	3181
NSA 13	972	1105	1419	2009	2617	3189
NSA 14	975	1071	1370	1952	2557	3130
NSA 15	940	1019	1317	1902	2510	3082
NSA 16	942	1020	1317	1902	2509	3081
NSA 17	977	1015	1290	1861	2462	3035
NSA 18	902	1395	1850	2527	3168	3727
NSA 19	900	1380	1830	2504	3144	3704
NSA 20	955	1343	1758	2407	3037	3603
NSA 21	955	1322	1728	2373	3000	3568
NSA 22	898	1309	1735	2393	3027	3592
NSA 23	913	1267	1671	2316	2943	3511
NSA 24	926	1262	1659	2299	2925	3493
NSA 25	939	1254	1643	2277	2900	3469
NSA 26	950	1248	1630	2259	2880	3450
NSA 27	855	1230	1647	2300	2932	3497
NSA 28	964	1243	1615	2238	2857	3427
NSA 29	732	1218	1677	2358	3001	3558
NSA 30	876	1405	1873	2558	3203	3758
NSA 31	888	1407	1871	2554	3198	3754
NSA 32	3090	2523	2096	1552	1173	858
NSA 33	3029	2456	2022	1466	1080	778
NSA 34	1370	985	905	1231	1762	2333
NSA 35	2723	2108	1625	1002	652	952
NSA 36	700	952	1345	1970	2570	3021
NSA 37 not relevant	497	483	890	1550	2175	2662
NSA 38	1047	800	919	1391	1937	2350



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**DECIBEL -**  
**Map 8,0 m/s**  
**Calculation:**  
 Additional/total noise impact: C01 (without NSA 37)

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 Dreekamp 5  
 DE-26605 Aurich  
 04941/927-0  
 Eric Merfels / Site Assessment  
 Calculated:  
 18.05.2016 14:01/3.0.651

Map: terrängkartan , Print scale 1:25.000, Map center SWE99TM East: 398.750 North: 6.340.900

New WTG

Noise sensitive area

Noise calculation model: Swedish 2009. Wind speed: 8,0 m/s  
 Height above sea level: 0,0 m