WindPRO version 2.8.552 Jul 2012

Project:

Barzowice

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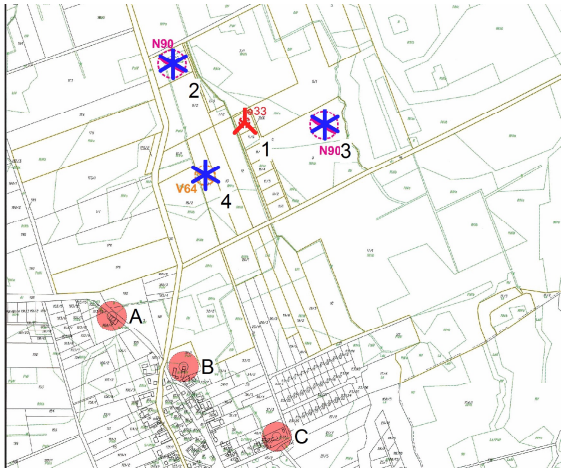
Calculated:

2014-11-21 10:35/2.8.552

DECIBEL - Main Result

Calculation: wariant skumulowany 1 G=0,3

Noise calculation model:
ISO 9613-2 General
Wind speed:
8,0 m/s
Ground attenuation:
General, Ground factor: 0,3
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)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4,0 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)



Scale 1:25 000

New WTG Existing WTG Noise sensitive area

WTGs

	Geo [deg,min,sec]-WGS84			Row data/Description	WTG type						Noise data						
	Longitude	Latitude	Z [m]		Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name	Wind speed [m/s]	Status	LwA,ref [dB(A)]	Pure tones	
1	16°30'42,79" East	54°29'18,85" North	6,0	ENERCON E-33 300 33.0 !O! hub: 49,0 m ...	No	ENERCON	E-33-300	300	33,0	49,0	EMD	8m/s DEWI 09/92	8,0	User value	100,0	0 dB	h
2	16°30'29,29" East	54°29'24,91" North	4,0	NORDEX N90 2300 90.0 !-! hub: 100,0 m (...	Yes	NORDEX	N90-2 300	2 300	90,0	100,0	EMD	Level 0 - official - - 11-2005	8,0	From other hub height	104,5	0 dB	h
3	16°30'57,51" East	54°29'18,88" North	6,0	NORDEX N90 2300 90.0 !-! hub: 100,0 m (...	Yes	NORDEX	N90-2 300	2 300	90,0	100,0	EMD	Level 0 - official - - 11-2005	8,0	From other hub height	104,5	0 dB	h
4	16°30'35,73" East	54°29'13,15" North	7,5	VENSYS 64 1200 64.0 !-! hub: 85,0 m (TO...	Yes	VENSYS	64-1 200	1 200	64,0	85,0	EMD	Level 0 - guaranteed - FGW(Germany) - 10/2005	8,0	Generic data based on turbine power (very uncertain)	102,2	0 dB	a

a) Generic data based on turbine power (very uncertain)
h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area			Geo [deg,min,sec]-WGS84				Demands	Sound Level	Demands fulfilled ?
No.	Name		Longitude	Latitude	Z [m]	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Noise
A	Noise sensitive point:	(1)	16°30'19,06" East	54°28'57,69" North	12,0	4,0	45,0	39,9	Yes
B	Noise sensitive point:	(2)	16°30'32,48" East	54°28'52,47" North	15,5	4,0	45,0	39,0	Yes
C	Noise sensitive point:	(3)	16°30'49,85" East	54°28'45,16" North	33,5	4,0	45,0	36,5	Yes

Distances (m)

WTG	A	B	C
1	781	836	1049
2	861	1005	1283
3	953	933	1051
4	564	642	902

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DECIBEL - Detailed results

Calculation: wariant skumulowany 1 G=0,3**Noise calculation model:** ISO 9613-2 General 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: (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	781	782	**30,67**	100,0	0,00	68,87	-	-	0,00	0,00	-	0,00
2	861	866	**34,08**	104,5	0,00	69,75	-	-	0,00	0,00	-	0,00
3	953	957	**33,01**	104,5	0,00	70,62	-	-	0,00	0,00	-	0,00
4	564	570	**36,11**	102,2	0,00	66,11	-	-	0,00	0,00	-	0,00

Sum 39,91

- Data undefined due to calculation with octave data

Noise sensitive area: B Noise sensitive point: (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	836	837	**29,96**	100,0	0,00	69,46	-	-	0,00	0,00	-	0,00
2	1 005	1 008	**32,45**	104,5	0,00	71,07	-	-	0,00	0,00	-	0,00
3	933	937	**33,24**	104,5	0,00	70,43	-	-	0,00	0,00	-	0,00
4	642	646	**34,81**	102,2	0,00	67,21	-	-	0,00	0,00	-	0,00

Sum 38,97

- Data undefined due to calculation with octave data

Noise sensitive area: C Noise sensitive point: (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	1 049	1 049	**27,53**	100,0	0,00	71,42	-	-	0,00	0,00	-	0,00
2	1 283	1 285	**29,77**	104,5	0,00	73,18	-	-	0,00	0,00	-	0,00
3	1 051	1 054	**31,97**	104,5	0,00	71,45	-	-	0,00	0,00	-	0,00
4	902	903	**31,29**	102,2	0,00	70,12	-	-	0,00	0,00	-	0,00

Sum 36,47

- Data undefined due to calculation with octave data

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DECIBEL - Assumptions for noise calculation

Calculation: wariant skumulowany 1 G=0,3**Noise calculation model:** ISO 9613-2 General 8,0 m/s

Noise calculation model:
ISO 9613-2 General
Wind speed:
8,0 m/s
Ground attenuation:
General, Ground factor: 0,3
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)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4,0 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	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: ENERCON E-33 300 33.0 !O!
Noise: 8m/s DEWI 09/92

Source	Source/Date	Creator	Edited
DEWI	1992-09-23	EMD	2003-08-08 16:34

					Octave data							
Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
User value	8,0	100,0	No	Generic data	81,6	88,6	92,0	94,6	94,4	91,5	86,7	77,2

WTG: NORDEX N90 2300 90.0 !-!
Noise: Level 0 - official - - 11-2005

Source	Source/Date	Creator	Edited
Manufacturer	2005-11-28	EMD	2006-05-09 11:59

Warrenty levels according to IEC 61400-11:1002
Terrain roughness length z0=0,05m
Tonal audibility <=4dB

						Octave data							
Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From other hub height	100,0	8,0	104,5	No	Generic data	86,1	93,1	96,5	99,1	98,9	96,0	91,2	81,7

WTG: VENSYS 64 1200 64.0 !-!
Noise: Level 0 - guaranteed - FGW(Germany) - 10/2005

Source	Source/Date	Creator	Edited
VENSYS	2005-10-28	EMD	2006-07-14 13:39

According to VENSYS specification "Schall Garantie.pdf" Version 1.0 for VENSYS 64 with 1200kW rated power

						Octave data							
Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones		63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
Generic data based on turbine power (very uncertain)	85,0	8,0	102,2	No	Generic data	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

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DECIBEL - Assumptions for noise calculation

Calculation: wariant skumulowany 1 G=0,3**Noise calculation model:** ISO 9613-2 General 8,0 m/s

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

Noise demand: 45,0 dB(A)
Distance demand:

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

Noise demand: 45,0 dB(A)
Distance demand:

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

Noise demand: 45,0 dB(A)
Distance demand:

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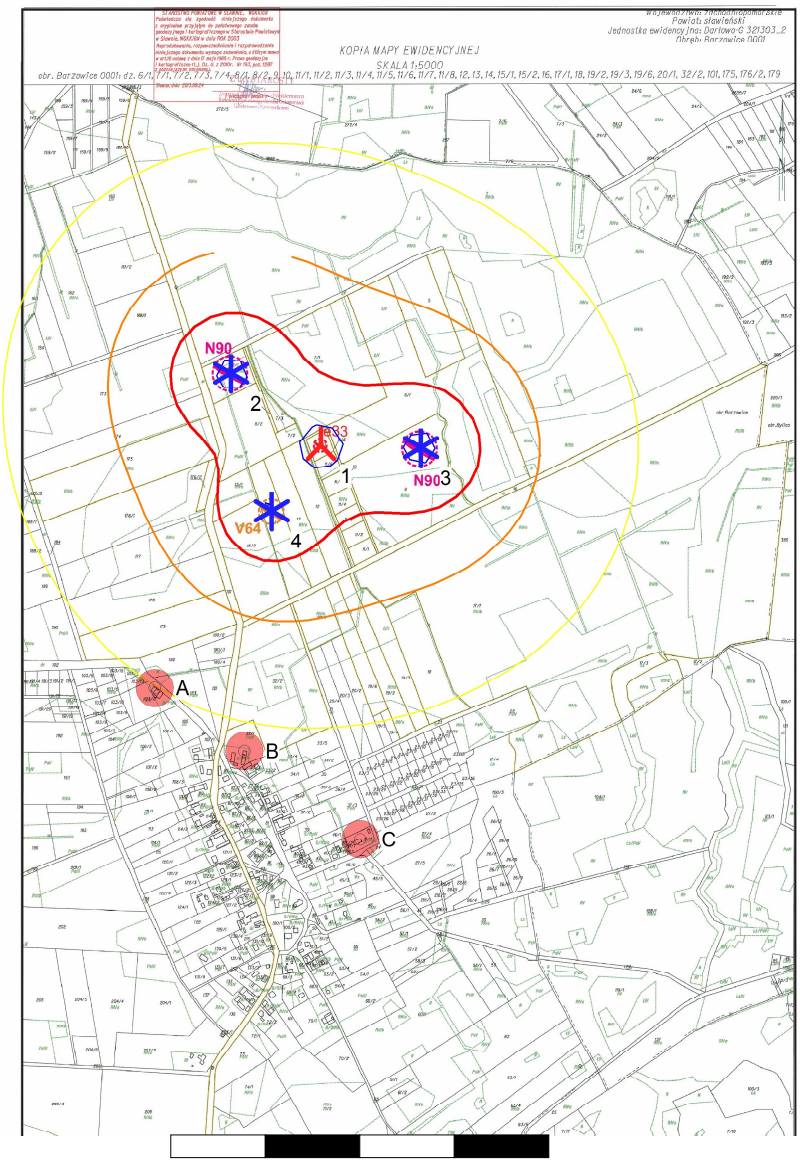
DECIBEL - Map 8,0 m/s

Calculation: wariant skumulowany 1 G=0,3**Noise calculation model:** ISO 9613-2 General 8,0 m/s

Noise [dB(A)]
40 dB(A)
45 dB(A)
50 dB(A)
55 dB(A)



Map: mapa , Print scale 1:20 000, Map center Geo WGS84 East: 16°30'43,48" East North: 54°29'19,01" North

New WTG Existing WTG Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 8,0 m/s
Height above sea level from active line object