

Project:

Borkowo-Falenta

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2014-03-25 07:43 / 1

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Enerko Przedsiębiorstwo Rozwoju Energii Odnawialnej Michal Kubecki

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Calculated:

2014-03-24 15:44/2.8.552

DECIBEL - Main Result**Calculation:** G97 90m+2xe53 poprawione**Noise calculation model:**

ISO 9613-2 General

Wind speed:

8,0 m/s

Ground attenuation:

General, Ground factor: 0,9

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:

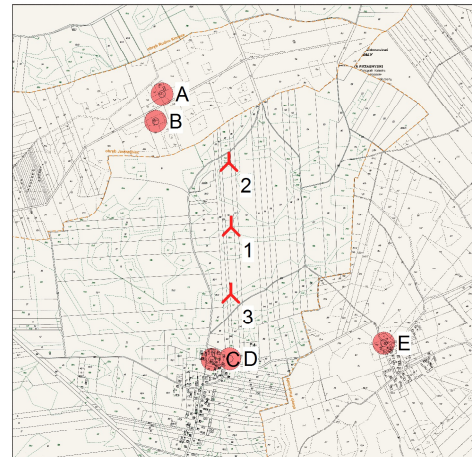
Pure and Impulse tone penalty are added to WTG source noise

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 1:40 000

New WTG

Noise sensitive area

WTGs

Geo [deg,min,sec]-WGS84 Longitude	Latitude	Z [m]	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data		Wind speed [m/s]	Status	LwA,ref [dB(A)]	Pure tones
				Valid	Manufact.	Type-generator				Creator	Name				
1 20°45'46,56" East	53°05'29,53" North	158,2	GAMESA G97 2000 97.0 I:OI hub: 9...	Yes	GAMESA	G97-2 000	2 000	97,0	90,0	EMD	Level 0 - Estimated - - 07-2012	8,0	User value	105,8	0 dB h
2 20°45'45,83" East	53°05'40,75" North	160,0	ENERCON E-53 800 53.0 I: hub: 73...	Yes	ENERCON	E-53-800	800	53,0	73,0	EMD	Level 0 - man.spec. - Enercon - 05/2010	8,0	User value	102,5	0 dB h
3 20°45'46,47" East	53°05'17,91" North	152,7	ENERCON E-53 800 53.0 I: hub: 73...	Yes	ENERCON	E-53-800	800	53,0	73,0	EMD	Level 1 - man.spec. - 750kW/Rev.1.0 - 09/2010	8,0	User value	101,0	0 dB h

h) Generic octave distribution used

Calculation Results**Sound Level**

Noise sensitive area No.	Name	Geo [deg,min,sec]-WGS84 Longitude		Latitude	Z [m]	Imission height [m]	Demands Noise [dB(A)]	Sound Level From WTGs [dB(A)]	Demands fulfilled ? Noise
A	Noise sensitive point: (1)	20°45'26,79" East	53°05'52,60" North	160,0	4,0	45,0	38,0	Yes	
B	Noise sensitive point: (2)	20°45'25,01" East	53°05'47,80" North	160,0	4,0	45,0	39,4	Yes	
C	Noise sensitive point: (3)	20°45'41,13" East	53°05'06,59" North	150,0	4,0	45,0	39,6	Yes	
D	Noise sensitive point: (4)	20°45'46,17" East	53°05'06,67" North	150,0	4,0	45,0	39,9	Yes	
E	Noise sensitive point: (5)	20°46'30,10" East	53°05'09,53" North	150,0	4,0	45,0	33,9	Yes	

Distances (m)

NSA	WTG		
	1	2	3
A	802	509	1133
B	692	444	1006
C	716	1059	364
D	707	1053	347
E	1019	1268	852

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DECIBEL - Detailed results**Calculation:** G97 90m+2xe53 poprawione **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	802	806	34,00	105,8	0,00	69,13	-	-	0,00	0,00	-	0,00
2	509	514	35,39	102,5	0,00	65,22	-	-	0,00	0,00	-	0,00
3	1 133	1 134	25,48	101,0	0,00	72,09	-	-	0,00	0,00	-	0,00
Sum	38,01											

- 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	692	697	35,54	105,8	0,00	67,87	-	-	0,00	0,00	-	0,00
2	444	450	36,74	102,5	0,00	64,06	-	-	0,00	0,00	-	0,00
3	1 006	1 008	26,79	101,0	0,00	71,07	-	-	0,00	0,00	-	0,00
Sum	39,44											

- 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	716	722	35,17	105,8	0,00	68,18	-	-	0,00	0,00	-	0,00
2	1 059	1 062	27,71	102,5	0,00	71,53	-	-	0,00	0,00	-	0,00
3	364	371	37,16	101,0	0,00	62,38	-	-	0,00	0,00	-	0,00
Sum	39,58											

- Data undefined due to calculation with octave data

Noise sensitive area: D Noise sensitive point: (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	707	713	35,31	105,8	0,00	68,06	-	-	0,00	0,00	-	0,00
2	1 053	1 056	27,78	102,5	0,00	71,47	-	-	0,00	0,00	-	0,00
3	347	355	37,59	101,0	0,00	62,00	-	-	0,00	0,00	-	0,00
Sum	39,89											

- Data undefined due to calculation with octave data

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DECIBEL - Detailed results**Calculation:** G97 90m+2xe53 poprawione **Noise calculation model:** ISO 9613-2 General 8,0 m/s**Noise sensitive area: E Noise sensitive point: (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	1 019	1 023	31,42	105,8	0,00	71,20	-	-	0,00	0,00	-	0,00
2	1 268	1 271	25,70	102,5	0,00	73,08	-	-	0,00	0,00	-	0,00
3	852	855	28,58	101,0	0,00	69,64	-	-	0,00	0,00	-	0,00

Sum 33,95

- Data undefined due to calculation with octave data

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DECIBEL - Assumptions for noise calculation**Calculation:** G97 90m+2xe53 poprawione **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: 0,9

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	125	250	500	1 000	2 000	4 000	8 000
[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]	[db/km]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: GAMESA G97 2000 97.0 !O!**Noise:** Level 0 - Estimated - - 07-2012

Source Source/Date Creator Edited
 Manufacturer 2012-07-30 EMD 2013-07-18 10:08
 Based on document GD161807-en, Rev.0.

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]	
User value	90,0	8,0	105,8	No	Generic data	87,4	94,4	97,8	100,4	100,2	97,3	92,5	83,0

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]	
User value	73,3	8,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7

WTG: ENERCON E-53 800 53.0 !-!**Noise:** Level 1 - man.spec. - 750kW/Rev.1.0 - 09/2010

Source Source/Date Creator Edited
 Enercon 2010-09-01 EMD 2011-01-13 12:29
 According to Enercon specification SIAS-04-SPL E-53 red 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]	
User value	73,0	8,0	101,0	No	Generic data	82,6	89,6	93,0	95,6	95,4	92,5	87,7	78,2

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

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DECIBEL - Assumptions for noise calculation

Calculation: G97 90m+2xe53 poprawione **Noise calculation model:** ISO 9613-2 General 8,0 m/s

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:

NSA: Noise sensitive point: (4)-D

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: (5)-E

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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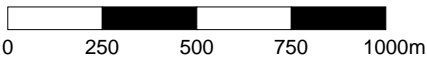
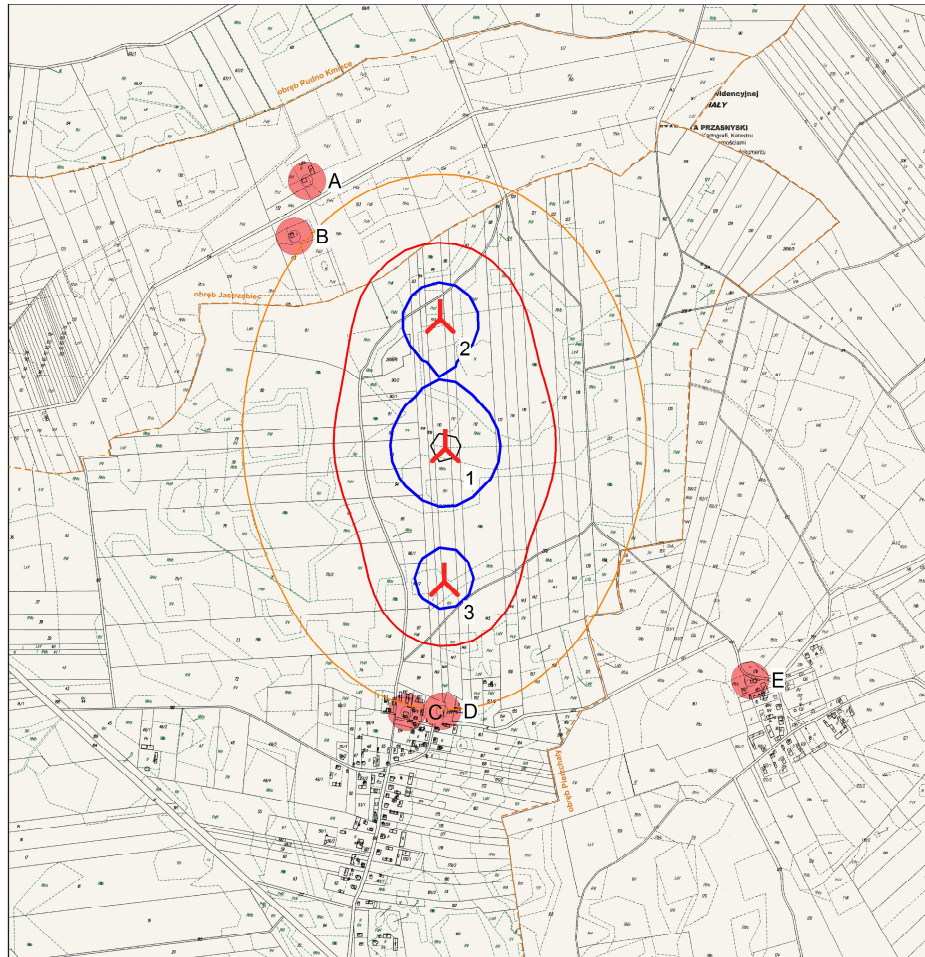
Calculated:

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DECIBEL - Map 8,0 m/s


Calculation: G97 90m+2xe53 poprawione Noise calculation model: ISO 9613-2 General 8,0 m/s

Noise [dB(A)]	
	40
	45
	50
	55



Map: mapa falenty , Print scale 1:20 000, Map center Geo WGS84 East: 20°45'46,26" East North: 53°05'29,31" North

 New 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