

## DECIBEL - Main Result

**Calculation:** Analiza akustyczna - wariant alternatywny

### Noise calculation model:

ISO 9613-2 General

### Wind speed:

10,0 m/s

### Ground attenuation:

General, fixed, Ground factor: 0,8

### 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:

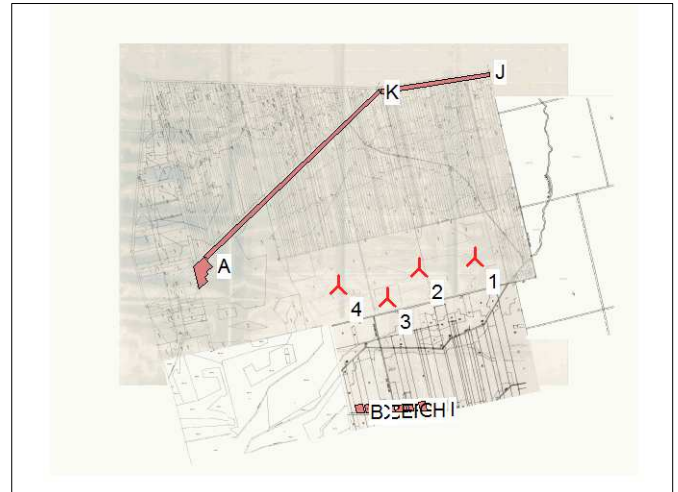
Pure and Impulse tone penalty are added to WTG source noise

### Height above ground level, when no value in NSA object:

4,0 m 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

	Longitude	Latitude	Z [m]	Row data/Description	WTG type				Noise data				Wind speed [m/s]	Status	LwA,ref [dB(A)]	Pure tones	
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name					
1	20°28'02,76" E	51°03'50,76" N	253,9	EW4	No	REpower	3.0M122-3 000	3 000	122,0	143,0	USER	Level 0 - Guaranteed	-- 07-2013	10,0	Interpolated	103,8	No g
2	20°27'47,63" E	51°03'48,92" N	255,2	EW2	No	REpower	3.0M122-3 000	3 000	122,0	143,0	USER	Level 0 - Guaranteed	-- 07-2013	10,0	Interpolated	103,8	No g
3	20°27'38,77" E	51°03'43,75" N	253,8	EW1	No	REpower	3.0M122-3 000	3 000	122,0	143,0	USER	Level 0 - Guaranteed	-- 07-2013	10,0	Interpolated	103,8	No g
4	20°27'25,50" E	51°03'45,95" N	254,7	EW3	No	REpower	3.0M122-3 000	3 000	122,0	143,0	USER	Level 0 - Guaranteed	-- 07-2013	10,0	Interpolated	103,8	No g

g) Data calculated from data for other wind speed (uncertain)

## Calculation Results

### Sound Level

Noise sensitive area				Demands			Sound Level			Demands fulfilled ?	
No.	Name	Longitude	Latitude	Z [m]	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Distance to noise demand [m]	Noise	Distance to noise demand [m]	Noise
A	R1	20°26'50,85" E	51°03'49,32" N	254,2	4,0	45,0	36,8	458	Yes		
B	R2	20°27'31,92" E	51°03'25,22" N	250,0	4,0	40,0	39,5	35	Yes		
C	R3	20°27'33,66" E	51°03'25,25" N	250,5	4,0	40,0	39,6	29	Yes		
D	R4	20°27'37,07" E	51°03'25,02" N	251,1	4,0	40,0	39,5	31	Yes		
E	R5	20°27'40,48" E	51°03'25,15" N	252,9	4,0	40,0	39,6	27	Yes		
F	R6	20°27'43,92" E	51°03'25,27" N	254,3	4,0	40,0	39,6	28	Yes		
G	R7	20°27'45,73" E	51°03'25,19" N	254,4	4,0	40,0	39,5	35	Yes		
H	R8	20°27'47,22" E	51°03'25,55" N	255,6	4,0	40,0	39,6	29	Yes		
I	R9	20°27'51,15" E	51°03'25,77" N	255,3	4,0	40,0	39,4	40	Yes		
J	MN/RM	20°27'36,95" E	51°04'19,55" N	269,9	4,0	40,0	35,6	373	Yes		
K	MN/RM	20°27'08,21" E	51°04'02,18" N	266,8	4,0	40,0	38,4	107	Yes		

### Distances (m)

WTG				
NSA	1	2	3	4
A	1400	1105	949	682
B	991	793	588	652
C	971	780	580	658
D	939	766	580	681
E	902	747	576	702
F	869	734	579	717
G	857	734	588	742
H	817	717	586	759
I	791	718	606	799
J	958	967	1107	1062
K	994	829	823	594

## DECIBEL - Detailed results

**Calculation:** Analiza akustyczna - wariant alternatywny **Noise calculation model:** ISO 9613-2 General 10,0 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 R1

		Wind speed: 10,0 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	1 400	1 407	<b>26,19</b>	103,8	0,00	73,97	-	-	0,00	0,00	-	0,00
2	1 105	1 114	<b>28,83</b>	103,8	0,00	71,94	-	-	0,00	0,00	-	0,00
3	949	959	<b>30,49</b>	103,8	0,00	70,63	-	-	0,00	0,00	-	0,00
4	682	697	<b>33,90</b>	103,8	0,00	67,86	-	-	0,00	0,00	-	0,00

Sum 36,77

- Data undefined due to calculation with octave data

### Noise sensitive area: B R2

		Wind speed: 10,0 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	991	1 002	<b>30,01</b>	103,8	0,00	71,01	-	-	0,00	0,00	-	0,00
2	793	806	<b>32,35</b>	103,8	0,00	69,13	-	-	0,00	0,00	-	0,00
3	588	605	<b>35,37</b>	103,8	0,00	66,63	-	-	0,00	0,00	-	0,00
4	652	668	<b>34,34</b>	103,8	0,00	67,50	-	-	0,00	0,00	-	0,00

Sum 39,49

- Data undefined due to calculation with octave data

### Noise sensitive area: C R3

		Wind speed: 10,0 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	971	981	<b>30,24</b>	103,8	0,00	70,83	-	-	0,00	0,00	-	0,00
2	780	793	<b>32,53</b>	103,8	0,00	68,99	-	-	0,00	0,00	-	0,00
3	580	597	<b>35,50</b>	103,8	0,00	66,52	-	-	0,00	0,00	-	0,00
4	659	674	<b>34,24</b>	103,8	0,00	67,58	-	-	0,00	0,00	-	0,00

Sum 39,57

- Data undefined due to calculation with octave data

### Noise sensitive area: D R4

		Wind speed: 10,0 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	939	950	<b>30,59</b>	103,8	0,00	70,55	-	-	0,00	0,00	-	0,00
2	766	779	<b>32,72</b>	103,8	0,00	68,83	-	-	0,00	0,00	-	0,00
3	580	596	<b>35,52</b>	103,8	0,00	66,51	-	-	0,00	0,00	-	0,00
4	685	699	<b>33,86</b>	103,8	0,00	67,89	-	-	0,00	0,00	-	0,00

Sum 39,55

- Data undefined due to calculation with octave data

## DECIBEL - Detailed results

**Calculation:** Analiza akustyczna - wariant alternatywny **Noise calculation model:** ISO 9613-2 General 10,0 m/s

### Noise sensitive area: E R5

WTG		Wind speed: 10,0 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	902	913	<b>31,02</b>	103,8	0,00	70,21	-	-	0,00	0,00	-	0,00
2	747	761	<b>32,98</b>	103,8	0,00	68,62	-	-	0,00	0,00	-	0,00
3	576	592	<b>35,59</b>	103,8	0,00	66,45	-	-	0,00	0,00	-	0,00
4	706	719	<b>33,56</b>	103,8	0,00	68,14	-	-	0,00	0,00	-	0,00

Sum 39,61

- Data undefined due to calculation with octave data

### Noise sensitive area: F R6

WTG		Wind speed: 10,0 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	869	880	<b>31,42</b>	103,8	0,00	69,89	-	-	0,00	0,00	-	0,00
2	734	747	<b>33,16</b>	103,8	0,00	68,47	-	-	0,00	0,00	-	0,00
3	580	596	<b>35,53</b>	103,8	0,00	66,50	-	-	0,00	0,00	-	0,00
4	733	746	<b>33,19</b>	103,8	0,00	68,45	-	-	0,00	0,00	-	0,00

Sum 39,60

- Data undefined due to calculation with octave data

### Noise sensitive area: G R7

WTG		Wind speed: 10,0 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	857	868	<b>31,57</b>	103,8	0,00	69,77	-	-	0,00	0,00	-	0,00
2	734	747	<b>33,17</b>	103,8	0,00	68,47	-	-	0,00	0,00	-	0,00
3	589	605	<b>35,37</b>	103,8	0,00	66,64	-	-	0,00	0,00	-	0,00
4	753	765	<b>32,91</b>	103,8	0,00	68,68	-	-	0,00	0,00	-	0,00

Sum 39,50

- Data undefined due to calculation with octave data

### Noise sensitive area: H R8

WTG		Wind speed: 10,0 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	835	847	<b>31,83</b>	103,8	0,00	69,55	-	-	0,00	0,00	-	0,00
2	722	735	<b>33,34</b>	103,8	0,00	68,33	-	-	0,00	0,00	-	0,00
3	586	602	<b>35,42</b>	103,8	0,00	66,59	-	-	0,00	0,00	-	0,00
4	759	771	<b>32,83</b>	103,8	0,00	68,75	-	-	0,00	0,00	-	0,00

Sum 39,58

- Data undefined due to calculation with octave data

### Noise sensitive area: I R9

WTG		Wind speed: 10,0 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	805	816	<b>32,23</b>	103,8	0,00	69,23	-	-	0,00	0,00	-	0,00
2	718	732	<b>33,38</b>	103,8	0,00	68,29	-	-	0,00	0,00	-	0,00
3	606	621	<b>35,10</b>	103,8	0,00	66,86	-	-	0,00	0,00	-	0,00
4	799	811	<b>32,30</b>	103,8	0,00	69,18	-	-	0,00	0,00	-	0,00

Sum 39,44

- Data undefined due to calculation with octave data

### Noise sensitive area: J MN/RM

WTG		Wind speed: 10,0 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	1 022	1 028	<b>29,72</b>	103,8	0,00	71,24	-	-	0,00	0,00	-	0,00
2	969	976	<b>30,29</b>	103,8	0,00	70,79	-	-	0,00	0,00	-	0,00
3	1 107	1 113	<b>28,85</b>	103,8	0,00	71,93	-	-	0,00	0,00	-	0,00
4	1 062	1 068	<b>29,30</b>	103,8	0,00	71,57	-	-	0,00	0,00	-	0,00

Sum 35,59

- Data undefined due to calculation with octave data

Project:

**Elektrownie wiatrowe Smyków**

Licensed user:

**ENVO**  
ul.Sikorskiego 25/20  
PL-62 030 Lubon  
0048 662 643 300  
ENVO / envo-i.nowicki@wp.pl  
Calculated:  
2015-06-28 20:12/3.0.578

## DECIBEL - Detailed results

**Calculation:** Analiza akustyczna - wariant alternatywny **Noise calculation model:** ISO 9613-2 General 10,0 m/s

**Noise sensitive area: K MN/RM**

**WTG**

**Wind speed: 10,0 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	1 119	1 126	<b>28,71</b>	103,8	0,00	72,03	-	-	0,00	0,00	-	0,00
2	870	879	<b>31,42</b>	103,8	0,00	69,88	-	-	0,00	0,00	-	0,00
3	823	833	<b>32,00</b>	103,8	0,00	69,42	-	-	0,00	0,00	-	0,00
4	604	618	<b>35,16</b>	103,8	0,00	66,81	-	-	0,00	0,00	-	0,00

Sum 38,45

- Data undefined due to calculation with octave data

## DECIBEL - Assumptions for noise calculation

**Calculation:** Analiza akustyczna - wariant alternatywny **Noise calculation model:** ISO 9613-2 General 10,0 m/s

**Noise calculation model:**

ISO 9613-2 General

**Wind speed:**

10,0 m/s

**Ground attenuation:**

General, fixed, Ground factor: 0,8

**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 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:** REpower 3.0M122 3000 122.0 !O!

**Noise:** Level 0 - Guaranteed - - 07-2013

Source	Source/Date	Creator	Edited
Manufacturer	2013-07-10	USER	2013-12-23 10:16

Based on document SD-3.5-WT.PC-00-A-C-EN.

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Generic data	Octave data							
						63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
Interpolated	143,0	10,0	103,8	No		85,4	92,4	95,8	98,4	98,2	95,3	90,5	81,0

**NSA:** R1-A

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R2-B

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R3-C

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R4-D

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

## DECIBEL - Assumptions for noise calculation

**Calculation:** Analiza akustyczna - wariant alternatywny **Noise calculation model:** ISO 9613-2 General 10,0 m/s

**NSA:** R5-E

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R6-F

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R7-G

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R8-H

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** R9-I

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** MN/RM-J

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**

**NSA:** MN/RM-K

**Predefined calculation standard:**

**Imission height(a.g.l.):** Use standard value from calculation model

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

**No distance demand**