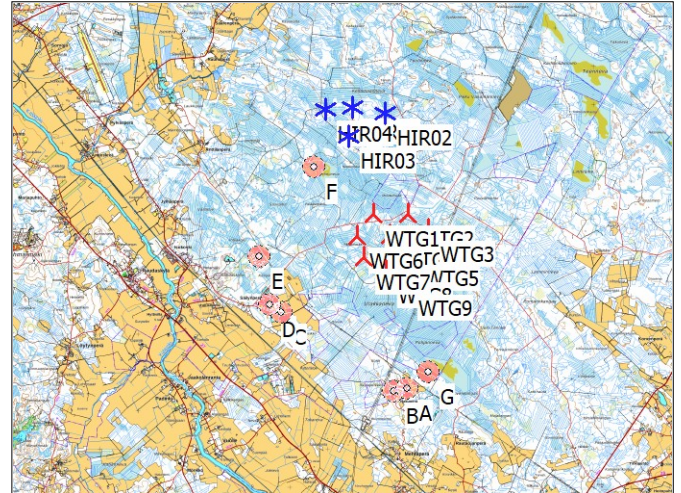


DECIBEL - Main Result

Calculation: 2023-01-25_Urakkaneva_Noise_ISO-9613_9xV172-7.2MW_HH169_106.9+2.0dB_with Hirvineva

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014 " from the Ministry of the Environment of Finland

All coordinates are in UTM (north)-ETRS89 Zone: 35



Scale 1:200.000
 ▲ New WTG
 ■ Noise sensitive area

WTGs

	Easting	Northing	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)]
					Valid	Manufact.	Type-generator				Creator	Name		
HIR01	395.638	7.103.907	90,0	VESTAS V150-4.2 4200 150.0...	Yes	VESTAS	V150-4.2-4.200	4.200	150,0	155,0	USER	ZZ_FIN_OCT_V150_STE_4.2_PO1_104.9+2.0dB(A)	8,0	106,9
HIR02	396.514	7.103.767	95,0	VESTAS V150-4.2 4200 150.0...	Yes	VESTAS	V150-4.2-4.200	4.200	150,0	155,0	USER	ZZ_FIN_OCT_V150_STE_4.2_PO1_104.9+2.0dB(A)	8,0	106,9
HIR03	395.550	7.103.150	90,0	VESTAS V150-4.2 4200 150.0...	Yes	VESTAS	V150-4.2-4.200	4.200	150,0	155,0	USER	ZZ_FIN_OCT_V150_STE_4.2_PO1_104.9+2.0dB(A)	8,0	106,9
HIR04	394.929	7.103.873	86,6	VESTAS V150-4.2 4200 150.0...	Yes	VESTAS	V150-4.2-4.200	4.200	150,0	155,0	USER	ZZ_FIN_OCT_V150_STE_4.2_PO1_104.9+2.0dB(A)	8,0	106,9
WTG1	396.211	7.101.094	94,2	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG2	397.111	7.101.106	95,5	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG3	397.634	7.100.697	99,0	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG4	396.621	7.100.560	95,9	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG5	397.234	7.100.072	97,3	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG6	395.776	7.100.518	94,5	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG7	395.945	7.099.964	95,0	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG8	396.528	7.099.617	95,3	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9
WTG9	397.062	7.099.281	96,6	VESTAS V172-7.2 7200 172.0...	Yes	VESTAS	V172-7.2-7.200	7.200	172,0	169,0	USER	PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms	8,0	108,9

Calculation Results

Sound level

Noise sensitive area

No.	Name	Easting	Northing	Z	Immission height	Demands Noise	Sound level From WTGs	Demands fulfilled ?	2 dB penalty applied for one or more WTGs
				[m]	[m]	[dB(A)]	[dB(A)]	Noise	
A	A Asuinrakennus (Hakuperäntie 202)	397.098	7.096.526	95,0	4,0	40,0	31,7	Yes	No
B	B Asuinrakennus (Hakuperäntie 169)	396.724	7.096.452	91,8	4,0	40,0	31,5	Yes	No
C	C Asuinrakennus (Säilyntie 285)	393.762	7.098.532	81,3	4,0	40,0	33,0	Yes	No
D	D Asuinrakennus (Säilyntie 264)	393.460	7.098.729	85,0	4,0	40,0	32,4	Yes	No
E	E Lomarakennus (Raudaskallion metsatie)	393.183	7.099.996	90,0	4,0	40,0	33,0	Yes	No
F	F Lomarakennus (Hirvinevanhaara 147)	394.644	7.102.345	90,5	4,0	40,0	38,4	Yes	No
G	G Lomarakennus (Pohjanneva)	397.651	7.096.966	99,4	4,0	40,0	32,9	Yes	No

Distances (m)

WTG	A	B	C	D	E	F	G
HIR01	7524	7534	5693	5617	4618	1851	7227
HIR02	7265	7318	5914	5891	5032	2349	6895
HIR03	6802	6800	4952	4890	3943	1212	6531
HIR04	7660	7635	5467	5350	4252	1554	7424
WTG1	4654	4671	3544	3628	3221	2004	4373
WTG2	4580	4670	4224	4357	4082	2761	4175
WTG3	4205	4341	4436	4615	4506	3414	3731
WTG4	4062	4110	3506	3653	3484	2663	3739
WTG5	3549	3656	3798	4006	4052	3446	3134

To be continued on next page...

Project:

Urakkaneva

Licensed user:

ABO Wind AG

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+49 611 26765 0

Dominik Fremgen / dominik.fremgen@abo-wind.de

Calculated:

26.01.2023 09:31/3.6.361

DECIBEL - Main Result

Calculation: 2023-01-25_Urakkaneva_Noise_ISO-9613_9xV172-7.2MW_HH169_106.9+2.0dB_with Hirvineva

...continued from previous page

WTG	A	B	C	D	E	F	G
WTG6	4205	4175	2828	2927	2645	2150	4016
WTG7	3626	3598	2611	2775	2762	2713	3450
WTG8	3143	3171	2971	3194	3367	3316	2879
WTG9	2755	2849	3384	3644	3944	3903	2389

Project:

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Dominik Fremgen / dominik.fremgen@abo-wind.de

Calculated:

26.01.2023 09:31/3.6.361

DECIBEL - Assumptions for noise calculation

Calculation: 2023-01-25_Urakkaneva_Noise_ISO-9613_9xV172-7.2MW_HH169_106.9+2.0dB_with Hirvineva

Noise calculation model:

ISO 9613-2 Finland

Wind speed (in 10 m height):

8,0 m/s

Ground attenuation:

General, Ground factor: 0,4

Meteorological coefficient, CO:

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 tones penalty is added to total noise impact at receptors

Noise sensitive area

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

Uncertainty margin:

0,0 dB; Uncertainty margin in NSA has priority

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Frequency dependent 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]
0,10	0,38	1,12	2,36	4,08	8,78	26,60	95,00

All coordinates are in

UTM (north)-ETRS89 Zone: 35

WTG: VESTAS V172-7.2 7200 172.0 !O!

Noise: PS_FIN_V172-7.2_PO7200_7200kW_106.9+2.0dB_8ms

Source Source/Date Creator Edited
 Man./DF 30.06.2022 USER 25.01.2023 15:54
 0128-4336_00 (2022-06-30)

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	169,0	8,0	108,9	No	92,5	100,1	103,3	103,5	101,9	97,3	89,8	79,1

WTG: VESTAS V150-4.2 4200 150.0 !O!

Noise: ZZ_FIN_OCT_V150_STE_4.2_PO1_104.9+2.0dB(A)

Source Source/Date Creator Edited
 Man./CJ 11.01.2018 USER 10.09.2019 12:16
 Data for projects in Finland; adding 2.0 dB(a) uncertainty margin as per guidance provided by the Finnish authorities.

DMS 0067-4767 V03 (2017-11-13)

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	155,0	8,0	106,9	No	87,9	95,6	100,2	102,0	100,9	96,8	89,9	80,0

Noise sensitive area: A A Asuinrakennus (Hakuperäntie 202)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Project:

Urakkaneva

Licensed user:

ABO Wind AG

Unter den Eichen, 7

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Dominik Fremgen / dominik.fremgen@abo-wind.de

Calculated:

26.01.2023 09:31/3.6.361

DECIBEL - Assumptions for noise calculation

Calculation: 2023-01-25_Urakkaneva_Noise_ISO-9613_9xV172-7.2MW_HH169_106.9+2.0dB_with Hirvineva

Noise sensitive area: B B Asuinrakennus (Hakuperäntie 169)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: C C Asuinrakennus (Säilyntie 285)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: D D Asuinrakennus (Säilyntie 264)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: E E Lomarakenus (Raudaskallion metsätie)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: F F Lomarakenus (Hirvinevanhaara 147)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: G G Lomarakenus (Pohjanneva)

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

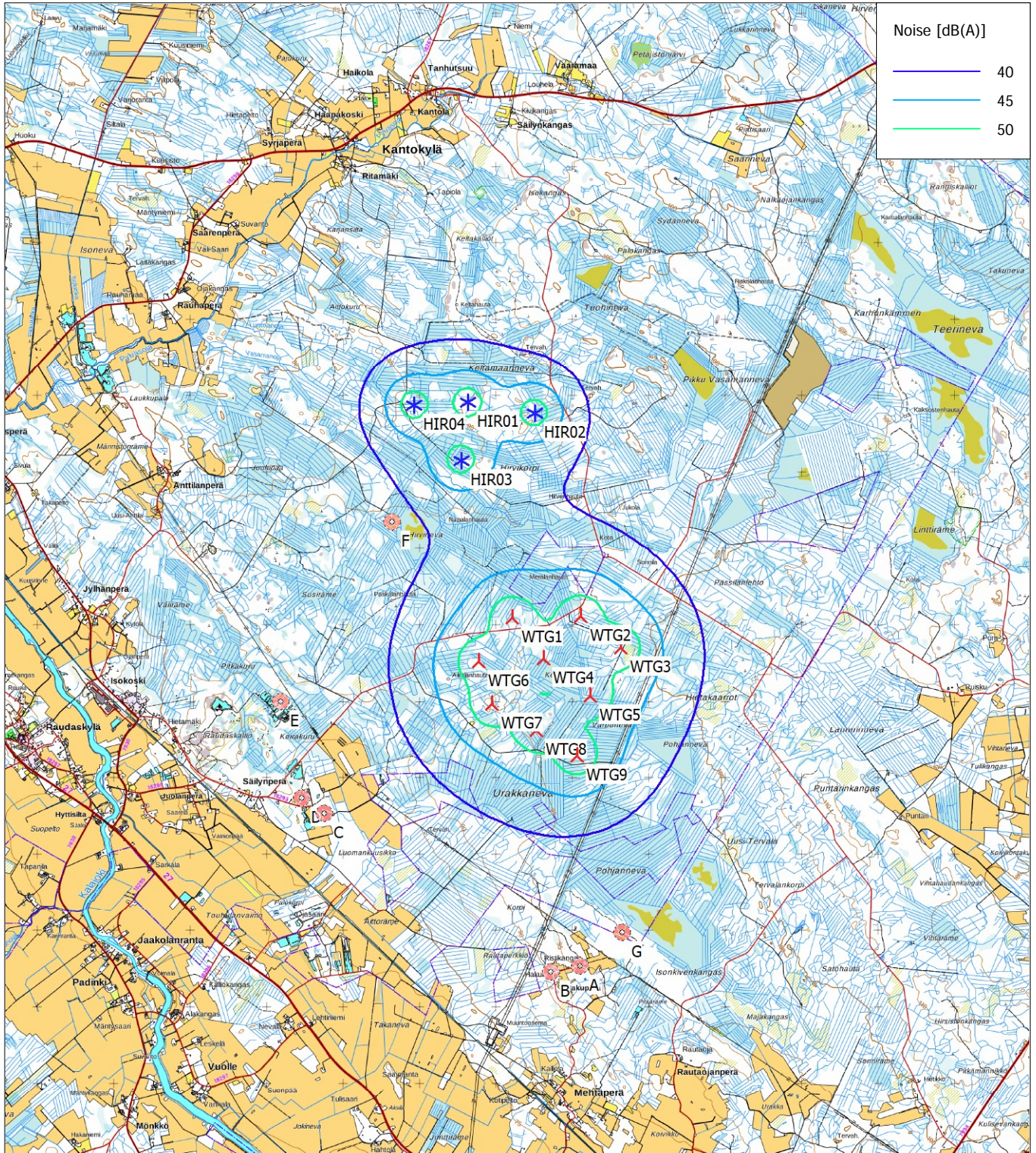
Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

DECIBEL - Map 8,0 m/s

Calculation: 2023-01-25_Urakkaneva_Noise_ISO-9613_9xV172-7.2MW_HH169_106.9+2.0dB_with Hirvineva



Map: NLS_terrain_map , Print scale 1:75.000, Map center UTM (north)-ETRS89 Zone: 35 East: 396.282 North: 7.101.594
 New WTG * Existing WTG Noise sensitive area
 Noise calculation model: ISO 9613-2 Finland. Wind speed: 8,0 m/s
 Height above sea level from active line object