

Windturbineproject mechelen-noord

Geluidsstudie

Ecopower

16 juli 2026



Contactpersoon

DAVID MERTENS

E david.mertens@arcadis.com

Arcadis Belgium nv

Gaston Crommenlaan 8 bus
101

9050 Gent

België

INHOUDSOPGAVE

1	INLEIDING	5
2	REGELGEVEND KADER	6
3	TOETSING AAN DE VLAREM II-NORMEN VOOR TURBINEGELUID	7
3.1	Bepaling van de richtwaarden	7
3.2	Uitgangspunten geluidsmodellering	11
3.3	Berekening van het specifiek geluid	13
3.3.1	Berekende geluidsimmissie van het project (WT1) in standaardmodus	13
3.3.2	Berekende geluidsimmissie van het project (WT1) in 'gereduceerde modus'	21
4	CONCLUSIES GELUIDSIMPACT	27

TABELLEN

Tabel 3-1: Richtwaarden voor turbinegeluid in open lucht volgens de VLAREM II regelgeving (bijlage 5.20.6.1)	7
Tabel 3-2: Richtwaarden voor turbinegeluid ter hoogte van de relevante beoordelingspunten.	10
Tabel 3-3: Specificaties van de windturbines in functie van de geluidsberekeningen.	13
Tabel 3-4: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (1996), als gevolg van het project (WT1) in een "standaard"modus, bij 95% van het nominaal vermogen, zoals bepaald met WindPRO	14
Tabel 3-5: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (2024), als gevolg van het project (WT1) in een "standaard"modus, bij 95% van het nominaal vermogen, zoals bepaald met WindPRO	16
Tabel 3-6: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (1996), als gevolg van het project (WT1) in een "gereduceerde" modus, zoals bepaald met WindPRO	22
Tabel 3-7: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (2024), als gevolg van het project (WT1) in een "gereduceerde" modus, zoals bepaald met WindPRO	23

FIGUREN

Figuur 3-1: Situering van de geluidsreceptoren op de geldende bestemmingsplannen, inclusief buffer van 500 meter rond industriezones en KMO-zones (paarse lijn)	9
Figuur 3-2: Octaafwaarden van de windturbine.	13
Figuur 3-3: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – dagperiode	18
<i>Figuur 3-4: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – nachtperiode</i>	19
Figuur 3-5: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – dagperiode	20
<i>Figuur 3-6: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – nachtperiode</i>	21
Figuur 3-7: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'gereduceerde modus' (avond- en nachtperiode), bij 95% van het nominaal vermogen, uitgevoerd met het WindPRO-model	25
Figuur 3-8: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'gereduceerde modus' (avond- en nachtperiode), bij 95% van het nominaal vermogen, uitgevoerd met het WindPRO-model	26

1 Inleiding

Deze geluidstudie omvat, conform punt 3 van het Addendum R20.1.6 Windturbines van het Omgevingsvergunningsdecreet, een beschrijving van de te verwachten geluidseffecten van de door Ecopower geplande windturbine WT1 op grondgebied te Mechelen, op het terrein van de Vlaamse Milieumaatschappij (VMM), aansluitend op het bedrijventerrein Mechelen-Noord II. Ten zuidoosten van de windturbine is het af- en oprittencomplex E19/A1 – N16 gelegen en ten westen stroomt de Dijle met, achterliggend, de woonwijk Battel. Ten zuiden van de windturbine ligt het recyclagepark van IVAREM en de waterzuiveringsinstallatie van Aquafin.

Er bevinden zich geen voor geluid relevante bestaande of vergunde windturbines in de omgeving van de geplande windturbine WT1, noch zijn er voor geluid relevante windturbines in ontwikkeling in de buurt. Daarom worden in deze studie geen cumulatieve effecten met bestaande, vergunde of in ontwikkeling zijnde windturbines beschreven.

In paragraaf 3.2 worden de technische specificaties van de geplande windturbine toegelicht, alsook de overige uitgangspunten voor de modellering van het specifieke geluid. Een situering van de windturbine en onderzochte beoordelingspunten is eveneens in Figuur 3-1 weergegeven. In paragraaf 3.3 worden vervolgens de resultaten van de geluidsmodellering besproken. De gedetailleerde resultaten van de geluidsmodellering zijn tevens opgenomen in Annex A bij deze geluidstudie.

2 Regelgevend kader

Op 7 juli 2023 stelde de Vlaamse regering een besluit vast met sectorale milieuvoorwaarden, die van toepassing zijn op alle vergunningsplichtige en meldingsplichtige inrichtingen voor het opwekken van elektriciteit door middel van windenergie in Vlaanderen. Dit besluit werd gepubliceerd in het Belgisch Staatsblad op 17 juli 2023 en trad in werking op 23 juli 2023. Thans vormen deze sectorale voorwaarden het kader voor de toetsing van geluidsemissies bij windenergieprojecten.

Overeenkomstig deze VLAREM II-bepalingen moet het specifieke geluid in openlucht, tenzij anders vermeld in de milieuvergunning, in de nabijheid van het dichtstbijzijnde bewoonde gebouw vreemd aan de inrichting of het dichtstbijzijnde woongebied of woonuitbreidingsgebied, per beoordelingsperiode beperkt worden tot de richtwaarde of tot het achtergrondgeluid. In het geval het achtergrondgeluid maatgevend is als norm, moet de afstand van de windturbine tot de woningen meer dan 3 maal de rotordiameter bedragen. In dat geval geldt:

$$L_{sp} < \text{MAX (richtwaarde, } L_{A,95})$$

De bepaling van het specifiek geluid dient volgens ISO-norm 9613-2 (1996) te gebeuren bij meewindvoorwaarden, d.w.z. als de geluidsimpact van de windturbine op het te beschouwen punt maximaal is (zie paragraaf §3.2).

Aanvullend wordt de immissieberekening uitgevoerd volgens ISO-norm 9613-2 (2024).

3 Toetsing aan de VLAREM II-normen voor turbinegeluid

3.1 Bepaling van de richtwaarden

Als relevante beoordelingspunten (receptoren) werden, overeenkomstig de VLAREM II-bepalingen, de dichtstbijzijnde woningen en de dichtstbijzijnde woongebieden geïdentificeerd. Het mogelijke effect van de geplande windturbine wordt berekend naar de meest relevante 'worst case-beoordelingspunten', d.w.z. naar beoordelingspunten welke het dichtst bij de windturbine zijn gelegen en het meeste effect zullen ondervinden. Er zijn een aantal beoordelingspunten die representatief zijn voor een cluster van woningen of voor individuele woningen. De ligging van de beoordelingspunten rondom het projectgebied wordt weergegeven op Figuur 3-1. Het betreffen 28 beoordelingspunten, gelegen rondom het projectgebied.

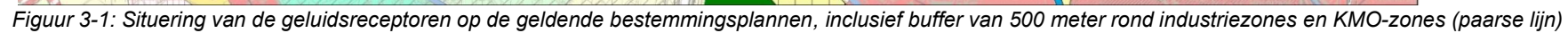
De richtwaarden voor turbinegeluid ter hoogte van de beoordelingspunten zijn afhankelijk van de ligging van de beoordelingspunten op de bestemmingsplannen. In Tabel 3-1: Richtwaarden voor turbinegeluid in open lucht volgens de VLAREM II regelgeving (bijlage 5.20.6.1) worden de VLAREM II-richtwaarden weergegeven volgens bijlage 5.20.6.1 uit de sectorale voorwaarden.

Tabel 3-1: Richtwaarden voor turbinegeluid in open lucht volgens de VLAREM II regelgeving (bijlage 5.20.6.1)

Gebiedsbestemming bij vergunning	Richtwaarde voor het specifiek geluid in open lucht in dB(A)		
	Overdag 7u – 19u	's Avonds 19u -22u	's Nachts 22u - 7u
1° Landelijke gebieden en gebieden voor verblijfrecreatie	44	39	39
2a° Gebieden of delen van gebieden, uitgezonderd woongebieden of delen van woongebieden, gelegen op minder dan 500 m van industriegebieden	50	45	45
2b° Woongebieden of delen van woongebieden op minder dan 500 m gelegen van industriegebieden	48	43	43
3a° Gebieden of delen van gebieden, uitgezonderd woongebieden of delen van woongebieden, op minder dan 500 m gelegen van gebieden voor ambachtelijke bedrijven en kleine en middelgrote ondernemingen, van dienstverleningsgebieden of van ontginningsgebieden, tijdens de ontginning	48	43	43
3b° Woongebieden of delen van woongebieden op minder dan 500 m gelegen van gebieden voor ambachtelijke bedrijven en kleine en middelgrote ondernemingen, van dienstverlenings-gebieden of van ontginningsgebieden, tijdens de ontginning	44	39	39
4° Woongebieden	44	39	39

Gebiedsbestemming bij vergunning	Richtwaarde voor het specifiek geluid in open lucht in dB(A)		
	Overdag 7u – 19u	's Avonds 19u -22u	's Nachts 22u - 7u
5° Industriegebieden, dienstverleningsgebieden, gebieden voor gemeenschapsvoorzieningen en openbare nutsvoorzieningen en ontginningsgebieden tijdens de ontginning	60	55	55
5bis° [...]	[...]	[...]	[...]
6° Recreatiegebieden, uitgezonderd gebieden voor verblijfsrecreatie	48	43	43
7° Alle andere gebieden, uitgezonderd: bufferzones, militaire domeinen en deze waarvoor in bijzondere besluiten richtwaarden worden vastgelegd	44	39	39
8° Bufferzones	55	50	50
9° Gebieden of delen van gebieden op minder dan 500 m gelegen van voor grindwinning bestemde ontginningsgebieden tijdens de ontginning	48	43	43
10° Agrarische gebieden	48	43	43

Opmerking: Als een gebied valt onder twee of meer punten van de tabel dan is in dat gebied de hoogste richtwaarde van toepassing.



Naast het gewestplan zijn in voor deze geluidstudie zeker ook de gewestelijke ruimtelijke uitvoeringsplannen (GRUPs) "Afbakening regionaalstedelijk gebied Mechelen" (RUP_02000_212_00132_00001), "Gebieden van het geactualiseerd Sigmaphan Cluster Dijlemonding" (RUP_02000_212_00328_00001) en "Regionaalstedelijk gebied Mechelen" (RUP_02000_212_00531_00001) van belang. Dit geldt eveneens voor de gemeentelijke ruimtelijke uitvoeringsplannen "RUP Mechelen Noord IV", "RUP Keerdok-Eandis", "RUP Zonevremde woningen" en "RUP Zonevremde bedrijven" van de stad Mechelen en de gemeentelijke ruimtelijke uitvoeringsplannen "RUP 003 Zonevremde woningen" en "RUP 008 Rozendaal" van de gemeente Sint-Katelijne-Waver, en in mindere mate ook enkele andere RUPs en BPA's.

De richtwaarden die van toepassing zijn ter hoogte van de geselecteerde beoordelingspunten worden weergegeven in Tabel 3-2: Richtwaarden voor turbinegeluid ter hoogte van de relevante beoordelingspunten. Hieronder. Hierbij werd rekening gehouden met de ligging van de beoordelingspunten op de bestemmingsplannen (zie Figuur 3-1). De richtwaarden hangen ook af van de afstand tot industriezones en KMO-zones, zodat op Figuur 3-1 ook een buffer van 500 meter aangeduid is rondom deze zones.

Tabel 3-2: Richtwaarden voor turbinegeluid ter hoogte van de relevante beoordelingspunten.

Receptor	Ligging	Lambert 72 coördinaten		Indeling volgens tabel bijlage 5.20.6.1	Richtwaarde voor specifiek geluid in open lucht		
		X (m)	Y (m)		Overdag 7u-19u	s Avonds 19u-22u	s Nachts 22u-7u
1	Baron Eduard Empainlaan 20 - 2800 Mechelen	155119	192608	4° Woongebieden	44	39	39
2	Otterstraat 18 - 2800 Mechelen	155492	192590	4° Woongebieden	44	39	39
3	Oude Antwerpsebaan 243 - 2800 Mechelen	156392	192789	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
4	Oude Antwerpsebaan 291 - 2800 Mechelen	156159	192861	5° Industriegebieden	60	55	55
5	Oude Antwerpsebaan 47 - 2800 Mechelen	157072	192304	4° Woongebieden	44	39	39
6	Hogeweg 124 - 2800 Mechelen	154976	193447	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
7	Generaal De Wittelaan 8 - 2800 Mechelen	155970	194306	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
8	Oude Baan 20 - 2800 Mechelen	156440	193727	5° Industriegebieden	60	55	55
9	Walemstraat 115 - 2860 Sint-Katelijne-Waver	157257	193908	4° Woongebieden	44	39	39
10	Hogeweg 120 - 2800 Mechelen	155255	193012	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
11	Karekietstraat 55 - 2800 Mechelen	156934	193184	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
12	Lindestraat 50 - 2860 Sint-Katelijne-Waver	157464	194308	4° Woongebieden	44	39	39
13	Oude Baan 82 - 2800 Mechelen	156165	194669	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
14	Hoogland 6 - 2800 Mechelen	157478	193126	4° Woongebieden	44	39	39
15	Neerweg 84 - 2800 Mechelen	155886	192141	4° Woongebieden	44	39	39
16	Battelsesteenweg 427 - 2800 Mechelen	155908	191746	4° Woongebieden	44	39	39
17	Fabiolaan 4 - 2801 Mechelen	153837	193151	4° Woongebieden	44	39	39
18	Leestsesteenweg 100 - 2800 Mechelen	154642	192035	4° Woongebieden	44	39	39
19	Mechelbaan 7 - 2801 Mechelen	154025	192542	10° Agrarische gebieden	48	43	43
20	Emmaüsdrif 20 - 2800 Mechelen	155761	194296	2a° Gebieden op minder dan 500 m van industriegebied	50	45	45
21	Blokhuisstraat 45 - 2800 Mechelen	156387	193344	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43
22	Blarenberglaan 9 - 2800 Mechelen	156189	193574	5° Industriegebieden	60	55	55
23	Gustave Van de Woestijnestraat 31 - 2800 Mechelen	156619	191500	4° Woongebieden	44	39	39
24	Antwerpsesteenweg 20 - 2860 Sint-Katelijne-Waver	156818	193494	2a° Gebieden op minder dan 500 m van industriegebied	50	45	45
25	Rozendaalweg 3 - 2860 Sint-Katelijne-Waver	157004	194247	2a° Gebieden op minder dan 500 m van industriegebied	50	45	45
26	Hogeweg 253 - 2800 Mechelen	154665	193573	2a° Gebieden op minder dan 500 m van industriegebied	50	45	45
27	Hogeweg 76 - 2800 Mechelen	155349	192671	2a° Gebieden op minder dan 500 m van industriegebied	50	45	45
28	Oude Baan 36 - 2800 Mechelen	156486	193844	2b° Woongebieden op minder dan 500 m van industriegebied	48	43	43

Opmerkingen bij Tabel 3-2:

- Een aantal punten vallen zowel onder punt 3a° (Gebieden op minder dan 500m van gebieden voor ambachtelijke bedrijven of KMO) als onder punt 10° (Agrarische gebieden), waarvoor identieke richtwaarden gelden. In dit geval wordt systematisch een indeling onder punt 10° vermeld in de tabel.

- Een aantal punten vallen zowel onder punt 3b° (Woongebieden op minder dan 500m van gebieden voor ambachtelijke bedrijven of KMO) als onder punt 4° (Woongebieden), waarvoor identieke richtwaarden gelden. In dit geval wordt systematisch een indeling onder punt 4° vermeld in de tabel.
- Beoordelingspunt 9 ligt volgens Figuur 3-1 net buiten de buffer van 500m rond industriegebied. Bij het bepalen van de buffer werd het bedrijventerrein 'Martal' (gelegen in de hoek van de Walemstraat en de Antwerpsesteenweg echter niet als industriegebied, maar als 'gebied voor ambachtelijke bedrijven en KMO' beschouwd. Conform het gewestplan is de bestemming in dit gebied echter 'Industriegebied'. Sinds de publicatie van het gewestplan heeft het voormalige houtbedrijf op de site echter plaatsgemaakt voor een bedrijventerrein met KMO-units, complementaire kantoren en showroomunits. De bestemming 'gebied voor ambachtelijke bedrijven en KMO' sluit derhalve beter aan bij het huidige gebruik van de site. Deze interpretatie geeft bovendien aanleiding tot de strengste richtwaarden ter hoogte van beoordelingspunt 9, en werd daarom weerhouden (als worst case-benadering).
- Beoordelingspunt 15 valt overeenkomstig Figuur 3-1 buiten de buffer van 500m rond industriegebied. Bij het bepalen van deze buffer werd het bedrijventerrein ten noordoosten van beoordelingspunt 15, dat volgens het 'GRUP Afbakening regionaalstedelijk gebied Mechelen' als 'gemengd regionaalbedrijventerrein' wordt omschreven, beschouwd als 'gebied voor ambachtelijke bedrijven en KMO'. Tevens werd ook het bedrijventerrein ten oosten van beoordelingspunt 15, dat volgens het 'RUP Mechelen Noord IV' als een 'Specifiek regionaal bedrijventerrein voor kleinhandel' wordt omschreven, beschouwd als 'gebied voor ambachtelijke bedrijven en KMO'. Deze interpretatie geeft aanleiding tot de strengste richtwaarden ter hoogte van beoordelingspunt 15, en werd daarom weerhouden (als worst case-benadering).
- Beoordelingspunt 23 valt overeenkomstig Figuur 3-1 buiten de buffer van 500m rond industriegebied. Bij het bepalen van deze buffer werd het bedrijventerrein ten noorden van beoordelingspunt 23, dat volgens het 'RUP Keerdok Eandis' gewoon als 'bedrijventerrein' wordt omschreven, beschouwd als 'gebied voor ambachtelijke bedrijven en KMO'. De omschrijving 'bedrijventerrein' laat immers ruimte voor interpretatie tussen 'industriegebied' of 'gebied voor ambachtelijke bedrijven en KMO'. De laatste interpretatie geeft aanleiding tot de strengste richtwaarden ter hoogte van beoordelingspunt 23, en werd daarom weerhouden (als worst case-benadering).

3.2 Uitgangspunten geluidsmodellering

Het specifiek geluid (L_{sp}) van de windturbine is berekend aan de hand van het rekenmodel WindPRO¹. Bij de berekeningen wordt rekening gehouden met de geluidsafname t.g.v. de afstand, de bodeminvloed en de luchtabsorptie.

De immissieberekening of bepaling van het specifieke geluid gebeurt volgens ISO-norm 9613-2 (1996), conform artikel 5.20.6.4 VLAREM II. Bij de immissieberekeningen is het volgende in rekening genomen:

- De windturbines zijn gemodelleerd als puntbronnen op ashoogte van waaruit het geluid zich driedimensionaal voortplant;
- De geluidsimmissie is berekend in octaafbanden vanaf 63 Hz tot 8000 Hz;
- De immissiehoogte van de ontvanger is 4 m;
- Gevelreflectie is niet beschouwd;
- Standaardwaarden voor atmosferische omstandigheden zijn gehanteerd: temperatuur 10 °C en luchtvochtigheid 70%;
- De immissieberekeningen zijn uitgevoerd met de in de ISO ingebouwde lichte meewindvoorwaarden (windrichtingsafhankelijke correctiefactoren zijn niet toegepast);
- Voor de bodemterm is gekozen voor de frequentieafhankelijke formule binnen de ISO 9613-2;

¹ WindPRO 3.0.654 by EMD International A/S, Tel. +45 96 35 44 44, www.emd.dk, windpro@emd.dk

- Voor de geluidsabsorptie door de bodem is een gemiddelde bodemabsorptiefactor G_2 van 0,2 aangehouden voor grotere bedrijventerreinen Mechelen-Noord I en II, alsook de site van Pauwels transformers) en grote watervlakken (Dijle, Grote Vijver Zuid). Voor de overige gebieden (eerder agrarische omgeving) werd er een bodemabsorptiefactor van $G = 0,8$ gehanteerd.
- De meteocorrectie term is niet gebruikt ($C_{meteo} = 0$);
- De invloed van individuele woningen en andere gebouwen, bomen, struiken en andere gewassen is niet beschouwd.

Sinds de inwerking van artikel 5.20.6.4 VLAREM II is er een nieuwe versie van de ISO-norm uitgebracht, met name ISO 9613-2 (2024). Rekening houdend met de 'best beschikbare technieken' in het kader van deze effectenbeoordeling, wordt de immissieberekening aanvullend uitgevoerd volgens ISO-norm 9613-2 (2024).

Ten opzichte van de ISO-norm 9613-2 (1996), worden de gemiddelde bodemabsorptiefactoren G van 0,2 en 0,8 aangepast naar respectievelijk 0 en 0,5.

Bovenstaande modelleringen resulteren in een conservatieve inschatting van de geluidsimpact. De berekeningen worden uitgevoerd voor het slechtst denkbare geval, namelijk bij meteorologische condities die gunstig zijn voor de verspreiding van geluid. Bovendien wordt er geen rekening gehouden met dempingsfactoren (ander dan de bodemabsorptiefactor) of schermwerking in de overdrachtsweg, zoals deze afkomstig van vegetatie en overige obstakels.

Voor de immissieberekeningen is het geluidsvermogen beschouwd bij 95% van het nominale vermogen van de verschillende windturbines. Deze situatie stemt overeen met de aanname van 106,5 dB(A) voor een windsnelheid van 7 m/s op een ashoogte van 129 m. Op basis van het berekende windklimaat voor de site is de kans minder dan 67% dat de windsnelheid van 7 m/s wordt gehaald op de ashoogte van 129 m. Op 129 m ashoogte geldt immers een gemiddelde windsnelheid van slechts ca. 6,2 m/s. Met deze windsnelheid bedraagt het geluidsbronvermogen nog ongeveer 104,0 dB(A). Bovendien is er bij heel lage windsnelheden (doorgaans 3 m/s) geen geluidsproductie omdat de windturbine dan buiten haar werkingsgebied treedt.

De berekeningen zijn in de eerste plaats uitgevoerd voor een "standaard"-scenario d.w.z. dat er voor de geplande windturbine geen reducties zijn beschouwd en het productievermogen gelijk is gedurende de dag, avond- en nachtperiode.

De specifieke geluidsemissie van de windturbine werd berekend. Er werd geen referentiesituatie of cumulatieve situatie berekend, gezien er zich geen andere, voor geluid relevante windturbines in de omgeving bevinden.

Het exacte type windturbine dat door Ecopower zal gebouwd worden, is momenteel nog niet gekend. Verschillende opties, waaronder de Enercon E-138 EP3 E3, de Eno140, de Nordex N131, de Nordex N133, de Vestas V126 en de Vestas V136 (niet-limitatieve lijst), zijn nog mogelijk. Voor de berekening van het specifiek geluid in "standaard" scenario werd uitgegaan van een maximaal bronvermogen $L_w(A)$ van 106,5 dB(A). Dit bronvermogen komt vrij op de laagst mogelijke waarde van de masthoogte, bij 95% van het maximaal nominaal vermogen. De laagste mogelijke masthoogte kan beschouwd worden als worst case-scenario, omdat hierbij de afstand kleiner is tussen geluidsbron en receptor. Voor dit project betekent dit concreet een masthoogte van 129m.

De specificaties en gegevens van de geplande windturbine – in functie van de geluidsberekeningen – worden samengevat in Tabel 3-3.

² de bodemabsorptiefactor $G=1$ geldt bij absolute absorptie, en de bodemabsorptiefactor $G=0$ geldt bij absolute reflectie (omvangrijke wateroppervlakken in de buurt van het immissiepunt). In een agrarische omgeving wordt standaard gerekend met een bodem-absorptiefactor $G = 0,8$. In omgevingen waarin nabij het immissiepunt veel verharde of reflecterende oppervlakken zijn, wordt $G = 0,2$.

Tabel 3-3: Specificaties van de windturbines in functie van de geluidsberekeningen³.

ID	Omschrijving	Lambert 72-coördinaten		Type windturbine	Minimum masthoogte (m)	Bronvermogen		
		X (m)	Y (m)			Standaard (dB(A))	Gereduceerd dag (dB(A))	Gereduceerd avond-nacht (dB(A))
Project Ecopower								

WT1	Nieuwe windturbine Ecopower	155615	193121	Nog te bepalen	129.0	106.5	Nog te bepalen	Nog te bepalen
-----	-----------------------------	--------	--------	----------------	-------	-------	----------------	----------------

De resultaten van de geluidsmodellering worden besproken in onderstaande paragraaf 3.3. De bekomen resultaten blijven echter berekende immissies.

In onderstaande figuur staan de octaafwaarden van de windturbine.

Status	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	95% rated power	106.50	No Generic data	88.08	95.08	98.48	101.08	100.88	97.98	93.18	83.68

Figuur 3-2: Octaafwaarden van de windturbine.

3.3 Berekening van het specifiek geluid

3.3.1 Berekende geluidsimmissie van het project (WT1) in standaardmodus

In onderstaande Tabel 3-4 en Tabel 3-5 wordt de berekende specifieke geluidsbijdrage van het project (dus de geplande windturbine WT1) volgens respectievelijk de ISO-normen 9613-2 (1996) en 9613-2 (2024) ter hoogte van de relevante beoordelingspunten getoetst aan de toepasselijke VLAREM II richtwaarden (volgens bijlage 5.20.6.1 uit de sectorale voorwaarden).

Er wordt een vergelijking van het specifieke geluid met enerzijds de dagrichtwaarden en anderzijds de avond- en nachtrichtwaarden weergegeven. Waar de specifieke geluidsbijdrage hoger is dan de toepasselijke richtwaarde, wordt dit rood gekleurd. Waar de specifieke geluidsbijdrage lager is dan of gelijk is aan de toepasselijke richtwaarde, wordt dit groen gekleurd.

Daarnaast worden ook de isocontouren van het specifiek geluid van het project, met de geplande windturbine (WT1) in een ‘standaard’ mode, volgens ISO 9613-2 (1996) weergegeven in Figuur 3-3 en Figuur 3-4 en volgens ISO 9613-

³ De technische kenmerken van de bestaande/vergunde windturbines werden overgenomen uit geopunt, data afkomstig van het publieke loket en aangeleverde data door de opdrachtgever.

2 (2024) in Figuur 3-5 en Figuur 3-6. Ten behoeve van de toetsing aan de richtwaarden, werden in Figuur 3-3 en Figuur 3-5 de isocontouren afgestemd op de dagrichtwaarden, en in Figuur 3-4 en Figuur 3-6 op de nachtrichtwaarden.

Tabel 3-4: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (1996), als gevolg van het project (WT1) in een "standaard"modus, bij 95% van het nominaal vermogen, zoals bepaald met WindPRO

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))		Specifiek geluid (dB(A))	Toetsing (dB(A))	
	X (m)	Y (m)	Dag	Avond/Nacht		Dag	Avond/Nacht
1	155119	192608	44	39	36.5	-7.5	-2.5
2	155492	192590	44	39	39.3	-4.7	+0.3
3	156392	192789	48	43	34.7	-13.3	-8.3
4	156159	192861	60	55	38.3	-21.8	-16.8
5	157072	192304	44	39	27.0	-17.0	-12.0
6	154976	193447	48	43	37.8	-10.2	-5.2
7	155970	194306	48	43	32.1	-15.9	-10.9
8	156440	193727	60	55	34.5	-25.5	-20.5
9	157257	193908	44	39	26.3	-17.7	-12.7
10	155255	193012	48	43	44.1	-3.9	+1.1
11	156934	193184	48	43	30.8	-17.2	-12.2
12	157464	194308	44	39	24.1	-19.9	-14.9
13	156165	194669	48	43	28.8	-19.2	-14.2
14	157478	193126	44	39	25.9	-18.1	-13.1
15	155886	192141	44	39	32.8	-11.2	-6.2
16	155908	191746	44	39	29.1	-14.9	-9.9

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))		Specifiek geluid (dB(A))	Toetsing (dB(A))	
	X (m)	Y (m)	Dag	Avond/Nacht		Dag	Avond/Nacht
17	153837	193151	44	39	26.4	-17.6	-12.6
18	154642	192035	44	39	28.6	-15.4	-10.4
19	154025	192542	48	43	26.9	-21.1	-16.1
20	155761	194296	50	45	31.4	-18.6	-13.6
21	156387	193344	48	43	36.9	-11.1	-6.1
22	156189	193574	60	55	37.9	-22.1	-17.1
23	156619	191500	44	39	25.4	-18.6	-13.6
24	156818	193494	50	45	31.7	-18.3	-13.3
25	157004	194247	50	45	26.7	-23.3	-18.3
26	154665	193573	50	45	32.6	-17.4	-12.4
27	155349	192671	50	45	39.7	-10.3	-5.3
28	156486	193844	48	43	33.4	-14.6	-9.6

Tabel 3-5: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (2024), als gevolg van het project (WT1) in een "standaard"modus, bij 95% van het nominaal vermogen, zoals bepaald met WindPRO

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))		Specifiek geluid (dB(A))	Toetsing (dB(A))	
	X (m)	X (m)	Dag	Avond/Nacht		Dag	Avond/Nacht
1	155119	192608	44	39	37.5	-6.5	-1.5
2	155492	192590	44	39	40.3	-3.7	+1.3
3	156392	192789	48	43	35.7	-12.3	-7.3
4	156159	192861	60	55	39.2	-20.8	-15.8
5	157072	192304	44	39	28.1	-15.9	-10.9
6	154976	193447	48	43	38.6	-9.4	-4.4
7	155970	194306	48	43	33.0	-15.0	-10.0
8	156440	193727	60	55	35.3	-24.8	-19.8
9	157257	193908	44	39	27.4	-16.6	-11.6
10	155255	193012	48	43	44.8	-3.2	+1.8
11	156934	193184	48	43	31.8	-16.3	-11.3
12	157464	194308	44	39	25.1	-18.9	-13.9
13	156165	194669	48	43	29.7	-18.3	-13.3
14	157478	193126	44	39	27.0	-17.0	-12.0
15	155886	192141	44	39	33.8	-10.2	-5.2
16	155908	191746	44	39	30.1	-13.9	-8.9
17	153837	193151	44	39	27.5	-16.6	-11.6

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))		Specifiek geluid (dB(A))	Toetsing (dB(A))	
	X (m)	X (m)	Dag	Avond/Nacht		Dag	Avond/Nacht
18	154642	192035	44	39	29.7	-14.4	-9.4
19	154025	192542	48	43	28.0	-20.0	-15.0
20	155761	194296	50	45	32.4	-17.6	-12.6
21	156387	193344	48	43	37.7	-10.3	-5.3
22	156189	193574	60	55	38.7	-21.3	-16.3
23	156619	191500	44	39	26.5	-17.5	-12.5
24	156818	193494	50	45	32.5	-17.5	-12.5
25	157004	194247	50	45	27.7	-22.3	-17.3
26	154665	193573	50	45	33.6	-16.4	-11.4
27	155349	192671	50	45	40.7	-9.3	-4.3
28	156486	193844	48	43	34.2	-13.8	-8.8

Uit de vergelijking met de **dagrichtwaarden** blijkt dat de dagrichtwaarden overal (ruim) gerespecteerd worden binnen de standaardmodus van $L_{W(A)_{WT1}} = 106,5 \text{ dB(A)}$.

Uit de vergelijking met de **avond- en nachtrichtwaarden** blijkt echter dat de avond- en nachtrichtwaarden ter hoogte van beoordelingspunten 2 en 10 worden overschreden (uitgaande van de standaardmodus voor de geplande turbine). De overschrijdingen bedragen respectievelijk 0,3 dB(A) en 1,1 dB(A) volgens ISO 9613-2 (1996) en 1,3 dB(A) en 1,8 dB(A) volgens ISO 9613-2 (2024). De betrokken beoordelingspunten situeren zich in woongebied, meer bepaald in de woonwijk Battel.

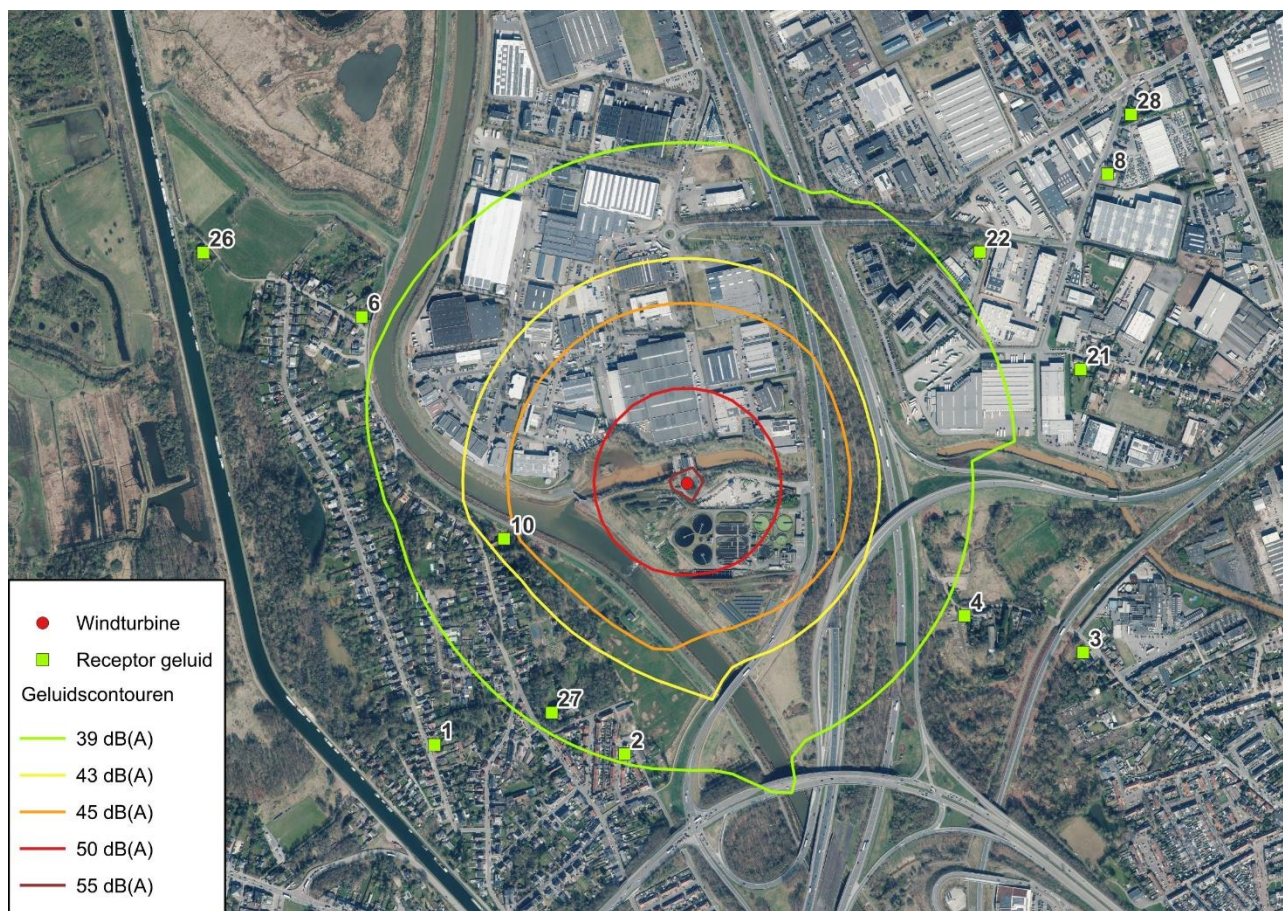
Beoordelingspunt 2 bevindt zich ten zuiden van de geplande windturbine, ter hoogte van een woning in de Otterstraat. Dit beoordelingspunt bevindt zich op net iets meer dan 500 meter van industriegebied. De geldende richtwaarde tijdens de avond- en nachtperiode bedraagt er 39 dB(A), overeenkomstig de bestemming (woongebieden). Beoordelingspunt 10 bevindt zich ten westen van de geplande windturbine, ter hoogte van een woning in de Hoge Weg, niet ver van de Dijle. De geldende richtwaarde tijdens de avond- en nachtperiode bedraagt er 43 dB(A), overeenkomstig de bestemming (woongebied op minder dan 500 meter van industriegebied)

Ter hoogte van alle overige beoordelingspunten worden de avond- en nachtrichtwaarden gerespecteerd. Er zijn bijgevolg projectgeïntegreerde maatregelen nodig tijdens de avond en de nacht.

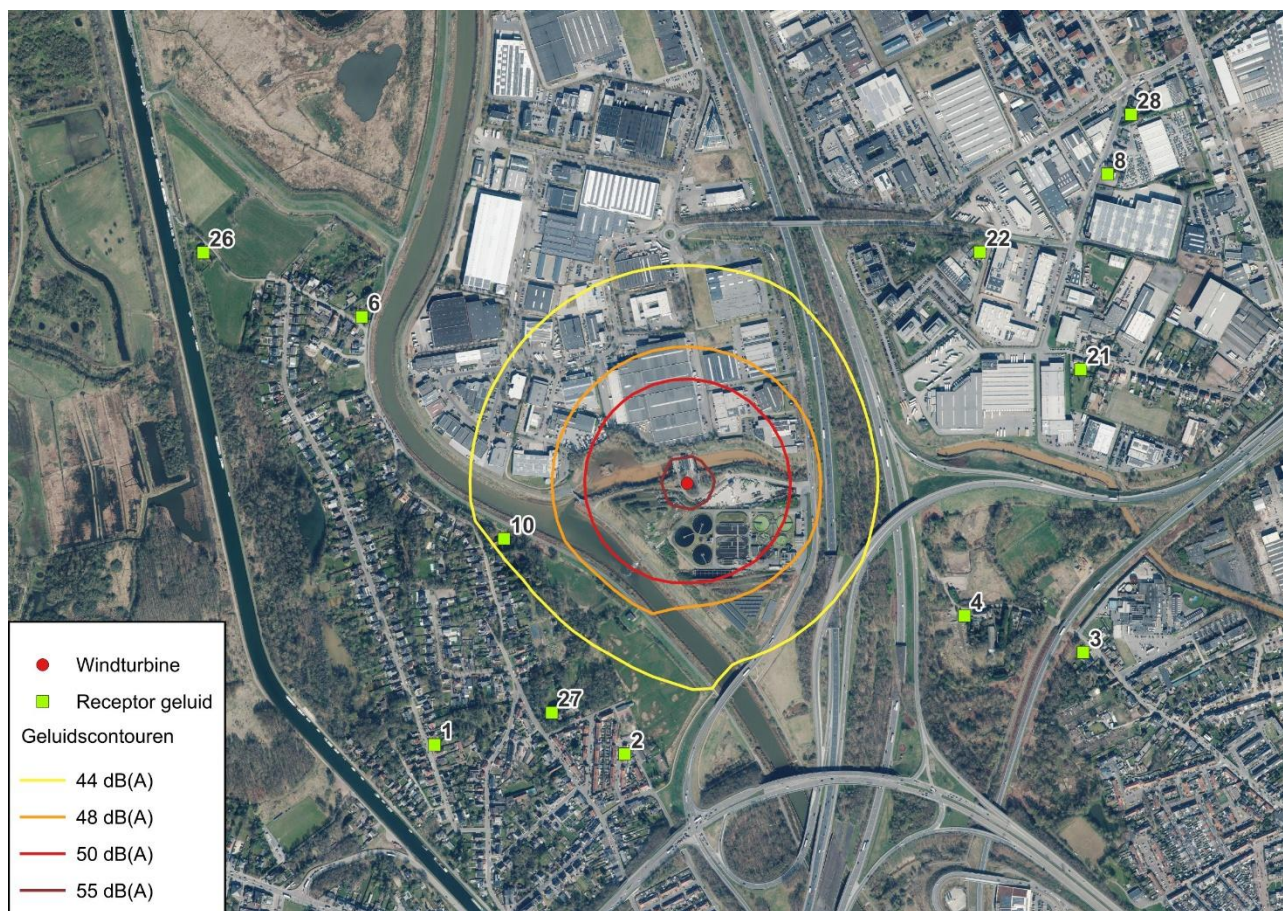
Er kan besloten worden dat de geluidsbijdrage van het project (WT1) overdag steeds de VLAREM II-dagrichtwaarde zal respecteren (in een standaardmodus met $L_{W(A)_{WT1}} = 106,5 \text{ dB(A)}$). 's Avonds en 's nachts zal de geluidsbijdrage van het project echter de geldende VLAREM II-richtwaarden overschrijden ter hoogte van twee beoordelingspunten (opnieuw uitgaande van een standaardmodus met $L_{W(A)_{WT1}} = 106,5 \text{ dB(A)}$). Er zullen derhalve projectgeïntegreerde maatregelen nodig zijn.



Figuur 3-3: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – dagperiode



Figuur 3-4: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – nachtperiode



Figuur 3-5: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – dagperiode



Figuur 3-6: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'standaardmodus', bij 95% van het nominaal vermogen, uitgevoerd met WindPRO – nachtperiode

3.3.2 Berekende geluidsimmissie van het project (WT1) in 'gereduceerde modus'

In Tabel 3-6 en Tabel 3-7 worden de berekende specifieke geluidsbijdragen van het project (WT1) volgens respectievelijk de ISO-normen 9613-2 (1996) en 9613-2 (2024) ter hoogte van de relevante beoordelingspunten opnieuw getoetst aan de toepasselijke VLAREM II richtwaarden, maar nu na toepassing van de projectgeïntegreerde maatregelen, die nodig zijn om het specifieke geluid van het project te laten voldoen aan de sectorale voorwaarden in VLAREM II. Dit betekent:

- behoud van de 'standaardmodus' voor de geplande windturbine (WT1) tijdens de dagperiode (met $L_w(A)=106,5$ dB(A));
- een 'gereduceerde modus' voor de geplande windturbine (WT1) tijdens de avond- en nachtperiode, dewelke een bridge omvat met 1,9 dB(A), tot een maximaal bronvermogen van 104,6 dB(A).

Voor de dagperiode is er geen verschil met paragraaf 3.3.1. Daarom bevatten Tabel 3-6 en Tabel 3-7 enkel de toetsing van het berekende specifieke geluid voor de avond- en nachtperiode aan de avond- en nachtrichtwaarden.

Op basis van paragraaf 3.3.1 blijkt dat de **dagrichtwaarden** gerespecteerd worden ter hoogte van alle beoordelingspunten. **Er zijn dan ook geen bijkomende projectgeïntegreerde maatregelen nodig tijdens de dagperiode.**

Ook tijdens de avond- en nachtperiode voldoet het specifiek geluid de geplande windturbine WT1, ten gevolge van de gereduceerde modus, ter hoogte van alle beoordelingspunten aan de geldende avond- en nachtrichtwaarden.

Hierdoor worden de sectorale voorwaarden conform VLAREM II dus steeds gerespecteerd. **De vermelde projectgeïntegreerde maatregelen voor de avond- en nachtperiode volstaan.**

Tabel 3-6: Berekenende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (1996), als gevolg van het project (WT1) in een "gereduceerde" modus, zoals bepaald met WindPRO

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))	Specifiek geluid (dB(A))	Toetsing (dB(A))
	X (m)	Y (m)	Avond/Nacht		Avond/Nacht
1	155119	192608	39	34.6	-4.4
2	155492	192590	39	37.4	-1.6
3	156392	192789	43	32.8	-10.2
4	156159	192861	55	36.4	-18.7
5	157072	192304	39	25.1	-13.9
6	154976	193447	43	35.9	-7.1
7	155970	194306	43	30.2	-12.8
8	156440	193727	55	32.6	-22.4
9	157257	193908	39	24.4	-14.6
10	155255	193012	43	42.2	-0.8
11	156934	193184	43	28.9	-14.1
12	157464	194308	39	22.2	-16.8
13	156165	194669	43	26.9	-16.1
14	157478	193126	39	24.0	-15.0
15	155886	192141	39	30.9	-8.1
16	155908	191746	39	27.2	-11.8
17	153837	193151	39	24.5	-14.5

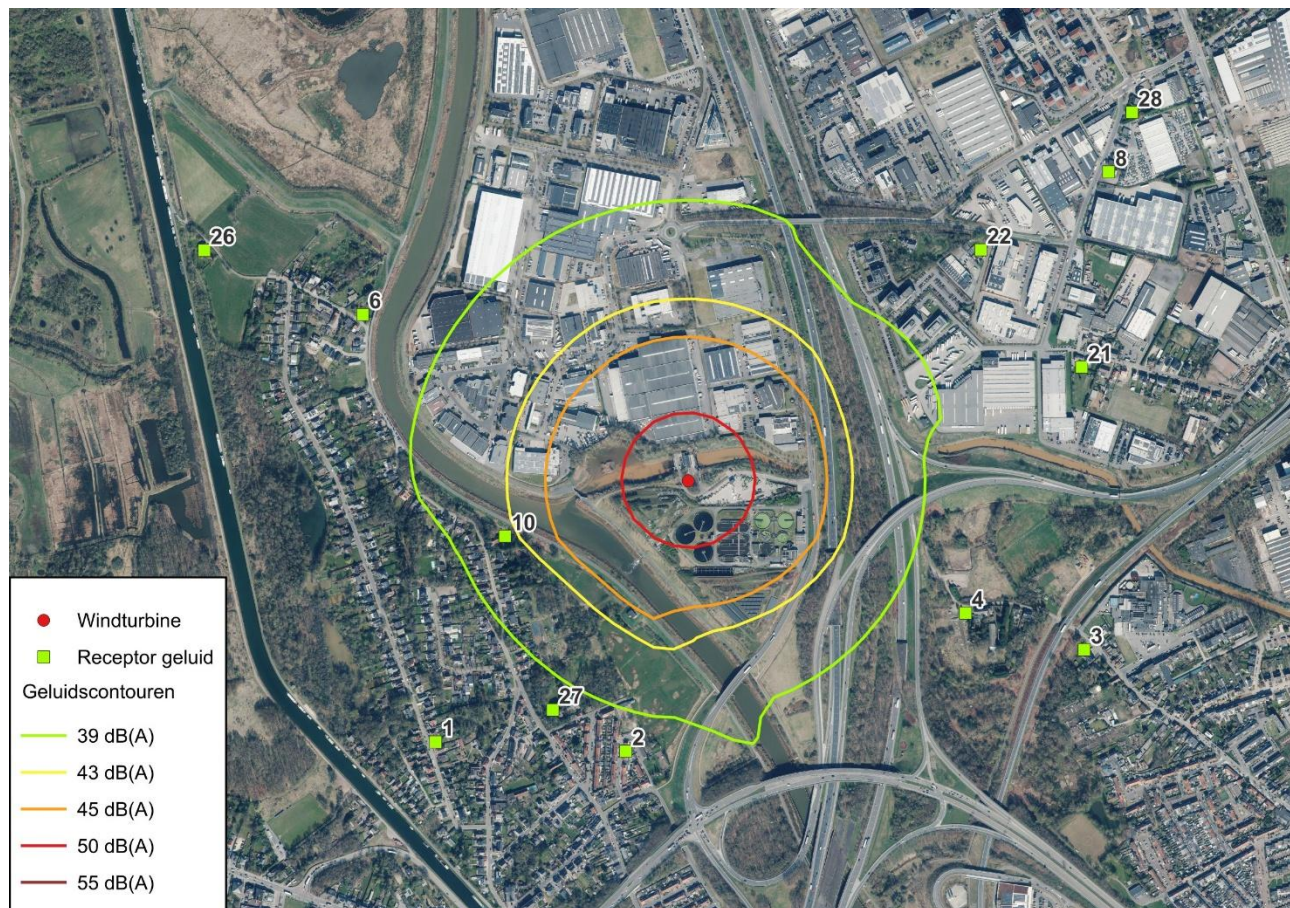
18	154642	192035	39	26.7	-12.3
19	154025	192542	43	25.0	-18.0
20	155761	194296	45	29.5	-15.5
21	156387	193344	43	35.0	-8.0
22	156189	193574	55	36.0	-19.0
23	156619	191500	39	23.5	-15.5
24	156818	193494	45	29.8	-15.2
25	157004	194247	45	24.8	-20.2
26	154665	193573	45	30.7	-14.3
27	155349	192671	45	37.8	-7.2
28	156486	193844	43	31.5	-11.5

Tabel 3-7: Berekende immissiebijdrage voor geluid ter hoogte van de geselecteerde beoordelingspunten volgens ISO 9613-2 (2024), als gevolg van het project (WT1) in een "gereduceerde" modus, zoals bepaald met WindPRO

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))	Specifiek geluid (dB(A))	Toetsing (dB(A))
	X (m)	X (m)	Avond/Nacht		Avond/Nacht
1	155119	192608	39	35.6	-3.4
2	155492	192590	39	38.4	-0.6
3	156392	192789	43	33.8	-9.2
4	156159	192861	55	37.3	-17.7
5	157072	192304	39	26.2	-12.8
6	154976	193447	43	36.7	-6.3

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))	Specifiek geluid (dB(A))	Toetsing (dB(A))
	X (m)	X (m)	Avond/Nacht		Avond/Nacht
7	155970	194306	43	31.1	-11.9
8	156440	193727	55	33.4	-21.7
9	157257	193908	39	25.5	-13.5
10	155255	193012	43	42.9	-0.1
11	156934	193184	43	29.9	-13.2
12	157464	194308	39	23.2	-15.8
13	156165	194669	43	27.8	-15.2
14	157478	193126	39	25.1	-13.9
15	155886	192141	39	31.9	-7.1
16	155908	191746	39	28.2	-10.8
17	153837	193151	39	25.6	-13.5
18	154642	192035	39	27.8	-11.3
19	154025	192542	43	26.1	-16.9
20	155761	194296	45	30.5	-14.5
21	156387	193344	43	35.8	-7.2
22	156189	193574	55	36.8	-18.2
23	156619	191500	39	24.6	-14.4
24	156818	193494	45	30.6	-14.4

Receptor ID	Lambert 72-coördinaten		Richtwaarden (dB(A))	Specifiek geluid (dB(A))	Toetsing (dB(A))
	X (m)	Y (m)	Avond/Nacht		Avond/Nacht
25	157004	194247	45	25.8	-19.2
26	154665	193573	45	31.7	-13.3
27	155349	192671	45	38.8	-6.2
28	156486	193844	43	32.3	-10.7



Figuur 3-7: Geluidsmodellering volgens ISO 9613-2 (1996) voor het project (WT1) in 'gereduceerde modus' (avond- en nachtperiode), bij 95% van het nominaal vermogen, uitgevoerd met het WindPRO-model



Figuur 3-8: Geluidsmodellering volgens ISO 9613-2 (2024) voor het project (WT1) in 'gereduceerde modus' (avond- en nachtperiode), bij 95% van het nominaal vermogen, uitgevoerd met het WindPRO-model

Er kan besloten worden dat ter hoogte van alle beoordelingspunten voldaan kan worden aan de VLAREM II-richtwaarden voor de dag-, avond- en nachtperiode. Hierbij kan de geplande windturbine (WT1) in een standaardmodus met $L_W(A)=106,5$ dB(A) draaien tijdens de dagperiode, maar is tijdens de avond- en nachtperiode een gereduceerde modus vereist met $L_W(A)=104,6$ dB(A).

De isocontouren van het specifiek geluid van het project (WT1) tijdens de avond- en nachtperiode volgens ISO 9613-2 (1996) en ISO 9613-2 (2024), na toepassing van de projectgeïntegreerde maatregelen, worden tevens weergegeven in respectievelijk Figuur 3-7 en Figuur 3-8. Hierbij werd voor de geplande windturbine WT1 uitgegaan van de 'gereduceerde modus' (dus bridge tot 104,6 dB(A) tijdens de avond- en nachtperiode).

4 Conclusies geluidsimpact

Overeenkomstig VLAREM II moet het specifieke geluid in openlucht in de nabijheid van het dichtstbijzijnde bewoonde gebouw vreemd aan de inrichting of het dichtstbijzijnde woongebied of woonuitbreidingsgebied, per beoordelingsperiode beperkt worden tot de richtwaarde of tot het achtergrondgeluid.

In voorliggend project werd, met het oog op de beschrijving en beoordeling van de worst case-geluidsimpact, gerekend met een bronvermogen van 106,5 dB(A) bij 95% nominaal vermogen op 129m ashoogte.

Het specifieke geluid van het project (WT1) werd bepaald ter hoogte van de dichtstbijzijnde woningen en de dichtstbijzijnde woongebieden overeenkomstig de VLAREM II-bepalingen, alsook volgens de best beschikbare technieken. De aldus bekomen resultaten kunnen beschouwd worden als een worst case, omdat ze uitgaan van de maximale geluidsproductie van de windturbine (bij hoge windsnelheden) en van meewindcondities.

Het specifiek geluid van het project (WT1) in “standaardmodus” ligt tijdens de dagperiode ter hoogte van alle geselecteerde beoordelingspunten onder de geldende richtwaarden. Voor de avond- en de nachtperiode overschrijdt het specifiek geluid van de geplande windturbine (in “standaardmodus”) echter de geldende richtwaarden ter hoogte van beoordelingspunten 2 en 10. Ter hoogte van alle andere beoordelingspunten ligt het specifiek geluid van het project, met de geplande windturbine WT1 in “standaardmodus”, ook tijdens de avond- en de nachtperiode onder de geldende richtwaarden.

Het toepassen van een gereduceerde modus met $L_{W(A)_{WT1}} = 104,6 \text{ dB(A)}$ tijdens de avond- en nachtperiode (en het behoud van de standaardmodus overdag), volstaat om ter hoogte alle beoordelingspunten te voldoen aan de geldende VLAREM II-richtwaarden.

ANNEX A: GEDETAILLEERDE MODELLERINGEN

DECIBEL - Main Result

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,8

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,2

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

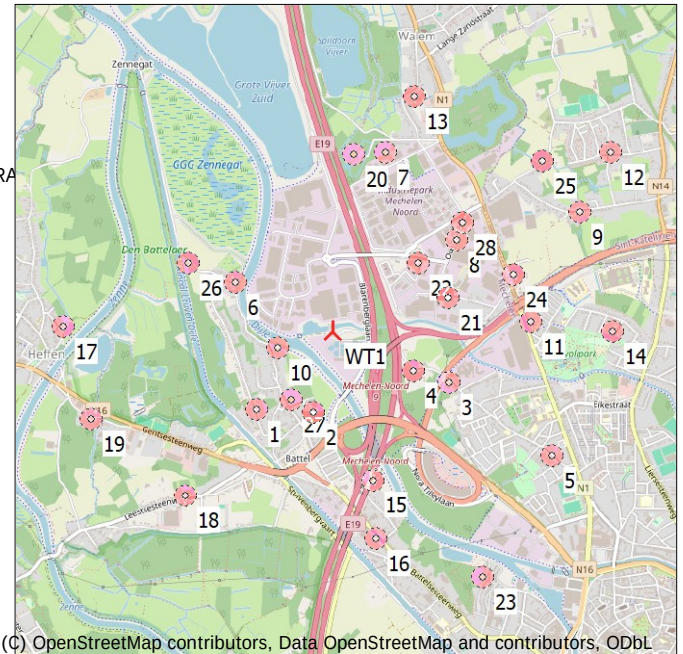
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	106.5 dB(A)	(95%) 106,50 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

New WTG

Scale 1:50.000
Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	44,00	36,47	379	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	44,00	39,32	186	Yes
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	48,00	34,71	600	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	60,00	38,25		Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	44,00	26,99	1.323	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	48,00	37,78	474	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	48,00	32,13	992	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	60,00	34,46		Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	44,00	26,33	1.464	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	48,00	44,10	133	Yes
11	Karekietstraat 55	156.934	193.184	6,9	4,0	48,00	30,83	1.076	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	44,00	24,09	1.831	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	48,00	28,84	1.398	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	44,00	25,90	1.516	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	44,00	32,79	661	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	44,00	29,06	1.041	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	44,00	26,38	1.383	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	44,00	28,57	1.124	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	48,00	26,88	1.448	Yes
20	Emmaüsdrif 20	155.761	194.296	5,0	4,0	50,00	31,37	998	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	48,00	36,94	561	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Dag Project-ISO 9613-2:1996

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	60,00	37,93		Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	44,00	25,37	1.576	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	50,00	31,67	1.076	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	50,00	26,71	1.605	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	50,00	32,64	869	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	50,00	39,70	341	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	48,00	33,40	888	Yes

Distances (m)

WTG	
NSA	WT1
1	714
2	545
3	845
4	603
5	1670
6	717
7	1236
8	1024
9	1821
10	376
11	1320
12	2197
13	1643
14	1862
15	1017
16	1406
17	1777
18	1458
19	1692
20	1184
21	804
22	731
23	1906
24	1259
25	1788
26	1052
27	522
28	1131

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	36,47	106,50	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	39,32	106,50	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	34,71	106,50	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	38,25	106,50	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	26,99	106,50	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	37,78	106,50	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	32,13	106,50	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	34,46	106,50	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	26,33	106,50	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	44,10	106,50	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	30,83	106,50	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	24,09	106,50	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	28,84	106,50	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	25,90	106,50	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	32,79	106,50	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	29,06	106,50	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	26,38	106,50	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	28,57	106,50	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	26,88	106,50	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	31,37	106,50	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	36,94	106,50	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	37,93	106,50	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	25,37	106,50	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	31,67	106,50	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	26,71	106,50	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	32,64	106,50	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	39,70	106,50	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	33,40	106,50	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise calculation model:
ISO 9613-2:2024 General
Wind speed (at hubheight):
95% rated power
Ground attenuation:
General, terrain specific
Ground factor for porous ground: 0,8
Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)
Area type with hard ground: ZVI height: 0,0 m
Ground factor for hard ground: 0,2
Meteorological coefficient, C0:
Selected option: Fixed value: 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:
Fixed penalty added to source noise of WTGs with pure tones
Model: 5,0 dB(A)
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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in
Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!
Noise: Bronvermogen 106.5 dB(A)

Source Source/Date Creator Edited
ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48
The sound power levels do not include uncertainties.
According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).
Enercon reserves the right to change the above specifications without prior notice.

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
				[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
User value	95% rated power	106,50	No	Generic data	88,08	95,08	98,48	101,08	100,88	97,98	93,18	83,68

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 44,0 dB(A)
No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 44,0 dB(A)
No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:23/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:1996

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

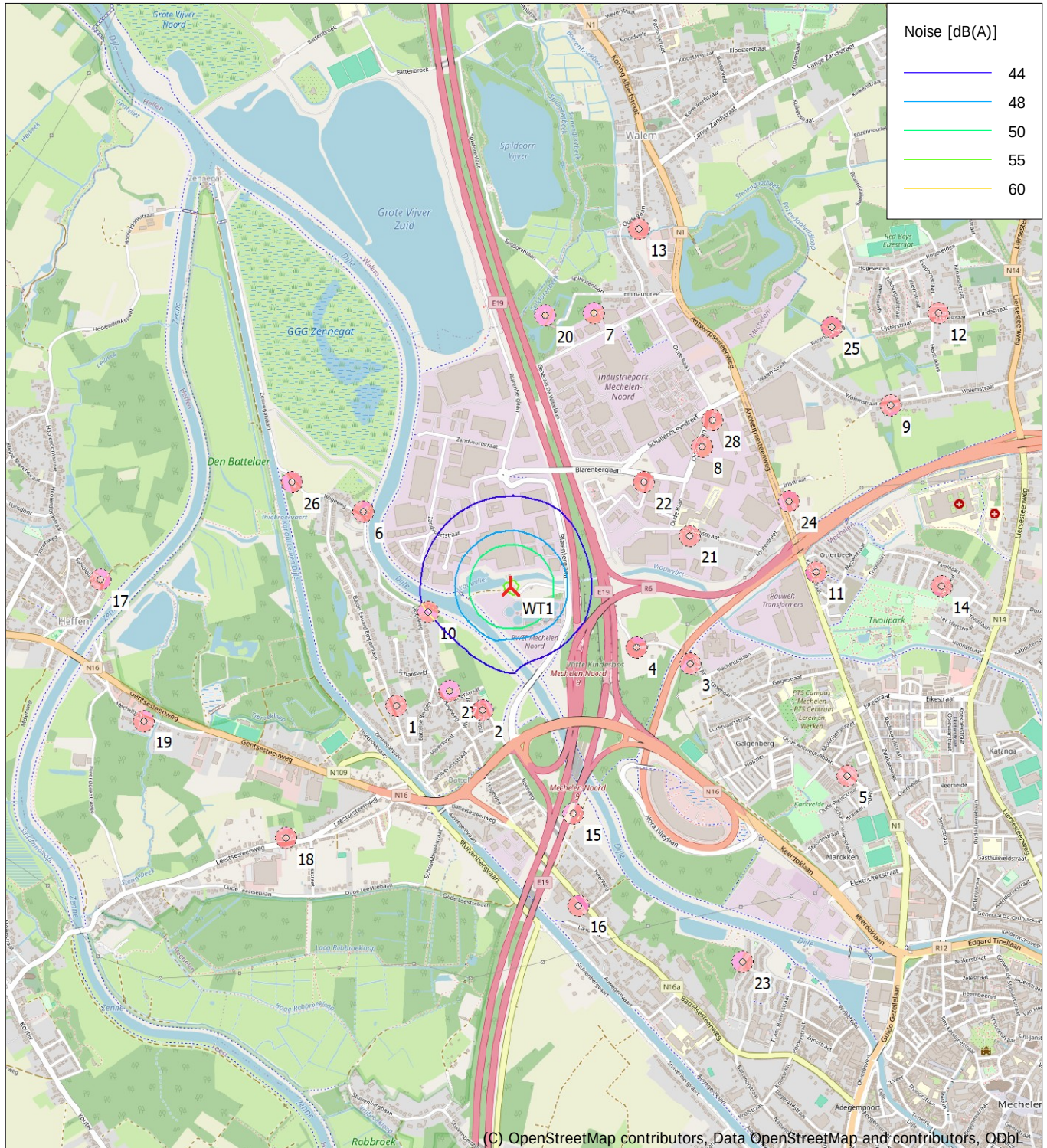
Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power Calculation: Geluid Dag Project-ISO 9613-2:1996



Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
 New WTG Noise sensitive area
 Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
 Height above sea level from active line object

DECIBEL - Main Result

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

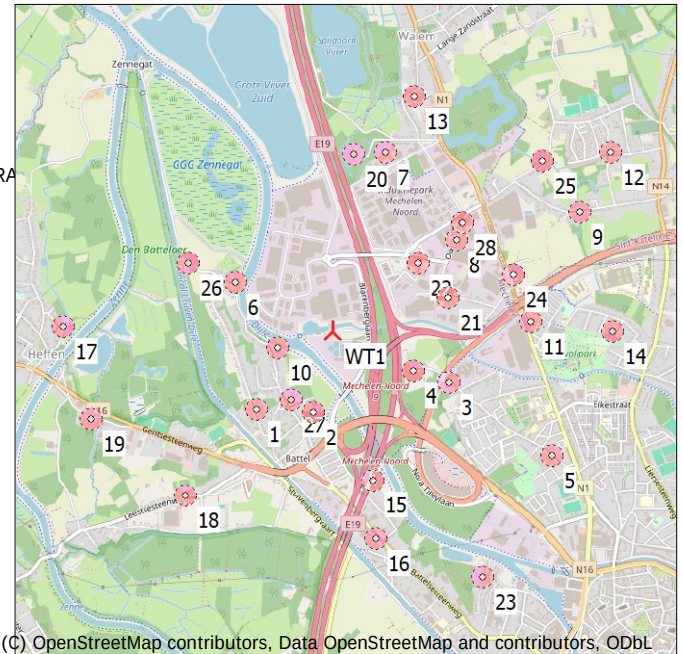
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	106.5 dB(A)	(95%) 106,50 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

New WTG

Scale 1:50.000
Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	44,00	37,47	347	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	44,00	40,28	162	Yes
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	48,00	35,72	580	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	60,00	39,23		Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	44,00	28,08	1.296	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	48,00	38,59	452	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	48,00	32,96	970	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	60,00	35,25		Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	44,00	27,37	1.440	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	48,00	44,84	111	Yes
11	Karekietstraat 55	156.934	193.184	6,9	4,0	48,00	31,75	1.059	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	44,00	25,14	1.808	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	48,00	29,71	1.376	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	44,00	26,96	1.489	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	44,00	33,81	619	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	44,00	30,12	1.003	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	44,00	27,45	1.351	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	44,00	29,65	1.092	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	48,00	27,96	1.427	Yes
20	Emmaüsdroef 20	155.761	194.296	5,0	4,0	50,00	32,36	980	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	48,00	37,72	540	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Dag Project-ISO 9613-2:2024

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	60,00	38,70		Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	44,00	26,48	1.540	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	50,00	32,54	1.059	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	50,00	27,72	1.587	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	50,00	33,62	851	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	50,00	40,67	323	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	48,00	34,20	866	Yes

Distances (m)

WTG
NSA WT1
1 714
2 545
3 845
4 603
5 1670
6 717
7 1236
8 1024
9 1821
10 376
11 1320
12 2197
13 1643
14 1862
15 1017
16 1406
17 1777
18 1458
19 1692
20 1184
21 804
22 731
23 1906
24 1259
25 1788
26 1052
27 522
28 1131

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	37,47	106,50	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	40,28	106,50	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	35,72	106,50	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	39,23	106,50	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	28,08	106,50	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	38,59	106,50	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	32,96	106,50	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	35,25	106,50	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	27,37	106,50	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	44,84	106,50	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	31,75	106,50	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	25,14	106,50	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	29,71	106,50	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	26,96	106,50	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	33,81	106,50	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	30,12	106,50	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	27,45	106,50	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	29,65	106,50	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	27,96	106,50	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	32,36	106,50	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	37,72	106,50	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	38,70	106,50	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Dag Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	26,48	106,50	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	32,54	106,50	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	27,72	106,50	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	33,62	106,50	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	40,67	106,50	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	34,20	106,50	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!

Noise: Bronvermogen 106.5 dB(A)

Source Source/Date Creator Edited

ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48

The sound power levels do not include uncertainties.

According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260

kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).

Enercon reserves the right to change the above specifications without prior notice.

Status	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	95% rated power	106,50	No	Generic data	88,08	95,08	98,48	101,08	100,88	97,98	93,18	83,68

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 60,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 44,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:22/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Dag Project-ISO 9613-2:2024

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 50,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

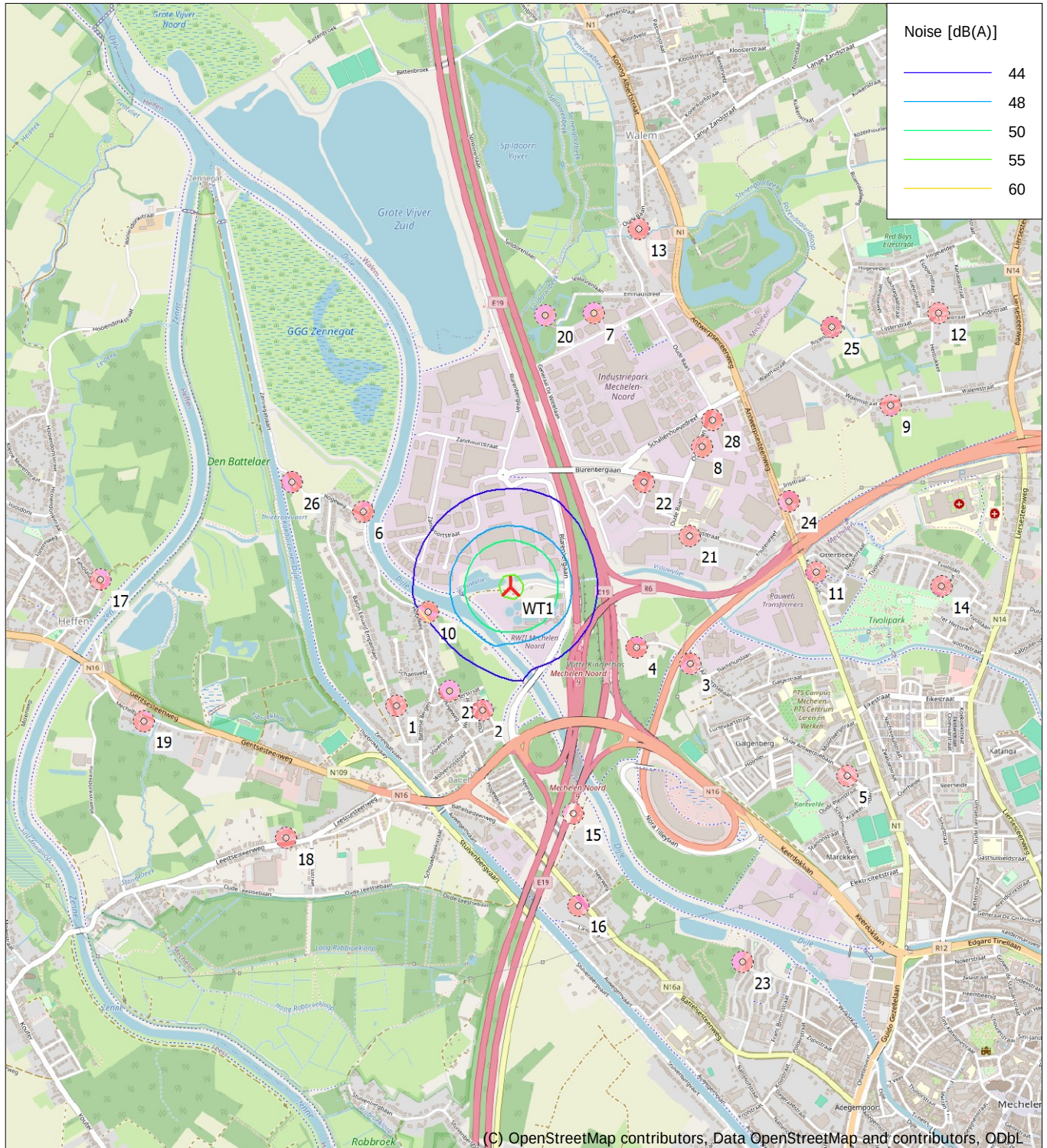
No temporal binning

Noise demand: 48,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power

Calculation: Geluid Dag Project-ISO 9613-2:2024



0 250 500 750 1000m

Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
 New WTG Noise sensitive area
 Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
 Height above sea level from active line object

DECIBEL - Main Result

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,8

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,2

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

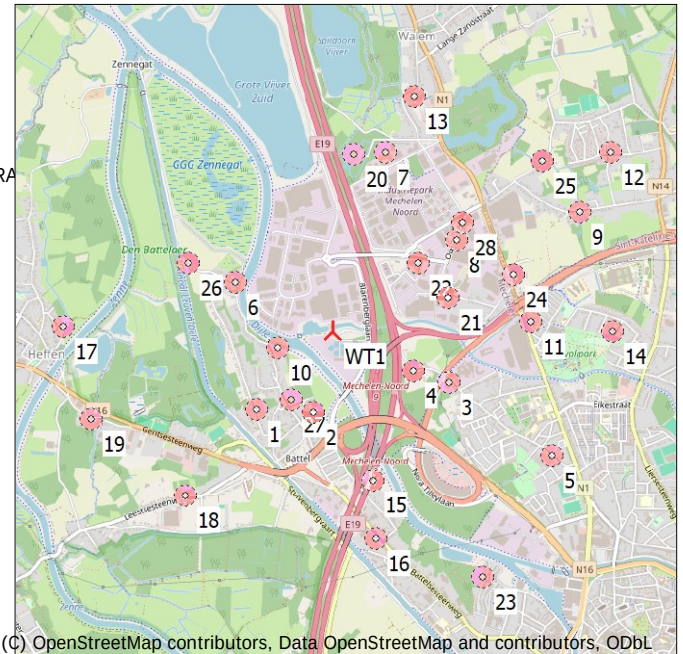
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	104.6 dB(A)	(95%) 104,60 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:50.000
 New WTG Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	39,00	34,56	253	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	39,00	37,42	79	Yes
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	43,00	32,81	520	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	55,00	36,35		Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	39,00	25,09	1.206	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	43,00	35,88	361	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	43,00	30,22	880	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	55,00	32,56		Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	39,00	24,43	1.303	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	43,00	42,20	26	Yes
11	Karekietstraat 55	156.934	193.184	6,9	4,0	43,00	28,93	998	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	39,00	22,19	1.682	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	43,00	26,94	1.287	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	39,00	23,99	1.372	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	39,00	30,88	485	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	39,00	27,16	874	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	39,00	24,48	1.232	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	39,00	26,67	997	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	43,00	24,98	1.340	Yes
20	Emmaüsdrif 20	155.761	194.296	5,0	4,0	45,00	29,47	903	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	43,00	35,04	479	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	55,00	36,03		Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	39,00	23,47	1.410	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	45,00	29,76	985	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	45,00	24,80	1.508	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	45,00	30,74	772	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	45,00	37,80	256	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	43,00	31,50	781	Yes

Distances (m)

WTG	
NSA WT1	
1	714
2	545
3	845
4	603
5	1670
6	717
7	1236
8	1024
9	1821
10	376
11	1320
12	2197
13	1643
14	1862
15	1017
16	1406
17	1777
18	1458
19	1692
20	1184
21	804
22	731
23	1906
24	1259
25	1788
26	1052
27	522
28	1131

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	34,56	104,60	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	37,42	104,60	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	32,81	104,60	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	36,35	104,60	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	25,09	104,60	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	35,88	104,60	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	30,22	104,60	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	32,56	104,60	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	24,43	104,60	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	42,20	104,60	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	28,93	104,60	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	22,19	104,60	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	26,94	104,60	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	23,99	104,60	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	30,88	104,60	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	27,16	104,60	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	24,48	104,60	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	26,67	104,60	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	24,98	104,60	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	29,47	104,60	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	35,04	104,60	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	36,03	104,60	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	23,47	104,60	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	29,76	104,60	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	24,80	104,60	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	30,74	104,60	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	37,80	104,60	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	31,50	104,60	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise calculation model:
ISO 9613-2:2024 General
Wind speed (at hubheight):
95% rated power
Ground attenuation:
General, terrain specific
Ground factor for porous ground: 0,8
Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)
Area type with hard ground: ZVI height: 0,0 m
Ground factor for hard ground: 0,2
Meteorological coefficient, C0:
Selected option: Fixed value: 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:
Fixed penalty added to source noise of WTGs with pure tones
Model: 5,0 dB(A)
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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in
Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!
Noise: Bronvermogen 104.6 dB(A)

Source Source/Date Creator Edited
ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48
The sound power levels do not include uncertainties.
According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).
Enercon reserves the right to change the above specifications without prior notice.

Status	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	95% rated power	104,60	No	Generic data	86,18	93,18	96,58	99,18	98,98	96,08	91,28	81,78

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 39,0 dB(A)
No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 39,0 dB(A)
No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:27/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

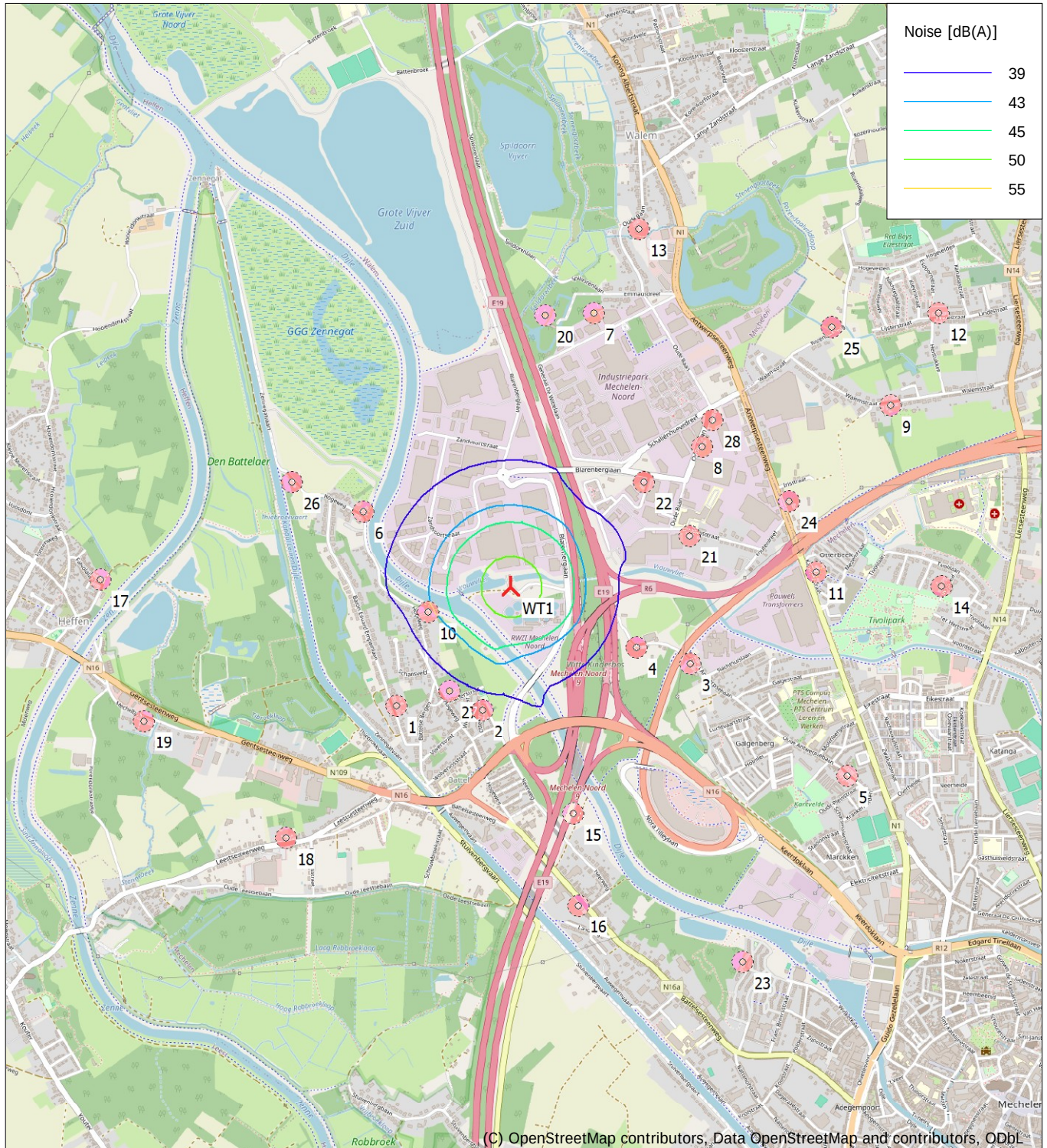
No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:1996



Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
 人 New WTG ■ Noise sensitive area
 Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
 Height above sea level from active line object

DECIBEL - Main Result

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

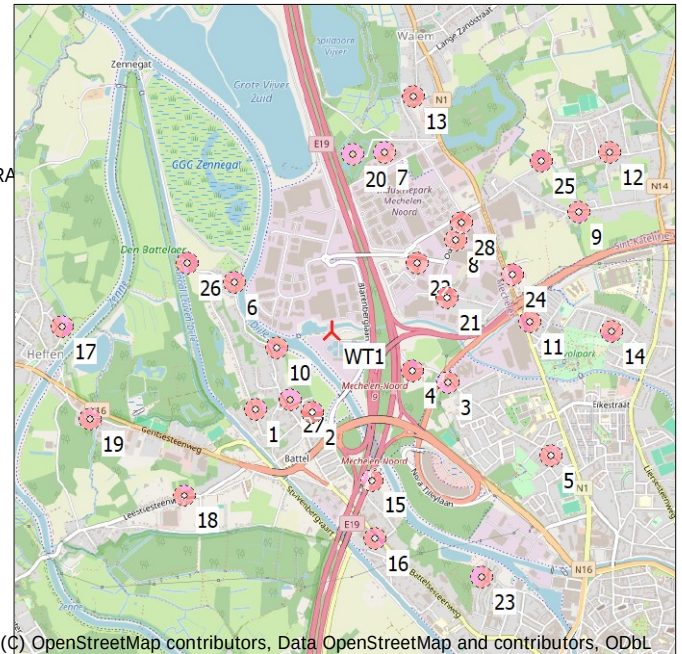
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	104.6 dB(A)	(95%) 104,60 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:50.000
 New WTG Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	39,00	35,57	205	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	39,00	38,38	33	Yes
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	43,00	33,82	498	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	55,00	37,33		Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	39,00	26,17	1.160	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	43,00	36,69	332	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	43,00	31,06	851	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	55,00	33,35		Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	39,00	25,47	1.240	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	43,00	42,94	2	Yes
11	Karekietstraat 55	156.934	193.184	6,9	4,0	43,00	29,85	975	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	39,00	23,24	1.615	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	43,00	27,81	1.257	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	39,00	25,06	1.301	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	39,00	31,90	441	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	39,00	28,22	833	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	39,00	25,55	1.195	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	39,00	27,75	949	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	43,00	26,06	1.312	Yes
20	Emmaüsdroef 20	155.761	194.296	5,0	4,0	45,00	30,46	878	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	43,00	35,82	456	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	55,00	36,80		Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	39,00	24,58	1.359	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	45,00	30,64	966	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	45,00	25,81	1.483	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	45,00	31,72	748	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	45,00	38,76	239	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	43,00	32,29	761	Yes

Distances (m)

WTG	
NSA	WT1
1	714
2	545
3	845
4	603
5	1670
6	717
7	1236
8	1024
9	1821
10	376
11	1320
12	2197
13	1643
14	1862
15	1017
16	1406
17	1777
18	1458
19	1692
20	1184
21	804
22	731
23	1906
24	1259
25	1788
26	1052
27	522
28	1131

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	35,57	104,60	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	38,38	104,60	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	33,82	104,60	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	37,33	104,60	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	26,17	104,60	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	36,69	104,60	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	31,06	104,60	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	33,35	104,60	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	25,47	104,60	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	42,94	104,60	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	29,85	104,60	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	23,24	104,60	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	27,81	104,60	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	25,06	104,60	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	31,90	104,60	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	28,22	104,60	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	25,55	104,60	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	27,75	104,60	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	26,06	104,60	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	30,46	104,60	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	35,82	104,60	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	36,80	104,60	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	24,58	104,60	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	30,64	104,60	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	25,81	104,60	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	31,72	104,60	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	38,76	104,60	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	32,29	104,60	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:26/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!

Noise: Bronvermogen 104.6 dB(A)

Source Source/Date Creator Edited

ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48

The sound power levels do not include uncertainties.

According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260

kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).

Enercon reserves the right to change the above specifications without prior notice.

Status	Wind speed [m/s]	LWA,ref [dB(A)]	Pure tones	Octave data							
				63	125	250	500	1000	2000	4000	8000
				[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
User value	95% rated power	104,60	No	Generic data	86,18	93,18	96,58	99,18	98,98	96,08	91,28 81,78

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:26/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

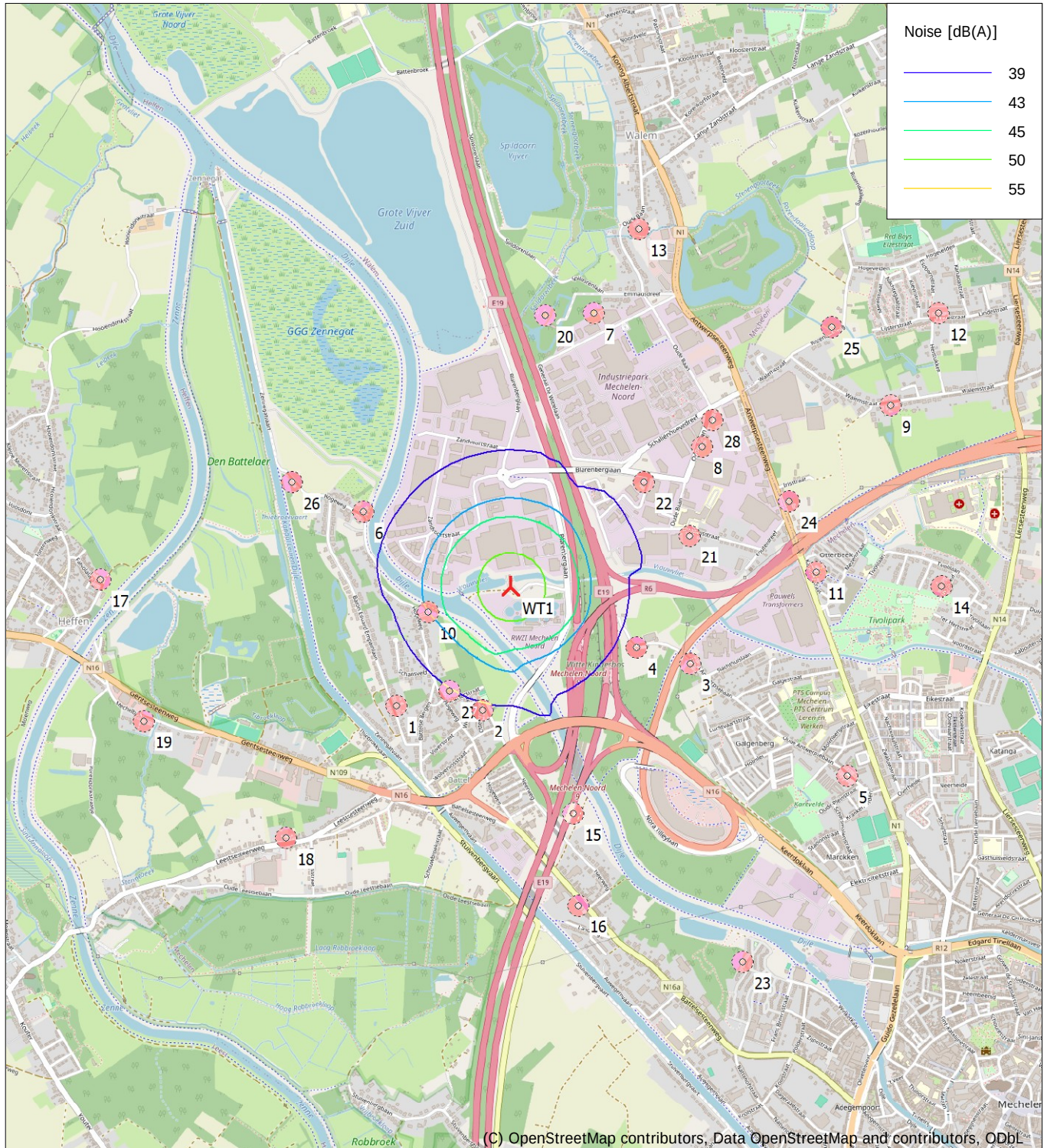
No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power

Calculation: Geluid Nacht (gebrideerd) Project-ISO 9613-2:2024



0 250 500 750 1000m

Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
 New WTG Noise sensitive area
 Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
 Height above sea level from active line object

DECIBEL - Main Result

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,8

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,2

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

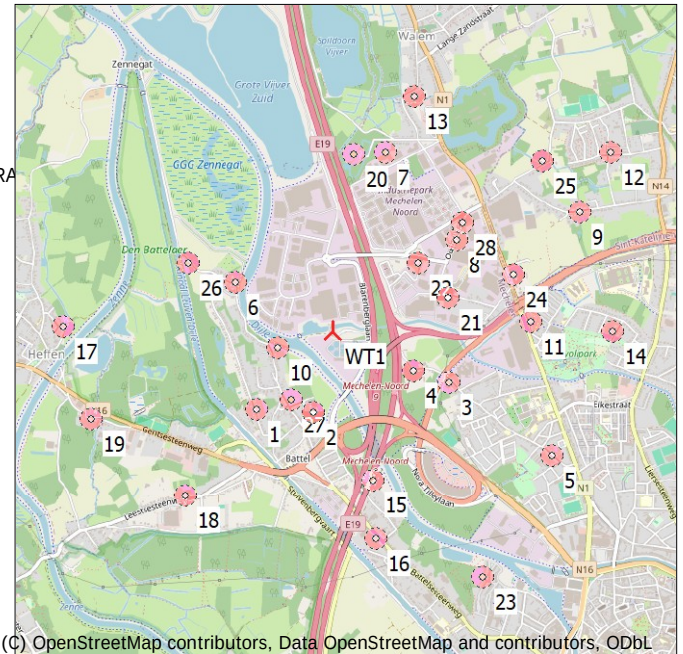
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	106.5 dB(A)	(95%) 106,50 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

New WTG

Scale 1:50.000
Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	39,00	36,47	155	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	39,00	39,32	-17	No
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	43,00	34,71	466	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	55,00	38,25	577	Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	39,00	26,99	1.110	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	43,00	37,78	277	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	43,00	32,13	796	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	55,00	34,46	996	Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	39,00	26,33	1.167	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	43,00	44,10	-29	No
11	Karekietstraat 55	156.934	193.184	6,9	4,0	43,00	30,83	943	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	39,00	24,09	1.542	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	43,00	28,84	1.203	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	39,00	25,90	1.223	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	39,00	32,79	378	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	39,00	29,06	773	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	39,00	26,38	1.152	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	39,00	28,57	900	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	43,00	26,88	1.268	Yes
20	Emmaüsdroef 20	155.761	194.296	5,0	4,0	45,00	31,37	831	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	43,00	36,94	427	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	55,00	37,93	704	Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	39,00	25,37	1.290	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	45,00	31,67	936	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	45,00	26,71	1.441	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	45,00	32,64	700	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	45,00	39,70	210	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	43,00	33,40	728	Yes

Distances (m)

NSA	WTG
1	714
2	545
3	845
4	603
5	1670
6	717
7	1236
8	1024
9	1821
10	376
11	1320
12	2197
13	1643
14	1862
15	1017
16	1406
17	1777
18	1458
19	1692
20	1184
21	804
22	731
23	1906
24	1259
25	1788
26	1052
27	522
28	1131

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	36,47	106,50	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	39,32	106,50	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	34,71	106,50	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	38,25	106,50	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	26,99	106,50	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	37,78	106,50	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebredeerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	32,13	106,50	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	34,46	106,50	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	26,33	106,50	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	44,10	106,50	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	30,83	106,50	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	24,09	106,50	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	28,84	106,50	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	25,90	106,50	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebriideerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	32,79	106,50	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	29,06	106,50	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	26,38	106,50	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	28,57	106,50	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	26,88	106,50	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	31,37	106,50	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	36,94	106,50	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	37,93	106,50	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebredeerd) Project-ISO 9613-2:1996 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	25,37	106,50	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	31,67	106,50	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	26,71	106,50	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	32,64	106,50	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	39,70	106,50	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	33,40	106,50	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise calculation model:
ISO 9613-2:2024 General
Wind speed (at hubheight):
95% rated power
Ground attenuation:
General, terrain specific
Ground factor for porous ground: 0,8
Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)
Area type with hard ground: ZVI height: 0,0 m
Ground factor for hard ground: 0,2
Meteorological coefficient, C0:
Selected option: Fixed value: 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:
Fixed penalty added to source noise of WTGs with pure tones
Model: 5,0 dB(A)
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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in
Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!
Noise: Bronvermogen 106.5 dB(A)

Source Source/Date Creator Edited
ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48
The sound power levels do not include uncertainties.
According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).
Enercon reserves the right to change the above specifications without prior notice.

Status	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	95% rated power	106,50	No	Generic data	88,08	95,08	98,48	101,08	100,88	97,98	93,18	83,68

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 39,0 dB(A)
No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:
Immission height(a.g.l.): Use standard value from calculation model
Uncertainty margin: Use default value from calculation model
No temporal binning
Noise demand: 39,0 dB(A)
No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:25/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:1996

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

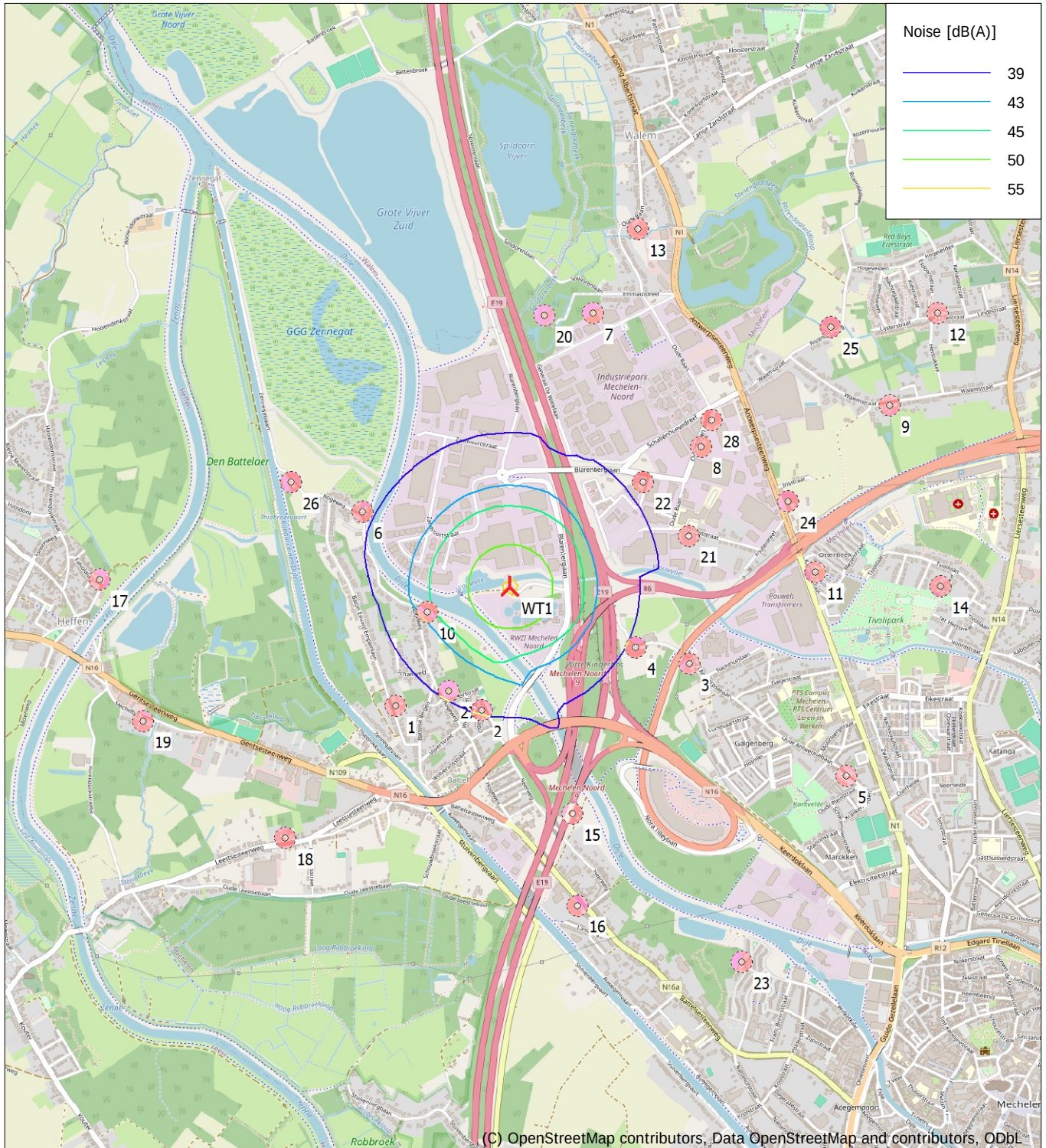
No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power

Calculation: Geluid Nacht (ongebiedeerd) Project-ISO 9613-2:1996



Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
 New WTG Noise sensitive area
 Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
 Height above sea level from active line object

DECIBEL - Main Result

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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)

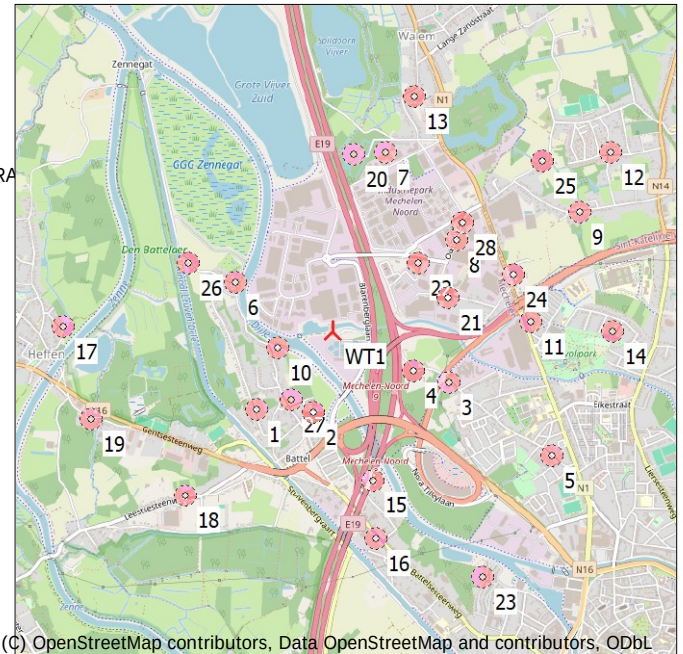
All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTGs

	X	Y	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		
WT1	155.615	193.121	5,0	ENERCON E-138 EP3 E3 ...	Yes	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	129,0	USER	Bronvermogen	106.5 dB(A)	(95%) 106,50 h

h) Generic octave distribution used



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:50.000

New WTG

Noise sensitive area

Calculation Results

Sound level

Noise sensitive area

No.	Name	X	Y	Z	Immission height	Demands Noise	Sound level From WTGs	Distance to noise demand	Demands fulfilled ? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[m]	
1	Baron Eduard Empainlaan 20	155.119	192.608	10,0	4,0	39,00	37,47	99	Yes
2	Otterstraat 18	155.492	192.590	5,7	4,0	39,00	40,28	-74	No
3	Oude Antwerpsebaan 243	156.392	192.789	5,8	4,0	43,00	35,72	432	Yes
4	Oude Antwerpsebaan 291	156.159	192.861	5,0	4,0	55,00	39,23	553	Yes
5	Oude Antwerpsebaan 47	157.072	192.304	5,0	4,0	39,00	28,08	1.054	Yes
6	Hogeweg 124	154.976	193.447	4,5	4,0	43,00	38,59	242	Yes
7	Generaal De Wittelaan 8	155.970	194.306	5,0	4,0	43,00	32,96	761	Yes
8	Oude Baan 20	156.440	193.727	5,0	4,0	55,00	35,25	975	Yes
9	Walemstraat 115	157.257	193.908	5,0	4,0	39,00	27,37	1.113	Yes
10	Hogeweg 120	155.255	193.012	5,0	4,0	43,00	44,84	-53	No
11	Karekietstraat 55	156.934	193.184	6,9	4,0	43,00	31,75	908	Yes
12	Lindestraat 50	157.464	194.308	5,0	4,0	39,00	25,14	1.488	Yes
13	Oude Baan 82	156.165	194.669	5,0	4,0	43,00	29,71	1.167	Yes
14	Hoogland 6	157.478	193.126	5,9	4,0	39,00	26,96	1.168	Yes
15	Neerweg 84	155.886	192.141	10,0	4,0	39,00	33,81	333	Yes
16	Battelsesteenweg 427	155.908	191.746	5,0	4,0	39,00	30,12	727	Yes
17	Fabiolaan 4	153.837	193.151	5,0	4,0	39,00	27,45	1.122	Yes
18	Leestsesteenweg 100	154.642	192.035	9,8	4,0	39,00	29,65	843	Yes
19	Mechelbaan 7	154.025	192.542	5,0	4,0	43,00	27,96	1.241	Yes
20	Emmaüsdrif 20	155.761	194.296	5,0	4,0	45,00	32,36	802	Yes
21	Blokhuisstraat 45	156.387	193.344	5,0	4,0	43,00	37,72	391	Yes

To be continued on next page...

DECIBEL - Main Result

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

...continued from previous page

Noise sensitive area					Demands	Sound level		Demands fulfilled ?
No. Name	X	Y	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise
			[m]	[m]	[dB(A)]	[dB(A)]	[m]	
22 Blarenberglaan 9	156.189	193.574	5,0	4,0	55,00	38,70	683	Yes
23 Gustave Van de Woestijnestraat 31	156.619	191.500	5,0	4,0	39,00	26,48	1.254	Yes
24 Antwerpsesteenweg 20	156.818	193.494	5,0	4,0	45,00	32,54	914	Yes
25 Rozendaalweg 3	157.004	194.247	5,0	4,0	45,00	27,72	1.421	Yes
26 Hogeweg 253	154.665	193.573	5,0	4,0	45,00	33,62	671	Yes
27 Hogeweg 76	155.349	192.671	10,0	4,0	45,00	40,67	187	Yes
28 Oude Baan 36	156.486	193.844	5,0	4,0	43,00	34,20	703	Yes

Distances (m)

WTG	
NSA	WT1
1	714
2	545
3	845
4	603
5	1670
6	717
7	1236
8	1024
9	1821
10	376
11	1320
12	2197
13	1643
14	1862
15	1017
16	1406
17	1777
18	1458
19	1692
20	1184
21	804
22	731
23	1906
24	1259
25	1788
26	1052
27	522
28	1131

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 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: 1 Baron Eduard Empainlaan 20

95% rated power

WTG

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]
WT1	714	724	37,47	106,50	0,00	68,19	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 2 Otterstraat 18

95% rated power

WTG

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]
WT1	545	559	40,28	106,50	0,00	65,95	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 3 Oude Antwerpsebaan 243

95% rated power

WTG

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]
WT1	845	854	35,72	106,50	0,00	69,63	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 4 Oude Antwerpsebaan 291

95% rated power

WTG

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]
WT1	603	616	39,23	106,50	0,00	66,79	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 5 Oude Antwerpsebaan 47

95% rated power

WTG

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]
WT1	1.670	1.674	28,08	106,50	0,00	75,48	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 6 Hogeweg 124

95% rated power

WTG

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]
WT1	717	728	38,59	106,50	0,00	68,25	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebriideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 7 Generaal De Wittelaan 8

95% rated power

WTG

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]
WT1	1.236	1.243	32,96	106,50	0,00	72,89	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 8 Oude Baan 20

95% rated power

WTG

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]
WT1	1.024	1.032	35,25	106,50	0,00	71,27	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 9 Walemstraat 115

95% rated power

WTG

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]
WT1	1.821	1.825	27,37	106,50	0,00	76,23	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 10 Hogeweg 120

95% rated power

WTG

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]
WT1	376	397	44,84	106,50	0,00	62,97	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 11 Karekietstraat 55

95% rated power

WTG

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]
WT1	1.320	1.326	31,75	106,50	0,00	73,45	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 12 Lindestraat 50

95% rated power

WTG

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]
WT1	2.197	2.200	25,14	106,50	0,00	77,85	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 13 Oude Baan 82

95% rated power

WTG

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]
WT1	1.643	1.647	29,71	106,50	0,00	75,34	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 14 Hoogland 6

95% rated power

WTG

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]
WT1	1.862	1.867	26,96	106,50	0,00	76,42	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebriideerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 15 Neerweg 84

95% rated power

WTG

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]
WT1	1.017	1.024	33,81	106,50	0,00	71,20	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 16 Battelsesteenweg 427

95% rated power

WTG

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]
WT1	1.406	1.411	30,12	106,50	0,00	73,99	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 17 Fabiolalaan 4

95% rated power

WTG

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]
WT1	1.777	1.782	27,45	106,50	0,00	76,02	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 18 Leestsesteenweg 100

95% rated power

WTG

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]
WT1	1.458	1.463	29,65	106,50	0,00	74,30	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 19 Mechelbaan 7

95% rated power

WTG

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]
WT1	1.692	1.696	27,96	106,50	0,00	75,59	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 20 Emmaüsdreef 20

95% rated power

WTG

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]
WT1	1.184	1.190	32,36	106,50	0,00	72,51	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 21 Blokhuisstraat 45

95% rated power

WTG

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]
WT1	804	813	37,72	106,50	0,00	69,21	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 22 Blarenberglaan 9

95% rated power

WTG

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]
WT1	731	742	38,70	106,50	0,00	68,41	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Detailed Results

Calculation: Geluid Nacht (ongebredeerd) Project-ISO 9613-2:2024 Noise calculation model: ISO 9613-2:2024 General 30,0 m/s

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

95% rated power

WTG

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]
WT1	1.906	1.910	26,48	106,50	0,00	76,62	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 24 Antwerpsesteenweg 20

95% rated power

WTG

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]
WT1	1.259	1.265	32,54	106,50	0,00	73,04	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 25 Rozendaalweg 3

95% rated power

WTG

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]
WT1	1.788	1.792	27,72	106,50	0,00	76,07	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 26 Hogeweg 253

95% rated power

WTG

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]
WT1	1.052	1.060	33,62	106,50	0,00	71,50	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 27 Hogeweg 76

95% rated power

WTG

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]
WT1	522	536	40,67	106,50	0,00	65,58	-	-	-	0,00	-

- Data undefined due to calculation with octave data

Noise sensitive area: 28 Oude Baan 36

95% rated power

WTG

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]
WT1	1.131	1.138	34,20	106,50	0,00	72,12	-	-	-	0,00	-

- Data undefined due to calculation with octave data

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebriideerd) Project-ISO 9613-2:2024

Noise calculation model:

ISO 9613-2:2024 General

Wind speed (at hubheight):

95% rated power

Ground attenuation:

General, terrain specific

Ground factor for porous ground: 0,5

Area object with hard ground: Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REGIONS_Mechelen-Noord_0.w2r (4)

Area type with hard ground: ZVI height: 0,0 m

Ground factor for hard ground: 0,0

Meteorological coefficient, C0:

Selected option: Fixed value: 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:

Fixed penalty added to source noise of WTGs with pure tones

Model: 5,0 dB(A)

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]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

The air absorption is for a temperature of 10,0 degrees C and 70,0 % humidity.

All coordinates are in

Belgian Lambert72-BD72 (BE 2001 <±1m)

WTG: ENERCON E-138 EP3 E3 4260 138.3 !O!

Noise: Bronvermogen 106.5 dB(A)

Source Source/Date Creator Edited

ENERCON GmbH 21/07/2025 USER 16/07/2026 9:48

The sound power levels do not include uncertainties.

According to manufacturer specification document (D03126321_0.0_de_Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260

kW.pdf/D03126322_0.0_de_Terzbandpegel Betriebsmodus OM-YO-11-1 - E-138 EP3 E3 - 4260 kW.pdf).

Enercon reserves the right to change the above specifications without prior notice.

Status	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	95% rated power	106,50	No	Generic data	88,08	95,08	98,48	101,08	100,88	97,98	93,18	83,68

Noise sensitive area: 1 Baron Eduard Empainlaan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 2 Otterstraat 18

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 3 Oude Antwerpsebaan 243

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 4 Oude Antwerpsebaan 291

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 5 Oude Antwerpsebaan 47

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 6 Hogeweg 124

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 7 Generaal De Wittelaan 8

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 8 Oude Baan 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 9 Walemstraat 115

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 10 Hogeweg 120

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 11 Karekietstraat 55

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 12 Lindestraat 50

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 13 Oude Baan 82

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 14 Hoogland 6

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 15 Neerweg 84

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 16 Battelsesteenweg 427

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 17 Fabiolalaan 4

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 18 Leestsesteenweg 100

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 19 Mechelbaan 7

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 20 Emmaüsdreef 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 21 Blokhuisstraat 45

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

Noise sensitive area: 22 Blarenberglaan 9

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 55,0 dB(A)

No distance demand

Noise sensitive area: 23 Gustave Van de Woestijnestraat 31

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 39,0 dB(A)

No distance demand

Noise sensitive area: 24 Antwerpsesteenweg 20

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 25 Rozendaalweg 3

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 26 Hogeweg 253

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Project:

Mechelen-Noord

Licensed user:

Arcadis Global B.V

Symphony, Gustav Mahlerplein 97-103
NL-1082 MS Amsterdam
+31 (0)88 4261 261
Margot Scheldeman /
margot.scheldeman@arcadis.com

Calculated:

16/07/2026 10:24/4.2.303

DECIBEL - Assumptions for noise calculation

Calculation: Geluid Nacht (ongebrideerd) Project-ISO 9613-2:2024

Noise sensitive area: 27 Hogeweg 76

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

No temporal binning

Noise demand: 45,0 dB(A)

No distance demand

Noise sensitive area: 28 Oude Baan 36

Predefined calculation standard:

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

Uncertainty margin: Use default value from calculation model

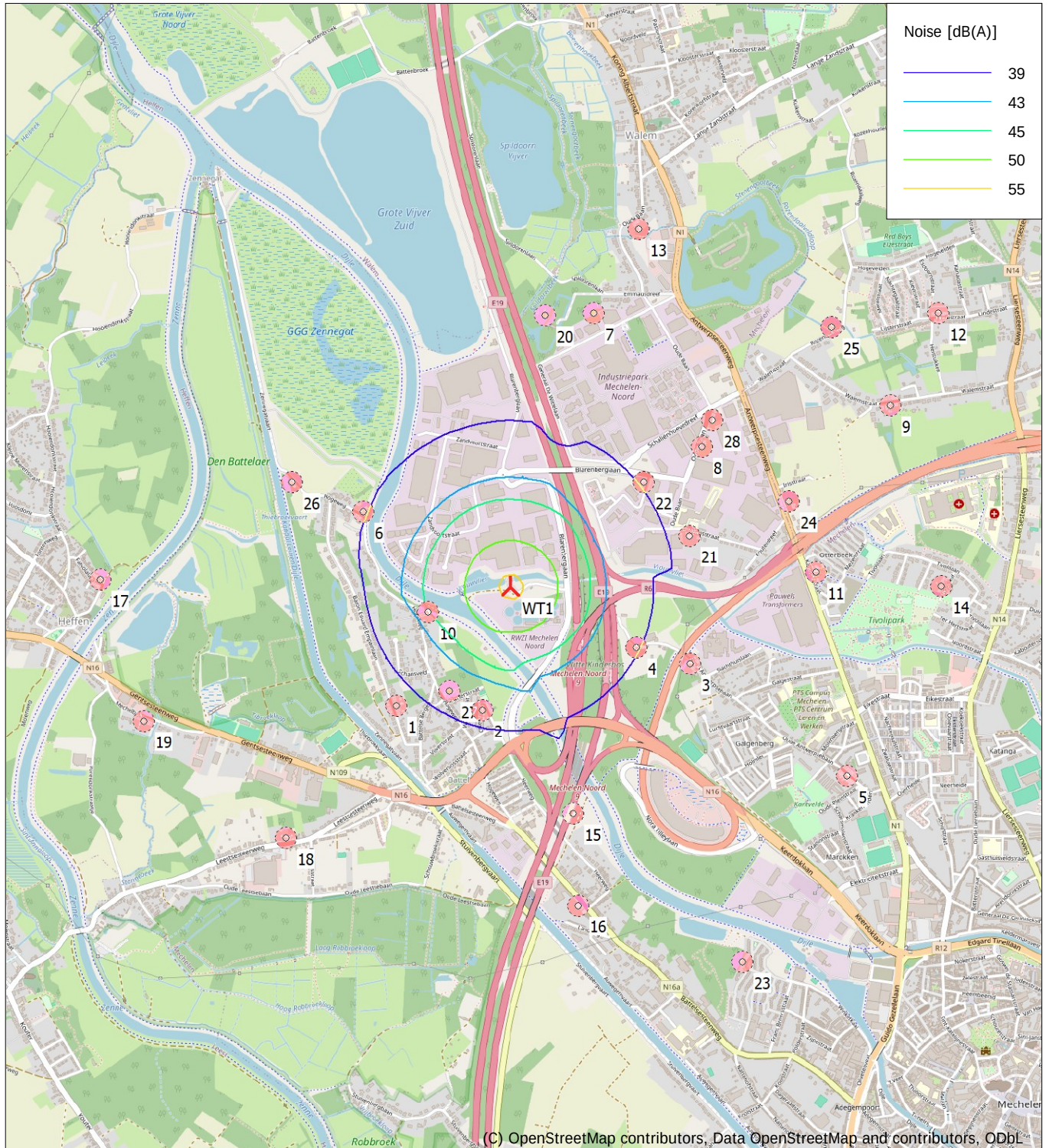
No temporal binning

Noise demand: 43,0 dB(A)

No distance demand

DECIBEL - Map 95 % rated power

Calculation: Geluid Nacht (ongebiedeerd) Project-ISO 9613-2:2024



Map: EMD OpenStreetMap, Print scale 1:25.000, Map center Belgian Lambert72-BD72 (BE 2001 $\pm 1m$) East: 155.615 North: 193.121
New WTG Noise sensitive area
Noise calculation model: ISO 9613-2:2024 General. Wind speed: 95% rated power
Height above sea level from active line object

