

**Appendix H:**  
**Noise Impact Assessment**



**Gaetz Brook Wind Farm  
Noise Impact Assessment Report  
June 2013**



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\*\* The WindPRO v2.8, Decibel Module Calculation Results for the Enercon E-92 2.3 MW @ 98 m Hub Height. . To review General Specification for the Enercon E-92 2.3 MW please contact:

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## I. Introduction

Natural Forces Inc. has undertaken a noise impact assessment for the proposed Gaetz Brook Wind Farm site to assess the impact of the wind farm's sound emissions on surrounding receptors. Details outlining the project, noise receptors, prediction methodology and assumptions made for the assessment are included herein, with WindPRO results for the turbine supplied in the annexes. The Land Use By-law for the Halifax Regional Municipality does not state any restriction pertaining to sound pressure levels relating to wind turbines activities. Therefore, the Ontario *Noise Guidelines for Wind Farms* will be used during this assessment as a guideline regarding acceptable noise emission from the proposed Gaetz Brook Wind Farm.

The noise analysis was conducted using the ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation model within the Decibel module of the software package, WindPRO version 2.8

## **2. General Description of Project Site and Surrounds**

The proposed Gaetz Brook Wind Farm consists of a single turbine wind farm located in Halifax Regional Municipality, Nova Scotia. Currently, an Enercon E-92 2.3 MW wind turbine generator (WTG) is being considered for the project. For this initial assessment, an Enercon E-92 2.3 MW was used to calculate sound pressure levels, however if the WTG type was to change a new noise assessment would be conducted. The project site is situated approximately 1.3 kilometres south of the Gaetz Brook community and adjacent to Highway 107. Land around the proposed project area is zoned as a Rural Wind Zone and so, will not require re-zoning. A map of the site and surrounding receptors is included in Annex A.

The predominant noise sources in the area are from road traffic along Highway 107 and along Marine Drive.

### 3. Noise Guidelines for Wind Farm

#### 3.1. Provincial and Municipal Noise Guidelines

As previously mentioned, the Land Use By-law for Planning districts 8 & 9 in the Halifax Regional Municipality does not include restrictions concerning acceptable sound pressure levels being emitted from wind turbines. A joint federal-provincial-territorial initiative to create national guidelines concerning wind turbine noise is underway. Although this initiative is only in draft format, Nova Scotia may choose to adopt these guidelines.

#### 3.2. Ontario Provincial Noise Guidelines

For the proposed Gaetz Brook Wind Farm, the *Ontario Noise Guidelines for Wind Farms* was used as a general guideline. The guidelines describe receptors in rural environments as Class 3. Table 1 demonstrates the sound level limits for wind turbines at different wind speeds.

Table 1: Summary of sound level limits for wind turbines (Ministry of the Environment, 2008).

Wind Speed (m/s) at 10 m height	4	5	6	7	8	9	10
Wind Turbine Sound Level Limits Class 3 Area, dB(A)	40.0	40.0	40.0	43.0	45.0	49.0	51.0

To ensure a conservative assessment of the sound level limits emitted by the proposed Gaetz Brook Wind Farm, a general limit of 40 dB(A) was used for wind speeds ranging between and including 4 and 12 m/s.

The noise assessment used the height above grade at the centre of the receptors of 4.5 m as proposed by the Ontario guideline for single and two story dwellings.



## 4. Description of Receptors

The 338 points of reception taken into consideration for this noise impact assessment represent residential buildings and/or seasonal homes located within approximately 2,000 m of the proposed WTG. Each receptor represents an individual dwelling located on Marine Drive, Pine Hill Drive, Lakehill Drive, Brookside Lane or other surrounding roads. It should be noted that there are no residential buildings and/or seasonal homes located within 1,000m of the turbines. Details of receptor locations and distances to nearest WTG are detailed in Annex B.

## 5. Description of Sources

### 5.1. Turbine Locations

A map of the project area with the proposed WTG layout is illustrated in Annex A. The nearest proposed large scale wind farm project to the proposed Gaetz Brook Wind Farm is in North Preston Nova Scotia located approximately 18 km West of the Gaetz Brook wind farm. A small scale turbine with an approximate hub height of 36 m and capacity of 100 kW is located 6.5 km West of the proposed project in Porters Lake.

Due to the the distance separating the Gaetz Brook Wind Farm to the proposed project in North Preston and the small scale wind turbine in Porters Lake, no cumulative shadow flicker impact will be evaluated as per the Ontario Guidelines. The UTM coordinates of the WTG is given below:

483812 m E, 4956090 m N (Zone 20, NAD 83)

### 5.2. Wind Turbine

The WTG model being considered for the proposed wind farm is the Enercon E-92 2.3 MW. The WTG will have a hub height of 98 m and a rotor diameter of 92 m as shown in Table 2, which outline the WTG's main characteristics. This model WTG utilizes a horizontal axis, 3-blade design and a microprocessor pitch control system (Enercon Canada, 2012).

Table 2: Enercon E-92 2.3 MW turbine characteristics (Enercon Canada, 2012).

<b>WTG Type</b>	<b>Rotor Diameter (m)</b>	<b>Hub Height (m)</b>	<b>Rated Output (MW)</b>
<b>E-92 2.3</b>	92.0	98	2.3

### 5.3. Power Curve Data

The power curve for the Enercon E-92 2.3 MW WTG at Noise Mode 0 and with an air density of 1.225 kg/m<sup>3</sup> is shown below in Figure I.

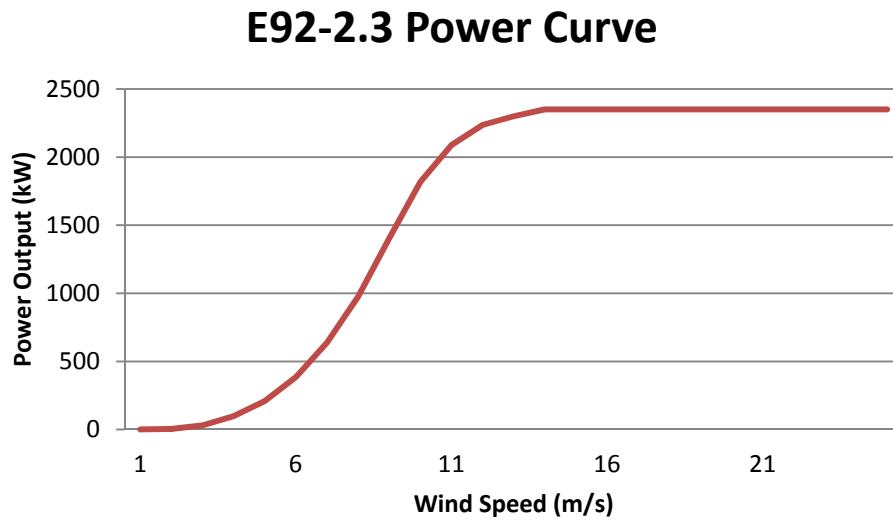


Figure I: Power curve for the Enercon E-92 2.3 (Enercon Canada, 2012).

## 6. Wind Turbine Noise Emission Rating

The noise emission data for the Enercon E-92 2.3 WTG, shown in Table 3, was provided by Enercon Canada. The sound pressure levels were measured to IEC 61400-11 standards, which stipulate measurements at a height of 10 m above ground level with an air density of 1.225 kg/m<sup>3</sup> that is taken to be representative of the project area. These source noise levels are incorporated in the prediction calculations referenced in Section 7.

Table 3: Enercon E-92 2.3 MW noise emission data for 98 m hub height (Enercon Canada, 2012).

Wind speed at 10 m a.g.l. (m/s)	SPL (LWA) (dB(A) re 10 <sup>-12</sup> Watts)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
4	97.6	79.2	86.2	89.6	92.2	92.0	89.1	84.3	74.8
5	99.9	81.5	88.5	91.9	94.5	94.3	91.4	86.6	77.1
6	102.2	83.8	90.8	94.2	96.8	96.6	93.7	88.9	79.4
7	103.4	85.0	92.0	95.4	98.0	97.8	94.9	90.1	80.6
8	104.4	86.0	93.0	96.4	99.0	98.8	95.9	91.1	81.6
9	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
10	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
11	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
12	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2

## 7. Impact Assessment

### 7.1. Prediction Methodology

The SPL was calculated at each point of reception (listed in Annex B) using the Decibel module of WindPRO v.2.8 which uses the ISO 9613-2 model “Attenuation of sound during propagation outdoors, Part 2: A general method of calculation”. The calculations were performed using the Enercon E-92 2.3 MW WTG with a hub height of 98 m. A global ground attenuation of zero was used to represent a ‘worst case scenario’ that produces results that are unaffected by vegetation characteristics such as trees or grass etc. The WindPRO software generated a noise contour map for the Enercon E-92 2.3 with a 98 m hub height; this can be found in Annex B.

As another conservative measure, downwind propagation has been assumed to occur simultaneously in all directions from the WTG. Furthermore, no attenuation from topographical shielding (other buildings, barns, trees etc.) has been considered between the WTG and the receptors. In reality, noise propagation in an upwind direction would lead to a significant reduction of incident noise levels at receptors located in the upwind direction.

No correction for special audible characteristics such as clearly audible tones, impulses or modulation of sound levels has been made. These are not common characteristics of modern, well designed wind turbines. Furthermore, the absence of tonal noise is normally guaranteed by WTG manufacturers and impulses and modulation of sound levels from the wind farm under normal conditions would not be of a level to necessitate the application of any penalty.

A full list of parameters assumed for the predictions is provided in Annex B.

### 7.2. Results of Noise Predictions

The results of the noise prediction model at each reception point, as summarized in Table 4, prove compliance with the Ontario *Noise Guidelines for Wind Farms* and the 40 dB(A) conservative SPL emission limit. As the guideline requirements have been exceeded, it was deemed unnecessary to conduct noise monitoring to establish background noise levels.

The receptors with the highest perceived noise are DZ, ED and KR which all received a maximum emission of 34 dB(A). The receptor LQ was very near the highest with a maximum emission of 33.9 dB(A).

The modelled noise results for a wind speed of 8 m/s, approximately the ‘noisiest’ operational speed of a WTG, in the form of a noise area plot is mapped in Annex B for the Enercon E-92 2.3MW. The receptor ID labels on the contour plot correspond with the WindPRO ID listed in Annex B.

Table 4: Wind turbine noise impact assessment summary.

Receptor ID	Max Sound Level dB(A)	Demands Fulfilled		
		Noise (below 40dBA)	Distance (Above 1000m)	All
A	26.4	Yes	Yes	Yes
B	26.5	Yes	Yes	Yes
C	26.6	Yes	Yes	Yes
D	26.5	Yes	Yes	Yes
E	26.6	Yes	Yes	Yes
F	26.6	Yes	Yes	Yes
G	26.6	Yes	Yes	Yes
H	26.6	Yes	Yes	Yes
I	26.8	Yes	Yes	Yes
J	26.8	Yes	Yes	Yes
K	27	Yes	Yes	Yes
L	26.9	Yes	Yes	Yes
M	27	Yes	Yes	Yes
N	27.1	Yes	Yes	Yes
O	27.1	Yes	Yes	Yes
P	27.2	Yes	Yes	Yes
Q	27.3	Yes	Yes	Yes
R	27.2	Yes	Yes	Yes
S	27.4	Yes	Yes	Yes
T	27.4	Yes	Yes	Yes
U	27.4	Yes	Yes	Yes
V	27.5	Yes	Yes	Yes
W	27.6	Yes	Yes	Yes
X	27.6	Yes	Yes	Yes
Y	27.6	Yes	Yes	Yes
Z	27.6	Yes	Yes	Yes
AA	27.5	Yes	Yes	Yes
AB	27.9	Yes	Yes	Yes
AC	28	Yes	Yes	Yes
AD	28	Yes	Yes	Yes
AE	28	Yes	Yes	Yes
AF	28.2	Yes	Yes	Yes
AG	28.4	Yes	Yes	Yes
AH	28.4	Yes	Yes	Yes

AI	28.5	Yes	Yes	Yes
AJ	28	Yes	Yes	Yes
AK	28.6	Yes	Yes	Yes
AL	28.5	Yes	Yes	Yes
AM	28.7	Yes	Yes	Yes
AN	28.7	Yes	Yes	Yes
AO	28.7	Yes	Yes	Yes
AP	28.7	Yes	Yes	Yes
AQ	28.7	Yes	Yes	Yes
AR	29	Yes	Yes	Yes
AS	28.8	Yes	Yes	Yes
AT	29	Yes	Yes	Yes
AU	29.3	Yes	Yes	Yes
AV	28.6	Yes	Yes	Yes
AW	29.3	Yes	Yes	Yes
AX	28.8	Yes	Yes	Yes
AY	29	Yes	Yes	Yes
AZ	28.9	Yes	Yes	Yes
BA	29.6	Yes	Yes	Yes
BB	29.1	Yes	Yes	Yes
BC	29.3	Yes	Yes	Yes
BD	29.3	Yes	Yes	Yes
BE	29.5	Yes	Yes	Yes
BF	29.4	Yes	Yes	Yes
BG	29	Yes	Yes	Yes
BH	29.5	Yes	Yes	Yes
BI	29.1	Yes	Yes	Yes
BJ	29.6	Yes	Yes	Yes
BK	29.7	Yes	Yes	Yes
BL	29.8	Yes	Yes	Yes
BM	29.4	Yes	Yes	Yes
BN	29.3	Yes	Yes	Yes
BO	29.4	Yes	Yes	Yes
BP	29.6	Yes	Yes	Yes
BQ	29.9	Yes	Yes	Yes
BR	29.7	Yes	Yes	Yes
BS	30	Yes	Yes	Yes
BT	29.8	Yes	Yes	Yes
BU	30.1	Yes	Yes	Yes

BV	30.3	Yes	Yes	Yes
BW	30.2	Yes	Yes	Yes
BX	30.4	Yes	Yes	Yes
BY	30	Yes	Yes	Yes
BZ	30.5	Yes	Yes	Yes
CA	30.5	Yes	Yes	Yes
CB	30.2	Yes	Yes	Yes
CC	30.7	Yes	Yes	Yes
CD	30.9	Yes	Yes	Yes
CE	30.8	Yes	Yes	Yes
CF	30.8	Yes	Yes	Yes
CG	31	Yes	Yes	Yes
CH	31.1	Yes	Yes	Yes
CI	31.2	Yes	Yes	Yes
CJ	31.2	Yes	Yes	Yes
CK	31.1	Yes	Yes	Yes
CL	31	Yes	Yes	Yes
CM	31.1	Yes	Yes	Yes
CN	31	Yes	Yes	Yes
CO	31.1	Yes	Yes	Yes
CP	31.6	Yes	Yes	Yes
CQ	31	Yes	Yes	Yes
CR	31	Yes	Yes	Yes
CS	31.8	Yes	Yes	Yes
CT	31.1	Yes	Yes	Yes
CU	31.8	Yes	Yes	Yes
CV	31.9	Yes	Yes	Yes
CW	29.4	Yes	Yes	Yes
CX	31.3	Yes	Yes	Yes
CY	30.2	Yes	Yes	Yes
CZ	31.5	Yes	Yes	Yes
DA	30	Yes	Yes	Yes
DB	32.3	Yes	Yes	Yes
DC	30.6	Yes	Yes	Yes
DD	30.8	Yes	Yes	Yes
DE	31.6	Yes	Yes	Yes
DF	32.4	Yes	Yes	Yes
DG	31.6	Yes	Yes	Yes
DH	30.8	Yes	Yes	Yes



DI	31.5	Yes	Yes	Yes
DJ	31.5	Yes	Yes	Yes
DK	30.6	Yes	Yes	Yes
DL	31.4	Yes	Yes	Yes
DM	32.9	Yes	Yes	Yes
DN	32.9	Yes	Yes	Yes
DO	33.3	Yes	Yes	Yes
DP	31.8	Yes	Yes	Yes
DQ	33.3	Yes	Yes	Yes
DR	30.5	Yes	Yes	Yes
DS	30.4	Yes	Yes	Yes
DT	30.5	Yes	Yes	Yes
DU	31.7	Yes	Yes	Yes
DV	30.5	Yes	Yes	Yes
DW	31.4	Yes	Yes	Yes
DX	30.6	Yes	Yes	Yes
DY	31.4	Yes	Yes	Yes
DZ	34	Yes	Yes	Yes
EA	30.9	Yes	Yes	Yes
EB	31.4	Yes	Yes	Yes
EC	32.7	Yes	Yes	Yes
ED	34	Yes	Yes	Yes
EE	31.5	Yes	Yes	Yes
EF	33.7	Yes	Yes	Yes
EG	30.3	Yes	Yes	Yes
EH	28.8	Yes	Yes	Yes
EI	30.6	Yes	Yes	Yes
EJ	31.5	Yes	Yes	Yes
EK	29.2	Yes	Yes	Yes
EL	28.4	Yes	Yes	Yes
EM	29.4	Yes	Yes	Yes
EN	29.6	Yes	Yes	Yes
EO	30.1	Yes	Yes	Yes
EP	30.5	Yes	Yes	Yes
EQ	29.8	Yes	Yes	Yes
ER	29	Yes	Yes	Yes
ES	31.4	Yes	Yes	Yes
ET	28.8	Yes	Yes	Yes
EU	29.4	Yes	Yes	Yes

EV	31.1	Yes	Yes	Yes
EW	33.1	Yes	Yes	Yes
EX	31.2	Yes	Yes	Yes
EY	29.5	Yes	Yes	Yes
EZ	31.2	Yes	Yes	Yes
FA	29.1	Yes	Yes	Yes
FB	33.7	Yes	Yes	Yes
FC	31	Yes	Yes	Yes
FD	29.5	Yes	Yes	Yes
FE	30.8	Yes	Yes	Yes
FF	32.9	Yes	Yes	Yes
FG	26.9	Yes	Yes	Yes
FH	31.4	Yes	Yes	Yes
FI	29.8	Yes	Yes	Yes
FJ	31.3	Yes	Yes	Yes
FK	33.1	Yes	Yes	Yes
FL	30.5	Yes	Yes	Yes
FM	28	Yes	Yes	Yes
FN	29.7	Yes	Yes	Yes
FO	28.4	Yes	Yes	Yes
FP	32.5	Yes	Yes	Yes
FQ	29.6	Yes	Yes	Yes
FR	32.3	Yes	Yes	Yes
FS	29.5	Yes	Yes	Yes
FT	32.1	Yes	Yes	Yes
FU	28.5	Yes	Yes	Yes
FV	27.6	Yes	Yes	Yes
FW	29.3	Yes	Yes	Yes
FX	31.5	Yes	Yes	Yes
FY	32.5	Yes	Yes	Yes
FZ	32.3	Yes	Yes	Yes
GA	31.5	Yes	Yes	Yes
GB	29	Yes	Yes	Yes
GC	32.1	Yes	Yes	Yes
GD	31.3	Yes	Yes	Yes
GE	31.8	Yes	Yes	Yes
GF	30.5	Yes	Yes	Yes
GG	30.1	Yes	Yes	Yes
GH	29.8	Yes	Yes	Yes

GI	27.1	Yes	Yes	Yes
GJ	29.7	Yes	Yes	Yes
GK	28.2	Yes	Yes	Yes
GL	27.5	Yes	Yes	Yes
GM	32.3	Yes	Yes	Yes
GN	30.7	Yes	Yes	Yes
GO	30.3	Yes	Yes	Yes
GP	31.4	Yes	Yes	Yes
GQ	29.8	Yes	Yes	Yes
GR	29.6	Yes	Yes	Yes
GS	32.4	Yes	Yes	Yes
GT	31.5	Yes	Yes	Yes
GU	27.3	Yes	Yes	Yes
GV	31.4	Yes	Yes	Yes
GW	29.1	Yes	Yes	Yes
GX	27	Yes	Yes	Yes
GY	29.5	Yes	Yes	Yes
GZ	30.7	Yes	Yes	Yes
HA	31.5	Yes	Yes	Yes
HB	29	Yes	Yes	Yes
HC	31.4	Yes	Yes	Yes
HD	29.1	Yes	Yes	Yes
HE	26.8	Yes	Yes	Yes
HF	32.6	Yes	Yes	Yes
HG	30.6	Yes	Yes	Yes
HH	26.7	Yes	Yes	Yes
HI	27.6	Yes	Yes	Yes
HJ	26.5	Yes	Yes	Yes
HK	32.5	Yes	Yes	Yes
HL	27.4	Yes	Yes	Yes
HM	27.2	Yes	Yes	Yes
HN	30.5	Yes	Yes	Yes
HO	32.4	Yes	Yes	Yes
HP	32.2	Yes	Yes	Yes
HQ	26.8	Yes	Yes	Yes
HR	30.9	Yes	Yes	Yes
HS	31.8	Yes	Yes	Yes
HT	30.1	Yes	Yes	Yes
HU	28.3	Yes	Yes	Yes

HV	30.1	Yes	Yes	Yes
HW	30.6	Yes	Yes	Yes
HX	29.9	Yes	Yes	Yes
HY	32.8	Yes	Yes	Yes
HZ	28.4	Yes	Yes	Yes
IA	27	Yes	Yes	Yes
IB	27.3	Yes	Yes	Yes
IC	26.9	Yes	Yes	Yes
ID	26.7	Yes	Yes	Yes
IE	33.2	Yes	Yes	Yes
IF	33.2	Yes	Yes	Yes
IG	26.4	Yes	Yes	Yes
IH	28.7	Yes	Yes	Yes
II	31.5	Yes	Yes	Yes
IJ	27.2	Yes	Yes	Yes
IK	32.2	Yes	Yes	Yes
IL	32.9	Yes	Yes	Yes
IM	30.5	Yes	Yes	Yes
IN	32.7	Yes	Yes	Yes
IO	26.5	Yes	Yes	Yes
IP	31.9	Yes	Yes	Yes
IQ	31	Yes	Yes	Yes
IR	27.3	Yes	Yes	Yes
IS	31.5	Yes	Yes	Yes
IT	29.2	Yes	Yes	Yes
IU	31.8	Yes	Yes	Yes
IV	29.4	Yes	Yes	Yes
IW	31.6	Yes	Yes	Yes
IX	32.5	Yes	Yes	Yes
IY	29.6	Yes	Yes	Yes
IZ	29.5	Yes	Yes	Yes
JA	32.4	Yes	Yes	Yes
JB	29.7	Yes	Yes	Yes
JC	30.8	Yes	Yes	Yes
JD	31.4	Yes	Yes	Yes
JE	29.5	Yes	Yes	Yes
JF	32.3	Yes	Yes	Yes
JG	31.1	Yes	Yes	Yes
JH	31.4	Yes	Yes	Yes

JI	32.1	Yes	Yes	Yes
JJ	31.4	Yes	Yes	Yes
JK	29.4	Yes	Yes	Yes
JL	32.4	Yes	Yes	Yes
JM	31.8	Yes	Yes	Yes
JN	32.2	Yes	Yes	Yes
JO	31.3	Yes	Yes	Yes
JP	29.6	Yes	Yes	Yes
JQ	32.4	Yes	Yes	Yes
JR	30.5	Yes	Yes	Yes
JS	29.4	Yes	Yes	Yes
JT	32.7	Yes	Yes	Yes
JU	31.2	Yes	Yes	Yes
JV	29.7	Yes	Yes	Yes
JW	31.7	Yes	Yes	Yes
JX	33.1	Yes	Yes	Yes
JY	31.8	Yes	Yes	Yes
JZ	30.9	Yes	Yes	Yes
KA	29.7	Yes	Yes	Yes
KB	33.3	Yes	Yes	Yes
KC	31.4	Yes	Yes	Yes
KD	32.3	Yes	Yes	Yes
KE	31.8	Yes	Yes	Yes
KF	33.6	Yes	Yes	Yes
KG	32.5	Yes	Yes	Yes
KH	31.2	Yes	Yes	Yes
KI	29.8	Yes	Yes	Yes
KJ	32.1	Yes	Yes	Yes
KK	33.4	Yes	Yes	Yes
KL	29.8	Yes	Yes	Yes
KM	32.7	Yes	Yes	Yes
KN	31.6	Yes	Yes	Yes
KO	32.7	Yes	Yes	Yes
KP	32.6	Yes	Yes	Yes
KQ	33.2	Yes	Yes	Yes
KR	34	Yes	Yes	Yes
KS	30.1	Yes	Yes	Yes
KT	32	Yes	Yes	Yes
KU	30.7	Yes	Yes	Yes

KV	30.9	Yes	Yes	Yes
KW	31.9	Yes	Yes	Yes
KX	32.1	Yes	Yes	Yes
KY	32.4	Yes	Yes	Yes
KZ	31.1	Yes	Yes	Yes
LA	32.8	Yes	Yes	Yes
LB	32.6	Yes	Yes	Yes
LC	31.5	Yes	Yes	Yes
LD	31.2	Yes	Yes	Yes
LE	30.2	Yes	Yes	Yes
LF	30.3	Yes	Yes	Yes
LG	31.9	Yes	Yes	Yes
LH	32.1	Yes	Yes	Yes
LI	30.6	Yes	Yes	Yes
LJ	30.8	Yes	Yes	Yes
LK	32	Yes	Yes	Yes
LL	32.2	Yes	Yes	Yes
LM	31.3	Yes	Yes	Yes
LN	31	Yes	Yes	Yes
LO	32.5	Yes	Yes	Yes
LP	31.4	Yes	Yes	Yes
LQ	33.9	Yes	Yes	Yes
LR	33.3	Yes	Yes	Yes
LS	31.3	Yes	Yes	Yes
LT	31.6	Yes	Yes	Yes
LU	32.2	Yes	Yes	Yes
LV	33.1	Yes	Yes	Yes
LW	31.8	Yes	Yes	Yes
LX	32.6	Yes	Yes	Yes
LY	32.9	Yes	Yes	Yes
LZ	28.9	Yes	Yes	Yes

## 8. Conclusions and Recommendations

Natural Forces Wind Inc. has completed a thorough assessment to evaluate the noise impact of the proposed Gaetz Brook Wind Farm at receptors representing residential locations within 2,000 m of the proposed wind turbine generators. Based on the parameters used to run the WindPRO noise prediction model, it has been shown that the worst case predicted sound pressure levels emitted by the proposed wind turbine generator is less than 40 dB(A) at any receptor within 2,000m, thus demonstrating compliance with the Ontario *Noise Guidelines for Wind Farms*. As a result of this study, no noise mitigation strategies are recommended.

## 9. References

Halifax Regional Municipality (2009). Land Use By-Law for Planning Districts 8 & 9 (Lake Echo/Porter's Lake). HRM.

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## **ANNEX A**

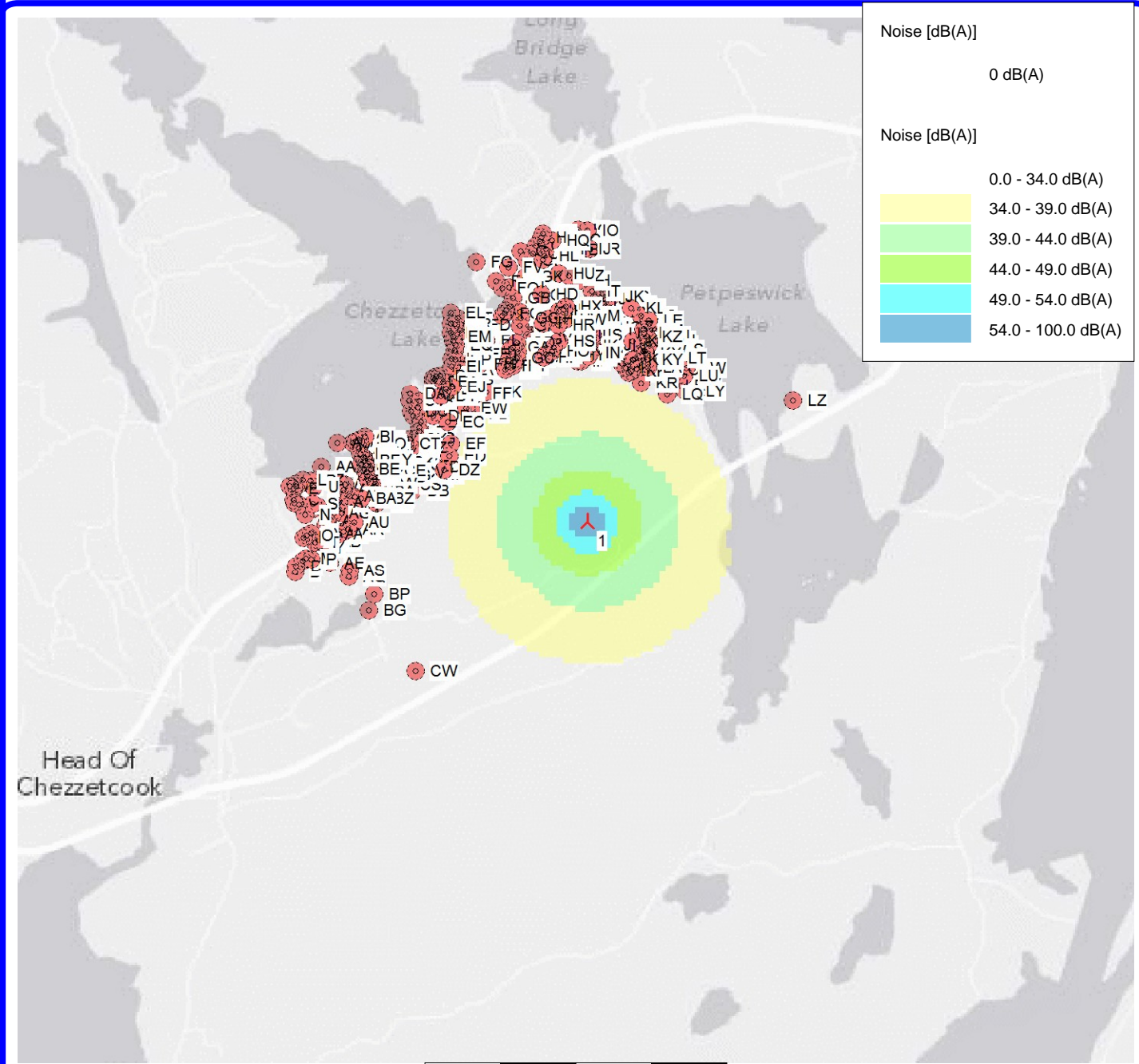
### **Site Layout Map**

Project:  
**GTZ\_noise assessment\_130603**

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 04/06/2013 10:31 AM/2.8.579

**DECIBEL - Map 8.0 m/s**

Calculation: GTZ\_noise assessment E92- 98m hub



Map: GTZ\_ARC background map , Print scale 1:40,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 483,812 North: 4,956,090  
 New WTG Noise sensitive area  
 Noise calculation model: ISO 9613-2 General. Wind speed: 8.0 m/s  
 Height above sea level from active line object

## **ANNEX B**

**WindPRO v2.8, Decibel Module Calculation Results**

**Enercon E-92 2.3 MW @ 98 m Hub Height**

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## DECIBEL - Main Result

**Calculation:** GTZ\_ noise assessment E92- 98m hub

### Noise calculation model:

ISO 9613-2 General

### Wind speed:

4.0 m/s - 12.0 m/s, step 1.0 m/s

### Ground attenuation:

None

### Meteorological coefficient, C0:

0.0 dB

### Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

### Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

### Pure tones:

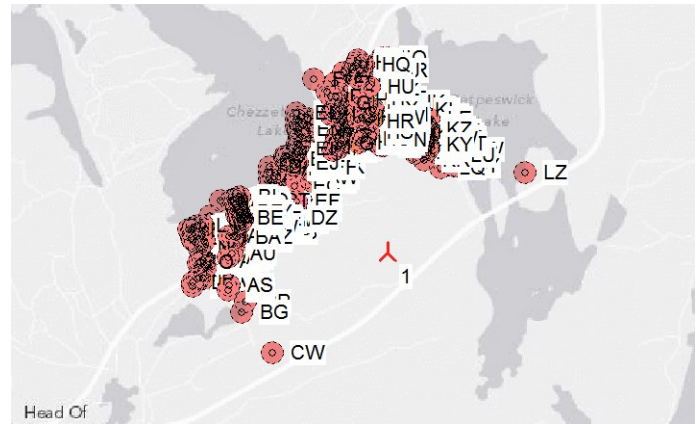
Pure and Impulse tone penalty are added to WTG source noise

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

4.5 m Don't allow override of model height with height from NSA object

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

0.0 dB(A)



Scale 1:75,000  
 New WTG Noise sensitive area

## WTGs

UTM (north)-NAD83 (US+CA) Zone: 20			WTG type			Noise data			First	LwaRef	Last	LwaRef	Pure					
East	North	Z	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	wind speed [m/s]	[dB(A)]	wind speed [m/s]	[dB(A)]	tones			
1	483,812	4,956,090	78.1	ENERCON	E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012	4.0	97.6	12.0	105.0	0 dB g

h) Generic octave distribution used  
 g) Data calculated from data for other wind speed (uncertain)

## Calculation Results

### Sound Level

Noise sensitive area No.	Name	UTM (north)-NAD83 (US+CA) Zone: 20			Demands			Sound Level		Demands fulfilled ?		
		East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All	
				[m]	[m]	[dB(A)]	[m]	[dB(A)]				
A	Noise sensitive point: User defined (1)	481,843	4,956,354	20.0	4.5	40.0	1000	26.4	Yes	Yes	Yes	
B	Noise sensitive point: User defined (2)	481,862	4,955,770	10.4	4.5	40.0	1000	26.5	Yes	Yes	Yes	
C	Noise sensitive point: User defined (3)	481,867	4,956,257	20.0	4.5	40.0	1000	26.6	Yes	Yes	Yes	
D	Noise sensitive point: User defined (4)	481,868	4,955,810	11.7	4.5	40.0	1000	26.5	Yes	Yes	Yes	
E	Noise sensitive point: User defined (5)	481,868	4,956,337	20.0	4.5	40.0	1000	26.6	Yes	Yes	Yes	
F	Noise sensitive point: User defined (6)	481,872	4,956,239	20.0	4.5	40.0	1000	26.6	Yes	Yes	Yes	
G	Noise sensitive point: User defined (7)	481,882	4,956,351	20.0	4.5	40.0	1000	26.6	Yes	Yes	Yes	
H	Noise sensitive point: User defined (8)	481,883	4,956,366	20.0	4.5	40.0	1000	26.6	Yes	Yes	Yes	
I	Noise sensitive point: User defined (9)	481,903	4,956,227	20.0	4.5	40.0	1000	26.8	Yes	Yes	Yes	
J	Noise sensitive point: User defined (10)	481,915	4,955,848	12.7	4.5	40.0	1000	26.8	Yes	Yes	Yes	
K	Noise sensitive point: User defined (11)	481,924	4,956,004	15.7	4.5	40.0	1000	27.0	Yes	Yes	Yes	
L	Noise sensitive point: User defined (12)	481,929	4,956,391	20.0	4.5	40.0	1000	26.9	Yes	Yes	Yes	
M	Noise sensitive point: User defined (13)	481,937	4,955,864	12.7	4.5	40.0	1000	27.0	Yes	Yes	Yes	
N	Noise sensitive point: User defined (14)	481,942	4,956,157	19.2	4.5	40.0	1000	27.1	Yes	Yes	Yes	
O	Noise sensitive point: User defined (15)	481,947	4,956,016	16.1	4.5	40.0	1000	27.1	Yes	Yes	Yes	
P	Noise sensitive point: User defined (16)	481,972	4,955,854	12.1	4.5	40.0	1000	27.2	Yes	Yes	Yes	
Q	Noise sensitive point: User defined (17)	481,980	4,956,032	17.1	4.5	40.0	1000	27.3	Yes	Yes	Yes	
R	Noise sensitive point: User defined (18)	481,980	4,956,389	20.0	4.5	40.0	1000	27.2	Yes	Yes	Yes	
S	Noise sensitive point: User defined (19)	481,990	4,956,229	20.0	4.5	40.0	1000	27.4	Yes	Yes	Yes	
T	Noise sensitive point: User defined (20)	481,999	4,955,970	15.9	4.5	40.0	1000	27.4	Yes	Yes	Yes	
U	Noise sensitive point: User defined (21)	482,001	4,956,345	20.0	4.5	40.0	1000	27.4	Yes	Yes	Yes	
V	Noise sensitive point: User defined (22)	482,004	4,956,200	20.0	4.5	40.0	1000	27.5	Yes	Yes	Yes	
W	Noise sensitive point: User defined (23)	482,020	4,955,984	16.3	4.5	40.0	1000	27.6	Yes	Yes	Yes	

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**DECIBEL - Main Result****Calculation:** GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
X	Noise sensitive point: User defined (24)	482,022	4,956,216	20.0	4.5	40.0	1000	27.6	Yes	Yes	Yes
Y	Noise sensitive point: User defined (25)	482,033	4,955,931	15.5	4.5	40.0	1000	27.6	Yes	Yes	Yes
Z	Noise sensitive point: User defined (26)	482,042	4,956,392	20.0	4.5	40.0	1000	27.6	Yes	Yes	Yes
AA	Noise sensitive point: User defined (27)	482,053	4,956,482	20.0	4.5	40.0	1000	27.5	Yes	Yes	Yes
AB	Noise sensitive point: User defined (28)	482,070	4,955,977	16.0	4.5	40.0	1000	27.9	Yes	Yes	Yes
AC	Noise sensitive point: User defined (29)	482,078	4,956,088	18.1	4.5	40.0	1000	28.0	Yes	Yes	Yes
AD	Noise sensitive point: User defined (30)	482,085	4,956,114	18.5	4.5	40.0	1000	28.0	Yes	Yes	Yes
AE	Noise sensitive point: User defined (31)	482,095	4,955,828	13.6	4.5	40.0	1000	28.0	Yes	Yes	Yes
AF	Noise sensitive point: User defined (32)	482,105	4,956,025	16.9	4.5	40.0	1000	28.2	Yes	Yes	Yes
AG	Noise sensitive point: User defined (33)	482,134	4,956,165	19.5	4.5	40.0	1000	28.4	Yes	Yes	Yes
AH	Noise sensitive point: User defined (34)	482,143	4,956,186	19.9	4.5	40.0	1000	28.4	Yes	Yes	Yes
AI	Noise sensitive point: User defined (35)	482,159	4,956,025	16.9	4.5	40.0	1000	28.5	Yes	Yes	Yes
AJ	Noise sensitive point: User defined (36)	482,167	4,956,639	20.0	4.5	40.0	1000	28.0	Yes	Yes	Yes
AK	Noise sensitive point: User defined (37)	482,168	4,956,240	20.0	4.5	40.0	1000	28.6	Yes	Yes	Yes
AL	Noise sensitive point: User defined (38)	482,172	4,956,367	20.0	4.5	40.0	1000	28.5	Yes	Yes	Yes
AM	Noise sensitive point: User defined (39)	482,183	4,956,166	19.6	4.5	40.0	1000	28.7	Yes	Yes	Yes
AN	Noise sensitive point: User defined (40)	482,189	4,956,043	17.3	4.5	40.0	1000	28.7	Yes	Yes	Yes
AO	Noise sensitive point: User defined (41)	482,200	4,956,320	20.0	4.5	40.0	1000	28.7	Yes	Yes	Yes
AP	Noise sensitive point: User defined (42)	482,210	4,956,358	20.0	4.5	40.0	1000	28.7	Yes	Yes	Yes
AQ	Noise sensitive point: User defined (43)	482,219	4,955,732	11.5	4.5	40.0	1000	28.7	Yes	Yes	Yes
AR	Noise sensitive point: User defined (44)	482,224	4,956,058	17.6	4.5	40.0	1000	29.0	Yes	Yes	Yes
AS	Noise sensitive point: User defined (45)	482,226	4,955,774	12.3	4.5	40.0	1000	28.8	Yes	Yes	Yes
AT	Noise sensitive point: User defined (46)	482,239	4,956,281	20.0	4.5	40.0	1000	29.0	Yes	Yes	Yes
AU	Noise sensitive point: User defined (47)	482,265	4,956,105	18.5	4.5	40.0	1000	29.3	Yes	Yes	Yes
AV	Noise sensitive point: User defined (48)	482,266	4,956,637	20.0	4.5	40.0	1000	28.6	Yes	Yes	Yes
AW	Noise sensitive point: User defined (49)	482,276	4,956,275	20.0	4.5	40.0	1000	29.3	Yes	Yes	Yes
AX	Noise sensitive point: User defined (50)	482,289	4,956,647	20.0	4.5	40.0	1000	28.8	Yes	Yes	Yes
AY	Noise sensitive point: User defined (51)	482,310	4,956,601	20.0	4.5	40.0	1000	29.0	Yes	Yes	Yes
AZ	Noise sensitive point: User defined (52)	482,315	4,956,657	20.0	4.5	40.0	1000	28.9	Yes	Yes	Yes
BA	Noise sensitive point: User defined (53)	482,316	4,956,264	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
BB	Noise sensitive point: User defined (54)	482,318	4,956,565	20.0	4.5	40.0	1000	29.1	Yes	Yes	Yes
BC	Noise sensitive point: User defined (55)	482,321	4,956,491	20.0	4.5	40.0	1000	29.3	Yes	Yes	Yes
BD	Noise sensitive point: User defined (56)	482,334	4,956,541	20.0	4.5	40.0	1000	29.3	Yes	Yes	Yes
BE	Noise sensitive point: User defined (57)	482,338	4,956,461	20.0	4.5	40.0	1000	29.5	Yes	Yes	Yes
BF	Noise sensitive point: User defined (58)	482,344	4,956,516	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
BG	Noise sensitive point: User defined (59)	482,346	4,955,502	10.6	4.5	40.0	1000	29.0	Yes	Yes	Yes
BH	Noise sensitive point: User defined (60)	482,349	4,956,489	20.0	4.5	40.0	1000	29.5	Yes	Yes	Yes
BI	Noise sensitive point: User defined (61)	482,351	4,956,677	20.0	4.5	40.0	1000	29.1	Yes	Yes	Yes
BJ	Noise sensitive point: User defined (62)	482,354	4,956,440	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
BK	Noise sensitive point: User defined (63)	482,357	4,956,415	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
BL	Noise sensitive point: User defined (64)	482,365	4,956,389	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
BM	Noise sensitive point: User defined (65)	482,372	4,956,604	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
BN	Noise sensitive point: User defined (66)	482,374	4,956,659	20.0	4.5	40.0	1000	29.3	Yes	Yes	Yes
BO	Noise sensitive point: User defined (67)	482,375	4,956,632	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
BP	Noise sensitive point: User defined (68)	482,385	4,955,612	12.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
BQ	Noise sensitive point: User defined (69)	482,388	4,956,460	20.0	4.5	40.0	1000	29.9	Yes	Yes	Yes
BR	Noise sensitive point: User defined (70)	482,402	4,956,579	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
BS	Noise sensitive point: User defined (71)	482,402	4,956,435	20.0	4.5	40.0	1000	30.0	Yes	Yes	Yes
BT	Noise sensitive point: User defined (72)	482,410	4,956,554	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
BU	Noise sensitive point: User defined (73)	482,410	4,956,392	20.0	4.5	40.0	1000	30.1	Yes	Yes	Yes
BV	Noise sensitive point: User defined (74)	482,412	4,956,293	20.0	4.5	40.0	1000	30.3	Yes	Yes	Yes
BW	Noise sensitive point: User defined (75)	482,412	4,956,360	20.0	4.5	40.0	1000	30.2	Yes	Yes	Yes
BX	Noise sensitive point: User defined (76)	482,413	4,956,231	20.0	4.5	40.0	1000	30.4	Yes	Yes	Yes
BY	Noise sensitive point: User defined (77)	482,422	4,956,520	20.0	4.5	40.0	1000	30.0	Yes	Yes	Yes
BZ	Noise sensitive point: User defined (78)	482,431	4,956,260	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes

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## DECIBEL - Main Result

Calculation: GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level	Demands fulfilled ?			
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
CA	Noise sensitive point: User defined (79)	482,434	4,956,309	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
CB	Noise sensitive point: User defined (80)	482,438	4,956,494	20.0	4.5	40.0	1000	30.2	Yes	Yes	Yes
CC	Noise sensitive point: User defined (81)	482,494	4,956,433	20.0	4.5	40.0	1000	30.7	Yes	Yes	Yes
CD	Noise sensitive point: User defined (82)	482,508	4,956,406	20.0	4.5	40.0	1000	30.9	Yes	Yes	Yes
CE	Noise sensitive point: User defined (83)	482,509	4,956,449	20.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
CF	Noise sensitive point: User defined (84)	482,513	4,956,467	20.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
CG	Noise sensitive point: User defined (85)	482,527	4,956,417	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
CH	Noise sensitive point: User defined (86)	482,548	4,956,471	20.0	4.5	40.0	1000	31.1	Yes	Yes	Yes
CI	Noise sensitive point: User defined (87)	482,566	4,956,490	20.0	4.5	40.0	1000	31.2	Yes	Yes	Yes
CJ	Noise sensitive point: User defined (88)	482,566	4,956,465	20.0	4.5	40.0	1000	31.2	Yes	Yes	Yes
CK	Noise sensitive point: User defined (89)	482,567	4,956,506	20.0	4.5	40.0	1000	31.1	Yes	Yes	Yes
CL	Noise sensitive point: User defined (90)	482,569	4,956,570	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
CM	Noise sensitive point: User defined (91)	482,570	4,956,535	20.0	4.5	40.0	1000	31.1	Yes	Yes	Yes
CN	Noise sensitive point: User defined (92)	482,571	4,956,555	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
CO	Noise sensitive point: User defined (93)	482,582	4,956,544	20.0	4.5	40.0	1000	31.1	Yes	Yes	Yes
CP	Noise sensitive point: User defined (94)	482,583	4,956,362	20.3	4.5	40.0	1000	31.6	Yes	Yes	Yes
CQ	Noise sensitive point: User defined (95)	482,583	4,956,601	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
CR	Noise sensitive point: User defined (96)	482,599	4,956,618	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
CS	Noise sensitive point: User defined (97)	482,606	4,956,353	22.1	4.5	40.0	1000	31.8	Yes	Yes	Yes
CT	Noise sensitive point: User defined (98)	482,614	4,956,631	20.0	4.5	40.0	1000	31.1	Yes	Yes	Yes
CU	Noise sensitive point: User defined (99)	482,624	4,956,431	20.2	4.5	40.0	1000	31.8	Yes	Yes	Yes
CV	Noise sensitive point: User defined (100)	482,642	4,956,439	20.4	4.5	40.0	1000	31.9	Yes	Yes	Yes
CW	Noise sensitive point: User defined (101)	482,644	4,955,089	26.4	4.5	40.0	1000	29.4	Yes	Yes	Yes
CX	Noise sensitive point: User defined (102)	482,651	4,956,660	20.0	4.5	40.0	1000	31.3	Yes	Yes	Yes
CY	Noise sensitive point: User defined (103)	482,654	4,956,918	20.0	4.5	40.0	1000	30.2	Yes	Yes	Yes
CZ	Noise sensitive point: User defined (104)	482,656	4,956,605	20.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
DA	Noise sensitive point: User defined (105)	482,656	4,956,970	20.0	4.5	40.0	1000	30.0	Yes	Yes	Yes
DB	Noise sensitive point: User defined (106)	482,656	4,956,312	26.4	4.5	40.0	1000	32.3	Yes	Yes	Yes
DC	Noise sensitive point: User defined (107)	482,658	4,956,845	20.0	4.5	40.0	1000	30.6	Yes	Yes	Yes
DD	Noise sensitive point: User defined (108)	482,672	4,956,816	20.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
DE	Noise sensitive point: User defined (109)	482,680	4,956,639	20.0	4.5	40.0	1000	31.6	Yes	Yes	Yes
DF	Noise sensitive point: User defined (110)	482,690	4,956,401	24.8	4.5	40.0	1000	32.4	Yes	Yes	Yes
DG	Noise sensitive point: User defined (111)	482,697	4,956,663	20.0	4.5	40.0	1000	31.6	Yes	Yes	Yes
DH	Noise sensitive point: User defined (112)	482,706	4,956,875	20.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
DI	Noise sensitive point: User defined (113)	482,713	4,956,712	20.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
DJ	Noise sensitive point: User defined (114)	482,715	4,956,738	20.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
DK	Noise sensitive point: User defined (115)	482,716	4,956,916	20.0	4.5	40.0	1000	30.6	Yes	Yes	Yes
DL	Noise sensitive point: User defined (116)	482,725	4,956,775	20.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
DM	Noise sensitive point: User defined (117)	482,740	4,956,417	26.9	4.5	40.0	1000	32.9	Yes	Yes	Yes
DN	Noise sensitive point: User defined (118)	482,761	4,956,475	25.2	4.5	40.0	1000	32.9	Yes	Yes	Yes
DO	Noise sensitive point: User defined (119)	482,798	4,956,453	29.7	4.5	40.0	1000	33.3	Yes	Yes	Yes
DP	Noise sensitive point: User defined (120)	482,807	4,956,814	21.2	4.5	40.0	1000	31.8	Yes	Yes	Yes
DQ	Noise sensitive point: User defined (121)	482,811	4,956,471	29.7	4.5	40.0	1000	33.3	Yes	Yes	Yes
DR	Noise sensitive point: User defined (122)	482,812	4,957,046	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
DS	Noise sensitive point: User defined (123)	482,815	4,957,075	20.0	4.5	40.0	1000	30.4	Yes	Yes	Yes
DT	Noise sensitive point: User defined (124)	482,821	4,957,063	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
DU	Noise sensitive point: User defined (125)	482,823	4,956,841	21.5	4.5	40.0	1000	31.7	Yes	Yes	Yes
DV	Noise sensitive point: User defined (126)	482,836	4,957,082	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
DW	Noise sensitive point: User defined (127)	482,854	4,956,941	21.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
DX	Noise sensitive point: User defined (128)	482,859	4,957,091	20.0	4.5	40.0	1000	30.6	Yes	Yes	Yes
DY	Noise sensitive point: User defined (129)	482,862	4,956,949	21.3	4.5	40.0	1000	31.4	Yes	Yes	Yes
DZ	Noise sensitive point: User defined (130)	482,870	4,956,452	38.0	4.5	40.0	1000	34.0	Yes	Yes	Yes
EA	Noise sensitive point: User defined (131)	482,881	4,957,049	20.0	4.5	40.0	1000	30.9	Yes	Yes	Yes
EB	Noise sensitive point: User defined (132)	482,898	4,956,995	21.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
EC	Noise sensitive point: User defined (133)	482,904	4,956,773	27.8	4.5	40.0	1000	32.7	Yes	Yes	Yes

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Project:

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**DECIBEL - Main Result****Calculation:** GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
ED	Noise sensitive point: User defined (134)	482,907	4,956,540	34.5	4.5	40.0	1000	34.0	Yes	Yes	Yes
EE	Noise sensitive point: User defined (135)	482,915	4,956,980	22.1	4.5	40.0	1000	31.5	Yes	Yes	Yes
EF	Noise sensitive point: User defined (136)	482,918	4,956,623	32.1	4.5	40.0	1000	33.7	Yes	Yes	Yes
EG	Noise sensitive point: User defined (137)	482,939	4,957,205	20.0	4.5	40.0	1000	30.3	Yes	Yes	Yes
EH	Noise sensitive point: User defined (138)	482,939	4,957,444	20.0	4.5	40.0	1000	28.8	Yes	Yes	Yes
EI	Noise sensitive point: User defined (139)	482,939	4,957,153	20.0	4.5	40.0	1000	30.6	Yes	Yes	Yes
EJ	Noise sensitive point: User defined (140)	482,940	4,957,013	22.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
EK	Noise sensitive point: User defined (141)	482,940	4,957,380	20.0	4.5	40.0	1000	29.2	Yes	Yes	Yes
EL	Noise sensitive point: User defined (142)	482,942	4,957,516	20.0	4.5	40.0	1000	28.4	Yes	Yes	Yes
EM	Noise sensitive point: User defined (143)	482,951	4,957,354	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
EN	Noise sensitive point: User defined (144)	482,951	4,957,324	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
EO	Noise sensitive point: User defined (145)	482,960	4,957,258	20.0	4.5	40.0	1000	30.1	Yes	Yes	Yes
EP	Noise sensitive point: User defined (146)	482,962	4,957,196	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
EQ	Noise sensitive point: User defined (147)	482,965	4,957,299	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
ER	Noise sensitive point: User defined (148)	482,967	4,957,437	20.0	4.5	40.0	1000	29.0	Yes	Yes	Yes
ES	Noise sensitive point: User defined (149)	482,977	4,957,064	22.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
ET	Noise sensitive point: User defined (150)	482,989	4,957,481	20.0	4.5	40.0	1000	28.8	Yes	Yes	Yes
EU	Noise sensitive point: User defined (151)	483,001	4,957,397	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
EV	Noise sensitive point: User defined (152)	483,011	4,957,129	20.2	4.5	40.0	1000	31.1	Yes	Yes	Yes
EW	Noise sensitive point: User defined (153)	483,026	4,956,861	30.0	4.5	40.0	1000	33.1	Yes	Yes	Yes
EX	Noise sensitive point: User defined (154)	483,028	4,957,130	20.7	4.5	40.0	1000	31.2	Yes	Yes	Yes
EY	Noise sensitive point: User defined (155)	483,039	4,957,391	20.0	4.5	40.0	1000	29.5	Yes	Yes	Yes
EZ	Noise sensitive point: User defined (156)	483,049	4,957,154	20.3	4.5	40.0	1000	31.2	Yes	Yes	Yes
FA	Noise sensitive point: User defined (157)	483,050	4,957,459	20.0	4.5	40.0	1000	29.1	Yes	Yes	Yes
FB	Noise sensitive point: User defined (158)	483,080	4,956,826	34.0	4.5	40.0	1000	33.7	Yes	Yes	Yes
FC	Noise sensitive point: User defined (159)	483,084	4,957,201	20.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
FD	Noise sensitive point: User defined (160)	483,096	4,957,431	20.0	4.5	40.0	1000	29.5	Yes	Yes	Yes
FE	Noise sensitive point: User defined (161)	483,097	4,957,233	20.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
FF	Noise sensitive point: User defined (162)	483,109	4,956,963	30.0	4.5	40.0	1000	32.9	Yes	Yes	Yes
FG	Noise sensitive point: User defined (163)	483,117	4,957,858	20.0	4.5	40.0	1000	26.9	Yes	Yes	Yes
FH	Noise sensitive point: User defined (164)	483,121	4,957,166	21.9	4.5	40.0	1000	31.4	Yes	Yes	Yes
FI	Noise sensitive point: User defined (165)	483,146	4,957,417	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
FJ	Noise sensitive point: User defined (166)	483,159	4,957,211	21.1	4.5	40.0	1000	31.3	Yes	Yes	Yes
FK	Noise sensitive point: User defined (167)	483,161	4,956,969	30.4	4.5	40.0	1000	33.1	Yes	Yes	Yes
FL	Noise sensitive point: User defined (168)	483,171	4,957,327	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes
FM	Noise sensitive point: User defined (169)	483,246	4,957,727	20.0	4.5	40.0	1000	28.0	Yes	Yes	Yes
FN	Noise sensitive point: User defined (170)	483,285	4,957,489	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
FO	Noise sensitive point: User defined (171)	483,288	4,957,679	20.0	4.5	40.0	1000	28.4	Yes	Yes	Yes
FP	Noise sensitive point: User defined (172)	483,293	4,957,128	26.4	4.5	40.0	1000	32.5	Yes	Yes	Yes
FQ	Noise sensitive point: User defined (173)	483,299	4,957,506	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
FR	Noise sensitive point: User defined (174)	483,307	4,957,153	25.7	4.5	40.0	1000	32.3	Yes	Yes	Yes
FS	Noise sensitive point: User defined (175)	483,310	4,957,528	20.0	4.5	40.0	1000	29.5	Yes	Yes	Yes
FT	Noise sensitive point: User defined (176)	483,315	4,957,189	23.9	4.5	40.0	1000	32.1	Yes	Yes	Yes
FU	Noise sensitive point: User defined (177)	483,331	4,957,683	20.0	4.5	40.0	1000	28.5	Yes	Yes	Yes
FV	Noise sensitive point: User defined (178)	483,334	4,957,819	21.6	4.5	40.0	1000	27.6	Yes	Yes	Yes
FW	Noise sensitive point: User defined (179)	483,334	4,957,554	20.0	4.5	40.0	1000	29.3	Yes	Yes	Yes
FX	Noise sensitive point: User defined (180)	483,335	4,957,264	20.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
FY	Noise sensitive point: User defined (181)	483,344	4,957,151	28.0	4.5	40.0	1000	32.5	Yes	Yes	Yes
FZ	Noise sensitive point: User defined (182)	483,350	4,957,180	26.7	4.5	40.0	1000	32.3	Yes	Yes	Yes
GA	Noise sensitive point: User defined (183)	483,351	4,957,275	20.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
GB	Noise sensitive point: User defined (184)	483,358	4,957,611	20.0	4.5	40.0	1000	29.0	Yes	Yes	Yes
GC	Noise sensitive point: User defined (185)	483,371	4,957,204	26.0	4.5	40.0	1000	32.1	Yes	Yes	Yes
GD	Noise sensitive point: User defined (186)	483,376	4,957,307	20.0	4.5	40.0	1000	31.3	Yes	Yes	Yes
GE	Noise sensitive point: User defined (187)	483,378	4,957,243	23.5	4.5	40.0	1000	31.8	Yes	Yes	Yes
GF	Noise sensitive point: User defined (188)	483,396	4,957,421	20.0	4.5	40.0	1000	30.5	Yes	Yes	Yes

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Project:

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**DECIBEL - Main Result****Calculation:** GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
GG	Noise sensitive point: User defined (189)	483,403	4,957,473	20.0	4.5	40.0	1000	30.1	Yes	Yes	Yes
GH	Noise sensitive point: User defined (190)	483,403	4,957,515	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
GI	Noise sensitive point: User defined (191)	483,415	4,957,926	28.2	4.5	40.0	1000	27.1	Yes	Yes	Yes
GJ	Noise sensitive point: User defined (192)	483,422	4,957,532	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
GK	Noise sensitive point: User defined (193)	483,446	4,957,755	20.0	4.5	40.0	1000	28.2	Yes	Yes	Yes
GL	Noise sensitive point: User defined (194)	483,455	4,957,863	24.4	4.5	40.0	1000	27.5	Yes	Yes	Yes
GM	Noise sensitive point: User defined (195)	483,461	4,957,213	30.0	4.5	40.0	1000	32.3	Yes	Yes	Yes
GN	Noise sensitive point: User defined (196)	483,464	4,957,409	21.1	4.5	40.0	1000	30.7	Yes	Yes	Yes
GO	Noise sensitive point: User defined (197)	483,466	4,957,465	20.6	4.5	40.0	1000	30.3	Yes	Yes	Yes
GP	Noise sensitive point: User defined (198)	483,468	4,957,325	22.8	4.5	40.0	1000	31.4	Yes	Yes	Yes
GQ	Noise sensitive point: User defined (199)	483,469	4,957,522	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
GR	Noise sensitive point: User defined (200)	483,476	4,957,556	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
GS	Noise sensitive point: User defined (201)	483,485	4,957,211	30.0	4.5	40.0	1000	32.4	Yes	Yes	Yes
GT	Noise sensitive point: User defined (202)	483,487	4,957,319	23.9	4.5	40.0	1000	31.5	Yes	Yes	Yes
GU	Noise sensitive point: User defined (203)	483,499	4,957,907	26.4	4.5	40.0	1000	27.3	Yes	Yes	Yes
GV	Noise sensitive point: User defined (204)	483,500	4,957,333	24.2	4.5	40.0	1000	31.4	Yes	Yes	Yes
GW	Noise sensitive point: User defined (205)	483,506	4,957,630	20.1	4.5	40.0	1000	29.1	Yes	Yes	Yes
GX	Noise sensitive point: User defined (206)	483,517	4,957,960	29.0	4.5	40.0	1000	27.0	Yes	Yes	Yes
GY	Noise sensitive point: User defined (207)	483,526	4,957,575	21.7	4.5	40.0	1000	29.5	Yes	Yes	Yes
GZ	Noise sensitive point: User defined (208)	483,528	4,957,419	24.4	4.5	40.0	1000	30.7	Yes	Yes	Yes
HA	Noise sensitive point: User defined (209)	483,530	4,957,330	26.2	4.5	40.0	1000	31.5	Yes	Yes	Yes
HB	Noise sensitive point: User defined (210)	483,531	4,957,656	20.8	4.5	40.0	1000	29.0	Yes	Yes	Yes
HC	Noise sensitive point: User defined (211)	483,542	4,957,343	26.9	4.5	40.0	1000	31.4	Yes	Yes	Yes
HD	Noise sensitive point: User defined (212)	483,544	4,957,634	21.6	4.5	40.0	1000	29.1	Yes	Yes	Yes
HE	Noise sensitive point: User defined (213)	483,545	4,957,991	29.5	4.5	40.0	1000	26.8	Yes	Yes	Yes
HF	Noise sensitive point: User defined (214)	483,550	4,957,205	32.1	4.5	40.0	1000	32.6	Yes	Yes	Yes
HG	Noise sensitive point: User defined (215)	483,553	4,957,437	24.8	4.5	40.0	1000	30.6	Yes	Yes	Yes
HH	Noise sensitive point: User defined (216)	483,557	4,958,017	30.0	4.5	40.0	1000	26.7	Yes	Yes	Yes
HI	Noise sensitive point: User defined (217)	483,564	4,957,866	22.8	4.5	40.0	1000	27.6	Yes	Yes	Yes
HJ	Noise sensitive point: User defined (218)	483,566	4,958,046	30.0	4.5	40.0	1000	26.5	Yes	Yes	Yes
HK	Noise sensitive point: User defined (219)	483,568	4,957,228	31.9	4.5	40.0	1000	32.5	Yes	Yes	Yes
HL	Noise sensitive point: User defined (220)	483,573	4,957,893	23.9	4.5	40.0	1000	27.4	Yes	Yes	Yes
HM	Noise sensitive point: User defined (221)	483,585	4,957,937	25.7	4.5	40.0	1000	27.2	Yes	Yes	Yes
HN	Noise sensitive point: User defined (222)	483,586	4,957,464	25.8	4.5	40.0	1000	30.5	Yes	Yes	Yes
HO	Noise sensitive point: User defined (223)	483,609	4,957,246	32.3	4.5	40.0	1000	32.4	Yes	Yes	Yes
HP	Noise sensitive point: User defined (224)	483,619	4,957,271	31.4	4.5	40.0	1000	32.2	Yes	Yes	Yes
HQ	Noise sensitive point: User defined (225)	483,625	4,957,995	26.3	4.5	40.0	1000	26.8	Yes	Yes	Yes
HR	Noise sensitive point: User defined (226)	483,651	4,957,424	26.9	4.5	40.0	1000	30.9	Yes	Yes	Yes
HS	Noise sensitive point: User defined (227)	483,655	4,957,314	30.2	4.5	40.0	1000	31.8	Yes	Yes	Yes
HT	Noise sensitive point: User defined (228)	483,661	4,957,519	24.3	4.5	40.0	1000	30.1	Yes	Yes	Yes
HU	Noise sensitive point: User defined (229)	483,668	4,957,772	20.0	4.5	40.0	1000	28.3	Yes	Yes	Yes
HV	Noise sensitive point: User defined (230)	483,693	4,957,529	23.7	4.5	40.0	1000	30.1	Yes	Yes	Yes
HW	Noise sensitive point: User defined (231)	483,701	4,957,460	25.5	4.5	40.0	1000	30.6	Yes	Yes	Yes
HX	Noise sensitive point: User defined (232)	483,707	4,957,549	23.1	4.5	40.0	1000	29.9	Yes	Yes	Yes
HY	Noise sensitive point: User defined (233)	483,725	4,957,217	34.1	4.5	40.0	1000	32.8	Yes	Yes	Yes
HZ	Noise sensitive point: User defined (234)	483,731	4,957,755	20.0	4.5	40.0	1000	28.4	Yes	Yes	Yes
IA	Noise sensitive point: User defined (235)	483,736	4,957,974	21.6	4.5	40.0	1000	27.0	Yes	Yes	Yes
IB	Noise sensitive point: User defined (236)	483,739	4,957,931	20.0	4.5	40.0	1000	27.3	Yes	Yes	Yes
IC	Noise sensitive point: User defined (237)	483,752	4,957,998	22.1	4.5	40.0	1000	26.9	Yes	Yes	Yes
ID	Noise sensitive point: User defined (238)	483,769	4,958,018	21.9	4.5	40.0	1000	26.7	Yes	Yes	Yes
IE	Noise sensitive point: User defined (239)	483,774	4,957,176	36.2	4.5	40.0	1000	33.2	Yes	Yes	Yes
IF	Noise sensitive point: User defined (240)	483,801	4,957,175	37.1	4.5	40.0	1000	33.2	Yes	Yes	Yes
IG	Noise sensitive point: User defined (241)	483,803	4,958,068	21.2	4.5	40.0	1000	26.4	Yes	Yes	Yes
IH	Noise sensitive point: User defined (242)	483,809	4,957,723	20.0	4.5	40.0	1000	28.7	Yes	Yes	Yes
II	Noise sensitive point: User defined (243)	483,815	4,957,362	29.6	4.5	40.0	1000	31.5	Yes	Yes	Yes

To be continued on next page...



Project:

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Calculated:

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## DECIBEL - Main Result

Calculation: GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
IJ	Noise sensitive point: User defined (244)	483,835	4,957,938	20.0	4.5	40.0	1000	27.2	Yes	Yes	Yes
IK	Noise sensitive point: User defined (245)	483,846	4,957,282	34.0	4.5	40.0	1000	32.2	Yes	Yes	Yes
IL	Noise sensitive point: User defined (246)	483,847	4,957,208	37.9	4.5	40.0	1000	32.9	Yes	Yes	Yes
IM	Noise sensitive point: User defined (247)	483,852	4,957,482	25.3	4.5	40.0	1000	30.5	Yes	Yes	Yes
IN	Noise sensitive point: User defined (248)	483,860	4,957,232	37.1	4.5	40.0	1000	32.7	Yes	Yes	Yes
IO	Noise sensitive point: User defined (249)	483,865	4,958,063	20.0	4.5	40.0	1000	26.5	Yes	Yes	Yes
IP	Noise sensitive point: User defined (250)	483,868	4,957,311	32.7	4.5	40.0	1000	31.9	Yes	Yes	Yes
IQ	Noise sensitive point: User defined (251)	483,872	4,957,422	27.8	4.5	40.0	1000	31.0	Yes	Yes	Yes
IR	Noise sensitive point: User defined (252)	483,876	4,957,934	20.0	4.5	40.0	1000	27.3	Yes	Yes	Yes
IS	Noise sensitive point: User defined (253)	483,881	4,957,354	30.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
IT	Noise sensitive point: User defined (254)	483,883	4,957,648	20.0	4.5	40.0	1000	29.2	Yes	Yes	Yes
IU	Noise sensitive point: User defined (255)	483,890	4,957,329	31.7	4.5	40.0	1000	31.8	Yes	Yes	Yes
IV	Noise sensitive point: User defined (256)	483,904	4,957,615	20.2	4.5	40.0	1000	29.4	Yes	Yes	Yes
IW	Noise sensitive point: User defined (257)	483,912	4,957,339	31.2	4.5	40.0	1000	31.6	Yes	Yes	Yes
IX	Noise sensitive point: User defined (258)	483,916	4,957,247	37.6	4.5	40.0	1000	32.5	Yes	Yes	Yes
IY	Noise sensitive point: User defined (259)	483,920	4,957,589	21.1	4.5	40.0	1000	29.6	Yes	Yes	Yes
IZ	Noise sensitive point: User defined (260)	483,937	4,957,602	20.5	4.5	40.0	1000	29.5	Yes	Yes	Yes
JA	Noise sensitive point: User defined (261)	483,944	4,957,253	37.4	4.5	40.0	1000	32.4	Yes	Yes	Yes
JB	Noise sensitive point: User defined (262)	483,954	4,957,573	21.5	4.5	40.0	1000	29.7	Yes	Yes	Yes
JC	Noise sensitive point: User defined (263)	483,955	4,957,437	26.8	4.5	40.0	1000	30.8	Yes	Yes	Yes
JD	Noise sensitive point: User defined (264)	483,958	4,957,359	30.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
JE	Noise sensitive point: User defined (265)	483,959	4,957,599	20.4	4.5	40.0	1000	29.5	Yes	Yes	Yes
JF	Noise sensitive point: User defined (266)	483,965	4,957,264	36.9	4.5	40.0	1000	32.3	Yes	Yes	Yes
JG	Noise sensitive point: User defined (267)	483,974	4,957,402	28.2	4.5	40.0	1000	31.1	Yes	Yes	Yes
JH	Noise sensitive point: User defined (268)	483,975	4,957,359	30.0	4.5	40.0	1000	31.4	Yes	Yes	Yes
JI	Noise sensitive point: User defined (269)	483,986	4,957,284	35.7	4.5	40.0	1000	32.1	Yes	Yes	Yes
JJ	Noise sensitive point: User defined (270)	483,991	4,957,363	29.7	4.5	40.0	1000	31.4	Yes	Yes	Yes
JK	Noise sensitive point: User defined (271)	484,006	4,957,610	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
JL	Noise sensitive point: User defined (272)	484,010	4,957,243	39.5	4.5	40.0	1000	32.4	Yes	Yes	Yes
JM	Noise sensitive point: User defined (273)	484,012	4,957,306	34.2	4.5	40.0	1000	31.8	Yes	Yes	Yes
JN	Noise sensitive point: User defined (274)	484,012	4,957,263	37.8	4.5	40.0	1000	32.2	Yes	Yes	Yes
JO	Noise sensitive point: User defined (275)	484,021	4,957,372	29.3	4.5	40.0	1000	31.3	Yes	Yes	Yes
JP	Noise sensitive point: User defined (276)	484,027	4,957,576	20.0	4.5	40.0	1000	29.6	Yes	Yes	Yes
JQ	Noise sensitive point: User defined (277)	484,032	4,957,243	39.4	4.5	40.0	1000	32.4	Yes	Yes	Yes
JR	Noise sensitive point: User defined (278)	484,038	4,957,466	24.4	4.5	40.0	1000	30.5	Yes	Yes	Yes
JS	Noise sensitive point: User defined (279)	484,041	4,957,609	20.0	4.5	40.0	1000	29.4	Yes	Yes	Yes
JT	Noise sensitive point: User defined (280)	484,046	4,957,210	42.8	4.5	40.0	1000	32.7	Yes	Yes	Yes
JU	Noise sensitive point: User defined (281)	484,048	4,957,377	28.7	4.5	40.0	1000	31.2	Yes	Yes	Yes
JV	Noise sensitive point: User defined (282)	484,050	4,957,569	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
JW	Noise sensitive point: User defined (283)	484,067	4,957,315	33.0	4.5	40.0	1000	31.7	Yes	Yes	Yes
JX	Noise sensitive point: User defined (284)	484,068	4,957,160	48.5	4.5	40.0	1000	33.1	Yes	Yes	Yes
JY	Noise sensitive point: User defined (285)	484,072	4,957,294	34.8	4.5	40.0	1000	31.8	Yes	Yes	Yes
JZ	Noise sensitive point: User defined (286)	484,073	4,957,405	26.7	4.5	40.0	1000	30.9	Yes	Yes	Yes
KA	Noise sensitive point: User defined (287)	484,076	4,957,552	20.0	4.5	40.0	1000	29.7	Yes	Yes	Yes
KB	Noise sensitive point: User defined (288)	484,092	4,957,127	49.2	4.5	40.0	1000	33.3	Yes	Yes	Yes
KC	Noise sensitive point: User defined (289)	484,094	4,957,339	30.7	4.5	40.0	1000	31.4	Yes	Yes	Yes
KD	Noise sensitive point: User defined (290)	484,105	4,957,234	39.5	4.5	40.0	1000	32.3	Yes	Yes	Yes
KE	Noise sensitive point: User defined (291)	484,108	4,957,295	34.6	4.5	40.0	1000	31.8	Yes	Yes	Yes
KF	Noise sensitive point: User defined (292)	484,112	4,957,094	50.0	4.5	40.0	1000	33.6	Yes	Yes	Yes
KG	Noise sensitive point: User defined (293)	484,113	4,957,209	40.6	4.5	40.0	1000	32.5	Yes	Yes	Yes
KH	Noise sensitive point: User defined (294)	484,114	4,957,358	29.5	4.5	40.0	1000	31.2	Yes	Yes	Yes
KI	Noise sensitive point: User defined (295)	484,116	4,957,538	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
KJ	Noise sensitive point: User defined (296)	484,131	4,957,250	37.0	4.5	40.0	1000	32.1	Yes	Yes	Yes
KK	Noise sensitive point: User defined (297)	484,132	4,957,106	47.6	4.5	40.0	1000	33.4	Yes	Yes	Yes
KL	Noise sensitive point: User defined (298)	484,139	4,957,530	20.0	4.5	40.0	1000	29.8	Yes	Yes	Yes

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**DECIBEL - Main Result****Calculation:** GTZ\_noise assessment E92- 98m hub

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 2Demands					Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
KM	Noise sensitive point: User defined (299)	484,141	4,957,180	41.2	4.5	40.0	1000	32.7	Yes	Yes	Yes
KN	Noise sensitive point: User defined (300)	484,146	4,957,305	32.6	4.5	40.0	1000	31.6	Yes	Yes	Yes
KO	Noise sensitive point: User defined (301)	484,149	4,957,182	40.4	4.5	40.0	1000	32.7	Yes	Yes	Yes
KP	Noise sensitive point: User defined (302)	484,156	4,957,186	40.0	4.5	40.0	1000	32.6	Yes	Yes	Yes
KQ	Noise sensitive point: User defined (303)	484,164	4,957,120	43.7	4.5	40.0	1000	33.2	Yes	Yes	Yes
KR	Noise sensitive point: User defined (304)	484,194	4,957,020	48.9	4.5	40.0	1000	34.0	Yes	Yes	Yes
KS	Noise sensitive point: User defined (305)	484,204	4,957,476	20.0	4.5	40.0	1000	30.1	Yes	Yes	Yes
KT	Noise sensitive point: User defined (306)	484,213	4,957,240	34.8	4.5	40.0	1000	32.0	Yes	Yes	Yes
KU	Noise sensitive point: User defined (307)	484,218	4,957,387	22.8	4.5	40.0	1000	30.7	Yes	Yes	Yes
KV	Noise sensitive point: User defined (308)	484,223	4,957,365	24.7	4.5	40.0	1000	30.9	Yes	Yes	Yes
KW	Noise sensitive point: User defined (309)	484,225	4,957,239	34.4	4.5	40.0	1000	31.9	Yes	Yes	Yes
KX	Noise sensitive point: User defined (310)	484,228	4,957,222	35.3	4.5	40.0	1000	32.1	Yes	Yes	Yes
KY	Noise sensitive point: User defined (311)	484,237	4,957,180	37.6	4.5	40.0	1000	32.4	Yes	Yes	Yes
KZ	Noise sensitive point: User defined (312)	484,241	4,957,339	26.5	4.5	40.0	1000	31.1	Yes	Yes	Yes
LA	Noise sensitive point: User defined (313)	484,242	4,957,131	40.0	4.5	40.0	1000	32.8	Yes	Yes	Yes
LB	Noise sensitive point: User defined (314)	484,243	4,957,151	39.3	4.5	40.0	1000	32.6	Yes	Yes	Yes
LC	Noise sensitive point: User defined (315)	484,251	4,957,283	30.4	4.5	40.0	1000	31.5	Yes	Yes	Yes
LD	Noise sensitive point: User defined (316)	484,252	4,957,315	28.6	4.5	40.0	1000	31.2	Yes	Yes	Yes
LE	Noise sensitive point: User defined (317)	484,253	4,957,445	20.0	4.5	40.0	1000	30.2	Yes	Yes	Yes
LF	Noise sensitive point: User defined (318)	484,260	4,957,426	20.0	4.5	40.0	1000	30.3	Yes	Yes	Yes
LG	Noise sensitive point: User defined (319)	484,271	4,957,224	33.3	4.5	40.0	1000	31.9	Yes	Yes	Yes
LH	Noise sensitive point: User defined (320)	484,283	4,957,201	34.2	4.5	40.0	1000	32.1	Yes	Yes	Yes
LI	Noise sensitive point: User defined (321)	484,294	4,957,377	20.2	4.5	40.0	1000	30.6	Yes	Yes	Yes
LJ	Noise sensitive point: User defined (322)	484,316	4,957,343	21.6	4.5	40.0	1000	30.8	Yes	Yes	Yes
LK	Noise sensitive point: User defined (323)	484,319	4,957,188	33.1	4.5	40.0	1000	32.0	Yes	Yes	Yes
LL	Noise sensitive point: User defined (324)	484,330	4,957,160	33.3	4.5	40.0	1000	32.2	Yes	Yes	Yes
LM	Noise sensitive point: User defined (325)	484,334	4,957,277	25.6	4.5	40.0	1000	31.3	Yes	Yes	Yes
LN	Noise sensitive point: User defined (326)	484,335	4,957,311	22.0	4.5	40.0	1000	31.0	Yes	Yes	Yes
LO	Noise sensitive point: User defined (327)	484,347	4,957,115	34.5	4.5	40.0	1000	32.5	Yes	Yes	Yes
LP	Noise sensitive point: User defined (328)	484,348	4,957,258	26.4	4.5	40.0	1000	31.4	Yes	Yes	Yes
LQ	Noise sensitive point: User defined (329)	484,363	4,956,941	44.0	4.5	40.0	1000	33.9	Yes	Yes	Yes
LR	Noise sensitive point: User defined (330)	484,386	4,957,004	38.3	4.5	40.0	1000	33.3	Yes	Yes	Yes
LS	Noise sensitive point: User defined (331)	484,390	4,957,245	22.1	4.5	40.0	1000	31.3	Yes	Yes	Yes
LT	Noise sensitive point: User defined (332)	484,412	4,957,191	23.4	4.5	40.0	1000	31.6	Yes	Yes	Yes
LU	Noise sensitive point: User defined (333)	484,481	4,957,070	25.4	4.5	40.0	1000	32.2	Yes	Yes	Yes
LV	Noise sensitive point: User defined (334)	484,483	4,956,963	33.9	4.5	40.0	1000	33.1	Yes	Yes	Yes
LW	Noise sensitive point: User defined (335)	484,495	4,957,123	20.0	4.5	40.0	1000	31.8	Yes	Yes	Yes
LX	Noise sensitive point: User defined (336)	484,498	4,957,011	29.5	4.5	40.0	1000	32.6	Yes	Yes	Yes
LY	Noise sensitive point: User defined (337)	484,521	4,956,957	30.4	4.5	40.0	1000	32.9	Yes	Yes	Yes
LZ	Noise sensitive point: User defined (338)	485,199	4,956,886	22.6	4.5	40.0	1000	28.9	Yes	Yes	Yes

**Distances (m)****WTG**

NSA	1
A	1987
B	1976
C	1952
D	1964
E	1960
F	1946
G	1948
H	1949
I	1914

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**WTG**

NSA 1  
 J 1912  
 K 1890  
 L 1907  
 M 1889  
 N 1871  
 O 1866  
 P 1855  
 Q 1833  
 R 1856  
 S 1827  
 T 1817  
 U 1829  
 V 1811  
 W 1795  
 X 1794  
 Y 1786  
 Z 1796  
 AA 1802  
 AB 1745  
 AC 1734  
 AD 1727  
 AE 1737  
 AF 1709  
 AG 1680  
 AH 1672  
 AI 1654  
 AJ 1734  
 AK 1651  
 AL 1663  
 AM 1631  
 AN 1624  
 AO 1628  
 AP 1624  
 AQ 1633  
 AR 1588  
 AS 1617  
 AT 1585  
 AU 1547  
 AV 1640  
 AW 1547  
 AX 1621  
 AY 1587  
 AZ 1601  
 BA 1506  
 BB 1567  
 BC 1544  
 BD 1545  
 BE 1520  
 BF 1529  
 BG 1580  
 BH 1516  
 BI 1575  
 BJ 1499  
 BK 1491  
 BL 1478  
 BM 1529  
 BN 1546

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**WTG**

NSA 1  
 BO 1536  
 BP 1505  
 BQ 1471  
 BR 1492  
 BS 1451  
 BT 1477  
 BU 1434  
 BV 1415  
 BW 1426  
 BX 1406  
 BY 1455  
 BZ 1391  
 CA 1395  
 CB 1432  
 CC 1362  
 CD 1341  
 CE 1352  
 CF 1353  
 CG 1326  
 CH 1320  
 CI 1309  
 CJ 1301  
 CK 1313  
 CL 1332  
 CM 1319  
 CN 1325  
 CO 1311  
 CP 1259  
 CQ 1331  
 CR 1323  
 CS 1234  
 CT 1314  
 CU 1236  
 CV 1221  
 CW 1538  
 CX 1293  
 CY 1424  
 CZ 1266  
 DA 1453  
 DB 1177  
 DC 1379  
 DD 1351  
 DE 1258  
 DF 1164  
 DG 1254  
 DH 1356  
 DI 1263  
 DJ 1275  
 DK 1372  
 DL 1285  
 DM 1121  
 DN 1119  
 DO 1077  
 DP 1239  
 DQ 1071  
 DR 1384  
 DS 1402

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**WTG**

NSA 1  
 DT 1388  
 DU 1242  
 DV 1391  
 DW 1281  
 DX 1382  
 DY 1281  
 DZ 1009  
 EA 1337  
 EB 1286  
 EC 1136  
 ED 1010  
 EE 1264  
 EF 1041  
 EG 1416  
 EH 1611  
 EI 1376  
 EJ 1270  
 EK 1557  
 EL 1670  
 EM 1529  
 EN 1505  
 EO 1446  
 EP 1395  
 EQ 1476  
 ER 1590  
 ES 1283  
 ET 1616  
 EU 1539  
 EV 1312  
 EW 1101  
 EX 1302  
 EY 1513  
 EZ 1309  
 FA 1566  
 FB 1038  
 FC 1328  
 FD 1520  
 FE 1348  
 FF 1121  
 FG 1900  
 FH 1279  
 FI 1485  
 FJ 1297  
 FK 1094  
 FL 1393  
 FM 1732  
 FN 1495  
 FO 1673  
 FP 1161  
 FQ 1507  
 FR 1176  
 FS 1524  
 FT 1206  
 FU 1664  
 FV 1794  
 FW 1540  
 FX 1267

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**WTG**

NSA 1  
 FY 1160  
 FZ 1183  
 GA 1271  
 GB 1587  
 GC 1198  
 GD 1293  
 GE 1232  
 GF 1395  
 GG 1442  
 GH 1483  
 GI 1878  
 GJ 1494  
 GK 1705  
 GL 1809  
 GM 1177  
 GN 1364  
 GO 1418  
 GP 1282  
 GQ 1472  
 GR 1504  
 GS 1168  
 GT 1271  
 GU 1844  
 GV 1282  
 GW 1570  
 GX 1893  
 GY 1512  
 GZ 1359  
 HA 1272  
 HB 1591  
 HC 1282  
 HD 1567  
 HE 1919  
 HF 1145  
 HG 1372  
 HH 1943  
 HI 1793  
 HJ 1971  
 HK 1164  
 HL 1819  
 HM 1861  
 HN 1393  
 HO 1174  
 HP 1197  
 HQ 1914  
 HR 1344  
 HS 1234  
 HT 1437  
 HU 1688  
 HV 1444  
 HW 1375  
 HX 1463  
 HY 1130  
 HZ 1667  
 IA 1886  
 IB 1842  
 IC 1909

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**DECIBEL - Main Result****Calculation:** GTZ\_noise assessment E92- 98m hub

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**WTG**

NSA 1  
 ID 1929  
 IE 1087  
 IF 1085  
 IG 1978  
 IH 1633  
 II 1272  
 IJ 1848  
 IK 1192  
 IL 1118  
 IM 1393  
 IN 1143  
 IO 1974  
 IP 1223  
 IQ 1333  
 IR 1845  
 IS 1266  
 IT 1560  
 IU 1241  
 IV 1528  
 IW 1253  
 IX 1162  
 IY 1503  
 IZ 1517  
 JA 1171  
 JB 1490  
 JC 1355  
 JD 1278  
 JE 1516  
 JF 1184  
 JG 1322  
 JH 1280  
 JI 1206  
 JJ 1285  
 JK 1532  
 JL 1170  
 JM 1233  
 JN 1190  
 JO 1299  
 JP 1502  
 JQ 1173  
 JR 1394  
 JS 1537  
 JT 1144  
 JU 1309  
 JV 1498  
 JW 1251  
 JX 1100  
 JY 1232  
 JZ 1341  
 KA 1486  
 KB 1074  
 KC 1281  
 KD 1181  
 KE 1241  
 KF 1048  
 KG 1159  
 KH 1303

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## DECIBEL - Main Result

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### WTG

NSA 1  
KI 1480  
KJ 1203  
KK 1065  
KL 1476  
KM 1139  
KN 1261  
KO 1143  
KP 1148  
KQ 1089  
KR 1006  
KS 1441  
KT 1218  
KU 1359  
KV 1340  
KW 1221  
KX 1206  
KY 1170  
KZ 1321  
LA 1126  
LB 1145  
LC 1272  
LD 1302  
LE 1425  
LF 1409  
LG 1224  
LH 1207  
LI 1375  
LJ 1351  
LK 1209  
LL 1188  
LM 1297  
LN 1329  
LO 1156  
LP 1285  
LQ 1014  
LR 1079  
LS 1292  
LT 1253  
LU 1187  
LV 1101  
LW 1238  
LX 1148  
LY 1120  
LZ 1599