CarbonFree Fort Frances Project

Acoustic Assessment Report

H375736-0000-846-066-0001

					
2026-03-13	**0**	**Approved for Use**	**M. Andargie**	**M. Choy**	**S. Thompson**
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**
				Discipline Lead	**Functional Manager**

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5. **The noise impact evaluation is based on preliminary design and vendor information with the intention of demonstrating that the CarbonFree Fort Frances Project will meet all regulatory requirements for achieving community noise constraints. It should be noted that the noise control features proposed herein may be subject to change prior to the final regulatory submission for alignment with the latest Project information.**

Table of Concordance

The following table of concordance describes the scope of the report herein as per the requirements identified in Table 1 of O. Reg. 359/09 [1].

Item	Document	Requirement per Table 1 of O. Reg. 359/09	Project Type
8	Noise study report	Report to be prepared in accordance with Appendix A of the publication of the Ministry of the Environment and Climate Change entitled, “Basic Comprehensive Certificates of Approval (Air) – User Guide”, dated April 2004, as amended from time to time and available from the Ministry.	Class 3 solar facility

Abbreviations and Definitions

AAR	Acoustic Assessment Report
AC	Alternating Current
dB	Decibel
dBA	A-weighted sound level
DC	Direct Current
IEEE	Institute of Electrical and Electronics Engineers
km	Kilometre
kV	Kilovolt
Leq	Equivalent sound level
m/s	Metre per second
MECP	Ministry of the Environment, Climate, and Parks
MVA	Megavolt-ampere
MW	Megawatt
NEMA	National Electrical Manufacturers Association
NPC	Noise Pollution Control
O. Reg.	Ontario Regulation
INV	Inverter System (combined inverter and medium-voltage transformer)
POR	Point of Reception
PV	Photovoltaic
PWC	Predictable Worst Case
REA	Renewable Energy Approval

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1. Introduction

CarbonFree Fort Frances Ltd. (CarbonFree) is proposing to develop a 167 megawatt (MW) Class 3 solar photovoltaic (PV) project adjacent to Highway 611 in the unincorporated township of Miscampbell, approximately 7.5 kilometres (km) northwest of Fort Frances.

The proposed CarbonFree Fort Frances Project (hereinafter referred to as 'the Facility') is a renewable energy generation facility which will use solar PV technology to generate electricity. Electricity generated by solar PV panels will be converted from direct current (DC) to alternating current (AC) by inverters and then stepped up (via pad-mounted inverters, medium-voltage transformers and a main substation transformer) to 230 kilovolts (kV) prior to being connected to the existing Hydro One Networks Inc. transmission line.

The Project aims to contribute to the government of Ontario's goal of accelerating new electricity generation from renewable sources to support the province's growing energy needs. Accordingly, CarbonFree intends to enter into an agreement for the sale or supply of electricity, the quantity of which will be commensurate with the nameplate capacity of the facility.

Construction of the Project will commence in early 2027 once the Renewable Energy Approval (REA) and other required permits have been obtained. This Acoustic Assessment Report (AAR) provides an evaluation of the community noise impact of the Facility under predictable worst-case (PWC) noise-emitting operating conditions.

1.1 Approach to Noise Assessment

The AAR follows the Province of Ontario regulations and guidelines: O. Reg. 359/09 [1], PIBS 8472e – "Technical Guide to Renewable Energy Approvals" [2], PIBS 4391e01 – "Basic Comprehensive Certificates of Approval (Air)" [3], and NPC-300 [4]. The Facility's noise performance limit is established as the higher of the 1-hour a-weighted equivalent sound level (Leq) identified for the applicable exclusion limit or the background sound level. No background measurements were taken, so the noise limit has been set to the applicable exclusion limit based on the surrounding receptor classifications. A review of the surrounding community identifies all noise sensitive receptors as Class 3.

A community noise model of the Facility has been developed to assess the noise impact of the nearest points of reception (PORs). The noise study area for modelling was extended 1 km from the outermost noise sources consistent with the approach outlined in the "Technical Guide to Renewable Energy Approvals" [2]. Participating and non-participating receptors were identified including receptors for vacant lots. Acoustic modelling was completed on a PWC basis that determined the equivalent 1-hour noise impact on the identified PORs. There are no other surrounding solar facilities within 1 km of the boundary of the Facility.

1.2 Vibration Sources

The Facility does not have any significant stationery or moving ground-borne vibration sources. As such, a vibration assessment is not required.

2. Facility Description

The Facility is located adjacent to Highway 611 in the unincorporated township of Miscampbell, approximately 7.5 km northwest of Fort Frances (see Appendix A).

The proposed 167 MW solar facility is comprised of approximately 346-, 008-, 625-W solar panels grouped into three arrays, each array isolated by its own switchgear. The panels are routed into 39 SunGrow SG4400, 4.4 megavolt-ampere (MVA) inverter/transformer modules spread across the three arrays. Each switchgear feeds the proposed high-voltage substation located to the north of the facility. The Facility is designed to operate during daylight hours, 7 days a week. The proposed layout of the Facility is included in Appendix B.

2.1 Operational Flexibility

The Facility is seeking the inclusion of operational flexibility with its REA application as described under Section 9 of PIBS 8472e [2]. Operational flexibility allows the Facility to make limited modifications to its operations or works without having to seek an amendment to the REA. These permissible operational flexibility changes include:

- Noise from site maintenance equipment including vegetation control, panel washing, snow clearing, access road and infrastructure maintenance.
- In-kind equipment replacements (panels, tracker motors, inverter systems, transformer, switches, etc.).
- Decreasing the number of project components.

3. Noise Source Summary

3.1 Panel Arrays

Panel racks will be fitted with a single axis tracker. The proposed Facility will have motor per tracker. A sample tracker is provided in Appendix C. The tracker motor operates briefly to tilt the panels into an optimal position for solar radiation exposure. Due to their relatively small size and brief operation, the tracker motors are considered insignificant community noise emission sources.

3.2 Inverter With Integrated Medium-Voltage Transformer

The 4.4 MW AC inverters convert the DC supplied by the PV modules to AC. A 4.4 MVA, 3-phase, liquid-filled transformer will then ‘step up’ the voltage to 34.5 kV. Each installation will consist of a SunGrow Solar Inverter Skid SG4400 or equivalent inverter system (INV) that combines the inverter and medium-voltage transformer in single container skid.

Noise from the inverter system comes from its air-cooling fans while noise from its medium-voltage transformer is largely from the magnetostriction hum. Due to the tonal nature of the magnetostriction hum, a 5 decibel (dB) tonal penalty is added to the noise emission of entire inverter system. Full calculations can be found in Appendix C.

3.3 Switchgear

The local panel array and substation switchgears are a combination of switches, fuses and circuit breakers used to safely isolate arrays or the entire facility for maintenance. Switchgear control panel cooling fans are small and are located indoors. Therefore, the switchgears are considered insignificant community noise emission sources.

3.4 Substation Transformer

The Facility contains one large 186 MVA transformer that will ‘step up’ the voltage from 34.5 kV to 230 kV. The substation transformer noise was calculated using the NEMA TP-80050 standard [5] with a 5 dB tonal penalty added for its magnetostriction hum. Calculations to characterize the sound emission of the substation transformer can be found in Appendix C. Transformer noise was modelled as a point source at half the height of the transformer.

Additional substation yard components such as the switchgear, communication tower, and line reactors are considered insignificant noise sources.

3.5 Other Nearby Solar Facilities and External Anthropic Noise Sources

There are no adjacent solar facilities within 1 km of the Facility. As such, a cumulative noise impact study that incorporates adjacent solar facilities, as recommended in Ontario’s Technical Guide to Renewable Energy Approvals [2], is not required.

A desktop review of Access Environment did not identify any Environmental Compliance Approvals for industrial applications within 1 km of the Facility. The land-use map included with Appendix A identifies that the site is surrounded by agricultural land. As such, additional external anthropic noise may include farming equipment. However, these external anthropic noise sources need not be included with the AAR.

3.6 Ancillary Distribution Lines

Aboveground ancillary distribution lines connecting the local panel switchgears to the substation will not emit significant amounts of isolator corona noise due to a relatively low AC line current and voltage (34.5 kV). Therefore, the noise from the ancillary distribution lines is considered insignificant.

3.7 Excluded Noise Sources

Insignificant and non-applicable noise sources were excluded from this assessment. Table 3-1 lists noise sources insignificant or outside the scope of this assessment.

Table 3-1: Excluded Noise Sources

Source	Reason for Exclusion
Vehicular Traffic	Noise exclusions identified in accordance with O. Reg 359/09 [1] and the Technical Guide to Renewable Energy Approvals [2]
Maintenance and Service Activities	
Emergency Conditions	
Construction and Decommissioning	

3.8 Noise Source Summary Table

Table 3-2 lists the significant noise sources from the Facility. The noise source layout is presented in Appendix B.

Table 3-2: Noise Source Summary Table

Source ID	Equipment Description	NV dB Library Source	Sound Power (Lw) Un-weighted Octave Band Spectrum, Hz (dB)									Overall (dBA)	Source Location	Sound Charac-teristic	Noise Control Measure	UTM Zone 16	
			31.5	63	125	250	500	1,000	2,000	4,000	8,000					E	N
INV01	Inverter System No 01	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	U	459741	5390725
INV02	Inverter System No 02	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459708	5390690
INV03	Inverter System No 03	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459928	5390724
INV04	Inverter System No 04	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459997	5390687
INV05	Inverter System No 05	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460122	5390719
INV06	Inverter System No 06	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460119	5390688
INV07	Inverter System No 07	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	458919	5389822
INV08	Inverter System No 08	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	458928	5389789
INV09	Inverter System No 09	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459085	5389820
INV10	Inverter System No 10	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459095	5389787
INV11	Inverter System No 11	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459271	5389820
INV12	Inverter System No 12	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459262	5389785
INV13	Inverter System No 13	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459420	5389804
INV14	Inverter System No 14	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459552	5389820
INV15	Inverter System No 15	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459624	5389817
INV16	Inverter System No 16	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460897	5389992
INV17	Inverter System No 17	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461063	5389955

Source ID	Equipment Description	NV dB Library Source	Sound Power (Lw) Un-weighted Octave Band Spectrum, Hz (dB)									Overall (dBA)	Source Location	Sound Charac-teristic	Noise Control Measure	UTM Zone 16	
			31.5	63	125	250	500	1,000	2,000	4,000	8,000					E	N
INV18	Inverter System No 18	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461200	5389992
INV19	Inverter System No 19	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461364	5389992
INV20	Inverter System No 20	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461509	5389992
INV21	Inverter System No 21	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461661	5389992
INV22	Inverter System No 22	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461766	5389976
INV23	Inverter System No 23	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461539	5389738
INV24	Inverter System No 24	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461536	5389551
INV25	Inverter System No 25	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	461575	5389346
INV26	Inverter System No 26	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	U	461576	5389192
INV27	Inverter System No 27	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	U	461575	5388932
INV28	Inverter System No 28	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	U	461011	5389258
INV29	Inverter System No 29	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460800	5389255
INV30	Inverter System No 30	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460646	5389242
INV31	Inverter System No 31	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460641	5389385
INV32	Inverter System No 32	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460631	5389717
INV33	Inverter System No 33	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460619	5389758
INV34	Inverter System No 34	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	458665	5389825
INV35	Inverter System No 35	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	458671	5389783

Source ID	Equipment Description	NV dB Library Source	Sound Power (Lw) Un-weighted Octave Band Spectrum, Hz (dB)									Overall (dBA)	Source Location	Sound Charac-teristic	Noise Control Measure	UTM Zone 16	
			31.5	63	125	250	500	1,000	2,000	4,000	8,000					E	N
INV36	Inverter System No 36	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459868	5389803
INV37	Inverter System No 37	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459980	5389433
INV38	Inverter System No 38	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	459407	5389620
INV39	Inverter System No 39	INV	90	87	91	92	95	88	88	93	80	97	O	S, T	B	460625	5388992
ST01	Substation Transformer	TR186	107	113	115	110	110	104	99	94	87	110	O	S, T	B	459689	5390922

*Spectra and Overall levels do NOT include tonal penalties. A 5 dB tonal penalty is added in the model for all sources with tonal sound characteristics.

1. O: located/installed outside the building, including on the roof, I: located/installed inside the building.
2. S: Steady; Q: Quasi Steady Impulsive; B: Buzzing; T: Tonal; C: Cyclic.
3. S: Silencer, Acoustic Louvre, Muffler; A: Acoustics lining, Plenum; B: Barrier, Berm, Screening; L: Lagging; E: Acoustic Enclosure; O: Other; U: Uncontrolled.

4. Points of Reception

PORs representing the worst-case community noise sensitive dwellings and vacant lots were identified around the Facility. In accordance with O. Reg. 359/09 [1] and the Technical Guide to Renewable Energy Approvals [2], the noise study area extent for POR identification was set to 1 km from each of the noise sources.

All PORs, participating receptors and vacant lots within 1 km of a Facility noise source were identified and included in the noise assessment. Though O. Reg. 359/09 [1] Clause (6) notes that a "*noise receptor does not include a location on a parcel of land if any part of the renewable energy generation facility will be located on that parcel of land once the facility is installed, constructed or expanded,*" these participating receptors are identified herein, but noise compliance for them have not been evaluated.

Each POR was modelled at 1.5 m above ground for single-storey dwellings or 4.5 m above ground for two-storey dwellings to represent a plane of window on the building façade. Building façade POR IDs are identified with a "f" suffix. Outdoor living areas are modelled at 1.5 m above ground within 30 m of a façade of the dwelling. Outdoor living POR IDs are identified with an "o" suffix. Table 4-1 lists the PORs impacted by the Facility. The layout of identified PORs is shown in Appendix D.

Table 4-1: Point of Reception Locations

POR ID	Description	UTM Coordinates (Zone 16)	
		Easting	Northing
Points of Reception			
RN01_f	ON-611 Existing residential dwelling	459001	5391603
RN01_o		459014	5391575
RN02_f	199 ON-611 Existing residential dwelling	459330	5391869
RN02_o		459338	5391841
RN03_f	200 ON-611 Existing residential dwelling	459518	5391699
RN03_o		459518	5391669
RN04_f	190 ON-611 Existing residential dwelling	459709	5391904
RN04_o		459709	5391875
RN05_f	189 ON-611 Existing residential dwelling	460050	5391839
RN05_o		460033	5391815
RN06_f	182 ON-611 Existing residential dwelling	460299	5391627
RN06_o		460284	5391601
RN07_f	130 Best Road Existing residential dwelling	460870	5391742
RN07_o		460861	5391713

POR ID	Description	UTM Coordinates (Zone 16)	
		Easting	Northing
RN08_f	136 Highway 611 Existing residential dwelling	460182	5391104
RN08_o		460183	5391084
RN09_f	182 Highway 611 Existing residential dwelling	460289	5390881
RN09_o		460268	5390883
RN10_f	ON-611 Existing residential dwelling	460331	5390747
RN10_o		460303	5390735
RN11_f	212 Highway 611 Existing residential dwelling	460306	5390480
RN11_o		460275	5390481
RN12_f	Kliner Road Existing residential dwelling	461161	5390200
RN12_o		461160	5390188
RN13_f	178 McFee Road Existing residential dwelling	460185	5390140
RN13_o		460156	5390125
RN14_f	200 McFee Road Existing residential dwelling	459313	5390245
RN14_o		459313	5390217
RN15_f	McFee Road Existing residential dwelling	458626	5390467
RN15_o		458638	5390494
RN16_f	204 Highway 611 Existing residential dwelling	460194	5389782
RN16_o		460175	5389782
RN17_f	ON-611 Existing residential dwelling	460182	5389330
RN17_o		460160	5389351
RN18_f	205 Highway 611 Existing residential dwelling	460189	5389201
RN18_o		460170	5389224
RN19_f	206 Highway 611 Existing residential dwelling	460200	5388823
RN19_o		460228	5388836
RN20_f	577 ON-611 Existing residential dwelling	460209	5388711
RN20_o		460217	5388741
RN21_f	168 Frog Creek Road Existing residential dwelling	460087	5388622
RN21_o		460089	5388651
RN22_f	169 Frog Creek Road Existing residential dwelling	459895	5388541
RN22_o		459894	5388571
RN23_f	170 Frog Creek Road Existing residential dwelling	459849	5388645
RN23_o		459849	5388673
RN24_f	171 Frog Creek Road Existing residential dwelling	459638	5388623
RN24_o		459638	5388653
RN25_f	172 Frog Creek Road Existing residential dwelling	459558	5388628
RN25_o		459558	5388658

POR ID	Description	UTM Coordinates (Zone 16)	
		Easting	Northing
RN26_f	173 Frog Creek Road Existing residential dwelling	459486	5388615
RN26_o		459486	5388646
RN27_f	175 Frog Creek Road Existing residential dwelling	459475	5388548
RN27_o		459485	5388572
RN28_f	659 Frog Creek Road Existing residential dwelling	459385	5388737
RN28_o		459388	5388767
RN29_f	174 Frog Creek Road Existing residential dwelling	459361	5388539
RN29_o		459368	5388568
RN30_f	209 Frog Creek Road Existing residential dwelling	461267	5388518
RN30_o		461267	5388548
RN31_f	Frog Creek Road Existing residential dwelling	461610	5388529
RN31_o		461609	5388553
RN32_f	991 Frog Creek Road Existing residential dwelling	461942	5388595
RN32_o		461930	5388627
RN33_f	775 Hill Road Existing residential dwelling	461910	5388330
RN33_o		461893	5388358
RN34_f	724 Hill Road Existing residential dwelling	462020	5388092
RN34_o		461999	5388112
RN35_f	242 Hill Road Existing residential dwelling	461913	5387949
RN35_o		461896	5387955
RN36_f	679 Hill Road Existing residential dwelling	461863	5387817
RN36_o		461855	5387846
RN37_f	678 Hill Road Existing residential dwelling	462032	5387835
RN37_o		462003	5387842
RN38_f	Frog Creek Road Existing residential dwelling	462087	5388687
RN38_o		462052	5388692
RN39_f	659 Frog Creek Road Existing residential dwelling	462170	5388657
RN39_o		462152	5388683
RN40_f	659 Frog Creek Road Existing residential dwelling	462155	5388537
RN40_o		462126	5388551
RN41_f	945 Frog Creek Road Existing residential dwelling	462202	5388611
RN41_o		462191	5388639
VN01	Vacant lot	459073	5391871
VN02	Vacant lot	460333	5391851
VN03	Vacant lot	458597	5390155
VN04	Vacant lot	458585	5388650

POR ID	Description	UTM Coordinates (Zone 16)	
		Easting	Northing
VN05	Vacant lot	458610	5388530
VN06	Vacant lot	459980	5388648
VN07	Vacant lot	462018	5388506
VN08	Vacant lot	462014	5387982
VN09	Vacant lot	462602	5388623
VN10	Vacant lot	462702	5388623
Participating Receptors			
RP01_f	203 Highway 611 Existing residential dwelling	460194	5389901
RP01_o		460165	5389901
RP02_f	1229 Frog Creek Road Existing residential dwelling	461118	5388651
RP02_o		461118	5388679
VP01	Vacant lot	460201	5390240
VP02	Vacant lot	460320	5390139
VP03	Vacant lot	460315	5389330

5. Mitigation Measures Summary

Table 5-1 lists the preliminary noise mitigation features proposed to be incorporated into the design. The evaluation of the community noise impact presented in Section 7 includes these mitigation features. The locations of these noise mitigation features are identified in Appendix D.

It should be noted that the noise control features proposed herein may be subject to change prior to the final regulatory submission for alignment with the latest Project information.

Table 5-1: Mitigation Summary Table

Mitigation ID	Targeted Noise Source	Description	Details
NB01	ST01	Noise barrier around substation transformer	15 m tall, 35 m total length, 3-sides, minimum 20 kg/m^2
NB02	INV02	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB03	INV03	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB04	INV04	Noise barrier	5 m tall, 15 m total length, 3-sides, minimum 20 kg/m^2
NB05	INV05	Noise barrier	5 m tall, 20 m total length, 3-sides, minimum 20 kg/m^2

Mitigation ID	Targeted Noise Source	Description	Details
NB06	INV06	Noise barrier	5 m tall, 15 m total length, 2-sides, minimum 20 kg/m^2
NB07	INV07	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB08	INV08	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB09	INV09	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB10	INV10	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB11	INV11	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB12	INV12	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB13	INV13	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB14	INV14	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB15	INV15	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB16	INV16	Noise barrier	5 m tall, 15 m total length, 1-side, minimum 20 kg/m^2
NB17	INV17	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB18	INV18	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB19	INV19	Noise barrier	5 m tall, 25 m total length, 2-sides, minimum 20 kg/m^2
NB20	INV20	Noise barrier	5 m tall, 25 m total length, 2-sides, minimum 20 kg/m^2
NB21	INV21	Noise barrier	5 m tall, 20 m total length, 2-sides, minimum 20 kg/m^2
NB22	INV22	Noise barrier	5 m tall, 15 m total length, 2-sides, minimum 20 kg/m^2
NB23	INV23	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB24	INV24	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB25	INV25	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB26	INV29	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2

Mitigation ID	Targeted Noise Source	Description	Details
NB27	INV30	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB28	INV31	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB29	INV32	Noise barrier	5 m tall, 20 m total length, 2-sides, minimum 20 kg/m^2
NB30	INV33	Noise barrier	5 m tall, 25 m total length, 3-sides, minimum 20 kg/m^2
NB31	INV34	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB32	INV35	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB33	INV36	Noise barrier	5 m tall, 20 m total length, 3-sides, minimum 20 kg/m^2
NB34	INV37	Noise barrier	5 m tall, 25 m total length, 3-sides, minimum 20 kg/m^2
NB35	INV38	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2
NB36	INV39	Noise barrier	5 m tall, 10 m total length, 1-side, minimum 20 kg/m^2

6. Assessment Criteria

The MECP publications; NPC-300 - Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning provides guidance on control of industrial noise emissions for Ontario [4] and Technical Guide to Renewable Energy Approvals [2] provide noise limits according to the surrounding POR classification. Table 6-1 shows the Class 3 performance limits for rural receptors at different times of the day. A conservative assessment limit of 40 dBA was used at all receptor locations under the likely potential for the Facility to operate, sometime throughout its lifecycle, at full power generation for at least 1 hour during the evening period.

Table 6-1: Class 3 Performance Limits

Class 3 Area	
Time Period	**Sound Level Limit – Leq [1 hour] (dBA)**
07:00 to 19:00 (Daytime)	45
19:00 to 23:00 (Evening)	40
23:00 to 07:00 (Nighttime)	40

7. Acoustic Assessment Summary

7.1 Analysis Methodology

To model the community noise impact of the project, a noise model was developed using CADNA-A software application. The ISO 9613-2 [7] algorithm was implemented using CADNA-A to evaluate the environmental noise exposure from stationary sources.

The assumptions used in the noise model are in accordance with Section 9.2 of the Technical Guide to Renewable Energy Approvals [2] and are as follows:

- The model is assessed at 10°C and 70% relative humidity.
- The noise study area extends 1 km from each noise source.
- Ground absorption was modelled with a global value of G=0.7.
- All equipment on-site operates continuously steady during daytime, and for at least 1 hour during evening and night periods without impulsive noise emissions.
- The substation transformer was modelled as a point source at half the height of the transformer and sound power data was estimated based on National Electrical Manufacturers Association (NEMA) [5] and Institute of Electrical and Electronics Engineers (IEEE) [6] standards.

7.2 Predictable Worst-Case Assessment Scenario

Acoustic modelling was completed on a PWC basis that determined the equivalent 1-hour noise impact on the identified noise PORs. The following worst-case scenario was analyzed as described in Table 7-1.

Table 7-1: Assessment Scenarios

Scenario	Description
Predictable Worst-Case (PWC)	39 INV units. One 186 MVA substation transformer. Panels as noise obstructions not modelled. All equipment operates simultaneously at design for 1 hour during the evening/nighttime period. Conservative noise limit of 40 dBA at all receptors, modelled 4.5 m above ground.

7.3 Noise Modelling Results

Table 7-2 summarizes the noise assessment results at each of the noise sensitive POR locations. Participating receptors are listed but not compared to the noise criteria as noted under Clause (6) of O. Reg. 359/09 [1] (Section 4). All applicable PORs are compliant with the NPC-300 40 dBA noise criteria for a Class 3 receptors during the evening and nighttime periods. To visualize the predicted noise emissions from the Facility, refer to the noise contour plot in Appendix D.

Table 7-2: Acoustic Assessment Summary Table

POR ID	Description	Sound Level (dBA)		Verified by Acoustic Audit	Performance Limit (dBA)		Compliance (Yes/No)
		Day	Night/ Evening		Day	Night/ Evening	
Points of Reception (Non-Participating)							
RN01_f	ON-611 Existing residential dwelling	35	35	No	45	40	Yes
RN01_o		36	36	No	45	40	Yes
RN02_f	199 ON-611 Existing residential dwelling	30	30	No	45	40	Yes
RN02_o		30	30	No	45	40	Yes
RN03_f	200 ON-611 Existing residential dwelling	31	31	No	45	40	Yes
RN03_o		32	32	No	45	40	Yes
RN04_f	190 ON-611 Existing residential dwelling	29	29	No	45	40	Yes
RN04_o		29	29	No	45	40	Yes
RN05_f	189 ON-611 Existing residential dwelling	28	28	No	45	40	Yes
RN05_o		28	28	No	45	40	Yes
RN06_f	182 ON-611 Existing residential dwelling	29	29	No	45	40	Yes
RN06_o		30	30	No	45	40	Yes
RN07_f	130 Best Road Existing residential dwelling	25	25	No	45	40	Yes
RN07_o		25	25	No	45	40	Yes
RN08_f	136 Highway 611 Existing residential dwelling	38	38	No	45	40	Yes
RN08_o		39	39	No	45	40	Yes
RN09_f	182 Highway 611 Existing residential dwelling	38	38	No	45	40	Yes
RN09_o		38	38	No	45	40	Yes
RN10_f	ON-611 Existing residential dwelling	38	38	No	45	40	Yes
RN10_o		38	38	No	45	40	Yes
RN11_f	212 Highway 611 Existing residential dwelling	38	38	No	45	40	Yes
RN11_o		38	38	No	45	40	Yes
RN12_f	Kliner Road Existing residential dwelling	39	39	No	45	40	Yes
RN12_o		38	38	No	45	40	Yes
RN13_f	178 McFee Road Existing residential dwelling	38	38	No	45	40	Yes
RN13_o		38	38	No	45	40	Yes
RN14_f	200 McFee Road Existing residential dwelling	39	39	No	45	40	Yes
RN14_o		38	38	No	45	40	Yes
RN15_f	McFee Road Existing residential dwelling	34	34	No	45	40	Yes
RN15_o		35	35	No	45	40	Yes
RN16_f	204 Highway 611 Existing residential dwelling	39	39	No	45	40	Yes
RN16_o		39	39	No	45	40	Yes

POR ID	Description	Sound Level (dBA)		Verified by Acoustic Audit	Performance Limit (dBA)		Compliance (Yes/No)
		Day	Night/ Evening		Day	Night/ Evening	
RN17_f	ON-611 Existing residential dwelling	39	39	No	45	40	Yes
RN17_o		38	38	No	45	40	Yes
RN18_f	205 Highway 611 Existing residential dwelling	37	37	No	45	40	Yes
RN18_o		37	37	No	45	40	Yes
RN19_f	206 Highway 611 Existing residential dwelling	38	38	No	45	40	Yes
RN19_o		36	36	No	45	40	Yes
RN20_f	577 ON-611 Existing residential dwelling	35	35	No	45	40	Yes
RN20_o		36	36	No	45	40	Yes
RN21_f	168 Frog Creek Road Existing residential dwelling	34	34	No	45	40	Yes
RN21_o		34	34	No	45	40	Yes
RN22_f	169 Frog Creek Road Existing residential dwelling	32	32	No	45	40	Yes
RN22_o		33	33	No	45	40	Yes
RN23_f	170 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN23_o		34	34	No	45	40	Yes
RN24_f	171 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN24_o		33	33	No	45	40	Yes
RN25_f	172 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN25_o		33	33	No	45	40	Yes
RN26_f	173 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN26_o		33	33	No	45	40	Yes
RN27_f	175 Frog Creek Road Existing residential dwelling	34	34	No	45	40	Yes
RN27_o		32	32	No	45	40	Yes
RN28_f	659 Frog Creek Road Existing residential dwelling	34	34	No	45	40	Yes
RN28_o		34	34	No	45	40	Yes
RN29_f	174 Frog Creek Road Existing residential dwelling	34	34	No	45	40	Yes
RN29_o		32	32	No	45	40	Yes
RN30_f	209 Frog Creek Road Existing residential dwelling	39	39	No	45	40	Yes
RN30_o		37	37	No	45	40	Yes
RN31_f	Frog Creek Road Existing residential dwelling	35	35	No	45	40	Yes
RN31_o		38	38	No	45	40	Yes
RN32_f	991 Frog Creek Road Existing residential dwelling	36	36	No	45	40	Yes
RN32_o		36	36	No	45	40	Yes
RN33_f	775 Hill Road Existing residential dwelling	35	35	No	45	40	Yes
RN33_o		33	33	No	45	40	Yes

POR ID	Description	Sound Level (dBA)		Verified by Acoustic Audit	Performance Limit (dBA)		Compliance (Yes/No)
		Day	Night/ Evening		Day	Night/ Evening	
RN34_f	724 Hill Road Existing residential dwelling	32	32	No	45	40	Yes
RN34_o		29	29	No	45	40	Yes
RN35_f	242 Hill Road Existing residential dwelling	31	31	No	45	40	Yes
RN35_o		28	28	No	45	40	Yes
RN36_f	679 Hill Road Existing residential dwelling	27	27	No	45	40	Yes
RN36_o		27	27	No	45	40	Yes
RN37_f	678 Hill Road Existing residential dwelling	29	29	No	45	40	Yes
RN37_o		27	27	No	45	40	Yes
RN38_f	Frog Creek Road Existing residential dwelling	35	35	No	45	40	Yes
RN38_o		35	35	No	45	40	Yes
RN39_f	659 Frog Creek Road Existing residential dwelling	34	34	No	45	40	Yes
RN39_o		34	34	No	45	40	Yes
RN40_f	659 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN40_o		33	33	No	45	40	Yes
RN41_f	945 Frog Creek Road Existing residential dwelling	33	33	No	45	40	Yes
RN41_o		34	34	No	45	40	Yes
VN01	Vacant lot	28	28	No	45	40	Yes
VN02	Vacant lot	27	27	No	45	40	Yes
VN03	Vacant lot	39	39	No	45	40	Yes
VN04	Vacant lot	34	34	No	45	40	Yes
VN05	Vacant lot	33	33	No	45	40	Yes
VN06	Vacant lot	36	36	No	45	40	Yes
VN07	Vacant lot	36	36	No	45	40	Yes
VN08	Vacant lot	31	31	No	45	40	Yes
VN09	Vacant lot	32	32	No	45	40	Yes
VN10	Vacant lot	31	31	No	45	40	Yes
Participating Receptors							
RP01_f	203 Highway 611 Existing residential dwelling	39	39	No	45	40	N/A
RP01_o		39	39	No	45	40	N/A
RP02_f	1229 Frog Creek Road Existing residential dwelling	38	38	No	45	40	N/A
RP02_o		39	39	No	45	40	N/A
VP01	Vacant lot	42	42	No	45	40	N/A
VP02	Vacant lot	41	41	No	45	40	N/A
VP03	Vacant lot	40	40	No	45	40	N/A

8. Conclusion

An acoustic assessment of the proposed Fort Frances 167 MW Class 3 solar PV facility has been completed. Based on this AAR's approach and noise mitigations included with the design, the proposed Project is expected to be compliant with the community noise limits identified in the MECP Technical Guide to Renewable Energy Approvals [2] and Environmental Noise Guidelines NPC-300 [4] for the PWC operating condition.

9. References

[1] Province of Ontario, O. Reg. 359/09 - Renewable Energy Approvals under Part V.0.1 of the Environmental Protection Act, 2016.

[2] Province of Ontario, PIBS 8472e – Technical Guide to Renewable Energy Approvals, 2013.

[3] Province of Ontario, PIBS 4391e01 – Basic Comprehensive Certificates of Approval (Air), 2011.

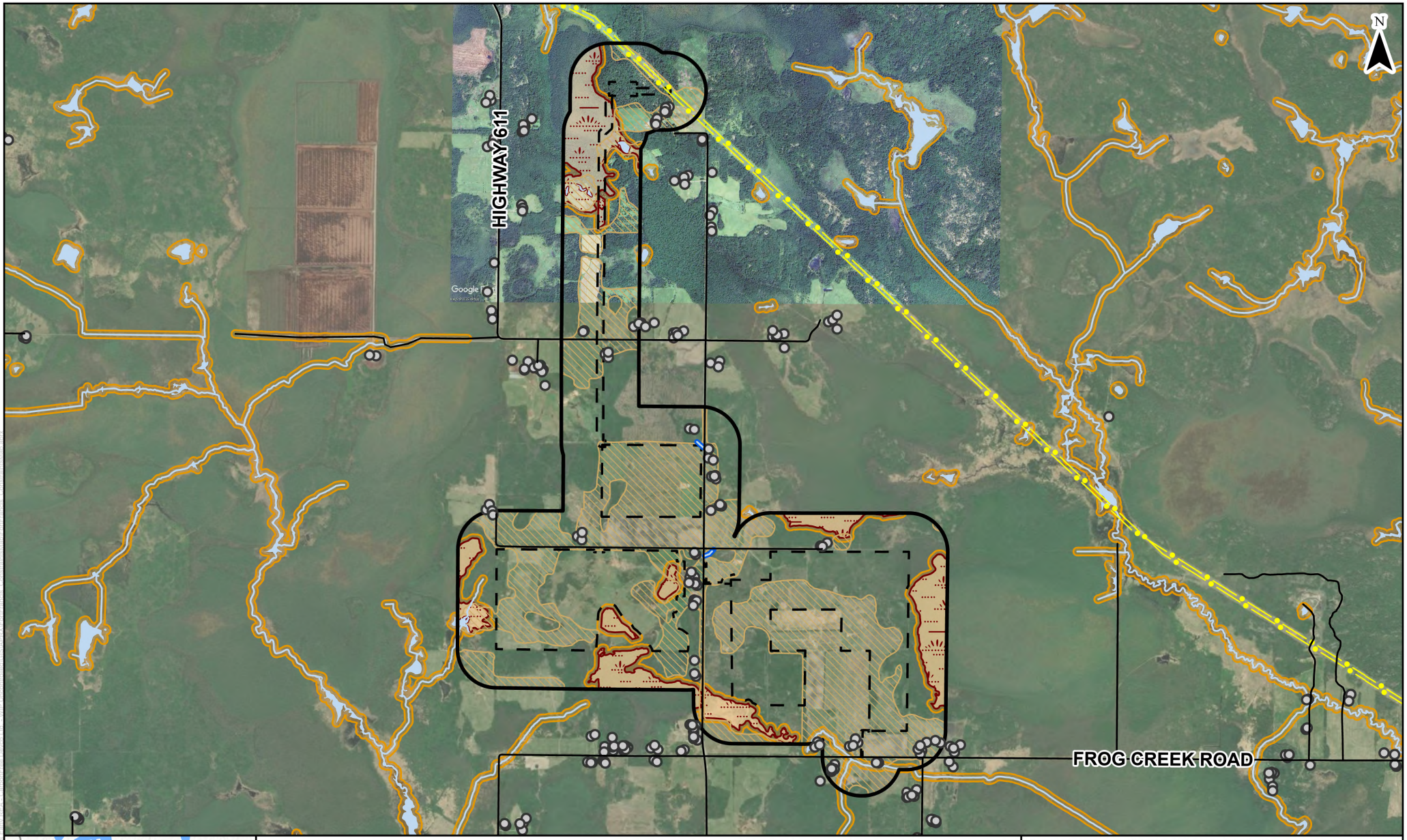
[4] Ontario Ministry of the Environment, Climate, and Parks (MECP), NPC-300 - Environmental Noise Guideline – Stationary and Transportation Sources, 2013.

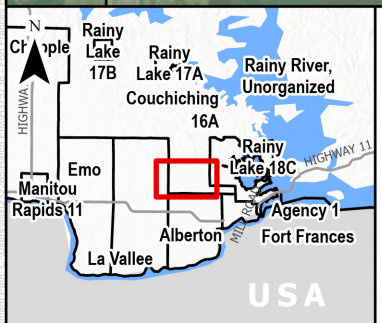
[5] National Electrical Manufacturers Association, "NEMA TP-80050-2013 (R2024): Transformers, Step Voltage Regulators, and Reactors," NEMA, Rosslyn, VA, USA, 2013.

[6] Institute of Electrical and Electronics Engineers, C57.12.90 Standard Test Code for Liquid-Immersed Distribution, Power and Regulating Transformers, 2010.

[7] International Organization for Standardization, "ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation," ISO, Geneva, Switzerland, 1996.

Appendix A
Zoning/Land-Use Siting Map





LEGEND

- Building
- Transmission Line
- Road
- Unnamed Watercourse
- Watercourse
- Agricultural Lands
- Project Location
- Study Area (300m Buffer)
- Setback
- Waterbody
- Wetland

NOTES:
1. Produced by Hatch, contains information licensed under the Open Government Licence – Ontario
2. Spatial referencing: NAD 1983 UTM Zone 15N

0 250 500 1,000 m
1:40,000

PROJECT:	CarbonFree Fort Frances Project - Project Description Report
FIGURE TITLE:	Project Location
CLIENT:	CarbonFree Fort Frances LTD

DWG BY:	CHK BY:	FIG NO.:	REV NO.:
V. BAXTER	C. SEHL	1	A
DATE: 02/03/26	PAGE: 1		

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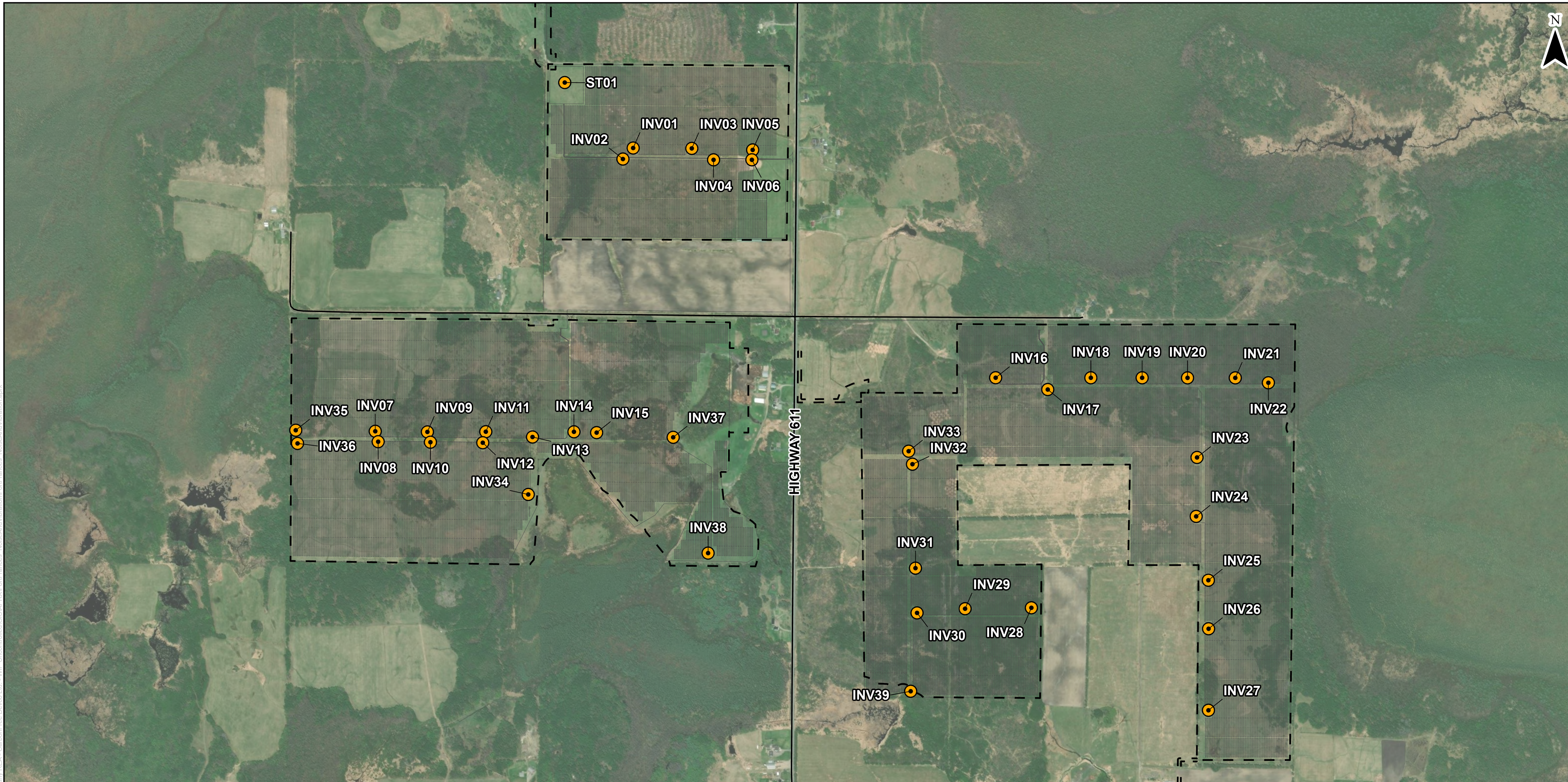
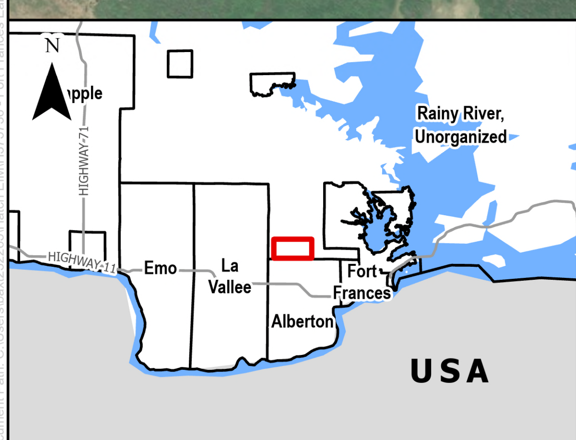
Appendix B
Site and Noise Source Layout

Vantor





LEGEND

- Noise Source
- PV Array
- Road
- Project Location

NOTES:
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2. Spatial referencing: NAD 1983 UTM Zone 15N

0 125 250 500 m

1:12,000

PROJECT:	Acoustic Assessment Report Fort Frances Solar Project
FIGURE TITLE:	Noise Source Layout
CLIENT:	CarbonFree Fort Frances LTD

DWG BY:	CHK BY:	FIG NO.:	REV NO.:
V. BAXTER	M. ANDARGIE	1	1
DATE: 09/03/26	PAGE: 1		

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Appendix C
Noise Source Sound Power Levels and Equipment Vendor Information

Equipment Type	Solar Inverter Skid		NV dB	INV	Project Tags: INV xx
Manufacturer	Sungrow				
Power	4400	kW	Date	25/2/2026	
Flow	-	(m^3/s)			
Pres	-	kPA	Source	Sungrow SG4400UD	
Temperature	-	(^{0}C)		2025-05-08 Test report	

	31.5	63	125	250	500	1000	2000	4000	8000	OVL(A)
Derrived Lw	90	87	91	92	95	88	88	93	80	97

Figure 1. Photo of Solar Inverter Skid (Looking South)

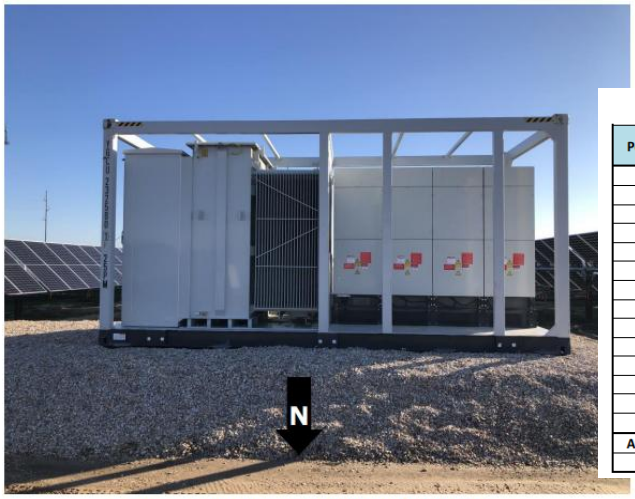
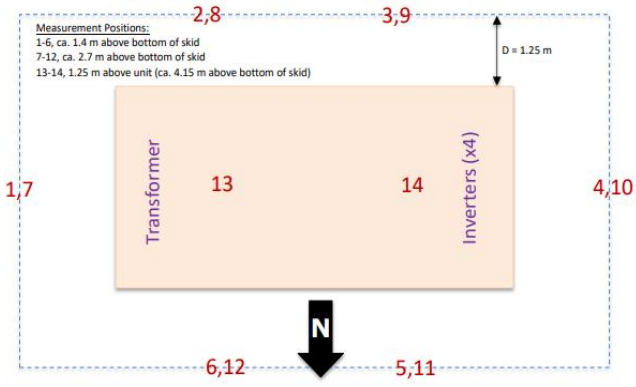


Table 1. Sound Measurement Data, dB

Position	Octave Band Center Frequency, Hz									dBA	dBZ, Calculated
	31.5	63	125	250	500	1000	2000	4000	8000		
1	67.9	64.7	67.9	61	54	47.3	46.7	51.8	36	58.5	72.3
2	64.9	65	69.1	70.3	75	68.5	68.3	67.3	59.7	75.8	78.9
3	68.5	65.9	71.5	77.4	80	72.2	72.9	71.6	63.8	80.4	83.7
4	65.4	63.8	67.3	67.2	67.8	61.7	63	67.4	53.5	71.5	75.0
5	62.9	64.3	66.8	67.9	66.5	61.5	64.7	78.8	62.5	79.9	80.1
6	60	65.8	68.9	62.4	58.7	58.1	60	68.4	53	70.4	73.8
7	61.4	63.1	69.1	56.3	53.8	46.5	47.2	49.9	35.2	57.5	70.9
8	66.1	63.9	70.9	68.3	75.1	68.3	66.8	65.9	55.6	75.2	78.7
9	67.8	65.7	71.4	76.3	77.9	71.6	69.5	67.1	56.5	78	82.0
10	64.9	62.9	70.4	66.8	67.2	60.9	61.9	65.3	51.9	70.2	75.1
11	63.9	63.2	68.2	67	64.6	59.5	64.6	74.2	60.4	75.8	77.0
12	59.4	64.7	66.2	64.9	59	55.7	57.5	68.9	52.5	70.5	73.2
13	69.1	62.3	71.6	62.1	64.8	59.7	58.5	66.2	49	69.3	75.4
14	76.3	68.1	68.6	68.1	70.8	64.9	63.5	68.8	53.2	73.3	79.4
Average	**68.1**	**64.8**	**69.5**	**70.3**	**72.7**	**65.9**	**65.9**	**70.8**	**57.6**	**75.1**	**78.3**
L_w	**90.0**	**86.7**	**91.4**	**92.2**	**94.6**	**87.8**	**87.7**	**92.6**	**79.5**	**97.0**	**100.2**

Figure 2. Measurement Positions, Overhead View



Equipment Type	110 kV BIL 186 MVA Transformer		NV dB	TR_186	Project Tags ST01
Manufacturer	Larson Electronics				
Power	186	MVA	Date	2025.03.04	
Flow	-	(m^3/s)			
Pres	-	kPA	Source	NEMA TR1-1993 (R2000), Oil Filled- Forced Air	
Temperature	-	(^0C)		Larson Electronics 186 MVA 110 kV BIL MT-PSTC-GSU	

	31.5	63	125	250	500	1000	2000	4000	8000	OVL
Derrived Lw	107	113	115	110	110	104	99	94	87	110

From Handbook of Noise and Vibration Control (Crocker, 2007, page 1335-1336, Eq. 18 and Table 20)

Average LpA	82	dBA	Based on NEMA TR1-1993 (R2000), Table 0-4, Dry type ventilated forced air cooled
Estimated surface area	402.9	m^2	Estimated based on IEEE Std C57.12.90-2010

	31.5	63	125	250	500	1000	2000	4000	8000	OVL (dBA)
STEP 1: Correction factors										
C1 Outdoors, indoors in mechanical room over 140 m^3	-11	-5	-3	-8	-8	-14	-19	-24	-31	
C2 - Indoors	-11	-2	3	-2	-2	-11	-19	-24	-31	
C3 - Serious Noise Problems	-11	-2	3	2	2	-4	-9	-14	-21	
STEP 2: Sound Power Level calculated as Lw=Average LpA + Awt + 10*log(Estimated surface area) + C + 10										
C1 based [dB]	107	113	115	110	110	104	99	94	87	110
C2 based [dB]	107	116	121	116	116	107	99	94	87	115
C3 based [dB]	107	116	121	120	120	114	109	104	97	120
A-weightings	-39.4	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1	

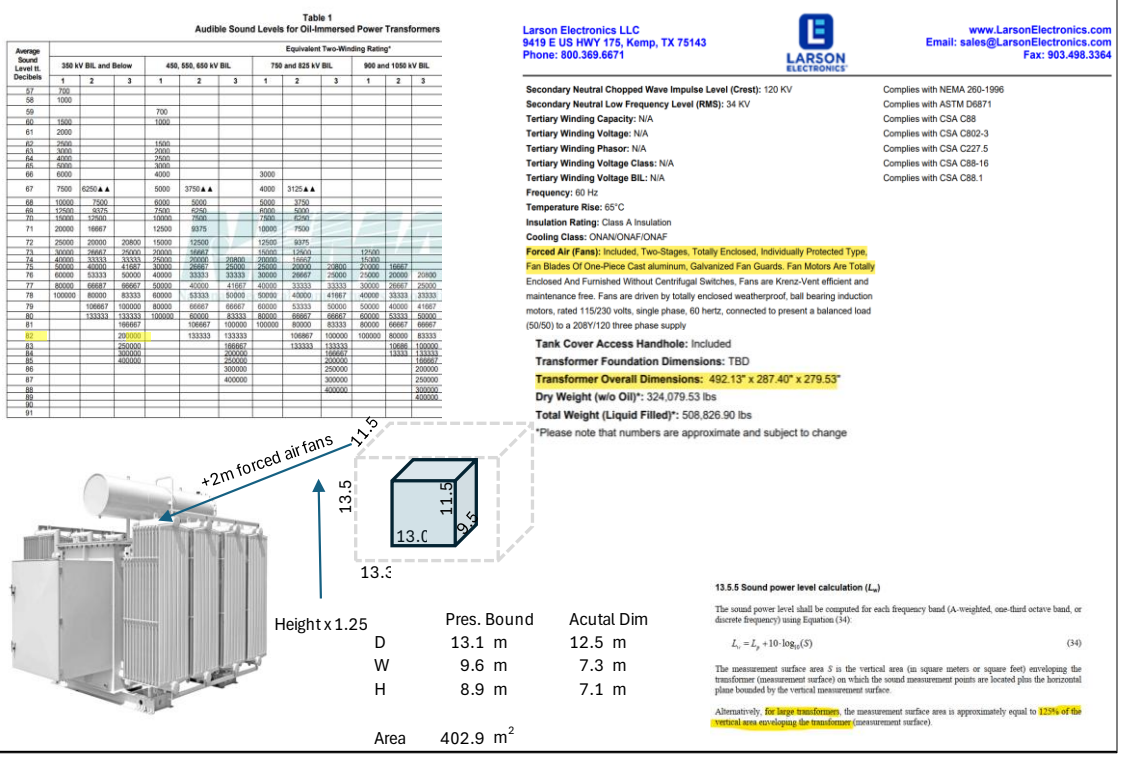


Table 1
Audible Sound Levels for Oil-Immersed Power Transformers

Larson Electronics LLC
9419 E US HWY 175, Kemp, TX 75143
Phone: 800.369.6671

www.LarsonElectronics.com
Email: sales@LarsonElectronics.com
Fax: 903.498.3364

Secondary Neutral Chopped Wave Impulse Level (Crest): 120 KV
Secondary Neutral Low Frequency Level (RMS): 34 KV
Tertiary Winding Capacity: N/A
Tertiary Winding Voltage: N/A
Tertiary Winding Phasor: N/A
Tertiary Winding Voltage Class: N/A
Tertiary Winding Voltage BIL: N/A
Frequency: 60 Hz
Temperature Rise: 65°C
Insulation Rating: Class A Insulation
Cooling Class: ONAN/ONAF/ONAF
Forced Air (Fans): Included, Two-Stages, Totally Enclosed, Individually Protected Type, Fan Blades Of One-Piece Cast aluminum, Galvanized Fan Guards. Fan Motors Are Totally Enclosed And Furnished Without Centrifugal Switches, Fans are Krenz-Vent efficient and maintenance free. Fans are driven by totally enclosed weatherproof, ball bearing induction motors, rated 115/230 volts, single phase, 60 hertz, connected to present a balanced load (50/50) to a 208Y/120 three phase supply

Complies with NEMA 260-1996
Complies with ASTM D6871
Complies with CSA C88
Complies with CSA C802-3
Complies with CSA C227.5
Complies with CSA C88-16
Complies with CSA C88.1

Tank Cover Access Handhole: Included
Transformer Foundation Dimensions: TBD
Transformer Overall Dimensions: 492.13" x 287.40" x 279.53"
Dry Weight (w/o Oil)*: 324,079.53 lbs
Total Weight (Liquid Filled)*: 508,826.90 lbs
*Please note that numbers are approximate and subject to change

Height x 1.25

	Pres. Bound	Acutal Dim
D	13.1 m	12.5 m
W	9.6 m	7.3 m
H	8.9 m	7.1 m
Area	402.9 m^2	

13.5.5 Sound power level calculation (L_w)

The sound power level shall be computed for each frequency band (A-weighted, one-third octave band, or discrete frequency) using Equation (34).

$$L_v = L_p + 10 \cdot \log_{10}(S) \quad (34)$$

The measurement surface area S is the vertical area (in square meters or square feet) enveloping the transformer (measurement surface) on which the sound measurement points are located plus the horizontal plane bounded by the vertical measurement surface.

Alternatively, for large transformers, the measurement surface area is approximately equal to 125% of the vertical area enveloping the transformer (measurement surface).

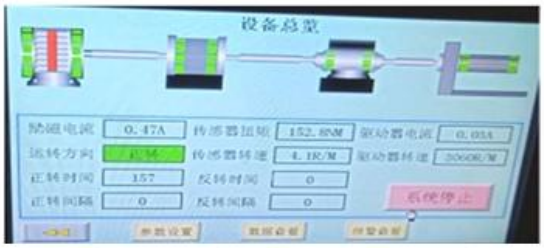
NEXTracker
A Flex Company

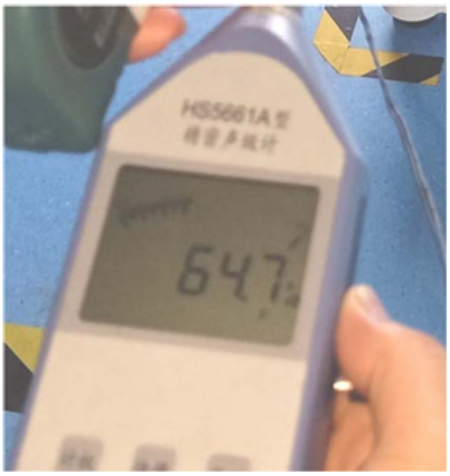
Nextracker Motor Sound Summary

Each Nextracker row uses a 24V DC motor powered by a Nextracker controller (SPC). To track the Sun, the motor operates for five to ten seconds every few minutes. The noise level of the motors is tested by the manufacturer. Test reports from the manufacturer indicate that the sound power level is approximately ~65dB. The sound level produced is low and essentially indistinguishable to surrounding site noises such as inverters, transformers, and HVAC units.

Below is a Motor test report from Nextracker Vendor.

Distance	Sound Level	Equivalent Sound
3m (9.8 ft)	~ 65dB	Normal Conversation, Quiet Suburb
30m (98 ft)	~ 45dB	Light Rain, Bird calls
300m (980 ft)	~ 25dB	Leaves Rustling, Whisper

Applicator	Lu Weijian	Departme nt	Technical	Date	2020.04.14
Sample name		Drawing No.		Sample No.	2
Test purpose	Test gearbox motor can meet the noise standard				
Test process	1. The test motor shall be isolated from the aging table to prevent it from being affected by the noise of the aging table. The torque shall be set to 150N.m for 10min forward rotation, 1min stop, 10min reverse and 1min stop, work for 2 cycles. The noise meter should be 1m to the under test motor. 2. Acceptable standard: Noise during the test shall be ≤65dB				
Test equipment	300N.m dynamometer， noise meter				
Test cycle	1 day				
Process Description	1. Clamp the sample motor and test the corresponding data according to the above test methods 1-1 Ambient noise 56.1dB  1-2 Dynamometer parameter setting 150N.m  1-3 Test the motor noise when running as required, and the horizontal distance from the motor is 1m  1-4 Motor noise test result: 64.7dB				

			
Test report	No. B1 Motor noise 64.7 dB; No. F1 Motor noise 63.2 dB;		
Test result	According to the test results show that the stable operation of electric motor noise can meet the performance requirements;		
Operator	Sun Jieying	Audit	Lu Weijian

Appendix D
POR Noise Impact Table and Noise Contour Plot

Point of Reception Noise Impact Table

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN01_f	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV13	INV09	INV11
	35 dBA	19 dBA	19 dBA	18 dBA	17 dBA	17 dBA	17 dBA	12 dBA	10 dBA	10 dBA
	848 m	1148 m	1155 m	1277 m	1353 m	1427 m	1445 m	1847 m	1784 m	1802 m
RN01_o	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV13	INV09	INV11
	35 dBA	20 dBA	20 dBA	18 dBA	18 dBA	17 dBA	17 dBA	12 dBA	10 dBA	10 dBA
	819 m	1119 m	1125 m	1249 m	1325 m	1400 m	1418 m	1818 m	1757 m	1774 m
RN02_f	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV07	INV08	INV09
	28 dBA	19 dBA	18 dBA	18 dBA	17 dBA	17 dBA	17 dBA	0 dBA	0 dBA	0 dBA
	955 m	1216 m	1238 m	1292 m	1357 m	1396 m	1421 m	2088 m	2119 m	2064 m
RN02_o	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV07	INV08	INV09
	28 dBA	19 dBA	19 dBA	18 dBA	18 dBA	17 dBA	17 dBA	0 dBA	0 dBA	0 dBA
	926 m	1187 m	1209 m	1263 m	1329 m	1369 m	1393 m	2062 m	2093 m	2037 m
RN03_f	ST01	INV01	INV02	INV03	INV04	INV06	INV05	INV13	INV37	INV14
	29 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA	8 dBA	6 dBA	4 dBA	3 dBA
	766 m	999 m	1027 m	1058 m	1119 m	1177 m	1151 m	1898 m	1929 m	1879 m
RN03_o	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV13	INV37	INV14
	29 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA	6 dBA	4 dBA	3 dBA
	736 m	970 m	997 m	1030 m	1092 m	1126 m	1151 m	1868 m	1899 m	1849 m
RN04_f	ST01	INV01	INV03	INV02	INV04	INV06	INV05	INV07	INV08	INV09
	26 dBA	19 dBA	19 dBA	19 dBA	18 dBA	18 dBA	12 dBA	0 dBA	0 dBA	0 dBA
	988 m	1179 m	1200 m	1214 m	1250 m	1283 m	1254 m	2227 m	2255 m	2175 m
RN04_o	ST01	INV01	INV03	INV02	INV04	INV06	INV05	INV07	INV08	INV09
	26 dBA	19 dBA	19 dBA	19 dBA	19 dBA	18 dBA	12 dBA	0 dBA	0 dBA	0 dBA
	959 m	1150 m	1171 m	1185 m	1221 m	1256 m	1227 m	2200 m	2227 m	2147 m
RN05_f	ST01	INV03	INV01	INV06	INV02	INV04	INV05	INV07	INV08	INV09
	24 dBA	20 dBA	19 dBA	19 dBA	19 dBA	11 dBA	8 dBA	0 dBA	0 dBA	0 dBA
	1048 m	1122 m	1156 m	1154 m	1199 m	1153 m	1122 m	2313 m	2337 m	2238 m
RN05_o	ST01	INV03	INV01	INV06	INV02	INV04	INV05	INV07	INV08	INV09
	24 dBA	20 dBA	20 dBA	20 dBA	19 dBA	11 dBA	8 dBA	0 dBA	0 dBA	0 dBA
	1019 m	1097 m	1129 m	1131 m	1171 m	1129 m	1100 m	2284 m	2308 m	2209 m
RN06_f	ST01	INV06	INV03	INV01	INV02	INV04	INV05	INV19	INV16	INV17
	23 dBA	21 dBA	21 dBA	20 dBA	20 dBA	15 dBA	12 dBA	12 dBA	11 dBA	11 dBA
	1041 m	956 m	976 m	1060 m	1107 m	986 m	925 m	1951 m	1740 m	1838 m
RN06_o	ST01	INV06	INV03	INV01	INV02	INV04	INV05	INV13	INV19	INV16
	24 dBA	22 dBA	22 dBA	21 dBA	20 dBA	16 dBA	12 dBA	12 dBA	12 dBA	11 dBA
	1012 m	928 m	946 m	1030 m	1077 m	957 m	896 m	1994 m	1937 m	1721 m
RN07_f	ST01	INV03	INV01	INV02	INV05	INV06	INV19	INV20	INV04	INV16
	19 dBA	17 dBA	16 dBA	16 dBA	12 dBA	12 dBA	12 dBA	12 dBA	11 dBA	11 dBA
	1571 m	1387 m	1519 m	1567 m	1267 m	1294 m	1818 m	1863 m	1369 m	1750 m

Source ID
Partial Level
Distance

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN07_o	ST01	INV03	INV01	INV02	INV05	INV06	INV19	INV20	INV04	INV16
	20 dBA	17 dBA	16 dBA	16 dBA	13 dBA	12 dBA	12 dBA	12 dBA	11 dBA	11 dBA
	1549 m	1360 m	1494 m	1541 m	1239 m	1266 m	1793 m	1839 m	1341 m	1721 m
RN08_f	INV03	INV01	INV06	INV02	ST01	INV04	INV05	INV31	INV13	INV30
	33 dBA	30 dBA	30 dBA	30 dBA	28 dBA	23 dBA	23 dBA	17 dBA	16 dBA	16 dBA
	457 m	582 m	421 m	629 m	681 m	456 m	390 m	1779 m	1507 m	1919 m
RN08_o	INV03	INV01	INV06	INV02	ST01	INV04	INV05	INV31	INV13	INV30
	34 dBA	31 dBA	30 dBA	30 dBA	28 dBA	24 dBA	24 dBA	17 dBA	16 dBA	16 dBA
	441 m	570 m	402 m	617 m	677 m	438 m	370 m	1760 m	1491 m	1899 m
RN09_f	INV01	INV06	INV02	INV05	ST01	INV03	INV04	INV31	INV30	INV29
	31 dBA	30 dBA	30 dBA	28 dBA	27 dBA	26 dBA	25 dBA	19 dBA	18 dBA	17 dBA
	570 m	257 m	611 m	233 m	767 m	394 m	350 m	1537 m	1678 m	1704 m
RN09_o	INV06	INV01	INV02	INV05	ST01	INV03	INV04	INV18	INV31	INV30
	31 dBA	31 dBA	30 dBA	28 dBA	27 dBA	26 dBA	25 dBA	21 dBA	19 dBA	18 dBA
	245 m	550 m	592 m	220 m	747 m	376 m	334 m	1289 m	1543 m	1683 m
RN10_f	INV01	INV02	INV06	INV05	ST01	INV04	INV03	INV18	INV31	INV16
	30 dBA	30 dBA	30 dBA	29 dBA	26 dBA	25 dBA	24 dBA	22 dBA	20 dBA	20 dBA
	590 m	625 m	220 m	211 m	829 m	339 m	404 m	1152 m	1397 m	944 m
RN10_o	INV06	INV05	INV01	INV02	ST01	INV04	INV03	INV18	INV31	INV16
	31 dBA	30 dBA	30 dBA	29 dBA	26 dBA	26 dBA	25 dBA	22 dBA	20 dBA	20 dBA
	189 m	181 m	562 m	596 m	804 m	309 m	375 m	1166 m	1392 m	952 m
RN11_f	INV06	INV01	INV02	INV16	INV03	INV05	ST01	INV04	INV18	INV31
	31 dBA	30 dBA	29 dBA	27 dBA	26 dBA	25 dBA	25 dBA	25 dBA	24 dBA	22 dBA
	279 m	616 m	634 m	766 m	450 m	302 m	905 m	372 m	1019 m	1145 m
RN11_o	INV06	INV03	INV01	INV16	INV02	INV05	ST01	INV04	INV18	INV31
	33 dBA	28 dBA	27 dBA	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	24 dBA	22 dBA
	259 m	424 m	587 m	791 m	604 m	283 m	878 m	346 m	1047 m	1155 m
RN12_f	INV18	INV17	INV16	INV19	INV20	INV28	INV31	INV32	INV29	INV26
	30 dBA	29 dBA	29 dBA	29 dBA	28 dBA	27 dBA	27 dBA	27 dBA	26 dBA	25 dBA
	212 m	264 m	336 m	291 m	405 m	954 m	967 m	717 m	1012 m	1091 m
RN12_o	INV18	INV17	INV19	INV16	INV20	INV32	INV28	INV31	INV21	INV29
	30 dBA	29 dBA	28 dBA	28 dBA	27 dBA	25 dBA	25 dBA	25 dBA	24 dBA	24 dBA
	201 m	253 m	283 m	328 m	400 m	708 m	942 m	957 m	538 m	1000 m
RN13_f	INV15	INV14	INV16	INV06	INV13	INV03	INV01	INV11	INV12	ST01
	29 dBA	28 dBA	28 dBA	28 dBA	26 dBA	26 dBA	24 dBA	24 dBA	24 dBA	24 dBA
	646 m	709 m	727 m	552 m	835 m	639 m	735 m	968 m	989 m	1034 m
RN13_o	INV15	INV14	INV06	INV13	INV03	INV11	INV01	INV12	INV16	ST01
	30 dBA	29 dBA	27 dBA	27 dBA	26 dBA	25 dBA	25 dBA	25 dBA	24 dBA	24 dBA
	614 m	677 m	564 m	803 m	641 m	936 m	730 m	957 m	753 m	1027 m
RN14_f	ST01	INV35	INV01	INV03	INV36	INV04	INV06	INV08	INV05	INV13
	30 dBA	29 dBA	29 dBA	29 dBA	29 dBA	29 dBA	27 dBA	27 dBA	27 dBA	25 dBA
	719 m	772 m	643 m	779 m	791 m	815 m	920 m	597 m	937 m	455 m

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN14_o	ST01	INV35	INV01	INV36	INV03	INV04	INV08	INV13	INV07	INV14
	28 dBA	27 dBA	27 dBA	27 dBA	27 dBA	26 dBA	26 dBA	24 dBA	24 dBA	23 dBA
	747 m	757 m	665 m	775 m	797 m	831 m	576 m	427 m	558 m	463 m
RN15_f	ST01	INV02	INV01	INV11	INV12	INV09	INV36	INV07	INV10	INV35
	26 dBA	25 dBA	25 dBA	23 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	20 dBA
	1011 m	1105 m	1144 m	913 m	932 m	793 m	685 m	708 m	825 m	643 m
RN15_o	ST01	INV11	INV02	INV01	INV09	INV12	INV36	INV07	INV10	INV35
	33 dBA	21 dBA	20 dBA	20 dBA	20 dBA	20 dBA	20 dBA	19 dBA	19 dBA	18 dBA
	988 m	924 m	1088 m	1126 m	809 m	944 m	712 m	729 m	841 m	670 m
RN16_f	INV15	INV30	INV14	INV13	INV34	INV39	INV06	INV11	INV12	INV16
	29 dBA	28 dBA	27 dBA	27 dBA	27 dBA	25 dBA	25 dBA	25 dBA	25 dBA	24 dBA
	570 m	705 m	643 m	774 m	804 m	900 m	908 m	923 m	932 m	734 m
RN16_o	INV15	INV30	INV14	INV13	INV34	INV06	INV11	INV12	INV39	INV03
	30 dBA	28 dBA	28 dBA	27 dBA	27 dBA	25 dBA	25 dBA	25 dBA	25 dBA	24 dBA
	552 m	716 m	624 m	755 m	785 m	908 m	905 m	913 m	909 m	974 m
RN17_f	INV15	INV38	INV14	INV28	INV34	INV13	INV16	INV37	INV10	INV09
	30 dBA	29 dBA	29 dBA	28 dBA	28 dBA	28 dBA	27 dBA	26 dBA	24 dBA	24 dBA
	740 m	226 m	798 m	832 m	828 m	897 m	975 m	567 m	1179 m	1201 m
RN17_o	INV38	INV15	INV14	INV34	INV28	INV13	INV37	INV16	INV11	INV12
	30 dBA	28 dBA	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	24 dBA	24 dBA	24 dBA
	197 m	710 m	767 m	800 m	856 m	867 m	537 m	977 m	1005 m	997 m
RN18_f	INV28	INV14	INV34	INV15	INV38	INV37	INV13	INV12	INV11	INV30
	26 dBA	26 dBA	26 dBA	25 dBA	25 dBA	25 dBA	24 dBA	23 dBA	23 dBA	23 dBA
	824 m	888 m	888 m	836 m	312 m	682 m	977 m	1096 m	1108 m	459 m
RN18_o	INV38	INV14	INV34	INV15	INV37	INV13	INV28	INV12	INV11	INV30
	26 dBA	26 dBA	26 dBA	26 dBA	25 dBA	25 dBA	24 dBA	23 dBA	23 dBA	22 dBA
	283 m	859 m	861 m	806 m	653 m	948 m	841 m	1068 m	1079 m	476 m
RN19_f	INV28	INV30	INV32	INV37	INV34	INV15	INV14	INV13	INV29	INV12
	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	25 dBA	24 dBA	24 dBA	24 dBA	23 dBA
	920 m	612 m	992 m	1034 m	1125 m	1149 m	1189 m	1252 m	739 m	1343 m
RN19_o	INV30	INV28	INV32	INV34	INV15	INV29	INV39	INV14	INV13	INV31
	26 dBA	26 dBA	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA
	583 m	890 m	969 m	1136 m	1152 m	710 m	428 m	1194 m	1261 m	687 m
RN20_f	INV30	INV28	INV29	INV32	INV34	INV39	INV15	INV14	INV31	INV13
	28 dBA	24 dBA	23 dBA	23 dBA	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	20 dBA
	688 m	971 m	804 m	1091 m	1213 m	503 m	1251 m	1289 m	801 m	1347 m
RN20_o	INV30	INV28	INV32	INV29	INV34	INV15	INV39	INV14	INV31	INV13
	29 dBA	25 dBA	23 dBA	23 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA
	659 m	948 m	1060 m	777 m	1196 m	1229 m	480 m	1267 m	771 m	1328 m
RN21_f	INV30	INV37	INV34	INV32	INV29	INV15	INV14	INV13	INV12	INV28
	26 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA	20 dBA
	835 m	1200 m	1208 m	1223 m	954 m	1282 m	1312 m	1357 m	1426 m	1122 m

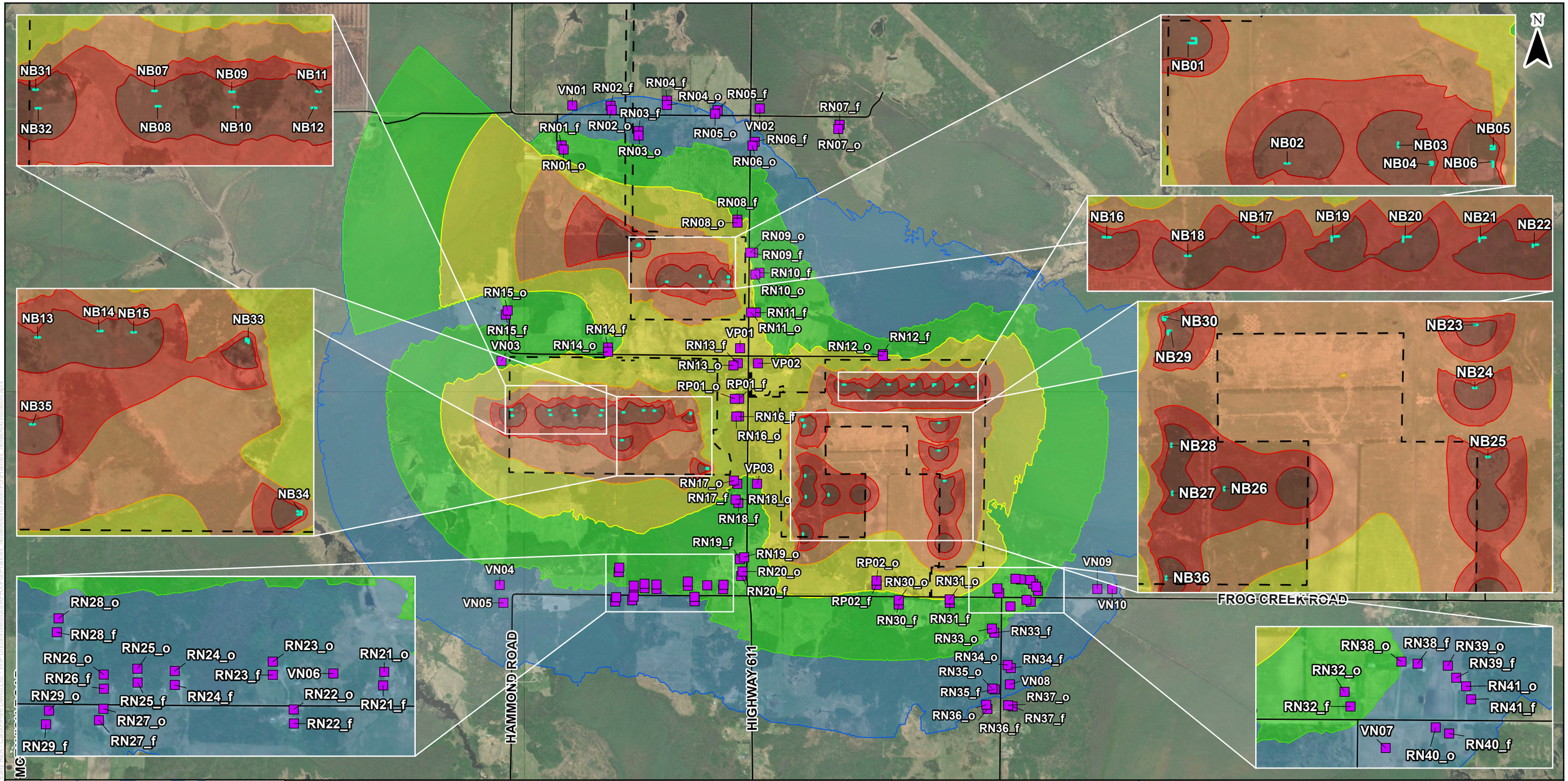
Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN21_o	INV30	INV28	INV37	INV34	INV32	INV15	INV14	INV29	INV13	INV12
	24 dBA	23 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	20 dBA
	812 m	1104 m	1172 m	1185 m	1196 m	1255 m	1286 m	933 m	1332 m	1403 m
RN22_f	INV34	INV37	INV15	INV14	INV28	INV13	INV12	INV11	INV10	INV09
	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA	20 dBA	19 dBA	19 dBA
	1185 m	1262 m	1305 m	1325 m	1327 m	1349 m	1396 m	1424 m	1481 m	1514 m
RN22_o	INV34	INV37	INV15	INV14	INV28	INV13	INV12	INV11	INV10	INV09
	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA	19 dBA
	1158 m	1232 m	1276 m	1295 m	1312 m	1321 m	1369 m	1397 m	1456 m	1489 m
RN23_f	INV34	INV37	INV15	INV14	INV13	INV12	INV11	INV28	INV10	INV09
	23 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA
	1071 m	1158 m	1194 m	1212 m	1235 m	1283 m	1310 m	1314 m	1369 m	1402 m
RN23_o	INV34	INV37	INV15	INV14	INV13	INV12	INV11	INV28	INV10	INV09
	24 dBA	23 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA
	1045 m	1129 m	1166 m	1184 m	1209 m	1257 m	1284 m	1301 m	1345 m	1378 m
RN24_f	INV34	INV13	INV14	INV15	INV12	INV11	INV10	INV08	INV07	INV37
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA
	1024 m	1200 m	1200 m	1194 m	1221 m	1252 m	1284 m	1364 m	1397 m	1201 m
RN24_o	INV34	INV13	INV14	INV15	INV12	INV11	INV10	INV08	INV07	INV37
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	20 dBA	20 dBA	19 dBA
	994 m	1171 m	1170 m	1164 m	1193 m	1223 m	1257 m	1339 m	1372 m	1172 m
RN25_f	INV34	INV13	INV15	INV12	INV14	INV11	INV10	INV08	INV07	INV36
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	20 dBA	19 dBA
	1004 m	1183 m	1191 m	1194 m	1192 m	1226 m	1248 m	1320 m	1354 m	1456 m
RN25_o	INV34	INV13	INV14	INV15	INV12	INV11	INV10	INV08	INV07	INV37
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	21 dBA	21 dBA	19 dBA
	974 m	1154 m	1162 m	1161 m	1165 m	1197 m	1220 m	1294 m	1327 m	1186 m
RN26_f	INV34	INV12	INV13	INV14	INV15	INV11	INV10	INV36	INV35	INV38
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	20 dBA	19 dBA	18 dBA
	1009 m	1191 m	1190 m	1207 m	1210 m	1225 m	1236 m	1424 m	1462 m	955 m
RN26_o	INV34	INV12	INV13	INV14	INV15	INV11	INV10	INV36	INV35	INV38
	24 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	22 dBA	20 dBA	20 dBA	19 dBA
	978 m	1161 m	1160 m	1176 m	1180 m	1194 m	1207 m	1399 m	1437 m	929 m
RN27_f	INV34	INV12	INV13	INV14	INV15	INV11	INV10	INV36	INV35	INV28
	26 dBA	24 dBA	24 dBA	24 dBA	24 dBA	23 dBA	23 dBA	22 dBA	21 dBA	20 dBA
	1075 m	1256 m	1257 m	1275 m	1279 m	1289 m	1297 m	1474 m	1513 m	1692 m
RN27_o	INV34	INV12	INV13	INV14	INV15	INV11	INV10	INV36	INV35	INV37
	24 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	19 dBA	19 dBA	18 dBA
	1051 m	1233 m	1233 m	1250 m	1253 m	1267 m	1276 m	1459 m	1497 m	1289 m
RN28_f	INV34	INV12	INV13	INV10	INV11	INV14	INV15	INV38	INV09	INV08
	26 dBA	23 dBA	23 dBA	23 dBA	23 dBA	23 dBA	23 dBA	21 dBA	20 dBA	19 dBA
	884 m	1056 m	1068 m	1090 m	1090 m	1096 m	1107 m	916 m	1124 m	1147 m

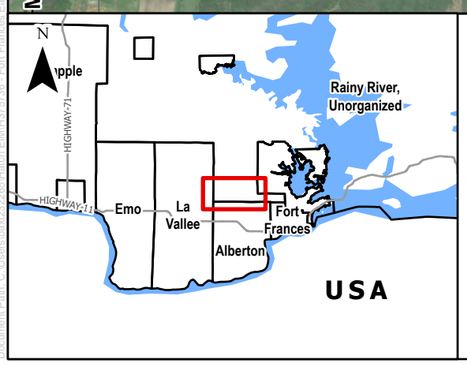
Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN28_o	INV34	INV12	INV13	INV10	INV11	INV14	INV15	INV38	INV36	INV09
	26 dBA	24 dBA	24 dBA	23 dBA	23 dBA	23 dBA	23 dBA	22 dBA	21 dBA	20 dBA
	854 m	1026 m	1037 m	1062 m	1061 m	1066 m	1077 m	891 m	1244 m	1096 m
RN29_f	INV34	INV12	INV13	INV10	INV11	INV14	INV15	INV36	INV35	INV09
	25 dBA	24 dBA	24 dBA	24 dBA	23 dBA	23 dBA	23 dBA	22 dBA	22 dBA	19 dBA
	1083 m	1250 m	1266 m	1277 m	1285 m	1296 m	1306 m	1423 m	1463 m	1311 m
RN29_o	INV34	INV12	INV13	INV10	INV11	INV14	INV15	INV36	INV35	INV09
	24 dBA	22 dBA	22 dBA	21 dBA	21 dBA	21 dBA	21 dBA	20 dBA	20 dBA	18 dBA
	1053 m	1222 m	1237 m	1249 m	1256 m	1265 m	1276 m	1401 m	1440 m	1284 m
RN30_f	INV27	INV26	INV28	INV39	INV29	INV25	INV30	INV24	INV31	INV32
	34 dBA	30 dBA	29 dBA	29 dBA	28 dBA	28 dBA	27 dBA	26 dBA	26 dBA	23 dBA
	516 m	741 m	783 m	797 m	873 m	883 m	953 m	1067 m	1069 m	1357 m
RN30_o	INV27	INV26	INV28	INV39	INV29	INV25	INV30	INV31	INV24	INV32
	32 dBA	28 dBA	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	24 dBA	21 dBA	21 dBA
	492 m	713 m	755 m	780 m	848 m	855 m	931 m	1045 m	1037 m	1330 m
RN31_f	INV27	INV26	INV25	INV39	INV28	INV24	INV29	INV30	INV23	INV31
	31 dBA	26 dBA	23 dBA	23 dBA	22 dBA	21 dBA	20 dBA	19 dBA	19 dBA	18 dBA
	404 m	663 m	817 m	1088 m	943 m	1024 m	1088 m	1199 m	1211 m	1293 m
RN31_o	INV27	INV26	INV25	INV28	INV29	INV39	INV30	INV24	INV23	INV31
	35 dBA	29 dBA	27 dBA	25 dBA	23 dBA	23 dBA	22 dBA	21 dBA	19 dBA	18 dBA
	380 m	639 m	793 m	925 m	1072 m	1077 m	1184 m	1000 m	1187 m	1276 m
RN32_f	INV27	INV26	INV25	INV28	INV29	INV24	INV39	INV30	INV31	INV23
	32 dBA	28 dBA	23 dBA	22 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA	19 dBA
	498 m	700 m	836 m	1143 m	1320 m	1038 m	1375 m	1449 m	1522 m	1212 m
RN32_o	INV27	INV26	INV25	INV28	INV24	INV29	INV39	INV30	INV23	INV31
	33 dBA	29 dBA	24 dBA	23 dBA	21 dBA	21 dBA	20 dBA	20 dBA	19 dBA	19 dBA
	468 m	666 m	802 m	1115 m	1004 m	1293 m	1354 m	1424 m	1178 m	1495 m
RN33_f	INV27	INV26	INV25	INV28	INV29	INV39	INV30	INV24	INV32	INV33
	30 dBA	27 dBA	26 dBA	23 dBA	22 dBA	22 dBA	21 dBA	19 dBA	19 dBA	18 dBA
	689 m	924 m	1070 m	1293 m	1446 m	1445 m	1559 m	1277 m	1887 m	1926 m
RN33_o	INV27	INV26	INV25	INV39	INV24	INV28	INV29	INV23	INV30	INV22
	29 dBA	25 dBA	21 dBA	20 dBA	18 dBA	18 dBA	17 dBA	17 dBA	16 dBA	15 dBA
	657 m	892 m	1038 m	1418 m	1245 m	1261 m	1415 m	1426 m	1529 m	1624 m
RN34_f	INV27	INV26	INV25	INV28	INV39	INV29	INV30	INV31	INV24	INV23
	27 dBA	24 dBA	23 dBA	21 dBA	20 dBA	20 dBA	19 dBA	19 dBA	17 dBA	15 dBA
	951 m	1186 m	1331 m	1543 m	1660 m	1687 m	1792 m	1891 m	1537 m	1716 m
RN34_o	INV27	INV26	INV25	INV24	INV28	INV39	INV29	INV23	INV30	INV31
	25 dBA	22 dBA	18 dBA	16 dBA	16 dBA	15 dBA	15 dBA	15 dBA	14 dBA	13 dBA
	922 m	1159 m	1304 m	1511 m	1513 m	1631 m	1657 m	1690 m	1762 m	1861 m
RN35_f	INV27	INV26	INV25	INV28	INV29	INV31	INV24	INV39	INV30	INV23
	26 dBA	23 dBA	22 dBA	21 dBA	20 dBA	18 dBA	16 dBA	16 dBA	15 dBA	15 dBA
	1040 m	1288 m	1438 m	1590 m	1717 m	1919 m	1646 m	1657 m	1810 m	1829 m

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RN35_o	INV27	INV26	INV25	INV28	INV24	INV39	INV29	INV30	INV23	INV31
	24 dBA	21 dBA	20 dBA	16 dBA	15 dBA	15 dBA	15 dBA	14 dBA	14 dBA	13 dBA
	1029 m	1278 m	1428 m	1576 m	1636 m	1641 m	1701 m	1795 m	1819 m	1903 m
RN36_f	INV27	INV26	INV25	INV28	INV39	INV24	INV29	INV30	INV23	INV31
	22 dBA	20 dBA	19 dBA	15 dBA	14 dBA	14 dBA	14 dBA	13 dBA	13 dBA	13 dBA
	1152 m	1405 m	1556 m	1675 m	1707 m	1765 m	1789 m	1874 m	1949 m	1988 m
RN36_o	INV27	INV26	INV25	INV28	INV39	INV24	INV29	INV30	INV23	INV31
	23 dBA	20 dBA	19 dBA	15 dBA	15 dBA	14 dBA	14 dBA	14 dBA	13 dBA	13 dBA
	1121 m	1374 m	1526 m	1646 m	1681 m	1734 m	1761 m	1847 m	1919 m	1960 m
RN37_f	INV27	INV26	INV25	INV28	INV29	INV24	INV39	INV23	INV30	ST01
	24 dBA	22 dBA	21 dBA	20 dBA	19 dBA	15 dBA	15 dBA	14 dBA	14 dBA	0 dBA
	1188 m	1431 m	1579 m	1752 m	1881 m	1786 m	1822 m	1966 m	1975 m	3987 m
RN37_o	INV27	INV26	INV25	INV28	INV24	INV39	INV29	INV23	INV30	ST01
	22 dBA	20 dBA	18 dBA	14 dBA	14 dBA	14 dBA	14 dBA	13 dBA	13 dBA	0 dBA
	1171 m	1415 m	1564 m	1729 m	1771 m	1795 m	1856 m	1952 m	1950 m	3963 m
RN38_f	INV27	INV26	INV25	INV24	INV23	INV28	INV22	INV21	INV29	INV20
	31 dBA	28 dBA	23 dBA	21 dBA	19 dBA	19 dBA	18 dBA	17 dBA	17 dBA	17 dBA
	567 m	718 m	834 m	1024 m	1185 m	1218 m	1328 m	1372 m	1407 m	1427 m
RN38_o	INV27	INV26	INV25	INV28	INV24	INV23	INV22	INV21	INV29	INV20
	31 dBA	28 dBA	23 dBA	22 dBA	21 dBA	19 dBA	18 dBA	17 dBA	17 dBA	17 dBA
	534 m	690 m	810 m	1185 m	1002 m	1166 m	1316 m	1358 m	1373 m	1409 m
RN39_f	INV27	INV26	INV25	INV24	INV23	INV28	INV39	INV30	INV22	INV21
	29 dBA	27 dBA	25 dBA	23 dBA	21 dBA	21 dBA	18 dBA	18 dBA	17 dBA	17 dBA
	655 m	799 m	910 m	1095 m	1252 m	1306 m	1580 m	1632 m	1380 m	1429 m
RN39_o	INV27	INV26	INV25	INV24	INV23	INV28	INV22	INV21	INV20	INV29
	30 dBA	27 dBA	26 dBA	20 dBA	19 dBA	18 dBA	17 dBA	17 dBA	16 dBA	16 dBA
	628 m	768 m	878 m	1063 m	1220 m	1278 m	1349 m	1398 m	1458 m	1468 m
RN40_f	INV27	INV26	INV25	INV28	INV24	INV29	INV39	INV30	INV23	INV31
	28 dBA	26 dBA	24 dBA	20 dBA	19 dBA	19 dBA	18 dBA	18 dBA	17 dBA	17 dBA
	701 m	873 m	995 m	1352 m	1187 m	1534 m	1595 m	1665 m	1350 m	1735 m
RN40_o	INV27	INV26	INV25	INV28	INV24	INV29	INV39	INV30	INV23	INV31
	29 dBA	26 dBA	21 dBA	21 dBA	19 dBA	19 dBA	18 dBA	18 dBA	18 dBA	17 dBA
	670 m	845 m	968 m	1321 m	1161 m	1502 m	1564 m	1634 m	1325 m	1703 m
RN41_f	INV27	INV26	INV25	INV24	INV23	INV28	INV30	INV22	INV21	INV20
	28 dBA	26 dBA	24 dBA	22 dBA	21 dBA	20 dBA	18 dBA	17 dBA	16 dBA	16 dBA
	704 m	854 m	966 m	1152 m	1308 m	1356 m	1679 m	1433 m	1483 m	1545 m
RN41_o	INV27	INV26	INV25	INV24	INV23	INV28	INV39	INV30	INV22	INV21
	29 dBA	26 dBA	25 dBA	23 dBA	21 dBA	21 dBA	18 dBA	18 dBA	17 dBA	16 dBA
	682 m	827 m	938 m	1122 m	1278 m	1333 m	1605 m	1659 m	1403 m	1453 m
RP01_f	INV15	INV14	INV16	INV13	INV06	INV30	INV34	INV03	INV11	INV01
	30 dBA	29 dBA	28 dBA	27 dBA	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	25 dBA
	576 m	647 m	709 m	780 m	790 m	799 m	836 m	865 m	927 m	940 m

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
RP01_o	INV15	INV14	INV13	INV06	INV34	INV30	INV03	INV11	INV12	INV01
	31 dBA	30 dBA	28 dBA	27 dBA	27 dBA	26 dBA	26 dBA	25 dBA	25 dBA	25 dBA
	547 m	618 m	751 m	788 m	809 m	815 m	857 m	898 m	911 m	927 m
RP02_f	INV27	INV39	INV28	INV29	INV26	INV30	INV25	INV31	INV32	INV24
	31 dBA	30 dBA	30 dBA	29 dBA	28 dBA	27 dBA	26 dBA	26 dBA	22 dBA	21 dBA
	536 m	600 m	617 m	683 m	708 m	757 m	831 m	876 m	1172 m	992 m
RP02_o	INV27	INV39	INV28	INV29	INV26	INV30	INV25	INV31	INV32	INV24
	32 dBA	30 dBA	30 dBA	29 dBA	28 dBA	28 dBA	27 dBA	26 dBA	22 dBA	21 dBA
	523 m	583 m	589 m	658 m	687 m	734 m	808 m	852 m	1146 m	966 m
VN01	ST01	INV01	INV02	INV03	INV04	INV05	INV06	INV07	INV08	INV09
	25 dBA	19 dBA	18 dBA	18 dBA	17 dBA	17 dBA	16 dBA	0 dBA	0 dBA	0 dBA
	1040 m	1326 m	1341 m	1430 m	1501 m	1558 m	1579 m	2055 m	2088 m	2051 m
VN02	ST01	INV03	INV01	INV06	INV02	INV16	INV05	INV04	INV07	INV08
	22 dBA	20 dBA	19 dBA	19 dBA	19 dBA	11 dBA	7 dBA	6 dBA	0 dBA	0 dBA
	1224 m	1198 m	1272 m	1183 m	1318 m	1942 m	1152 m	1211 m	2474 m	2496 m
VN03	INV09	INV10	INV11	INV12	INV07	INV13	INV08	INV35	ST01	INV36
	32 dBA	32 dBA	30 dBA	29 dBA	29 dBA	28 dBA	25 dBA	25 dBA	24 dBA	22 dBA
	592 m	619 m	753 m	761 m	464 m	895 m	494 m	337 m	1210 m	379 m
VN04	INV36	INV35	INV08	INV07	INV10	INV09	INV12	INV11	INV13	INV38
	25 dBA	24 dBA	24 dBA	24 dBA	24 dBA	24 dBA	23 dBA	23 dBA	22 dBA	21 dBA
	1136 m	1177 m	1189 m	1218 m	1245 m	1272 m	1321 m	1356 m	1424 m	1599 m
VN05	INV36	INV08	INV35	INV07	INV10	INV09	INV12	INV11	INV38	INV34
	24 dBA	23 dBA	23 dBA	23 dBA	23 dBA	23 dBA	22 dBA	22 dBA	20 dBA	18 dBA
	1254 m	1298 m	1296 m	1328 m	1347 m	1375 m	1414 m	1450 m	1640 m	1350 m
VN06	INV34	INV37	INV28	INV15	INV14	INV13	INV30	INV12	INV11	INV10
	25 dBA	25 dBA	24 dBA	24 dBA	24 dBA	23 dBA	23 dBA	23 dBA	23 dBA	22 dBA
	1129 m	1160 m	1199 m	1222 m	1248 m	1284 m	893 m	1345 m	1370 m	1442 m
VN07	INV27	INV26	INV25	INV28	INV29	INV39	INV30	INV31	INV24	INV23
	32 dBA	29 dBA	27 dBA	24 dBA	22 dBA	22 dBA	21 dBA	20 dBA	20 dBA	19 dBA
	614 m	815 m	949 m	1257 m	1430 m	1475 m	1557 m	1634 m	1150 m	1322 m
VN08	INV27	INV26	INV25	INV28	INV29	INV30	INV31	INV24	INV39	INV23
	26 dBA	23 dBA	22 dBA	21 dBA	20 dBA	19 dBA	18 dBA	16 dBA	15 dBA	15 dBA
	1047 m	1287 m	1433 m	1624 m	1760 m	1860 m	1964 m	1640 m	1718 m	1820 m
VN09	INV27	INV26	INV25	INV24	INV23	INV22	INV28	INV21	INV20	INV19
	26 dBA	24 dBA	24 dBA	22 dBA	21 dBA	21 dBA	20 dBA	16 dBA	15 dBA	14 dBA
	1072 m	1173 m	1256 m	1413 m	1541 m	1591 m	1713 m	1661 m	1752 m	1846 m
VN10	INV27	INV26	INV25	INV24	INV23	INV28	INV22	INV21	INV20	INV19
	24 dBA	24 dBA	23 dBA	22 dBA	21 dBA	19 dBA	16 dBA	15 dBA	15 dBA	14 dBA
	1169 m	1262 m	1339 m	1490 m	1612 m	1807 m	1646 m	1721 m	1817 m	1915 m
VP01	INV06	INV03	INV01	INV15	INV16	INV14	INV13	INV17	INV31	INV11
	35 dBA	33 dBA	31 dBA	30 dBA	30 dBA	29 dBA	28 dBA	27 dBA	27 dBA	26 dBA
	454 m	555 m	668 m	715 m	739 m	773 m	895 m	908 m	962 m	1020 m

Receptor ID	Top Noise Sources									
	1	2	3	4	5	6	7	8	9	10
VP02	INV06	INV16	INV03	INV15	INV01	INV31	INV14	INV13	INV30	INV29
	32 dBA	32 dBA	30 dBA	29 dBA	28 dBA	28 dBA	28 dBA	27 dBA	27 dBA	26 dBA
	584 m	595 m	705 m	767 m	824 m	819 m	832 m	961 m	954 m	1005 m
VP03	INV28	INV15	INV16	INV14	INV39	INV32	INV30	INV13	INV34	INV38
	30 dBA	28 dBA	28 dBA	27 dBA	27 dBA	27 dBA	26 dBA	26 dBA	26 dBA	26 dBA
	700 m	845 m	882 m	906 m	459 m	500 m	343 m	1012 m	953 m	350 m





LEGEND

- Point of Reception
- Noise Barrier
- Road
- Project Location

Noise Contour (dBA)

30-35 | 35-40 | 40-45 | 45-50 | 50-55 | >55

NOTES:
1. Produced by Hatch, contains information licensed under the Open Government Licence – Ontario
2. Spatial referencing: NAD 1983 UTM Zone 15N
3. Noise contour was generated based on a 10 x 10m grid at a 4.5m elevation above ground

0 250 500 1,000 m

1:25,000

PROJECT:	Acoustic Assessment Report Fort Frances Solar Project
FIGURE TITLE:	Noise Contours at 4.5m Above Ground
CLIENT:	CarbonFree Fort Frances LTD

DWG BY:	CHK BY:	FIG NO.:	REV NO.:
V. BAXTER	M. ANDARGIE	2	1
DATE: 09/03/26	**PAGE:** 1		

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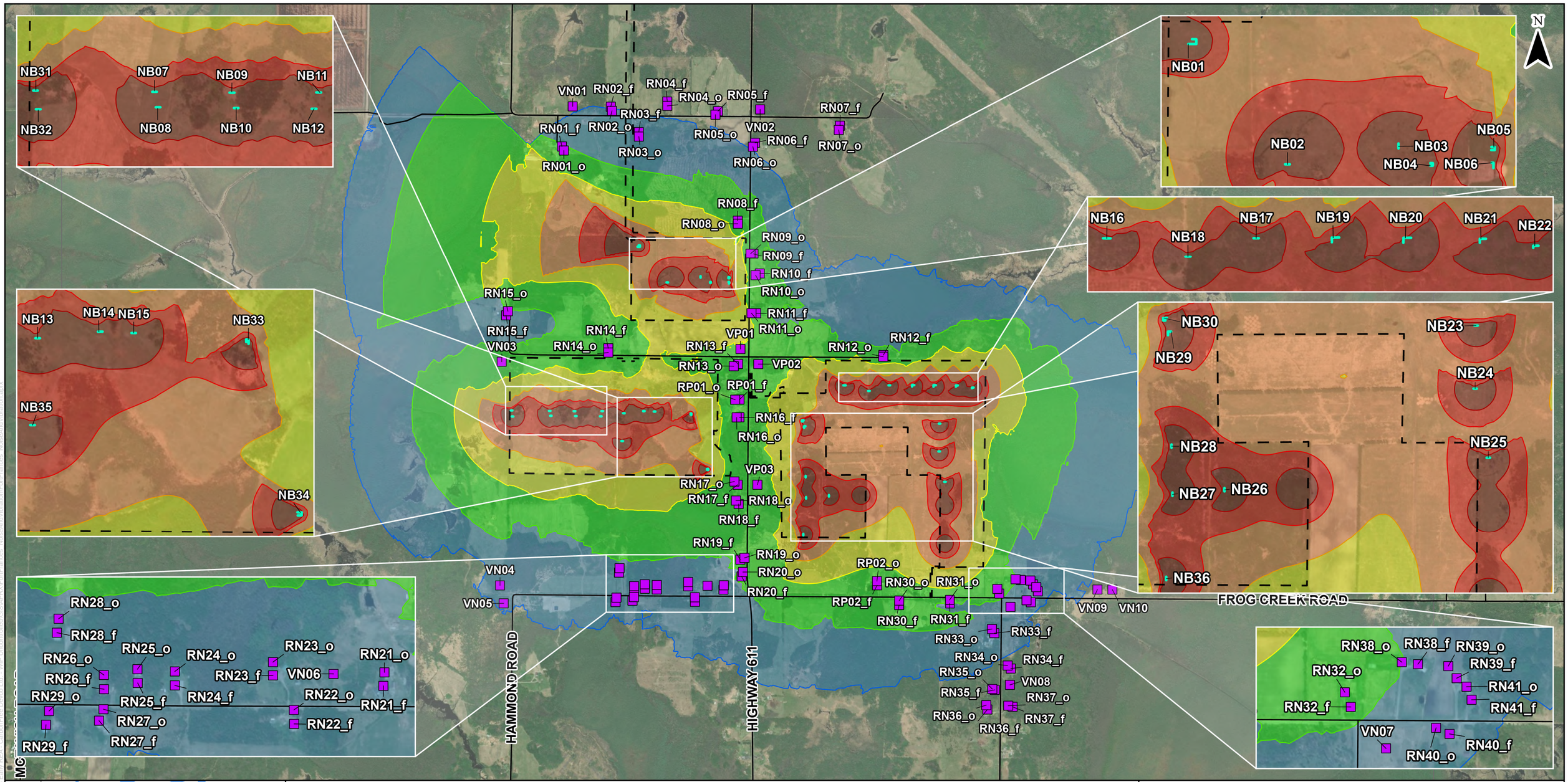

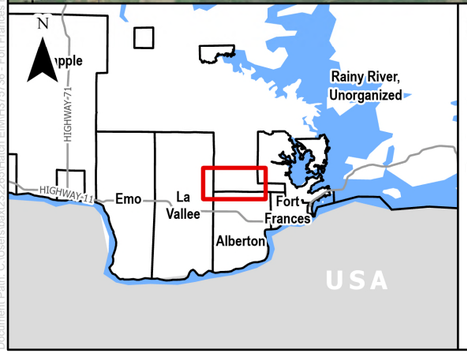

LEGEND

- Point of Reception
- Noise Barrier
- Road
- Project Location

Noise Contour (dBA)

30-35 | 35-40 | 40-45 | 45-50 | 50-55 | >55

NOTES:
1. Produced by Hatch, contains information licensed under the Open Government Licence – Ontario
2. Spatial referencing: NAD 1983 UTM Zone 15N
3. Noise contour was generated based on a 10 x 10m grid at a 1.5m elevation above ground

0 250 500 1,000 m

1:25,000

PROJECT:	Acoustic Assessment Report Fort Frances Solar Project
FIGURE TITLE:	Noise Contours at 1.5m Above Ground
CLIENT:	CarbonFree Fort Frances LTD

DWG BY:	CHK BY:	FIG NO.:	REV NO.:
V. BAXTER	M. ANDARGIE	3	1
DATE: 05/03/26	**PAGE:** 1		

HATCH

Appendix E
Acoustic Assessment Report Checklist

Ministry of the Environment | Ministère de l'Environnement

Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: CarbonFree Fort Frances Ltd.

Company Address: 1 St Clair Ave W#801
Toronto, Ontario M4T 1Y5

Location of Facility: Fort Frances, Ontario

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact: Doug Deeks
Name: Doug Deeks
Title: Vice President - Projects
Phone Number: 647-608-9680
Signature: _____
Date: _____

Technical Contact: Hatch Ltd
Name: Mervyn Choy
Representing: Hatch Ltd.
Phone Number: 289-326-2740
Signature: 
Date: 2026-03-13

ACOUSTIC ASSESSMENT REPORT CHECKLIST

	Required Information		
		Submitted	Explanation/Reference
1.0	**Introduction** (Project Background and Overview)	☒ Yes	Section 1
2.0	**Facility Description**		
	2.1 Operating hours of facility and significant Noise Sources	☒ Yes	Section 2
	2.2 Site Plan identifying all significant Noise Sources	☒ Yes	Appendix B
3.0	**Noise Source Summary**		
	3.1 ***Noise Source Summary Table***	☒ Yes	Table 3-4
	3.2 Source noise emissions specifications	☒ Yes	Appendix C
	3.3 Source power/capacity ratings	☒ Yes	Appendix C
	3.4 Noise control equipment description and acoustical specifications	☐ Yes	Section 5
4.0	**Point of Reception Noise Impact Calculations**		
	4.1 ***Point of Reception Noise Impact Table***	☒ Yes	Appendix D
	4.2 Point(s) of Reception (POR) list and description	☒ Yes	Table 4-1
	4.3 Land-use Zoning Plan	☒ Yes	Appendix A
	4.4 Scaled Area Location Plan	☒ Yes	Appendix A / B
	4.5 Procedure used to assess noise impacts at each POR	☒ Yes	Section 7.1
	4.6 List of parameters/assumptions used in calculations	☒ Yes	Section 7.1
5.0	**Acoustic Assessment Summary**		
	5.1 ***Acoustic Assessment Summary Table***	☒ Yes	Table 7-2
	5.2 Rationale for selecting applicable noise guideline limits	☒ Yes	Section 5
	5.3 Predictable Worst Case Impacts Operating Scenario	☒ Yes	Section 7.2
6.0	**Conclusions**		
	6.1 Statement of compliance with the selected noise performance limits	☒ Yes	Section 8
7.0	**Appendices** (Provide details such as)	☒ Yes	
	Listing of Insignificant Noise Sources	☒ Yes	Section 3
	Manufacture's Noise Specifications	☒ Yes	Appendix C
	Calculations	☒ Yes	Appendix C
	Instrumentation	☐ Yes	n/a
	Meteorology during Sound Level Measurements	☐ Yes	n/a
	Raw Data from Measurements	☐ Yes	n/a
	Drawings (Facility / Equipment)	☒ Yes	Appendix B