NORTHLAND POWER

Burk's Falls West Solar Project

Draft Noise Assessment Study Report

September 7, 2011

Northland Power Inc.
on behalf of
Northland Power Solar
Burk's Falls West L.P.
Toronto, Ontario

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Executive Summary

This report presents the results of the Noise Assessment Study required for Solar Facilities under Ontario Regulation 359/09 and 521/10, as part of the Renewable Energy Approval (REA) Process. Northland Power Solar Burk's Falls West L.P ("Northland") is proposing to develop a 10-Megawatt (MW) solar photovoltaic (PV) project titled Burk's Falls West Solar Project (the "Project"). The Project will be located on approximately 40 hectares (ha) of land, located south of Highway 520 at the border of Armour and Ryerson Townships, in the single tier municipality of Armour Township.

This Draft Noise Assessment Study Report has been prepared based on the document entitled "Basic Comprehensive Certificates of Approval (Air) – User Guide" by the Ontario Ministry of the Environment (MOE, 2004). The sound pressure levels at the points of reception (POR[1]) have been estimated using ISO 9613-2, implemented in the CADNA-A computer code. The performance limits used for verification of compliance correspond to the values for rural areas (45-dBA for day time and 40-dBA for night time). The results presented in this report are based on the best available information at this time. It is the intention that, in the detailed engineering phase of the project, certified noise data based on final plans and designs will confirm the conclusions of this noise impact Assessment study.

The results obtained in this study show that the sound pressure levels at POR will not exceed MOE requirements for rural areas. Any noise issues that might arise during commissioning will be manageable and will be resolved by implementing typical remediation measures such as acoustical barriers and enclosures. It is our intention to verify by field measurements taken on completion of installation and during commissioning that the noise levels at the POR resulting from the Project's operation are within the limits set by the MOE (45-dBA for day time and 40-dBA for night time).

[1] "Point of reception" in the context of this study is equivalent to "noise receptor" as defined in Ontario Regulation 521/10.

1. Introduction

1.1 Project Description

Northland Power Solar Burk's Falls West L.P ("Northland") is proposing to develop a 10-megawatt (MW) solar photovoltaic (PV) project titled Burk's Falls West Solar Project (the "Project"). The Project Location[2] is situated on approximately 40 hectares (ha) of land, located south of Highway 520 at the border of Armour and Ryerson Townships, in the single tier municipality of Armour Township.

The Project will be located on privately owned lands. Northland has entered into a lease agreement with the landowner for the duration of facility operation. The leased land is approximately 40 ha and is zoned residential settlement in the Township of Armour.

The proposed Project is a renewable energy generation facility which will use solar photovoltaic technology to generate electricity. Electricity generated by solar photovoltaic panels will be converted from Direct Current (DC) to Alternating Current (AC) by inverter clusters which will also step-up the voltage to 27.6-kV. A main transformer, located in the substation, will step up the voltage from the clusters to 44-kV prior to being sent to the existing local distribution line. In order to meet the Ontario Power Authority (OPA)'s Feed-In-Tariff (FIT) Program requirements, a specific percentage of equipment will be manufactured in Ontario.

The construction of the Project will begin once the Renewable Energy Approval (REA) has been obtained and a power purchase agreement is finalized with the OPA. The construction period is estimated to be approximately 6 months. Operationally, the anticipated lifespan of the Project will be 30 years.

1.2 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 and 521/10, made under the Environmental Protection Act identify the Renewable Energy Approval (REA) requirements for green energy projects in Ontario. As per Section 4 of the Ontario Regulation 359/09 and its amendment (O. Reg. 521/10), ground mounted solar facilities with a name plate capacity greater than 12 kilowatts (kW) are classified as a Class 3 solar facility, and therefore, require an REA.

Section 13 of the O. Reg. 359/09 requires proponents of Class 3 solar facilities to complete a Noise Study Report in accordance with Appendix A of the publication "Basic Comprehensive Certificates of Approval (Air) – User Guide, 2004" by the Ministry of the Environment (MOE, 2004).

The Noise Study Report is to include a general description of the facility, sources and points of reception (POR[1]), Assessment of compliance, as well as all the supporting information relevant to the Project. A draft of the Noise Study Report must be made available to the public, the local municipality and identified Aboriginal communities, at least 60 days prior to the final public consultation meeting in accordance with O. Reg. 359/09 and 521/10.

[2] "Project Location" means, when used in relation to a renewable energy project, a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposed to engage in the project" [Ontario Regulation 359/09, s. 1 (1)].

2. Facility Description

The Project will utilize photovoltaic (PV) panels installed on fixed racking structures mounted on the ground. The PV panels generate DC electricity which will be converted to AC electricity by inverters. The Project layout is based on 7 inverter clusters each one containing two inverters and one medium-voltage (27.6-kV) transformer, and one 10-MVA 44-kV substation transformer. The 27.6-kV power, collected from the inverter clusters, will be stepped-up to 44-kV by the substation transformer prior to being sent to the existing local distribution line.

Since the panels will be ground-mounted and the total nameplate capacity is over 12-kW, the Project is considered to be a Class 3 Solar Facility, according to the classification presented in O. Reg. 521/10.

Table 2.1 General Project Description

Project Description	Ground-mounted Solar PV, Class 3
System Nameplate Capacity	10-MW AC
Local Distribution Company	Hydro One Networks Inc.

2.1 Project Location

The Project location will be located on privately owned lands totalling approximately 40-ha. The Project Location is zoned residential settlement in the Township of Armour. Figure 2.1 shows the site layout plan while the zoning designation plan (Figure A.1) and area location plan (Figure A.2) drawings are included in Appendix A. There are 350 points of reception located within 1.2-km from the Project Site[3] boundary.

For modeling purposes, the vegetation that blocks some of the POR from the sources has not been incorporated.

2.2 Acoustical Environment

The Project location is surrounded by forested areas to the west east and south. The background noise levels are expected to be typical of rural areas, classified as a Class 3 based on Publication NPC-232 by the MOE. Some traffic noise, mainly during day hours, is expected from Highway 520 passing right up north of the Project Location. A quarry is located about 2 km northwest of the Project Location and Burks's Falls town resides about 1.5 km to the east. There are no airports within 5 km of the Project Location.

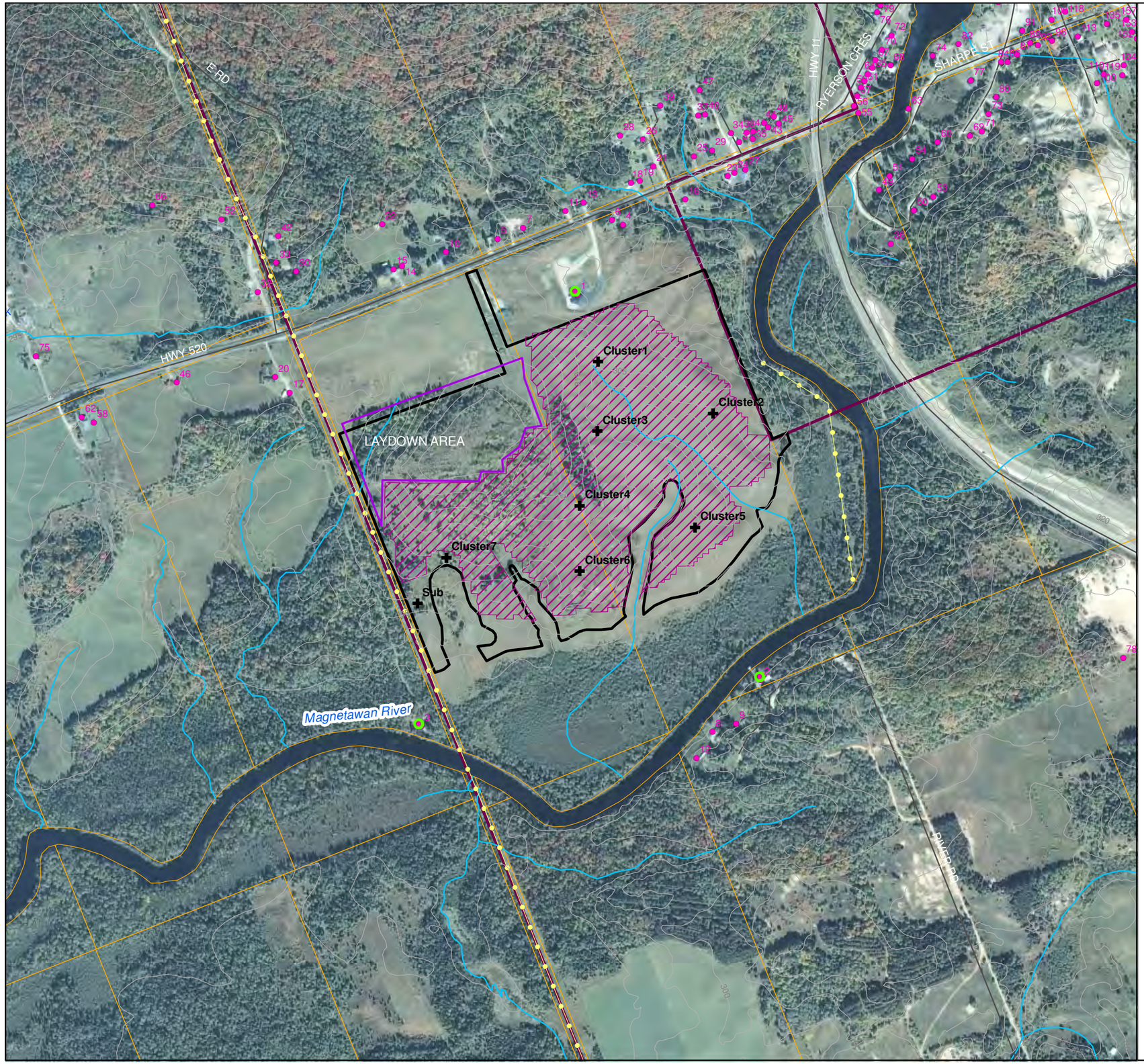
2.3 Life of Project

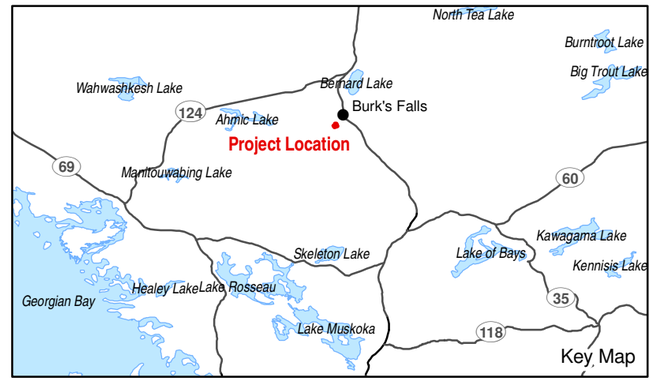
The expected life of the Project is 30 years. At that time (or earlier if the 20-yr power purchase agreement is not extended), the Project will be decommissioned or refurbished depending on market conditions and/or technological changes.

2.4 Operating Hours

Solar PV facilities produce electricity during the day hours, when the sun's rays are collected by the panels. After sunset the facility will not receive solar radiation to generate any electricity. Under these conditions the inverters will not produce any noise and the transformers will be energized, but not in operation (no fans).

[3] Project Site is the complete area owned by the Project but not necessary occupied by the Project infrastructure.





LEGEND

Existing Features

- Noise Receptor
- Representative Noise Receptor
- Road
- Transmission Line
- Topographic Contour (5m interval)
- Watercourse
- Lot
- Project Location
- Municipal Boundary

Proposed Project Components

- Sub — Substation
- Cluster# — Inverter Cluster
- Solar PV Panels
- Laydown Area

0 100 200 400 Metres

NORTH

1:8,000

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83.
3. Satellite imagery obtained from Google Earth Pro, imagery dated 2007.

Figure 2.1
Northland Power Inc.
Burk's Falls West Solar Energy Project
Site Layout Plan

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P:\\NiaDATA2\Projects\NORTHLAND\333751\DATABASES\334844\GIS\BurksFallsW\Burks FallsW_Noise_SiteLayoutPlan_.mxd Last updated Friday, September 02, 2011

2.5 Approach to the Study

The sound pressure levels at the POR were predicted using procedures from ISO 9613-2, which is a widely used and generally accepted standard for the evaluation of noise impact in environmental Assessments. The sound power level for the inverters was provided by the manufacturer while the sound power level for the transformers was estimated. The software package CADNA-A, which implements ISO-9613-2, was used to predict the noise levels at the closest POR. This numerical modeling software is able to simulate sound sources as well as sound mitigation measures taking into account atmospheric and ground attenuation. The height contours for the site were taken from the Ontario Base Maps (OBM).

3. Noise Source Summary

The main sources of noise from the Project will be seven inverter clusters, each one containing two inverters and one medium-voltage transformer, and a substation containing the main step-up transformer. Northland provided a layout of the solar PV facility (see Figure 2.1). The coordinates of each noise source are presented in Table B.1 of Appendix B.

All noise sources were modeled as non-directional point sources.

Switchgear and a small step-down transformer used for lighting, located at the substation, do not emit any significant noise and consequently have not been considered as sources of noise.

Two operational scenarios were accessed in the study; day time operation (all inverters and transformers in operation) and night time operation (energized transformers).

3.1 Substation Transformer

A 10-MVA step-up transformer that will step-up the 27.6-kV power to 44-kV, required by the local distribution company, will be located in the substation. Since the transformer make and model have not been selected at this point, the sound power levels resulting from the operation of the transformer were evaluated using data from NEMA TR 1-1993 (R2000). This standard provides maximum sound level values for transformers, and manufacturers routinely meet this specification. Hence, the results based on NEMA may slightly overestimate the impact on POR since the actual transformer is expected to be quieter.

The NEMA levels were then converted into frequency spectra using empirical correlations for transformer noise (Crocker, 2007). This calculation is available in Figure B.2 of Appendix B.

Power transformers are considered by the MOE to be tonal noise sources. A 5-dB penalty was added to the sound power spectrum, as recommended by Publication NPC-104, "Sound Level Adjustments" for tonality. Table B.2 in Appendix B shows the frequency spectrum used to model the substation transformer.

3.2 Inverter Clusters

At this stage of the Project, Northland is planning to use inverters manufactured by SMA. Seven inverter clusters will be installed as part of the Project. Each cluster comprises of two SMA Sunny Central 800CP inverters and one medium voltage transformer. A schematic layout with approximate dimensions of such cluster is available in Figure 3.1. The cluster components listed above were modeled as point sources shown in Figure 3.2.

The installed capacity of each Sunny Central 800CP inverter is 800-kW. SMA provided third-octave noise data for the Sunny Central 800CP inverter (Figure B.1 of Appendix B). The provided third octave spectrum was converted to a full octave spectrum and the contribution from two inverters was combined into a single sound power spectrum for use with CADNA-A model (calculations are available in Figure B.3 of Appendix B). A 5-dBA penalty was added to the frequency spectrum, as stipulated in Publication NPC-104, "Sound Level Adjustments," to allow for tonality. The frequency spectrum used to model combined noise emission from the two inverters located next to each other within the same cluster is shown in Table B.2 of Appendix B.

A 1.6-MVA transformer used to step-up the 360-V power from the inverters to 27.6-kV will be located in proximity to the inverters. Since the transformer make and model have not been selected at this point, the sound power levels resulting from the operation of the transformer were evaluated using data from NEMA TR 1-1993 (R2000). The NEMA levels were then converted into frequency spectrum using empirical correlations for transformer noise (Crocker, 2007). This calculation is available in Figure B.4 of Appendix B. Power transformers are considered by the MOE to be tonal noise sources. A 5-dB penalty was added to the sound power spectrum, as recommended by Publication NPC-104, "Sound Level Adjustments" for tonality. Table B.2 in Appendix B shows the frequency spectrum used to model the transformers located in the clusters.

Note also that at night time the facility will not operate. Under these conditions the inverters do not produce noise. The transformers (at the substation and clusters) are energized and make some magnetostrictive noise at a reduced level, but no cooling fans are in operation. To simulate night time operation it was assumed that only the transformers would emit noise at the same sound power level as during day time.

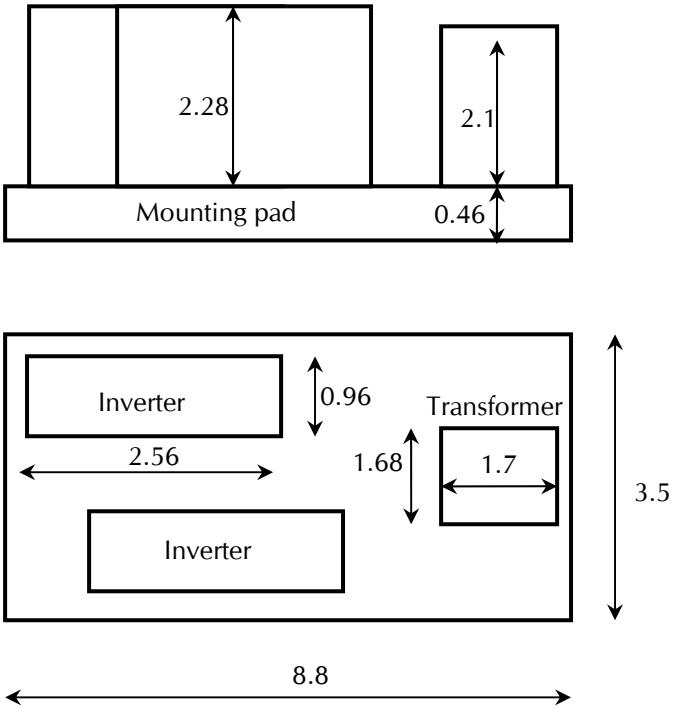


Figure 3.1 Schematic Inverter Cluster Layout
(all dimensions in metres)

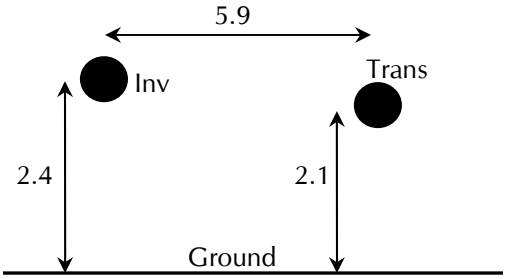


Figure 3.2 Inverter Cluster CADNA-A Acoustical Model

where: Inv = Noise Source Representing Two Sunny Central 800CP Inverters; and Trans = Noise Source Representing 27.6-kV/1.6-MVA Cluster Transformer (all dimensions in metres).

3.3 Noise Summary Table

A summary of the sound sources described above, including sound power level, characteristics and proposed noise control measures, is presented in Table 3.1.

Table 3.1 Noise Source Summary

Source ID	Description	Total Sound Power Level (dBA)	Source Location	Sound Characteristics	Noise Control Measures
Sub	44-kV/10-MVA substation transformer	90.8	O	S-T	U
Inv1	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv2	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv3	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv4	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv5	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv6	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Inv7	Two Sunny Central 800CP inverters	91.3	O	S-T	U
Trans1	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans2	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans3	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans4	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans5	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans6	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U
Trans7	27.6-kV/1.6-MVA cluster transformer	79.7	O	S-T	U

Notes:
1. A 5-dBA penalty is included in this table.
2. Location: Inside building (I), Outside building (O).
3. Sound Characteristics: Steady (S), Tonal (T), Impulsive (I), Quasi-Steady Impulsive (QSI).
4. Noise Control: Silencer (S), Acoustic lining (A), Barrier (B), Lagging (L), Enclosure (E), Other (O), Uncontrolled (U).

4. Point of Reception Summary

The POR used in this study were identified from the OBM and Google Earth Pro imagery (September 2007) within 1.2-km distance from the Project Site boundary.

The total number of POR considered in this study within a 1.2-km distance from the Project Site boundary is 350 (see Figure A.1 and Figure A.2 in Appendix A). Three of these noise receptors, identified in Table 4.1, were chosen as representative receptors for evaluating the noise contribution from each individual source. These three receptors were chosen in order to represent sound pressure levels on three sides of the Project Location. Each receptor was deemed the best representation of a given side. The complete set of results for all 350 noise receptors is provided in Appendix C, including two noise maps from CADNA-A. For this study, the POR elevation above ground is 4.5-m.

Table 4.1 Point of Reception Noise Impact (Day Time)

Source ID	POR 1		POR 2		POR 3	
	Distance (m)	L_{eq} Sound Level (dBA)	Distance (m)	L_{eq} Sound Level (dBA)	Distance (m)	L_{eq} Sound Level (dBA)
Sub	693	8.1	702	21.6	245	31.5
Inv1	140	32.1	712	21.4	809	14.4
Inv2	361	23.4	539	24.1	855	14.9
Inv3	275	25.2	592	23.2	686	13.9
Inv4	420	22.0	500	24.9	543	22.3
Inv5	521	19.9	330	28.7	677	17.3
Inv6	550	19.1	420	25.1	444	26.0
Inv7	584	8.7	671	22.0	340	28.5
Trans1	138	20.1	715	9.6	807	2.0
Trans2	357	11.7	540	12.5	851	3.1
Trans3	274	13.6	595	11.5	683	1.9
Trans4	420	10.2	504	13.1	540	11.0
Trans5	518	8.1	333	17.1	673	5.5
Trans6	550	6.8	425	12.0	440	14.5
Trans7	587	-3.5	677	10.2	339	16.9

5. Mitigation Measures

While the analysis indicates that no mitigation will be required, the noise levels will be verified at the closest POR after the Project goes into service. If measurements indicate a need to reduce sound levels to satisfy MOE criteria, mitigation measures will be installed at the sources.

6. Impact Assessment

The purpose of the acoustic Assessment report is to demonstrate that the facility is in compliance with the noise performance limits. The Project will be located in a Class 3 Area, based on the classification defined in Publication NPC-232 by the MOE. Class 3 area means a rural area with an acoustical environment that is dominated by natural sounds, having little or no traffic, such as an agricultural area.

Table 6.1 shows the performance limits set by the MOE for Class 3 Areas, according to Publication NPC-232.

Table 6.1 Performance Limits (One-Hour L_{eq}) by Time of Day for Class 3 Areas.

Time of Day	One Hour L_{eq} (dBA) Class 3 Area
07:00 to 19:00	45.0
19:00 to 23:00	40.0
23:00 to 07:00	40.0

The solar facility will be operating during the day light hours, that is, before 19:00 during most days of the year. However, in the summer months the sun may shine until past 21:00, although the inverters will be below 100% loading conditions. As such, during the summer the facility will be operating at the time the applicable performance limit changes from 45-dBA to 40-dBA. Also, the transformers remain energized at night. In order to account for this the noise model assumes that the cluster transformers and substation transformer will be operating 24 hours and compares the impact from the facility with the 40-dBA limit. In reality, the cooling fans will not be in operation at night.

For this study, the overall ground attenuation coefficient was estimated to be 0.7. Appendix D includes a list of all the parameters used in the CADNA-A model to predict the sound pressure levels at the POR.

The modelling does not consider the effect of the solar panels on the predicted sound pressure levels at the points of reception. The solar panels may act as barriers to further reduce noise at the POR.

6.1 Compliance With Performance Limits

Table 6.2 presents the predicted sound pressure levels for the representative POR. The complete set of results is included in Appendix C. Appendix D includes a detailed calculation log of the representative POR with the highest Sound Pressure Level.

Table 6.2 Acoustic Assessment Summary (Day and Night Time).

POR ID	POR Description	Total Sound Level at POR (L_{eq}) Day/Night (dBA)	Verified by Acoustic Audit (Yes/No)	Performance Limit (L_{eq}) Day/Night (dBA)	Compliance With Performance Limit (Yes/No)
1	Existing house - north	34.3/22.3	No	45.0/40.0	Yes
2	Existing house - southeast	33.9/24.5	No	45.0/40.0	Yes
3	Existing house - southwest	34.7/31.8	No	45.0/40.0	Yes

The results of this study show that all POR are compliant with MOE guidelines based on the performance limits.

7. Conclusions and Recommendations

For the Burk's Falls West Solar Project, the sound pressure levels at the POR have been estimated using the CADNA-A model, based on ISO 9613-2. The performance limits used for comparison correspond to Class 3 areas, with 45-dBA during day time (7:00 a.m. to 7:00 p.m.) and 40-dBA during night time. It has been determined that no mitigation measures are needed for the Project operation.

Based on the results obtained in this study, it is concluded that the sound pressure levels at the POR will be below MOE requirements for Class 3 areas at night time (40-dBA) and day time (45-dBA).

8. References

Ontario Regulation 359/09. Environmental Protection Act. Renewable Energy Approvals Under Part V.0.1 of the Act.

Ontario Regulation 521/10 made under Environmental Protection Act amending O.Reg. 359/09.

Ministry of the Environment (MOE). 2004. Basic Comprehensive Certificates of Approval (Air) – User Guide (Appendix A). Environmental Assessment and Approvals Branch.

Handbook of Noise and Vibration Control; Malcolm J. Crocker, 2007;

IEEE. 2006. C57.12.90-2006: Standard Test Code for Liquid-Immersed, Power and Regulating Transformers. pp 64 to 76.

Ministry of the Environment (MOE). 1997. Noise Assessment Criteria in Land Use Planning. Publication LU-131. Ontario Ministry of the Environment. 12 pp + Annex.

MOE. 1995. Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban). Publication NPC-205. Ontario Ministry of the Environment. 6 pp + Annex.

MOE. 1995. Sound Level Limits for Stationary Sources in Class 3 Areas (Rural). Publication NPC-232. Ontario Ministry of the Environment. 8 pp + Annex.

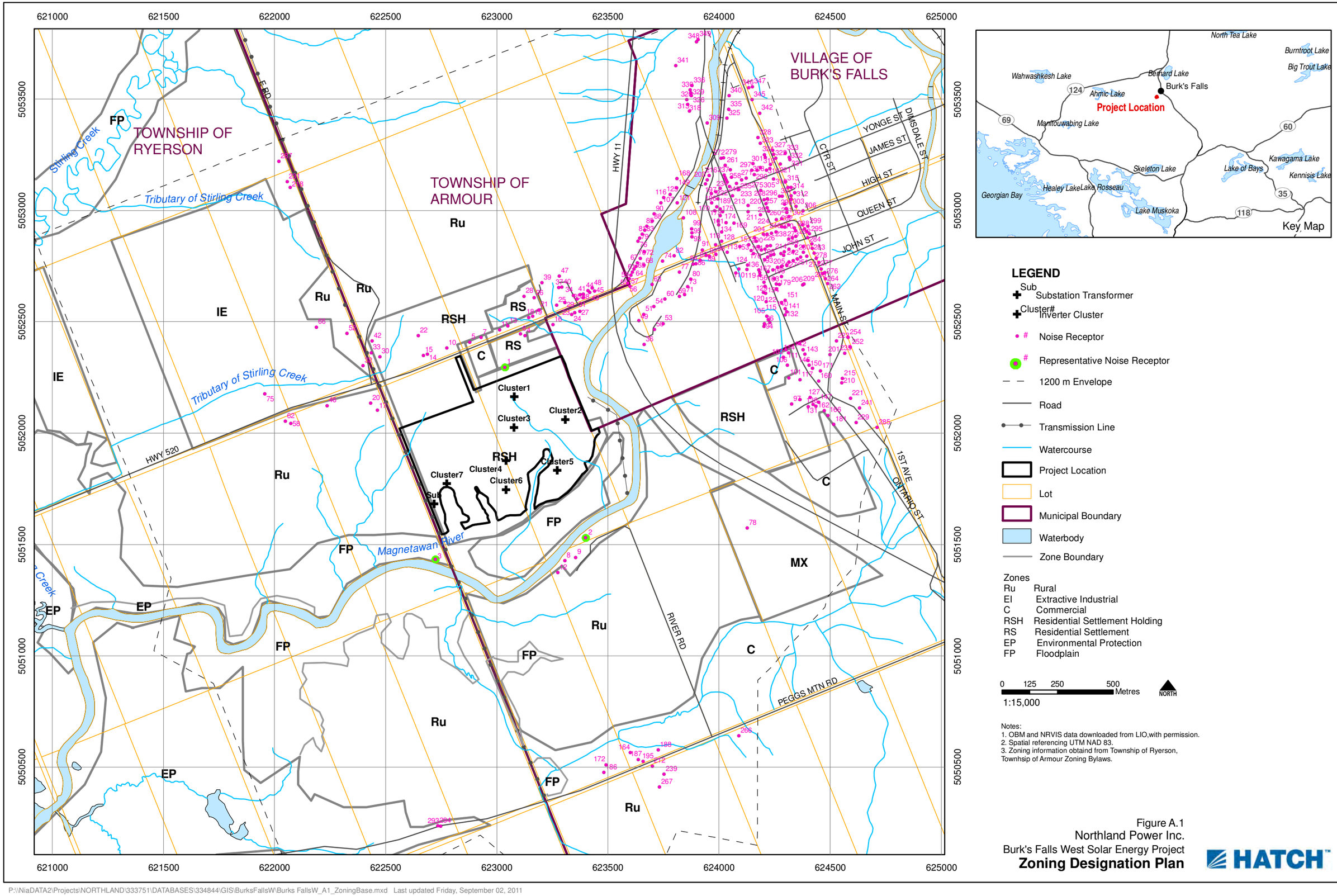
NEMA. 2000. Standards Publication No. TR 1-1993 (R2000): Transformers, Regulators and Reactors. National Electrical Manufacturers Association. 31 pp. (This reference probably not needed now).

International Organization for Standardization (ISO). Standard 1996-1: Description, Measurement and Assessment of Environmental Noise – Part 1: Basic Quantities and Assessment Procedures.

International Organization for Standardization (ISO). Standard 1913-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General Method of Calculation.

Appendix A

Land Use Zoning Designation Plan, and Area Location Plan



LEGEND

- Sub — Substation Transformer
- Cluster# — Inverter Cluster
- # — Noise Receptor
- # — Representative Noise Receptor
- 1200 m Envelope
- Road
- Transmission Line
- Watercourse
- Project Location
- Lot
- Municipal Boundary
- Waterbody
- Zone Boundary

Zones

Ru	Rural
EI	Extractive Industrial
C	Commercial
RSH	Residential Settlement Holding
RS	Residential Settlement
EP	Environmental Protection
FP	Floodplain

0 125 250 500 Metres

1:15,000

NORTH

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83.
3. Zoning information obtaind from Township of Ryerson, Townhsip of Armour Zoning Bylaws.

Figure A.1
Northland Power Inc.
Burk's Falls West Solar Energy Project
Zoning Designation Plan

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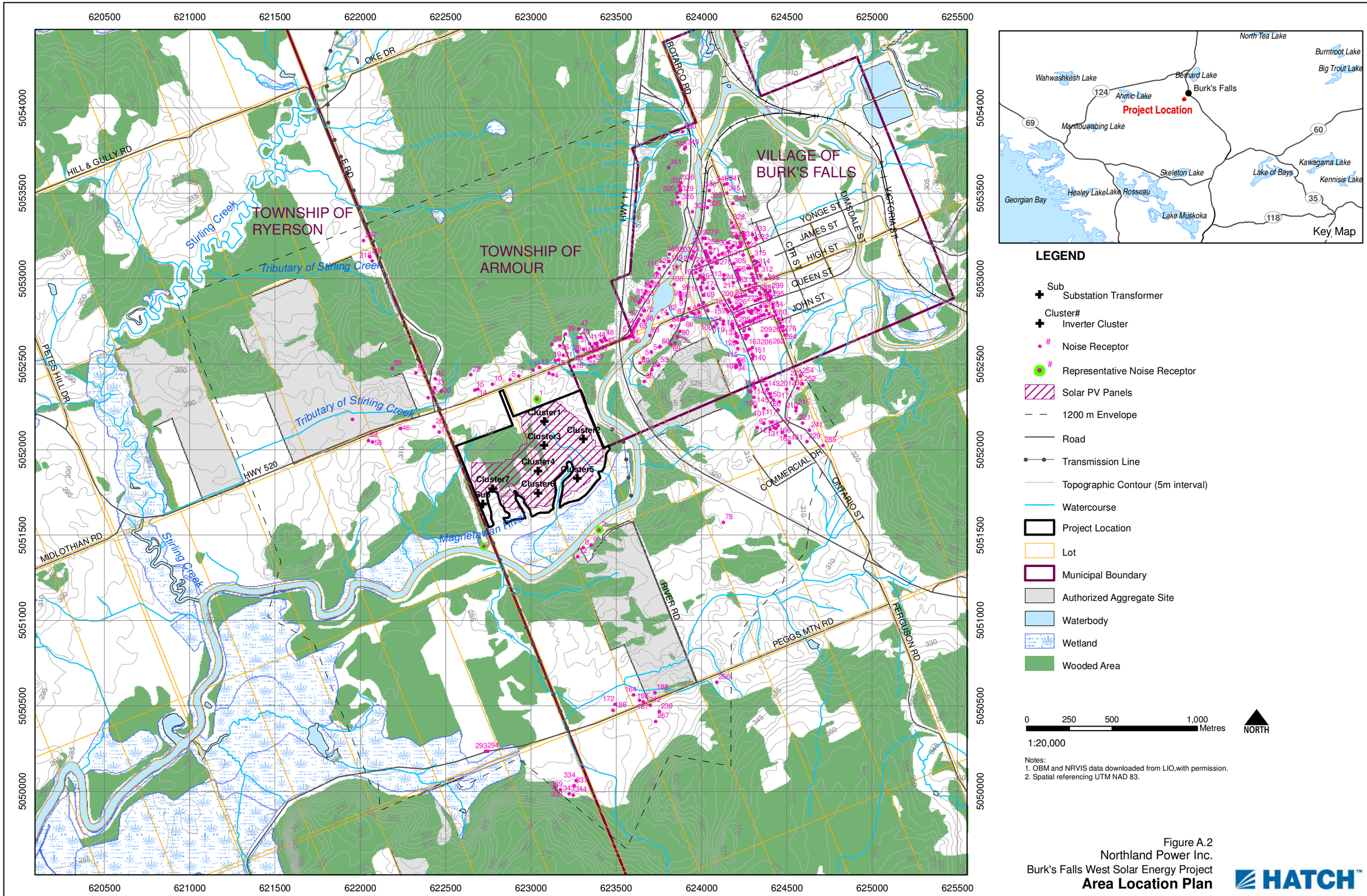

LEGEND

- Sub — Substation Transformer
- Cluster# — Inverter Cluster
- Noise Receptor
- Representative Noise Receptor
- Solar PV Panels
- 1200 m Envelope
- Road
- Transmission Line
- Topographic Contour (5m interval)
- Watercourse
- Project Location
- Lot
- Municipal Boundary
- Authorized Aggregate Site
- Waterbody
- Wetland
- Wooded Area

0 250 500 1,000 Metres

1:20,000

NORTH

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83.

Figure A.2
Northland Power Inc.
Burk's Falls West Solar Energy Project
Area Location Plan

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Appendix B

Noise Sources

Table B.1 Point Sources Used in CADNA-A, Includes Tonality Penalty of 5.0-dBA. NAD83 Zone17.

Source ID	Description	Spectra ID	Total Sound Power Level (dBA)		Correction (dBA)		Height (m)	Coordinates (m)		
			Day	Night	Day	Night		X	Y	Z
Sub	44-kV/10-MVA substation transformer	T44kV_10MVA	90.8	90.8	5.0	5.0	3.0	622719	5051683	300.7
Inv1	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623082	5052165	310.8
Inv2	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623312	5052062	301.0
Inv3	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623081	5052026	306.4
Inv4	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623045	5051878	312.6
Inv5	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623276	5051835	296.8
Inv6	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	623045	5051748	305.3
Inv7	Two Sunny Central 800CP inverters	SMA_SC800CPX2	91.3	0.0	5.0	0.0	2.4	622779	5051774	308.3
Trans1	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623076	5052165	310.3
Trans2	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623306	5052062	300.6
Trans3	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623075	5052026	307.0
Trans4	27.6-kV /1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623040	5051878	312.9
Trans5	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623270	5051835	296.8
Trans6	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	623039	5051748	304.8
Trans7	27.6-kV/1.6-MVA cluster transformer	T27.6kV_1.6MVA	79.7	79.7	5.0	5.0	2.1	622773	5051774	308.3

Table B.2 Frequency Spectra Used for Modelling the Noise Sources, Not Including Tonality Penalty.

Spectra ID	Octave Spectrum (dBA)										
	31.5	63	125	250	500	1000	2000	4000	8000	A	lin
SMA_SC800CPX2		63.1	73.9	80.5	82.3	78.7	74.1	65.0	72.7	86.3	95.0
T27.6kV_1.6MVA	31.9	51.1	63.2	65.7	71.1	68.3	64.5	59.3	50.2	74.7	83.3
T44kV_10MVA	43.0	62.2	74.3	76.8	82.2	79.4	75.6	70.4	61.3	85.8	94.4

SC 720CP-10 / SC 760CP-10 / SC 800CP-10

Economic

- Direct deployment in the field due to outdoor enclosure
- Simplified shipping without concrete substation

Efficient

- Full nominal power at ambient temperatures up to 50 °C
- 10 % additional power for constant operation at ambient temperatures up to 25 °C

Flexible

- Powerful grid management functions (including LVRT)
- DC voltage range configurable

Reliable

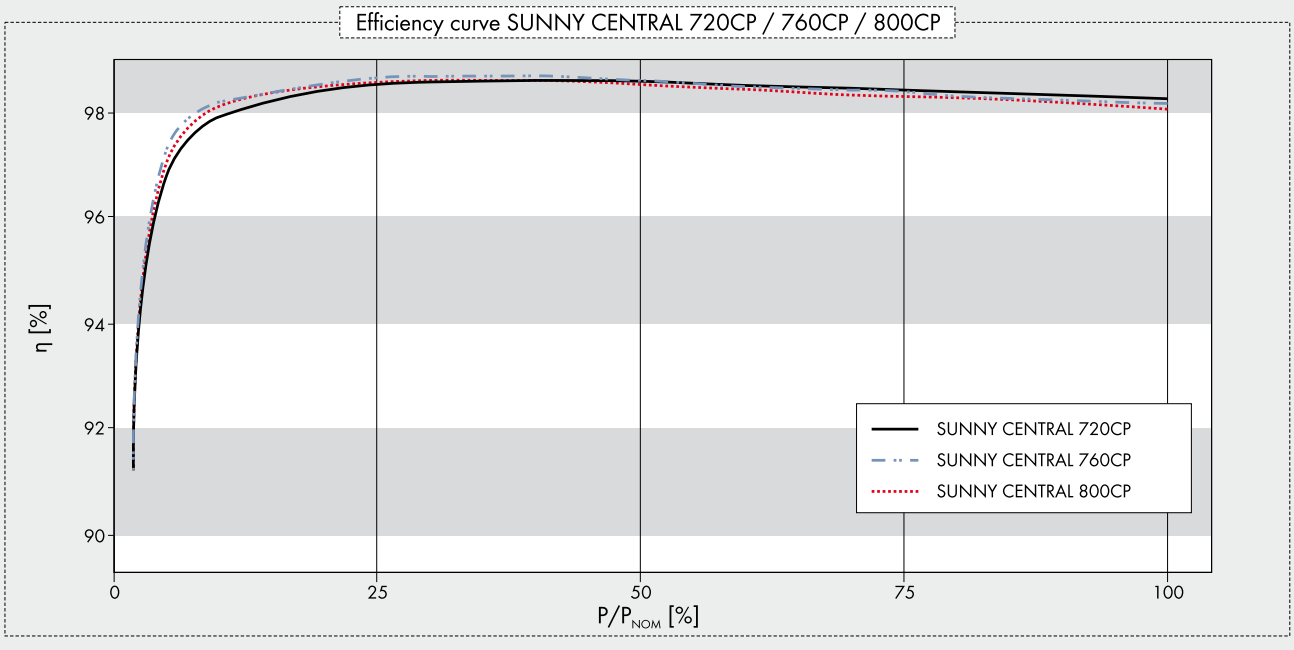
- Easy and safe installation due to a separate connection area
- Optional: extended input voltage range up to 1,100 V

SUNNY CENTRAL 720CP / 760CP / 800CP

High performance as standard

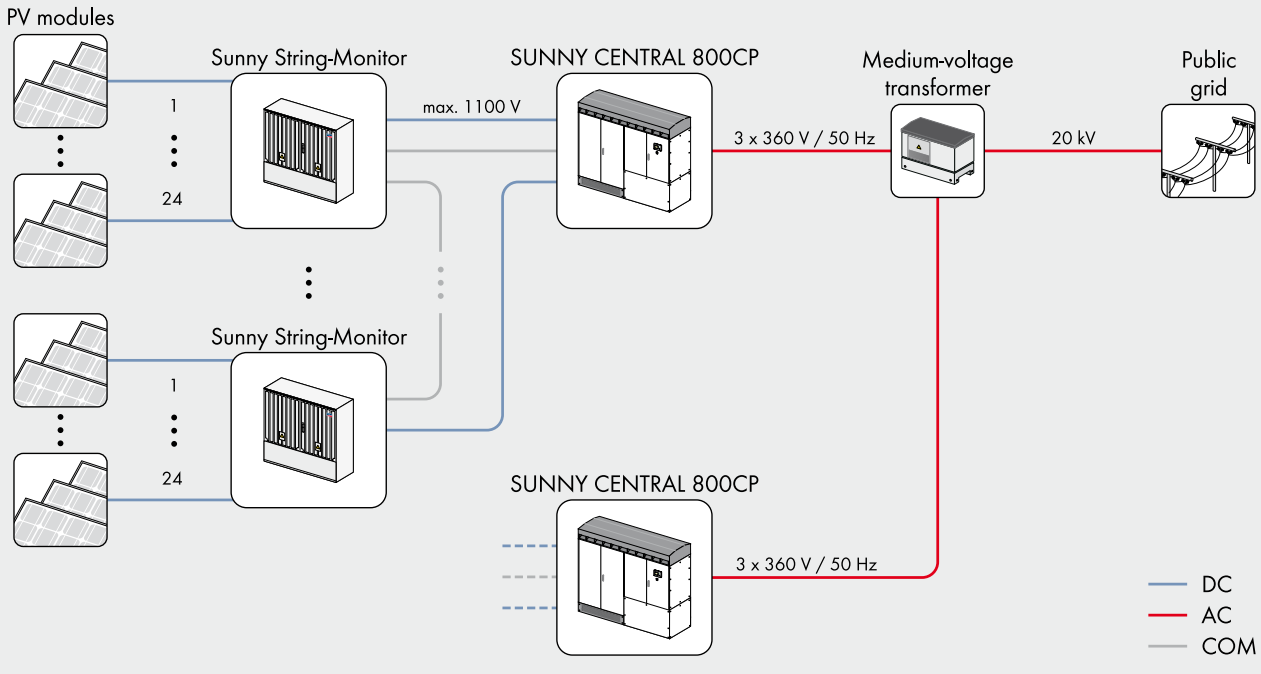
The completely new design of the Sunny Central CP series saves you real money. The compact and weatherproof enclosure is easy to load and transport and can be installed almost anywhere – there is no need for heavy protective concrete substations any longer. The innovative cooling concept OptiCool allows it to operate at full nominal power with ambient temperatures up to 50 °C. With the powerful grid management functions you are perfectly prepared for today's utility requirements as well as those still to come. The intelligent power management is the most important feature: in continuous operation, the Sunny Central 800CP can feed 880 kVA to the grid at ambient temperatures of up to 25 °C – that's 10 % more than the rated nominal power.

Technical data	Sunny Central 720CP	Sunny Central 760CP	Sunny Central 800CP
Input Data			
MPP voltage range	515 V – 820 V [3] [5]	545 V – 820 V [3] [5]	570 V – 820 V [3] [5]
Max. DC voltage		1000 V / 1100 V [1] Optional	
Max. DC current	1400 A	1400 A	1400 A
Number of DC inputs		9 fused inputs	
Output Values			
Nominal AC output @ 50 °C	720 kVA	760 kVA	800 kVA
Continuous AC power @ 25 °C	792 kVA	836 kVA	880 kVA
Max. AC current	1411 A	1411 A	1411 A
Nominal AC-current	1283 A	1283 A	1283 A
Nominal AC-voltage ±10 %	324 V	342 V	360 V
AC grid frequency 50 Hz	●	●	●
AC grid frequency 60 Hz	●	●	●
Power factor (cos φ)		0.9 leading ... 0.9 lagging	
Max. THD	< 3 %	< 3 %	< 3 %
Power consumption			
Internal consumption in operation	< 1500 W [4]	< 1500 W [4]	< 1500 W [4]
Standby consumption	< 100 W	< 100 W	< 100 W
External auxiliary voltage	3 x 230 V, 50 / 60 Hz	3 x 230 V, 50 / 60 Hz	3 x 230 V, 50 / 60 Hz
Dimensions and Weight			
Dimensions (W / H / D) in mm	2562 / 2279 / 956	2562 / 2279 / 956	2562 / 2279 / 956
Weight	1800 kg	1800 kg	1800 kg
Efficiency [2]			
Max. efficiency	98.6 %	98.6 %	98.6 %
Euro ETA	98.4 %	98.4 %	98.4 %
CEC-eta	98.4 %	98.4 %	98.4 %
Protection Rating and Ambient Conditions			
Protection rating (as per IEC 60529)	IP54	IP54	IP54
Protection rating (as per IEC 60721-3-3) Ambient conditions: fixed location, with protection against wind and weather	• Classification of chemically active substances: 3C2 • Classification of mechanically active substances: 3S2		
Operation temperature range	–20 °C ... +50 °C	–20 °C ... +50 °C	–20 °C ... +50 °C
Rel. humidity	15 % ... 95 %	15 % ... 95 %	15 % ... 95 %
Fresh air consumption	3000 m³/h	3000 m³/h	3000 m³/h
Max. altitude above sea level	2000 m	2000 m	2000 m

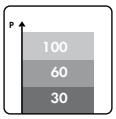


	Sunny Central 720CP	Sunny Central 760CP	Sunny Central 800CP
Features			
Sunny WebBox	●	●	●
Communication	Ethernet (optical fiber optional)	Ethernet (optical fiber optional)	Ethernet (optical fiber optional)
Communication with Sunny String-Monitor	RS485	RS485	RS485
LCD graphic display	●	●	●
Enclosure color	RAL 9016	RAL 9016	RAL 9016
Color of base	RAL 7005	RAL 7005	RAL 7005
Color of roof	RAL 7004	RAL 7004	RAL 7004
Ground fault monitoring / insulation monitoring	●	●	●
Circuit breaker AC side	●	●	●
Motor driven load disconnection switch on DC side	●	●	●
AC overvoltage protector	●	●	●
DC overvoltage protector	●	●	●
Overvoltage protectors for auxiliary supply	●	●	●
Certificates / Listings			
EMC	EN 61000-6-2 EN 61000-6-4		
CE conformity	●	●	●
BDEW-MSRL / FGW / TR8 [6]	●	●	●
RD 1633 / 2000	●	●	●
Arrêté du 23 / 04 / 08	●	●	●
● Standard features ❍ Optional features – Not available			
Type name	SC 720CP-10	SC 760CP-10	SC 800CP-10

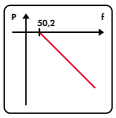
1) Startup at DC voltage < 1000 V
2) Efficiency measured without internal power supply
3) Further AC voltages, DC voltages and power classes can be configured (For detailed information see Technical Information „Innovations_CP“ at www.SMA.de)
4) Internal consumption at nominal power
5) At 1.05 $U_{AC,nom}$ and cos φ= 1
6) With complete dynamic grid support



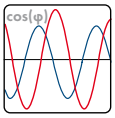
POWERFUL GRID MANAGEMENT FUNCTIONS



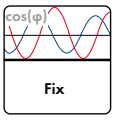
Remote controlled power reduction in case of grid overload
In order to avoid short-term grid overload, the grid operator presets a nominal active power value which the inverter will implement within 60 seconds. The nominal value is transmitted to the inverters via a ripple control receiver in combination with the SMA Power Reducer Box. Typical limit values are 100, 60, 30 or 0 per cent of the nominal power.



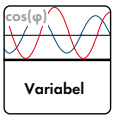
Frequency-dependent control of active power
As of a grid frequency of 50.2 Hz, the inverter automatically reduces the fed-in of active power according to a definable characteristic curve which thereby contributes to the stabilization of the grid frequency.



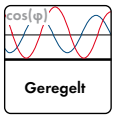
Static voltage support based on reactive power
To stabilize the grid voltage, SMA inverters feed reactive power (leading or lagging) into the grid. Three different modes are available:



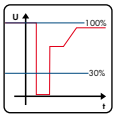
a) Fixed definition of the reactive power by the grid operator
The grid operator defines a fixed reactive power value or a fixed displacement factor between $\cos(\varphi)_{leading}$= 0.90 and $\cos(\varphi)_{lagging}$= 0.90.



b) Definition of a dynamic setpoint of the reactive power by the utility operator
The grid operator defines a dynamic displacement factor - any value between $\cos(\varphi)_{leading}$= 0.90 und $\cos(\varphi)_{lagging}$= 0.90. It is transmitted either through a communication unit the evaluation can e.g. be evaluated and processed by the SMA Power Reducer Box.



c) Control of the reactive power over a characteristic curve
The reactive power or the phase shift is controlled by a pre-defined characteristic curve – depending on the active power fed into the grid or the grid voltage.



Limited Dynamic Grid Support
The inverter continues to feed to the grid after short term voltage drops – as long as the grid voltage is within a defined voltage window.

Dynamic Grid Support
LVRT (Low-Voltage Ride Through): The inverter stays connected to the grid during voltage drops and supports the grid by feeding reactive power.

Terz-midle-frequency [kHz]	Soundpower-level L_{xpA} [dB_A]500kW	Soundpower-level L_{xpA} [dB_A]640kW	Soundpower-level L_{xpA} [dB_A]720kW	Soundpower-level L_{xpA} [dB_A]760kW	Soundpower level L_{xpA} [dB_A]800kW
0,05	63,30	55,30	57,70	67,00	56,50
0,063	60,80	53,10	56,80	63,20	54,00
0,08	63,90	56,30	56,50	59,50	55,20
0,1	64,10	66,20	65,00	66,50	68,10
0,125	65,70	64,50	60,60	65,20	62,00
0,16	72,30	65,80	65,50	63,20	66,40
0,2	67,30	64,60	66,80	64,90	67,80
0,25	66,10	76,20	77,50	70,80	72,40
0,315	78,40	79,80	77,70	82,20	75,10
0,4	73,70	73,90	73,90	72,80	66,70
0,5	77,80	78,70	77,70	77,40	74,70
0,63	78,90	78,90	74,60	77,40	77,00
0,8	70,60	72,50	74,10	70,60	72,00
1	72,20	71,00	70,00	68,90	67,90
1,25	72,40	72,00	71,50	70,80	71,80
1,6	67,30	68,30	76,70	68,60	68,50
2	69,30	66,30	66,50	67,20	65,30
2,5	65,10	66,80	64,60	64,80	63,90
3,15	62,60	64,30	65,00	63,20	61,00
4,0	53,50	54,20	54,70	52,30	53,80
5,0	51,30	49,50	50,50	51,20	49,80
6,3	68,90	72,60	73,50	73,50	69,70

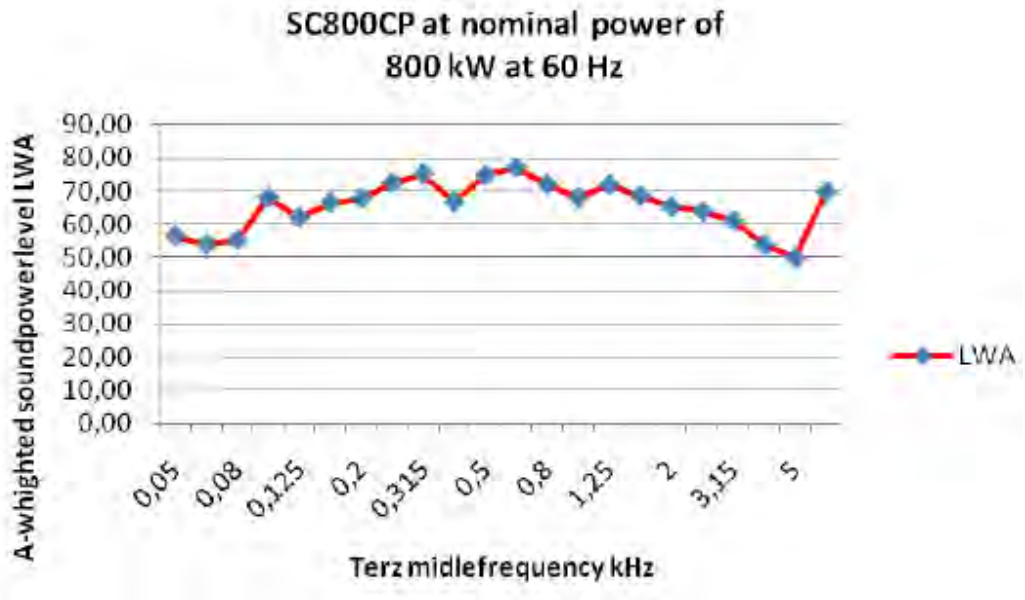


Figure B.1 SC800CP Inverter Sound Power Level as Provided by SMA. Note that the Header in the Table above Represents Various Inverter Models of CS###CP Series.

Estimated Frequency Spectra for Transformers

Transformer - 44kV/10MVA

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

Average LpA	68 dBA	Based on NEMA TR1-1993 (R2000), Table 0-2
Estimated surface area	35 m^2	Can be assumed, 25% of change will produce a difference of 1 dB on Lw, try to estimate on the high side

Correction factors are in dB

Freq. (Hz)	31	63	125	250	500	1000	2000	4000	8000	Notes
C1	-11.0	-5.0	-3.0	-8.0	-8.0	-14.0	-19.0	-24.0	-31.0	Outdoors, indoors in mechanical room over 140 m^3
C2	-11	-2	3	-2	-2	-11	-19	-24	-31	Indoors
C3	-11	-2	3	2	2	-4	-9	-14	-21	Serious Noise Problems

Sound Power Level calculated as Lw=Average LpA + 10*log(Estimated surface area) + C + 10

Freq. (Hz)	31	63	125	250	500	1000	2000	4000	8000	Combined [dB]
C1 based [dB]	82.4	88.4	90.4	85.4	85.4	79.4	74.4	69.4	62.4	**94.5**
C2 based [dB]	82.4	91.4	96.4	91.4	91.4	82.4	74.4	69.4	62.4	**99.5**
C3 based [dB]	82.4	91.4	96.4	95.4	95.4	89.4	84.4	79.4	72.4	**101.5**

Resulting A-weighted sound power level

Freq. (Hz)	A-Weight	C1 based [dBA]	C2 based [dBA]	C2 based [dBA]
31	-39.4	43.0	52.0	57.0
63	-26.2	62.2	65.2	65.2
125	-16.1	74.3	80.3	80.3
250	-8.6	76.8	82.8	86.8
500	-3.2	82.2	88.2	92.2
1000	0	79.4	82.4	89.4
2000	1.2	75.6	75.6	85.6
4000	1	70.4	70.4	80.4
8000	-1.1	61.3	61.3	71.3
LwA [dBA]		**85.8**	**90.8**	**95.6**

Used in the study

Figure B.2 Sound Power Level Calculation for 44-kV/10-MVA Substation Transformer.

Sound Power Level Calculation for SMA Sunny Central 800CP, 100% LOAD

Third octave, as provided		
Freq #	Freq (Hz)	LwA (dBA)
1	25	
2	31.5	
3	40	
4	50	56.5
5	63	54.0
6	80	55.2
7	100	68.1
8	125	62.0
9	160	66.4
10	200	67.8
11	250	72.4
12	315	75.1
13	400	66.7
14	500	74.7
15	630	77.0
16	800	72.0
17	1000	67.9
18	1250	71.8
19	1600	68.5
20	2000	65.3
21	2500	63.9
22	3150	61.0
23	4000	53.8
24	5000	49.8
25	6300	69.7
26	8000	
27	10000	
	Total LwA	**83.3**

Full octave, as used in CADNA-A model			
Freq #	Freq (Hz)	LwA 1 inverter (dBA)	LwA 2 inverters (dBA)
	31.5		
5	63	60.1	63.1
8	125	70.9	73.9
11	250	77.5	80.5
14	500	79.3	82.3
17	1000	75.7	78.7
20	2000	71.1	74.1
23	4000	62.0	65.0
26	8000	69.7	72.7
	Total LwA	**83.3**	**86.3**

$$10\log\left(10^{\frac{56.5}{10}}+10^{\frac{54.0}{10}}+10^{\frac{55.2}{10}}\right)=60.1dBA$$

$$10\log\left(10^{\frac{60.1}{10}}+10^{\frac{60.1}{10}}\right)=63.1dBA$$

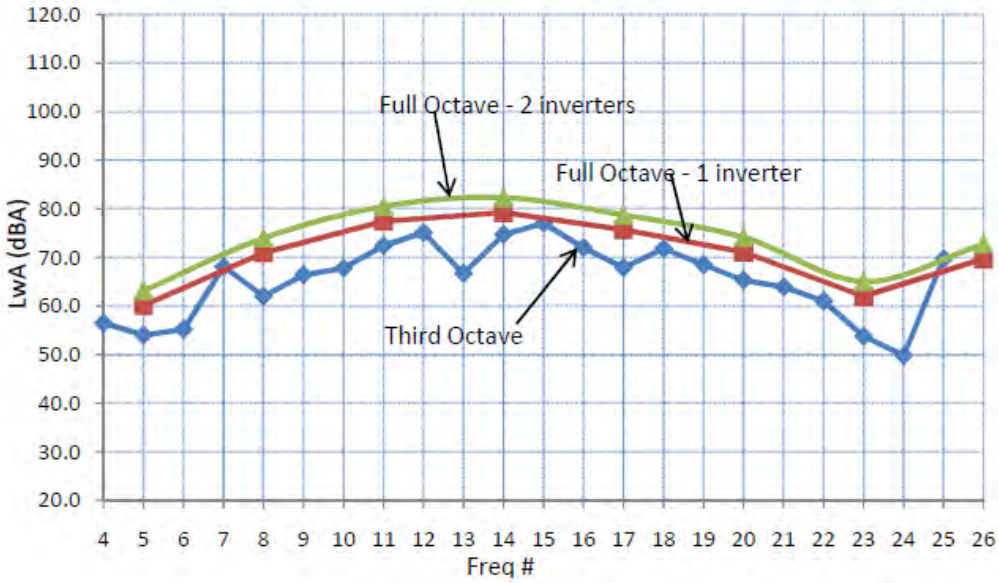


Figure B.3 Sound Power Level Calculation for SMA Sunny Central 800CP, 100% LOAD.

Estimated Frequency Spectra for Transformers

Transformer - 27.6kV/1.6MVA

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

Average LpA	61 dBA	Based on NEMA TR1-1993 (R2000), Table 0-2
Estimated surface area	13.52 m^2	Can be assumed, 25% of change will produce a difference of 1 dB on Lw, try to estimate on the high side

Correction factors are in dB

Freq. (Hz)	31	63	125	250	500	1000	2000	4000	8000	Notes
C1	-11.0	-5.0	-3.0	-8.0	-8.0	-14.0	-19.0	-24.0	-31.0	Outdoors, indoors in mechanical room over 140 m^3
C2	-11	-2	3	-2	-2	-11	-19	-24	-31	Indoors
C3	-11	-2	3	2	2	-4	-9	-14	-21	Serious Noise Problems

Sound Power Level calculated as Lw=Average LpA + 10*log(Estimated surface area) + C + 10

Freq. (Hz)	31	63	125	250	500	1000	2000	4000	8000	Combined [dB]
C1 based [dB]	71.3	77.3	79.3	74.3	74.3	68.3	63.3	58.3	51.3	**83.4**
C2 based [dB]	71.3	80.3	85.3	80.3	80.3	71.3	63.3	58.3	51.3	**88.4**
C3 based [dB]	71.3	80.3	85.3	84.3	84.3	78.3	73.3	68.3	61.3	**90.4**

Resulting A-weighted sound power level

Freq. (Hz)	A-Weight	C1 based [dBA]	C2 based [dBA]	C2 based [dBA]
31	-39.4	31.9	40.9	45.9
63	-26.2	51.1	54.1	54.1
125	-16.1	63.2	69.2	69.2
250	-8.6	65.7	71.7	75.7
500	-3.2	71.1	77.1	81.1
1000	0	68.3	71.3	78.3
2000	1.2	64.5	64.5	74.5
4000	1	59.3	59.3	69.3
8000	-1.1	50.2	50.2	60.2
LwA [dBA]		**74.7**	**79.6**	**84.5**

Used in the study

Figure B.4 Sound Power Level Calculation for 27.6-kV/1.6-MVA Cluster Transformer.

Appendix C

Sound Pressure Levels for Points of Reception, and Noise Maps from CADNA-A

Table C.1 Calculated Sound Pressure Levels at POR (shaded rows correspond to representative POR). Existing = Existing dwelling. NAD83 Zone17.

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
1	Existing	34.3	22.3	45.0	40.0	4.5	623039	5052298	314.5	138
2	Existing	33.9	24.5	45.0	40.0	4.5	623404	5051530	290.1	330
3	Existing	34.7	31.8	45.0	40.0	4.5	622726	5051438	289.5	245
4	Existing	28.5	16.6	45.0	40.0	4.5	623128	5052438	300.7	277
5	Existing	28.7	17.2	45.0	40.0	4.5	622879	5052410	319.5	314
6	Existing	29.1	17.4	45.0	40.0	4.5	623107	5052447	303.3	283
7	Existing	28.1	16.2	45.0	40.0	4.5	622930	5052431	314.5	304
8	Existing	33.1	24.8	45.0	40.0	4.5	623307	5051427	291.5	409
9	Existing	33.1	24.4	45.0	40.0	4.5	623355	5051443	294.6	399
10	Existing	27.3	16.1	45.0	40.0	4.5	622776	5052384	319.5	371
11	Existing	27.2	14.3	45.0	40.0	4.5	623014	5052466	306.2	307
12	Existing	32.7	24.7	45.0	40.0	4.5	623275	5051375	296.9	438
13	Existing	28.3	16.5	45.0	40.0	4.5	623050	5052482	304.5	318
14	Existing	25.7	15.7	45.0	40.0	4.5	622688	5052356	319.5	433
15	Existing	25.5	15.8	45.0	40.0	4.5	622671	5052350	319.5	445
16	Existing	27.4	15.7	45.0	40.0	4.5	623253	5052488	294.5	365
17	Existing	23.4	19.8	45.0	40.0	4.5	622463	5052103	312.8	452
18	Existing	27.7	16.0	45.0	40.0	4.5	623145	5052522	301.7	362
19	Existing	27.4	15.8	45.0	40.0	4.5	623162	5052526	300.2	370
20	Existing	23.2	19.1	45.0	40.0	4.5	622433	5052134	312.4	495
21	Existing	26.9	15.3	45.0	40.0	4.5	623190	5052554	299.5	403
22	Existing	25.1	14.6	45.0	40.0	4.5	622648	5052439	323.0	508
23	Existing	26.6	15.2	45.0	40.0	4.5	623338	5052535	299.5	449
24	Existing	26.4	15.1	45.0	40.0	4.5	623352	5052542	299.5	463
25	Existing	26.4	14.9	45.0	40.0	4.5	623270	5052575	300.7	451
26	Existing	26.1	14.7	45.0	40.0	4.5	623169	5052609	300.5	452
27	Existing	26.2	15.0	45.0	40.0	4.5	623374	5052548	298.7	481
28	Existing	26.1	14.8	45.0	40.0	4.5	623123	5052617	304.2	453
29	Existing	26.1	14.9	45.0	40.0	4.5	623307	5052587	304.5	478
30	Existing	23.3	16.0	45.0	40.0	4.5	622475	5052345	316.6	627
31	Existing	25.5	14.4	45.0	40.0	4.5	623361	5052604	299.5	519
32	Existing	22.8	16.2	45.0	40.0	4.5	622399	5052304	314.1	648
33	Existing	23.3	16.2	45.0	40.0	4.5	622436	5052363	319.0	670
34	Existing	25.4	14.3	45.0	40.0	4.5	623345	5052621	300.0	526
35	Existing	25.3	14.2	45.0	40.0	4.5	623388	5052610	299.0	539
36	Existing	27.5	16.0	45.0	40.0	4.5	623664	5052400	303.3	488
37	Existing	25.4	14.3	45.0	40.0	4.5	623279	5052656	306.6	528
38	Existing	25.2	14.2	45.0	40.0	4.5	623376	5052623	299.5	544
39	Existing	25.4	14.5	45.0	40.0	4.5	623203	5052677	310.5	526
40	Existing	25.4	14.4	45.0	40.0	4.5	623293	5052658	308.2	536

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
41	Existing	25.2	14.1	45.0	40.0	4.5	623389	5052625	299.5	552
42	Existing	23.6	16.3	45.0	40.0	4.5	622440	5052416	324.2	684
43	Existing	24.9	14.0	45.0	40.0	4.5	623419	5052633	298.6	576
44	Existing	24.9	13.9	45.0	40.0	4.5	623411	5052641	299.8	578
45	Existing	24.7	13.8	45.0	40.0	4.5	623440	5052640	296.0	592
46	Existing	23.1	17.4	45.0	40.0	4.5	622237	5052124	309.5	640
47	Existing	25.5	14.7	45.0	40.0	4.5	623282	5052707	313.1	577
48	Existing	24.7	13.7	45.0	40.0	4.5	623430	5052654	298.7	599
49	Existing	25.0	14.4	45.0	40.0	4.5	623640	5052508	293.2	553
50	Existing	26.5	15.5	45.0	40.0	4.5	623710	5052467	306.7	568
51	Existing	24.5	14.0	45.0	40.0	4.5	623661	5052536	293.0	588
52	Existing	23.1	15.6	45.0	40.0	4.5	622326	5052448	332.5	801
53	Existing	25.9	15.5	45.0	40.0	4.5	623749	5052494	308.1	614
54	Existing	23.8	13.5	45.0	40.0	4.5	623707	5052570	293.4	643
55	Existing	23.6	13.1	45.0	40.0	4.5	623599	5052661	290.3	664
56	Existing	23.5	13.0	45.0	40.0	4.5	623590	5052675	290.9	673
57	Existing	23.3	12.8	45.0	40.0	4.5	623597	5052696	290.5	695
58	Existing	22.2	16.4	45.0	40.0	4.5	622072	5052044	309.5	741
59	Existing	23.1	12.7	45.0	40.0	4.5	623604	5052712	290.6	712
60	Existing	23.2	12.9	45.0	40.0	4.5	623757	5052604	294.5	701
61	Existing	22.9	12.5	45.0	40.0	4.5	623611	5052725	290.6	727
62	Existing	22.0	16.1	45.0	40.0	4.5	622048	5052054	309.5	767
63	Existing	23.0	12.7	45.0	40.0	4.5	623699	5052670	289.5	721
64	Existing	22.8	12.4	45.0	40.0	4.5	623618	5052739	291.0	743
65	Existing	22.6	12.3	45.0	40.0	4.5	623627	5052751	291.1	757
66	Existing	21.9	14.5	45.0	40.0	4.5	622188	5052477	334.2	914
67	Existing	22.4	12.2	45.0	40.0	4.5	623633	5052766	291.2	774
68	Existing	22.4	12.1	45.0	40.0	4.5	623663	5052756	289.5	778
69	Existing	23.4	12.9	45.0	40.0	4.5	623822	5052616	301.1	753
70	Existing	22.2	11.9	45.0	40.0	4.5	623646	5052787	290.8	798
71	Existing	22.9	12.6	45.0	40.0	4.5	623846	5052624	301.2	775
72	Existing	21.8	11.6	45.0	40.0	4.5	623665	5052816	290.4	832
73	Existing	22.8	12.4	45.0	40.0	4.5	623859	5052659	304.5	810
74	Existing	21.8	11.7	45.0	40.0	4.5	623747	5052775	289.5	835
75	Existing	20.2	13.5	45.0	40.0	4.5	621956	5052177	301.4	909
76	Existing	21.4	9.6	45.0	40.0	4.5	623636	5052862	296.4	863
77	Existing	21.7	11.6	45.0	40.0	4.5	623823	5052725	292.8	838
78	Existing	21.4	11.8	45.0	40.0	4.5	624128	5051575	314.5	891
79	Existing	21.2	9.4	45.0	40.0	4.5	623643	5052876	296.5	879
80	Existing	22.2	12.0	45.0	40.0	4.5	623874	5052693	300.5	845
81	Existing	20.9	9.0	45.0	40.0	4.5	623655	5052894	295.2	900
82	Existing	21.3	11.2	45.0	40.0	4.5	623799	5052798	289.5	882
83	Existing	20.6	8.8	45.0	40.0	4.5	623666	5052912	294.3	921
84	Existing	21.1	11.5	45.0	40.0	4.5	623884	5052762	293.9	904

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
85	Existing	20.6	8.9	45.0	40.0	4.5	623675	5052930	296.2	941
86	Existing	21.1	11.4	45.0	40.0	4.5	623897	5052763	294.7	913
87	Existing	20.8	11.2	45.0	40.0	4.5	623916	5052778	294.7	937
88	Existing	20.8	9.3	45.0	40.0	4.5	623701	5052955	294.4	974
89	Existing	21.2	10.9	45.0	40.0	4.5	623942	5052801	297.3	971
90	Existing	20.0	8.5	45.0	40.0	4.5	623709	5052985	295.2	1005
91	Existing	21.2	10.9	45.0	40.0	4.5	623926	5052825	294.4	980
92	Existing	21.2	10.9	45.0	40.0	4.5	623957	5052796	298.4	977
93	Existing	20.3	10.3	45.0	40.0	4.5	623879	5052882	291.5	997
94	Existing	18.6	8.2	45.0	40.0	4.5	624202	5052481	310.1	984
95	Existing	20.1	10.2	45.0	40.0	4.5	623878	5052900	291.5	1012
96	Existing	18.2	7.5	45.0	40.0	4.5	624205	5052492	309.5	991
97	Existing	23.6	12.4	45.0	40.0	4.5	624327	5052131	324.5	1017
98	Existing	20.9	10.7	45.0	40.0	4.5	623986	5052805	300.7	1003
99	Existing	20.1	10.6	45.0	40.0	4.5	623877	5052919	291.6	1027
100	Existing	17.6	6.5	45.0	40.0	4.5	624075	5052721	299.5	1008
101	Existing	21.7	11.1	45.0	40.0	4.5	624314	5052250	314.5	1019
102	Existing	20.9	11.1	45.0	40.0	4.5	624290	5052342	314.5	1017
103	Existing	18.6	8.2	45.0	40.0	4.5	624229	5052498	309.5	1015
104	Existing	18.1	7.2	45.0	40.0	4.5	624223	5052510	308.6	1015
105	Existing	17.4	6.0	45.0	40.0	4.5	624215	5052527	306.5	1016
106	Existing	21.5	11.0	45.0	40.0	4.5	624308	5052306	314.5	1025
107	Existing	20.4	10.3	45.0	40.0	4.5	623739	5053035	297.4	1062
108	Existing	19.8	9.9	45.0	40.0	4.5	623841	5052968	289.6	1049
109	Existing	20.7	10.4	45.0	40.0	4.5	623985	5052847	304.1	1034
110	Existing	18.3	7.2	45.0	40.0	4.5	624089	5052739	299.5	1030
111	Existing	20.7	10.9	45.0	40.0	4.5	624302	5052375	314.5	1038
112	Existing	23.2	12.0	45.0	40.0	4.5	624365	5052152	324.5	1057
113	Existing	19.7	9.8	45.0	40.0	4.5	624037	5052814	300.5	1044
114	Existing	20.6	10.8	45.0	40.0	4.5	624313	5052362	314.5	1045
115	Existing	18.2	7.3	45.0	40.0	4.5	624213	5052593	309.5	1046
116	Existing	20.2	10.1	45.0	40.0	4.5	623752	5053060	304.0	1091
117	Existing	21.6	10.9	45.0	40.0	4.5	624365	5052241	318.3	1068
118	Existing	20.4	10.2	45.0	40.0	4.5	624012	5052863	305.2	1064
119	Existing	18.2	7.8	45.0	40.0	4.5	624126	5052737	299.5	1057
120	Existing	18.6	7.9	45.0	40.0	4.5	624200	5052634	309.5	1056
121	Existing	20.1	10.0	45.0	40.0	4.5	623813	5053034	294.5	1093
122	Existing	18.5	7.9	45.0	40.0	4.5	624210	5052629	309.5	1062
123	Existing	21.4	10.8	45.0	40.0	4.5	624402	5052119	324.5	1091
124	Existing	18.2	7.9	45.0	40.0	4.5	624129	5052756	299.5	1072
125	Existing	19.9	9.9	45.0	40.0	4.5	623781	5053074	302.0	1115
126	Existing	18.8	8.3	45.0	40.0	4.5	624208	5052661	309.6	1078
127	Existing	22.1	11.1	45.0	40.0	4.5	624411	5052161	324.5	1103
128	Existing	20.3	10.5	45.0	40.0	4.5	624012	5052904	308.9	1095

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
129	Existing	18.9	8.7	45.0	40.0	4.5	624203	5052680	310.0	1084
130	Existing	19.1	9.1	45.0	40.0	4.5	624185	5052712	309.6	1088
131	Existing	21.1	10.6	45.0	40.0	4.5	624424	5052129	324.5	1114
132	Existing	18.7	8.7	45.0	40.0	4.5	624298	5052532	309.6	1092
133	Existing	19.1	8.8	45.0	40.0	4.5	624183	5052724	309.7	1094
134	Existing	20.2	10.4	45.0	40.0	4.5	623999	5052935	311.5	1111
135	Existing	19.3	9.4	45.0	40.0	4.5	624095	5052839	304.1	1103
136	Existing	19.1	8.9	45.0	40.0	4.5	624180	5052735	309.7	1098
137	Existing	20.1	9.8	45.0	40.0	4.5	624361	5052403	314.5	1103
138	Existing	21.0	10.4	45.0	40.0	4.5	624436	5052123	324.5	1125
139	Existing	18.6	8.1	45.0	40.0	4.5	624281	5052588	311.9	1102
140	Existing	18.5	8.1	45.0	40.0	4.5	624298	5052559	310.4	1104
141	Existing	18.6	8.5	45.0	40.0	4.5	624305	5052547	310.4	1105
142	Existing	20.1	10.3	45.0	40.0	4.5	624379	5052377	314.7	1112
143	Existing	20.8	10.3	45.0	40.0	4.5	624387	5052355	315.2	1114
144	Existing	20.1	10.3	45.0	40.0	4.5	623997	5052953	310.8	1124
145	Existing	20.8	10.3	45.0	40.0	4.5	624399	5052328	318.7	1119
146	Existing	21.9	11.0	45.0	40.0	4.5	624406	5052306	320.9	1121
147	Existing	20.8	10.3	45.0	40.0	4.5	624449	5052140	324.5	1139
148	Existing	18.6	8.3	45.0	40.0	4.5	624258	5052650	311.5	1114
149	Existing	19.6	9.6	45.0	40.0	4.5	623810	5053103	303.3	1154
150	Existing	21.9	11.0	45.0	40.0	4.5	624421	5052291	323.2	1132
151	Existing	18.6	8.4	45.0	40.0	4.5	624298	5052598	313.6	1122
152	Existing	20.0	10.2	45.0	40.0	4.5	624155	5052809	313.1	1126
153	Existing	20.7	10.2	45.0	40.0	4.5	624145	5052823	314.9	1128
154	Existing	18.7	8.5	45.0	40.0	4.5	624258	5052671	312.0	1125
155	Existing	21.4	10.6	45.0	40.0	4.5	624032	5052946	314.5	1140
156	Existing	18.9	9.0	45.0	40.0	4.5	624222	5052727	311.8	1127
157	Existing	20.7	10.1	45.0	40.0	4.5	624134	5052847	315.7	1136
158	Existing	19.8	9.6	45.0	40.0	4.5	623980	5052999	307.8	1151
159	Existing	18.8	8.7	45.0	40.0	4.5	624249	5052696	312.3	1131
160	Existing	21.8	10.9	45.0	40.0	4.5	624449	5052234	324.5	1150
161	Existing	19.9	10.1	45.0	40.0	4.5	624006	5052979	311.5	1150
162	Existing	20.0	9.7	45.0	40.0	4.5	624475	5052101	324.5	1163
163	Existing	18.6	8.5	45.0	40.0	4.5	624273	5052669	312.6	1136
164	Existing	18.5	10.4	45.0	40.0	4.5	623602	5050566	299.5	1306
165	Existing	18.9	8.9	45.0	40.0	4.5	624206	5052780	313.7	1146
166	Existing	19.9	9.6	45.0	40.0	4.5	624491	5052081	324.5	1179
167	Existing	18.8	8.9	45.0	40.0	4.5	624243	5052735	313.0	1149
168	Existing	19.4	9.3	45.0	40.0	4.5	623811	5053144	308.6	1191
169	Existing	21.2	10.4	45.0	40.0	4.5	624068	5052945	315.7	1162
170	Existing	19.6	9.4	45.0	40.0	4.5	623967	5053036	307.8	1174
171	Existing	21.6	10.7	45.0	40.0	4.5	624457	5052281	325.3	1166
172	Existing	18.4	10.5	45.0	40.0	4.5	623493	5050511	298.5	1315

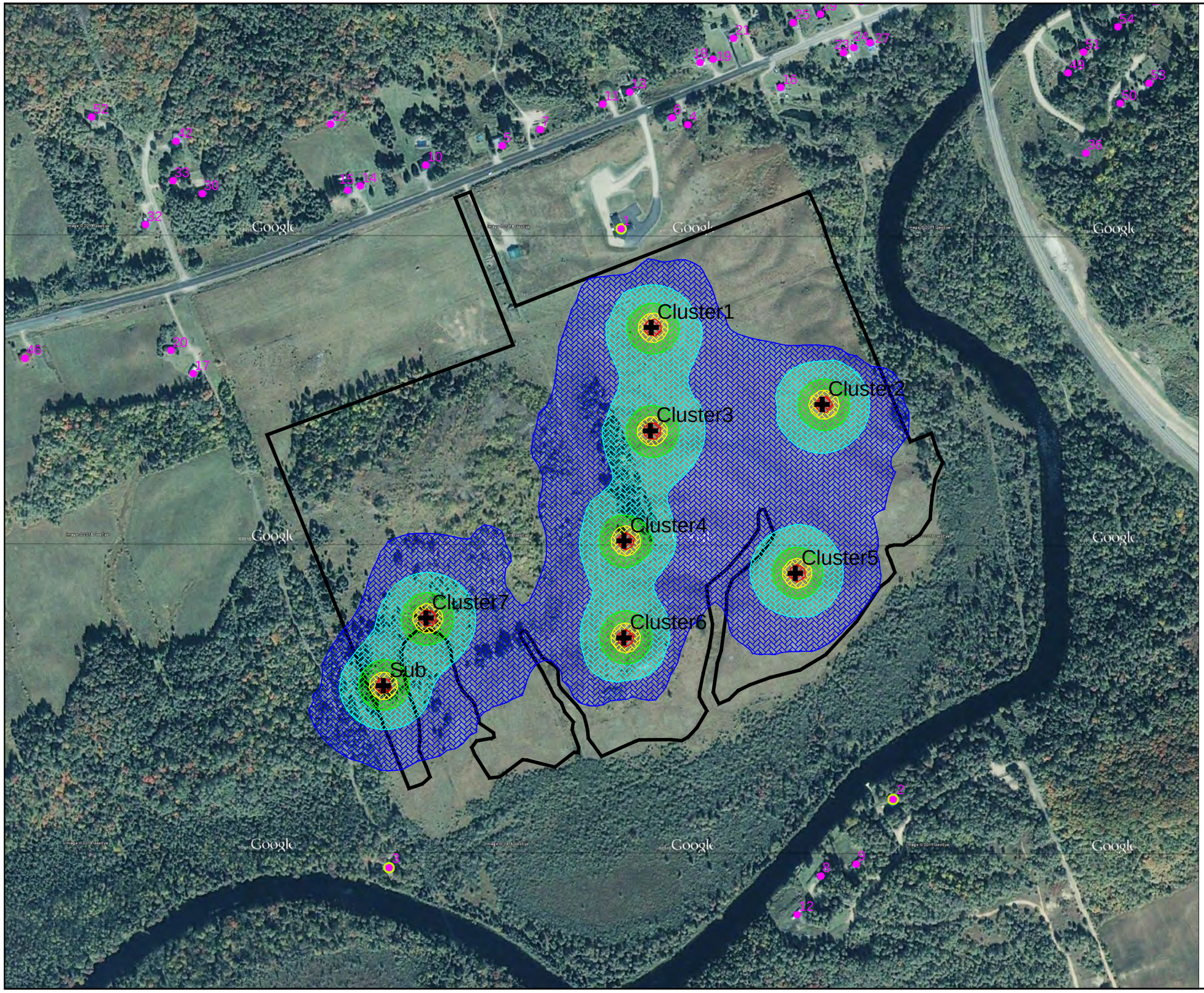
ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
173	Existing	19.7	9.5	45.0	40.0	4.5	623991	5053018	311.2	1172
174	Existing	19.8	10.0	45.0	40.0	4.5	624017	5052997	314.5	1171
175	Existing	19.8	10.0	45.0	40.0	4.5	624006	5053008	313.2	1173
176	Existing	20.4	9.9	45.0	40.0	4.5	624191	5052824	316.2	1163
177	Existing	20.4	9.9	45.0	40.0	4.5	624179	5052839	317.4	1164
178	Existing	18.8	9.4	45.0	40.0	4.5	624219	5052793	314.5	1165
179	Existing	18.6	8.6	45.0	40.0	4.5	624281	5052706	313.9	1163
180	Existing	20.4	9.9	45.0	40.0	4.5	624167	5052862	319.2	1171
181	Existing	18.8	9.4	45.0	40.0	4.5	624516	5052039	324.0	1204
182	Existing	20.4	9.8	45.0	40.0	4.5	624160	5052878	319.3	1177
183	Existing	18.6	8.7	45.0	40.0	4.5	624263	5052747	314.2	1172
184	Existing	20.3	9.8	45.0	40.0	4.5	624208	5052828	316.7	1179
185	Existing	19.6	9.3	45.0	40.0	4.5	624233	5052800	316.2	1180
186	Existing	19.2	11.0	45.0	40.0	4.5	623482	5050477	299.1	1344
187	Existing	18.2	10.1	45.0	40.0	4.5	623637	5050535	301.8	1349
188	Existing	18.2	9.9	45.0	40.0	4.5	623727	5050578	303.9	1335
189	Existing	19.4	9.2	45.0	40.0	4.5	623995	5053052	310.2	1203
190	Existing	19.3	9.2	45.0	40.0	4.5	623966	5053076	305.0	1206
191	Existing	18.5	8.6	45.0	40.0	4.5	624280	5052749	315.2	1187
192	Existing	20.2	9.7	45.0	40.0	4.5	624216	5052840	317.9	1193
193	Existing	19.5	9.2	45.0	40.0	4.5	624247	5052805	317.8	1194
194	Existing	18.5	8.6	45.0	40.0	4.5	624285	5052753	315.6	1193
195	Existing	18.1	9.9	45.0	40.0	4.5	623659	5050527	303.0	1363
196	Existing	19.2	9.1	45.0	40.0	4.5	623986	5053084	307.6	1224
197	Existing	19.2	9.1	45.0	40.0	4.5	623939	5053120	299.5	1230
198	Existing	20.1	9.6	45.0	40.0	4.5	624232	5052843	318.7	1207
199	Existing	18.3	8.5	45.0	40.0	4.5	624305	5052757	316.0	1212
200	Existing	20.1	9.5	45.0	40.0	4.5	624200	5052895	324.5	1217
201	Existing	21.0	10.2	45.0	40.0	4.5	624500	5052354	323.3	1223
202	Existing	19.3	9.0	45.0	40.0	4.5	624279	5052809	319.5	1222
203	Existing	19.0	8.9	45.0	40.0	4.5	623947	5053138	299.5	1250
204	Existing	20.0	9.4	45.0	40.0	4.5	624216	5052895	324.5	1229
205	Existing	18.3	8.4	45.0	40.0	4.5	624291	5052800	319.2	1226
206	Existing	18.1	8.2	45.0	40.0	4.5	624377	5052667	314.5	1225
207	Existing	19.0	8.9	45.0	40.0	4.5	624006	5053101	310.3	1249
208	Existing	18.2	8.4	45.0	40.0	4.5	624315	5052770	316.7	1228
209	Existing	18.0	8.1	45.0	40.0	4.5	624383	5052671	314.5	1232
210	Existing	21.5	10.5	45.0	40.0	4.5	624553	5052227	334.5	1252
211	Existing	20.6	9.8	45.0	40.0	4.5	624132	5052997	319.5	1243
212	Existing	17.8	9.7	45.0	40.0	4.5	623700	5050505	306.2	1395
213	Existing	19.2	9.4	45.0	40.0	4.5	624061	5053068	314.5	1254
214	Existing	19.2	8.9	45.0	40.0	4.5	624294	5052816	319.5	1238
215	Existing	21.5	10.4	45.0	40.0	4.5	624556	5052247	335.4	1257
216	Existing	18.9	8.8	45.0	40.0	4.5	623956	5053157	299.5	1271

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
217	Existing	19.8	9.3	45.0	40.0	4.5	624237	5052899	324.5	1247
218	Existing	5.7	-2.4	45.0	40.0	4.5	622070	5053105	303.5	1377
219	Existing	18.1	8.2	45.0	40.0	4.5	624335	5052777	317.1	1248
220	Existing	20.4	9.6	45.0	40.0	4.5	624132	5053025	318.7	1265
221	Existing	19.7	9.2	45.0	40.0	4.5	624592	5052157	327.5	1283
222	Existing	18.9	8.7	45.0	40.0	4.5	624048	5053108	314.2	1279
223	Existing	20.6	9.8	45.0	40.0	4.5	624529	5052415	323.0	1267
224	Existing	19.7	9.2	45.0	40.0	4.5	624187	5052981	319.5	1269
225	Existing	19.0	8.7	45.0	40.0	4.5	624316	5052828	319.8	1263
226	Existing	19.7	9.2	45.0	40.0	4.5	624257	5052904	324.5	1266
227	Existing	17.9	8.1	45.0	40.0	4.5	624353	5052785	317.6	1267
228	Existing	18.8	8.6	45.0	40.0	4.5	624038	5053128	314.1	1290
229	Existing	17.8	8.1	45.0	40.0	4.5	624617	5052048	323.1	1305
230	Existing	17.9	8.1	45.0	40.0	4.5	624334	5052818	319.5	1271
231	Existing	5.6	-2.6	45.0	40.0	4.5	622056	5053130	301.2	1404
232	Existing	18.7	8.6	45.0	40.0	4.5	624032	5053139	313.8	1295
233	Existing	18.9	9.1	45.0	40.0	4.5	624090	5053094	314.5	1292
234	Existing	18.7	8.5	45.0	40.0	4.5	624028	5053149	313.1	1301
235	Existing	20.7	9.8	45.0	40.0	4.5	624566	5052360	330.2	1289
236	Existing	17.8	8.0	45.0	40.0	4.5	624368	5052792	317.9	1284
237	Existing	18.6	8.5	45.0	40.0	4.5	624023	5053161	312.0	1309
238	Existing	18.8	8.6	45.0	40.0	4.5	624314	5052872	322.8	1288
239	Existing	18.3	9.8	45.0	40.0	4.5	623753	5050468	310.4	1448
240	Existing	18.7	9.0	45.0	40.0	4.5	624079	5053124	314.5	1310
241	Existing	17.7	8.0	45.0	40.0	4.5	624633	5052114	324.5	1322
242	Existing	17.9	8.5	45.0	40.0	4.5	624347	5052840	320.6	1295
243	Existing	18.6	8.4	45.0	40.0	4.5	624056	5053150	314.5	1318
244	Existing	19.4	8.9	45.0	40.0	4.5	624282	5052928	324.5	1300
245	Existing	19.4	8.9	45.0	40.0	4.5	624224	5052998	321.2	1307
246	Existing	19.3	6.9	45.0	40.0	4.5	624259	5052960	324.5	1305
247	Existing	18.5	6.1	45.0	40.0	4.5	624331	5052879	323.9	1306
248	Existing	19.2	6.8	45.0	40.0	4.5	624217	5053013	318.8	1313
249	Existing	19.2	6.8	45.0	40.0	4.5	624297	5052925	324.5	1309
250	Existing	17.4	5.1	45.0	40.0	4.5	624380	5052815	318.1	1307
251	Existing	17.4	5.0	45.0	40.0	4.5	624396	5052796	317.1	1309
252	Existing	20.2	7.8	45.0	40.0	4.5	624591	5052388	328.8	1320
253	Existing	17.4	5.1	45.0	40.0	4.5	624211	5053032	316.4	1322
254	Existing	20.1	7.7	45.0	40.0	4.5	624581	5052431	324.1	1321
255	Existing	18.3	6.7	45.0	40.0	4.5	624102	5053139	314.5	1336
256	Existing	17.4	5.0	45.0	40.0	4.5	624379	5052839	319.0	1320
257	Existing	17.0	4.5	45.0	40.0	4.5	624204	5053048	314.5	1329
258	Existing	18.2	5.8	45.0	40.0	4.5	624051	5053184	312.5	1343
259	Existing	18.4	6.0	45.0	40.0	4.5	624346	5052885	323.7	1321
260	Existing	19.1	6.7	45.0	40.0	4.5	624282	5052965	324.5	1325

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
261	Existing	18.1	5.8	45.0	40.0	4.5	624029	5053203	309.5	1347
262	Existing	17.2	4.8	45.0	40.0	4.5	624489	5052672	314.5	1325
263	Existing	19.0	6.7	45.0	40.0	4.5	624314	5052937	324.5	1330
264	Existing	17.2	4.8	45.0	40.0	4.5	624479	5052696	314.5	1328
265	Existing	17.2	4.8	45.0	40.0	4.5	624467	5052719	314.5	1329
266	Existing	19.9	9.5	45.0	40.0	4.5	624090	5050641	313.9	1445
267	Existing	18.7	13.2	45.0	40.0	4.5	623732	5050411	306.8	1495
268	Existing	16.9	4.4	45.0	40.0	4.5	624218	5053053	314.1	1343
269	Existing	17.1	4.8	45.0	40.0	4.5	624460	5052740	314.3	1333
270	Existing	19.0	6.6	45.0	40.0	4.5	624345	5052910	324.5	1336
271	Existing	18.2	6.6	45.0	40.0	4.5	624122	5053147	314.5	1354
272	Existing	18.0	5.6	45.0	40.0	4.5	624009	5053237	305.1	1366
273	Existing	19.0	6.6	45.0	40.0	4.5	624340	5052922	324.5	1340
274	Existing	17.1	4.8	45.0	40.0	4.5	624437	5052787	315.3	1338
275	Existing	16.8	4.3	45.0	40.0	4.5	624189	5053090	312.9	1351
276	Existing	17.1	4.7	45.0	40.0	4.5	624477	5052722	313.6	1339
277	Existing	17.1	4.8	45.0	40.0	4.5	624450	5052769	314.7	1340
278	Existing	17.1	4.7	45.0	40.0	4.5	624428	5052811	316.0	1344
279	Existing	17.9	5.6	45.0	40.0	4.5	624021	5053238	305.2	1373
280	Existing	17.1	4.7	45.0	40.0	4.5	624420	5052831	317.0	1349
281	Existing	18.8	6.5	45.0	40.0	4.5	624316	5052974	324.5	1356
282	Existing	17.1	4.7	45.0	40.0	4.5	624306	5052993	321.9	1362
283	Existing	17.1	4.7	45.0	40.0	4.5	624418	5052852	317.9	1359
284	Existing	17.2	5.7	45.0	40.0	4.5	624400	5052878	320.2	1360
285	Existing	16.9	4.5	45.0	40.0	4.5	624712	5052026	322.2	1400
286	Existing	16.4	3.9	45.0	40.0	4.5	624303	5053009	318.3	1371
287	Existing	7.2	-1.5	45.0	40.0	4.5	622019	5053222	301.7	1494
288	Existing	18.0	5.6	45.0	40.0	4.5	624385	5052919	324.2	1373
289	Existing	18.0	5.6	45.0	40.0	4.5	624395	5052906	322.7	1373
290	Existing	17.9	6.3	45.0	40.0	4.5	624159	5053163	314.4	1389
291	Existing	15.7	3.3	45.0	40.0	4.5	624295	5053029	313.9	1379
292	Existing	18.7	6.3	45.0	40.0	4.5	624375	5052935	324.5	1375
293	Existing	20.8	14.7	45.0	40.0	4.5	622748	5050236	293.2	1448
294	Existing	20.8	14.7	45.0	40.0	4.5	622735	5050237	293.1	1446
295	Existing	18.0	5.6	45.0	40.0	4.5	624407	5052896	321.0	1376
296	Existing	15.9	3.2	45.0	40.0	4.5	624272	5053065	309.6	1388
297	Existing	17.9	6.3	45.0	40.0	4.5	624148	5053183	314.5	1398
298	Existing	15.8	3.3	45.0	40.0	4.5	624285	5053065	309.5	1397
299	Existing	17.9	5.5	45.0	40.0	4.5	624401	5052930	323.9	1392
300	Existing	17.8	6.1	45.0	40.0	4.5	624172	5053182	314.5	1412
301	Existing	17.6	5.3	45.0	40.0	4.5	624153	5053211	314.5	1424
302	Existing	14.4	2.0	45.0	40.0	4.5	624347	5053020	311.5	1410
303	Existing	15.1	2.7	45.0	40.0	4.5	624324	5053051	310.0	1415
304	Existing	17.6	5.8	45.0	40.0	4.5	624186	5053194	314.4	1430

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
305	Existing	16.0	3.5	45.0	40.0	4.5	624246	5053142	309.5	1428
306	Existing	10.7	-1.9	45.0	40.0	4.5	624379	5052999	309.5	1420
307	Existing	15.2	2.8	45.0	40.0	4.5	624324	5053066	309.5	1425
308	Existing	16.1	3.8	45.0	40.0	4.5	624214	5053183	312.2	1439
309	Existing	14.9	2.0	45.0	40.0	4.5	623947	5053394	299.5	1476
310	Existing	15.7	3.1	45.0	40.0	4.5	624310	5053106	309.2	1444
311	Existing	16.0	3.6	45.0	40.0	4.5	624229	5053191	312.0	1454
312	Existing	15.2	2.8	45.0	40.0	4.5	624341	5053080	309.4	1447
313	Existing	12.6	0.1	45.0	40.0	4.5	623867	5053447	302.3	1492
314	Existing	15.5	3.1	45.0	40.0	4.5	624324	5053104	308.6	1452
315	Existing	15.8	3.3	45.0	40.0	4.5	624300	5053131	309.3	1455
316	Existing	16.0	3.6	45.0	40.0	4.5	624232	5053207	312.8	1469
317	Existing	18.5	5.4	45.0	40.0	4.5	624209	5053239	317.7	1480
318	Existing	13.0	0.6	45.0	40.0	4.5	623860	5053478	301.9	1518
319	Existing	18.4	5.4	45.0	40.0	4.5	624205	5053251	318.9	1487
320	Existing	13.1	-0.2	45.0	40.0	4.5	623855	5053500	301.3	1537
321	Existing	15.7	3.3	45.0	40.0	4.5	624276	5053210	310.0	1499
322	Existing	15.7	3.4	45.0	40.0	4.5	624256	5053235	313.6	1506
323	Existing	17.6	5.2	45.0	40.0	4.5	624186	5053303	324.5	1518
324	Existing	16.8	5.2	45.0	40.0	4.5	624246	5053254	316.2	1514
325	Existing	16.3	4.0	45.0	40.0	4.5	624036	5053416	302.7	1535
326	Existing	13.3	0.9	45.0	40.0	4.5	623876	5053517	299.5	1561
327	Existing	18.2	5.7	45.0	40.0	4.5	624242	5053272	318.6	1526
328	Existing	16.7	5.1	45.0	40.0	4.5	624176	5053329	324.5	1533
329	Existing	13.4	1.0	45.0	40.0	4.5	623875	5053530	299.8	1572
330	Existing	13.5	0.5	45.0	40.0	4.5	623871	5053544	300.7	1584
331	Existing	15.3	2.9	45.0	40.0	4.5	624319	5053229	307.9	1541
332	Existing	15.3	2.9	45.0	40.0	4.5	624317	5053240	308.2	1548
333	Existing	15.3	2.9	45.0	40.0	4.5	624299	5053259	309.4	1551
334	Existing	18.7	12.7	45.0	40.0	4.5	623266	5050063	299.4	1699
335	Existing	16.0	3.7	45.0	40.0	4.5	624044	5053456	303.3	1574
336	Existing	13.5	0.6	45.0	40.0	4.5	623879	5053563	300.7	1604
337	Existing	18.3	12.4	45.0	40.0	4.5	623254	5050034	300.6	1726
338	Existing	18.0	12.5	45.0	40.0	4.5	623141	5050022	304.1	1714
339	Existing	17.9	12.4	45.0	40.0	4.5	623174	5050009	304.1	1735
340	Existing	14.4	2.0	45.0	40.0	4.5	624046	5053518	301.9	1630
341	Existing	13.7	1.2	45.0	40.0	4.5	623806	5053652	311.7	1653
342	Existing	15.5	3.1	45.0	40.0	4.5	624184	5053439	324.2	1630
343	Existing	17.7	12.2	45.0	40.0	4.5	623225	5049986	304.8	1771
344	Existing	17.7	12.1	45.0	40.0	4.5	623249	5049980	306.7	1780
345	Existing	13.6	1.1	45.0	40.0	4.5	624149	5053500	309.5	1664
346	Existing	14.9	0.8	45.0	40.0	4.5	624134	5053553	309.5	1702
347	Existing	13.0	0.4	45.0	40.0	4.5	624150	5053558	308.4	1715
348	Existing	10.4	-2.1	45.0	40.0	4.5	623899	5053759	304.0	1790

ID	Description	Total Sound Pressure Level		Performance Limit		Height (m)	Coordinates			Min dist to source (m)
		Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)		X (m)	Y (m)	Z (m)	
349	Existing	9.2	-3.4	45.0	40.0	4.5	623906	5053769	303.0	1803
350	Existing	7.4	-5.1	45.0	40.0	4.5	623889	5053861	300.1	1877



Sub Substation Transformer

Cluster# Inverter Cluster

Noise Receptor

Representative Noise Receptor

From 40 to 45 dBA

From 45 to 50 dBA

From 50 to 55 dBA

From 55 to 60 dBA

Over 60 dBA

Project Location

Northland Power Solar Burk's Falls West L.P.

Burk's Falls West Solar Project – Noise Map at 4.5m – Day Time

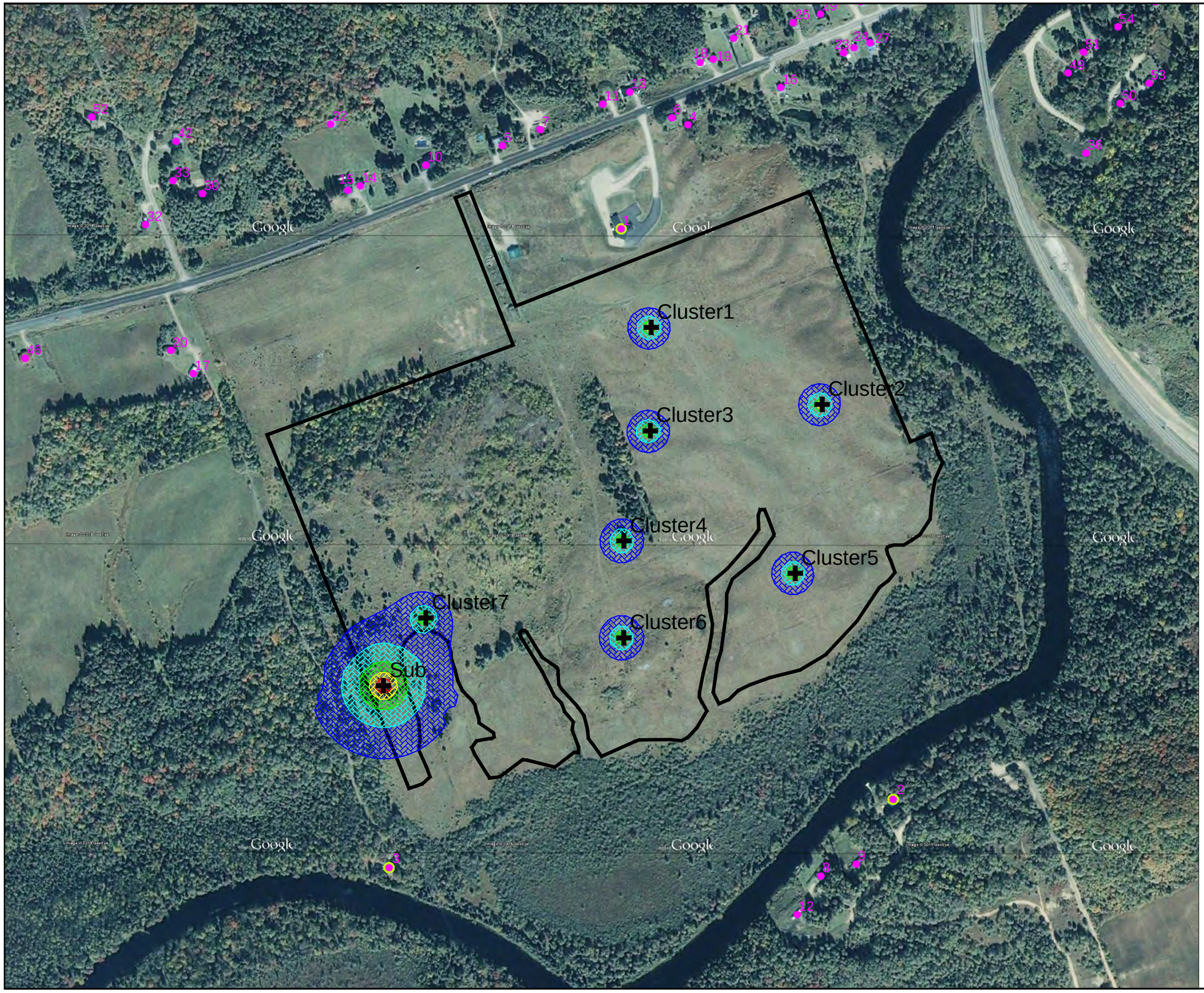
0 80 160 240 320 400 m

SCALE 1:5,000

Figure C.1

HATCH™

Rev 1.01



Sub Substation Transformer

Cluster# Inverter Cluster

Noise Receptor

Representative Noise Receptor

From 40 to 45 dBA

From 45 to 50 dBA

From 50 to 55 dBA

From 55 to 60 dBA

Over 60 dBA

Project Location

Northland Power Solar Burk's Falls West L.P.

Burk's Falls West Solar Project – Noise Map at 4.5m – Night Time

0 80 160 240 320 400 m

SCALE 1:5,000

Figure C.2

HATCH™

Rev 1.01

Appendix D

CADNA-A Sample Calculations

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (m)	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	0.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	1
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	0.70
Wind Speed for Dir. (m/s)	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03)	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver
Name: Receptors - Existing
ID: 3.0
X: 622726.39
Y: 5051438.41
Z: 289.50

Point Source, ISO 9613, Name: "Sub", ID: "Sub"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	622718.91	5051683.38	300.65	0	32	48.0	48.0	0.0	0.0	58.8	0.0	-3.3	0.0	0.0	0.0	0.0	-0.0	-7.6	-7.6
2	622718.91	5051683.38	300.65	0	63	67.2	67.2	0.0	0.0	58.8	0.0	-3.3	0.0	0.0	0.0	0.0	-0.0	11.6	11.6
3	622718.91	5051683.38	300.65	0	125	79.3	79.3	0.0	0.0	58.8	0.1	2.7	0.0	0.0	0.0	0.0	-0.0	17.7	17.7
4	622718.91	5051683.38	300.65	0	250	81.8	81.8	0.0	0.0	58.8	0.3	2.6	0.0	0.0	0.0	0.0	-0.0	20.1	20.1
5	622718.91	5051683.38	300.65	0	500	87.2	87.2	0.0	0.0	58.8	0.5	-0.8	0.0	0.0	0.0	0.0	-0.0	28.8	28.8
6	622718.91	5051683.38	300.65	0	1000	84.4	84.4	0.0	0.0	58.8	0.9	-1.0	0.0	0.0	0.0	0.0	-0.0	25.7	25.7
7	622718.91	5051683.38	300.65	0	2000	80.6	80.6	0.0	0.0	58.8	2.4	-1.0	0.0	0.0	0.0	0.0	-0.0	20.4	20.4
8	622718.91	5051683.38	300.65	0	4000	75.4	75.4	0.0	0.0	58.8	8.0	-1.0	0.0	0.0	0.0	0.0	-0.0	9.5	9.5
9	622718.91	5051683.38	300.65	0	8000	66.3	66.3	0.0	0.0	58.8	28.7	-1.0	0.0	0.0	0.0	0.0	-0.0	-20.2	-20.2

Point Source, ISO 9613, Name: "Inv1", ID: "Inv1"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623082.08	5052165.32	310.83	0	63	68.1	-88.0	0.0	0.0	69.2	0.1	-5.2	0.0	0.0	10.1	0.0	-0.0	-6.1	-88.0
2	623082.08	5052165.32	310.83	0	125	78.9	-88.0	0.0	0.0	69.2	0.3	3.9	0.0	0.0	1.1	0.0	-0.0	4.3	-88.0
3	623082.08	5052165.32	310.83	0	250	85.5	-88.0	0.0	0.0	69.2	0.8	3.0	0.0	0.0	2.4	0.0	-0.0	10.1	-88.0
4	623082.08	5052165.32	310.83	0	500	87.3	-88.0	0.0	0.0	69.2	1.6	-0.9	0.0	0.0	6.9	0.0	-0.0	10.5	-88.0
5	623082.08	5052165.32	310.83	0	1000	83.7	-88.0	0.0	0.0	69.2	3.0	-1.6	0.0	0.0	8.6	0.0	-0.0	4.5	-88.0
6	623082.08	5052165.32	310.83	0	2000	79.1	-88.0	0.0	0.0	69.2	7.8	-1.6	0.0	0.0	10.1	0.0	-0.0	-6.4	-88.0
7	623082.08	5052165.32	310.83	0	4000	70.0	-88.0	0.0	0.0	69.2	26.5	-1.6	0.0	0.0	12.1	0.0	-0.0	-36.2	-88.0
8	623082.08	5052165.32	310.83	0	8000	77.7	-88.0	0.0	0.0	69.2	94.6	-1.6	0.0	0.0	14.5	0.0	-0.0	-99.0	-88.0

Point Source, ISO 9613, Name: "Inv2", ID: "Inv2"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623312.02	5052061.69	300.97	0	63	68.1	-88.0	0.0	0.0	69.6	0.1	-5.3	0.0	0.0	10.1	0.0	-0.0	-6.4	-88.0
2	623312.02	5052061.69	300.97	0	125	78.9	-88.0	0.0	0.0	69.6	0.4	4.0	0.0	0.0	0.8	0.0	-0.0	4.1	-88.0
3	623312.02	5052061.69	300.97	0	250	85.5	-88.0	0.0	0.0	69.6	0.9	3.0	0.0	0.0	1.8	0.0	-0.0	10.2	-88.0
4	623312.02	5052061.69	300.97	0	500	87.3	-88.0	0.0	0.0	69.6	1.7	-0.9	0.0	0.0	5.7	0.0	-0.0	11.2	-88.0
5	623312.02	5052061.69	300.97	0	1000	83.7	-88.0	0.0	0.0	69.6	3.1	-1.6	0.0	0.0	6.3	0.0	-0.0	6.1	-88.0
6	623312.02	5052061.69	300.97	0	2000	79.1	-88.0	0.0	0.0	69.6	8.3	-1.6	0.0	0.0	6.4	0.0	-0.0	-3.6	-88.0
7	623312.02	5052061.69	300.97	0	4000	70.0	-88.0	0.0	0.0	69.6	28.0	-1.6	0.0	0.0	6.4	0.0	-0.0	-32.5	-88.0
8	623312.02	5052061.69	300.97	0	8000	77.7	-88.0	0.0	0.0	69.6	100.0	-1.6	0.0	0.0	6.4	0.0	-0.0	-96.7	-88.0

Point Source, ISO 9613, Name: "Inv3", ID: "Inv3"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623080.87	5052026.20	306.40	0	63	68.1	-88.0	0.0	0.0	67.7	0.1	-5.1	0.0	0.0	10.4	0.0	-0.0	-5.0	-88.0
2	623080.87	5052026.20	306.40	0	125	78.9	-88.0	0.0	0.0	67.7	0.3	3.7	0.0	0.0	2.3	0.0	-0.0	4.9	-88.0
3	623080.87	5052026.20	306.40	0	250	85.5	-88.0	0.0	0.0	67.7	0.7	3.0	0.0	0.0	4.1	0.0	-0.0	10.0	-88.0
4	623080.87	5052026.20	306.40	0	500	87.3	-88.0	0.0	0.0	67.7	1.3	-0.8	0.0	0.0	9.5	0.0	-0.0	9.6	-88.0
5	623080.87	5052026.20	306.40	0	1000	83.7	-88.0	0.0	0.0	67.7	2.5	-1.5	0.0	0.0	12.2	0.0	-0.0	2.8	-88.0
6	623080.87	5052026.20	306.40	0	2000	79.1	-88.0	0.0	0.0	67.7	6.6	-1.5	0.0	0.0	14.6	0.0	-0.0	-8.4	-88.0
7	623080.87	5052026.20	306.40	0	4000	70.0	-88.0	0.0	0.0	67.7	22.5	-1.5	0.0	0.0	17.3	0.0	-0.0	-36.0	-88.0
8	623080.87	5052026.20	306.40	0	8000	77.7	-88.0	0.0	0.0	67.7	80.3	-1.5	0.0	0.0	20.1	0.0	-0.0	-88.9	-88.0

Point Source, ISO 9613, Name: "Inv4", ID: "Inv4"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623045.40	5051878.16	312.61	0	63	68.1	-88.0	0.0	0.0	65.7	0.1	-4.9	0.0	0.0	9.3	0.0	-0.0	-2.1	-88.0
2	623045.40	5051878.16	312.61	0	125	78.9	-88.0	0.0	0.0	65.7	0.2	3.2	0.0	0.0	1.0	0.0	-0.0	8.8	-88.0
3	623045.40	5051878.16	312.61	0	250	85.5	-88.0	0.0	0.0	65.7	0.6	3.1	0.0	0.0	0.4	0.0	-0.0	15.8	-88.0
4	623045.40	5051878.16	312.61	0	500	87.3	-88.0	0.0	0.0	65.7	1.1	-0.8	0.0	0.0	2.4	0.0	-0.0	18.9	-88.0

Point Source, ISO 9613, Name: "Inv4", ID: "Inv4"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
5	623045.40	5051878.16	312.61	0	1000	83.7	-88.0	0.0	0.0	65.7	2.0	-1.4	0.0	0.0	1.4	0.0	-0.0	16.0	-88.0
6	623045.40	5051878.16	312.61	0	2000	79.1	-88.0	0.0	0.0	65.7	5.3	-1.5	0.0	0.0	1.5	0.0	-0.0	8.1	-88.0
7	623045.40	5051878.16	312.61	0	4000	70.0	-88.0	0.0	0.0	65.7	17.8	-1.5	0.0	0.0	1.5	0.0	-0.0	-13.5	-88.0
8	623045.40	5051878.16	312.61	0	8000	77.7	-88.0	0.0	0.0	65.7	63.6	-1.5	0.0	0.0	1.5	0.0	-0.0	-51.6	-88.0

Point Source, ISO 9613, Name: "Inv5", ID: "Inv5"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623275.86	5051834.55	296.82	0	63	68.1	-88.0	0.0	0.0	67.6	0.1	-5.1	0.0	0.0	9.9	0.0	-0.0	-4.4	-88.0
2	623275.86	5051834.55	296.82	0	125	78.9	-88.0	0.0	0.0	67.6	0.3	3.6	0.0	0.0	1.1	0.0	-0.0	6.2	-88.0
3	623275.86	5051834.55	296.82	0	250	85.5	-88.0	0.0	0.0	67.6	0.7	3.0	0.0	0.0	1.7	0.0	-0.0	12.4	-88.0
4	623275.86	5051834.55	296.82	0	500	87.3	-88.0	0.0	0.0	67.6	1.3	-0.8	0.0	0.0	5.6	0.0	-0.0	13.6	-88.0
5	623275.86	5051834.55	296.82	0	1000	83.7	-88.0	0.0	0.0	67.6	2.5	-1.5	0.0	0.0	6.3	0.0	-0.0	8.8	-88.0
6	623275.86	5051834.55	296.82	0	2000	79.1	-88.0	0.0	0.0	67.6	6.5	-1.5	0.0	0.0	6.3	0.0	-0.0	0.2	-88.0
7	623275.86	5051834.55	296.82	0	4000	70.0	-88.0	0.0	0.0	67.6	22.2	-1.5	0.0	0.0	6.3	0.0	-0.0	-24.6	-88.0
8	623275.86	5051834.55	296.82	0	8000	77.7	-88.0	0.0	0.0	67.6	79.2	-1.5	0.0	0.0	6.3	0.0	-0.0	-73.9	-88.0

Point Source, ISO 9613, Name: "Inv6", ID: "Inv6"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623045.24	5051747.59	305.34	0	63	68.1	-88.0	0.0	0.0	64.0	0.1	-4.6	0.0	0.0	0.0	0.0	-0.0	8.7	-88.0
2	623045.24	5051747.59	305.34	0	125	78.9	-88.0	0.0	0.0	64.0	0.2	2.9	0.0	0.0	0.0	0.0	-0.0	11.9	-88.0
3	623045.24	5051747.59	305.34	0	250	85.5	-88.0	0.0	0.0	64.0	0.5	3.2	0.0	0.0	0.0	0.0	-0.0	17.9	-88.0
4	623045.24	5051747.59	305.34	0	500	87.3	-88.0	0.0	0.0	64.0	0.9	-0.7	0.0	0.0	0.0	0.0	-0.0	23.2	-88.0
5	623045.24	5051747.59	305.34	0	1000	83.7	-88.0	0.0	0.0	64.0	1.6	-1.4	0.0	0.0	0.0	0.0	-0.0	19.5	-88.0
6	623045.24	5051747.59	305.34	0	2000	79.1	-88.0	0.0	0.0	64.0	4.3	-1.4	0.0	0.0	0.0	0.0	-0.0	12.2	-88.0
7	623045.24	5051747.59	305.34	0	4000	70.0	-88.0	0.0	0.0	64.0	14.6	-1.4	0.0	0.0	0.0	0.0	-0.0	-7.1	-88.0
8	623045.24	5051747.59	305.34	0	8000	77.7	-88.0	0.0	0.0	64.0	51.9	-1.4	0.0	0.0	0.0	0.0	-0.0	-36.8	-88.0

Point Source, ISO 9613, Name: "Inv7", ID: "Inv7"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	622778.98	5051774.35	308.34	0	63	68.1	-88.0	0.0	0.0	61.6	0.0	-4.2	0.0	0.0	0.0	0.0	-0.0	10.6	-88.0
2	622778.98	5051774.35	308.34	0	125	78.9	-88.0	0.0	0.0	61.6	0.1	2.5	0.0	0.0	0.0	0.0	-0.0	14.6	-88.0
3	622778.98	5051774.35	308.34	0	250	85.5	-88.0	0.0	0.0	61.6	0.4	3.3	0.0	0.0	0.0	0.0	-0.0	20.2	-88.0
4	622778.98	5051774.35	308.34	0	500	87.3	-88.0	0.0	0.0	61.6	0.7	-0.6	0.0	0.0	0.0	0.0	-0.0	25.6	-88.0
5	622778.98	5051774.35	308.34	0	1000	83.7	-88.0	0.0	0.0	61.6	1.3	-1.2	0.0	0.0	0.0	0.0	-0.0	22.0	-88.0
6	622778.98	5051774.35	308.34	0	2000	79.1	-88.0	0.0	0.0	61.6	3.3	-1.3	0.0	0.0	0.0	0.0	-0.0	15.4	-88.0
7	622778.98	5051774.35	308.34	0	4000	70.0	-88.0	0.0	0.0	61.6	11.2	-1.3	0.0	0.0	0.0	0.0	-0.0	-1.6	-88.0
8	622778.98	5051774.35	308.34	0	8000	77.7	-88.0	0.0	0.0	61.6	39.8	-1.3	0.0	0.0	0.0	0.0	-0.0	-22.5	-88.0

Point Source, ISO 9613, Name: "Trans1", ID: "Trans1"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623076.18	5052165.32	310.33	0	32	36.9	36.9	0.0	0.0	69.1	0.0	-5.3	0.0	0.0	10.1	0.0	-0.0	-37.1	-37.1
2	623076.18	5052165.32	310.33	0	63	56.1	56.1	0.0	0.0	69.1	0.1	-5.3	0.0	0.0	10.2	0.0	-0.0	-18.1	-18.1
3	623076.18	5052165.32	310.33	0	125	68.2	68.2	0.0	0.0	69.1	0.3	4.0	0.0	0.0	1.2	0.0	-0.0	-6.5	-6.5
4	623076.18	5052165.32	310.33	0	250	70.7	70.7	0.0	0.0	69.1	0.8	3.4	0.0	0.0	2.2	0.0	-0.0	-5.0	-5.0
5	623076.18	5052165.32	310.33	0	500	76.1	76.1	0.0	0.0	69.1	1.6	-0.3	0.0	0.0	6.8	0.0	-0.0	-1.1	-1.1
6	623076.18	5052165.32	310.33	0	1000	73.3	73.3	0.0	0.0	69.1	2.9	-1.5	0.0	0.0	9.2	0.0	-0.0	-6.5	-6.5
7	623076.18	5052165.32	310.33	0	2000	69.5	69.5	0.0	0.0	69.1	7.8	-1.6	0.0	0.0	11.0	0.0	-0.0	-16.9	-16.9
8	623076.18	5052165.32	310.33	0	4000	64.3	64.3	0.0	0.0	69.1	26.4	-1.6	0.0	0.0	13.2	0.0	-0.0	-42.9	-42.9
9	623076.18	5052165.32	310.33	0	8000	55.2	55.2	0.0	0.0	69.1	94.3	-1.6	0.0	0.0	15.7	0.0	-0.0	-122.4	-122.4

Point Source, ISO 9613, Name: "Trans2", ID: "Trans2"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623306.12	5052061.69	300.55	0	32	36.9	36.9	0.0	0.0	69.6	0.0	-5.3	0.0	0.0	10.1	0.0	-0.0	-37.5	-37.5
2	623306.12	5052061.69	300.55	0	63	56.1	56.1	0.0	0.0	69.6	0.1	-5.3	0.0	0.0	10.1	0.0	-0.0	-18.4	-18.4
3	623306.12	5052061.69	300.55	0	125	68.2	68.2	0.0	0.0	69.6	0.4	4.1	0.0	0.0	0.7	0.0	-0.0	-6.5	-6.5
4	623306.12	5052061.69	300.55	0	250	70.7	70.7	0.0	0.0	69.6	0.9	3.4	0.0	0.0	1.3	0.0	-0.0	-4.6	-4.6
5	623306.12	5052061.69	300.55	0	500	76.1	76.1	0.0	0.0	69.6	1.6	-0.3	0.0	0.0	5.1	0.0	-0.0	0.1	0.1
6	623306.12	5052061.69	300.55	0	1000	73.3	73.3	0.0	0.0	69.6	3.1	-1.5	0.0	0.0	6.3	0.0	-0.0	-4.2	-4.2

Point Source, ISO 9613, Name: "Trans2", ID: "Trans2"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
7	623306.12	5052061.69	300.55	0	2000	69.5	69.5	0.0	0.0	69.6	8.2	-1.6	0.0	0.0	6.4	0.0	-0.0	-13.1	-13.1
8	623306.12	5052061.69	300.55	0	4000	64.3	64.3	0.0	0.0	69.6	27.9	-1.6	0.0	0.0	6.4	0.0	-0.0	-38.0	-38.0
9	623306.12	5052061.69	300.55	0	8000	55.2	55.2	0.0	0.0	69.6	99.5	-1.6	0.0	0.0	6.4	0.0	-0.0	-118.7	-118.7

Point Source, ISO 9613, Name: "Trans3", ID: "Trans3"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623074.97	5052026.20	306.97	0	32	36.9	36.9	0.0	0.0	67.7	0.0	-5.1	0.0	0.0	10.1	0.0	-0.0	-35.8	-35.8
2	623074.97	5052026.20	306.97	0	63	56.1	56.1	0.0	0.0	67.7	0.1	-5.1	0.0	0.0	10.4	0.0	-0.0	-17.0	-17.0
3	623074.97	5052026.20	306.97	0	125	68.2	68.2	0.0	0.0	67.7	0.3	3.7	0.0	0.0	2.3	0.0	-0.0	-5.7	-5.7
4	623074.97	5052026.20	306.97	0	250	70.7	70.7	0.0	0.0	67.7	0.7	3.5	0.0	0.0	3.5	0.0	-0.0	-4.7	-4.7
5	623074.97	5052026.20	306.97	0	500	76.1	76.1	0.0	0.0	67.7	1.3	-0.3	0.0	0.0	8.8	0.0	-0.0	-1.4	-1.4
6	623074.97	5052026.20	306.97	0	1000	73.3	73.3	0.0	0.0	67.7	2.5	-1.5	0.0	0.0	12.0	0.0	-0.0	-7.4	-7.4
7	623074.97	5052026.20	306.97	0	2000	69.5	69.5	0.0	0.0	67.7	6.6	-1.5	0.0	0.0	14.4	0.0	-0.0	-17.7	-17.7
8	623074.97	5052026.20	306.97	0	4000	64.3	64.3	0.0	0.0	67.7	22.4	-1.5	0.0	0.0	17.1	0.0	-0.0	-41.4	-41.4
9	623074.97	5052026.20	306.97	0	8000	55.2	55.2	0.0	0.0	67.7	79.9	-1.5	0.0	0.0	19.9	0.0	-0.0	-110.8	-110.8

Point Source, ISO 9613, Name: "Trans4", ID: "Trans4"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623039.50	5051878.16	312.93	0	32	36.9	36.9	0.0	0.0	65.6	0.0	-4.9	0.0	0.0	9.5	0.0	-0.0	-33.4	-33.4
2	623039.50	5051878.16	312.93	0	63	56.1	56.1	0.0	0.0	65.6	0.1	-4.9	0.0	0.0	9.4	0.0	-0.0	-14.1	-14.1
3	623039.50	5051878.16	312.93	0	125	68.2	68.2	0.0	0.0	65.6	0.2	3.2	0.0	0.0	1.0	0.0	-0.0	-1.8	-1.8
4	623039.50	5051878.16	312.93	0	250	70.7	70.7	0.0	0.0	65.6	0.6	3.5	0.0	0.0	0.0	0.0	-0.0	0.9	0.9
5	623039.50	5051878.16	312.93	0	500	76.1	76.1	0.0	0.0	65.6	1.0	-0.2	0.0	0.0	1.6	0.0	-0.0	8.0	8.0
6	623039.50	5051878.16	312.93	0	1000	73.3	73.3	0.0	0.0	65.6	2.0	-1.4	0.0	0.0	1.4	0.0	-0.0	5.7	5.7
7	623039.50	5051878.16	312.93	0	2000	69.5	69.5	0.0	0.0	65.6	5.2	-1.5	0.0	0.0	1.5	0.0	-0.0	-1.4	-1.4
8	623039.50	5051878.16	312.93	0	4000	64.3	64.3	0.0	0.0	65.6	17.7	-1.5	0.0	0.0	1.5	0.0	-0.0	-19.1	-19.1
9	623039.50	5051878.16	312.93	0	8000	55.2	55.2	0.0	0.0	65.6	63.2	-1.5	0.0	0.0	1.5	0.0	-0.0	-73.6	-73.6

Point Source, ISO 9613, Name: "Trans5", ID: "Trans5"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623269.96	5051834.55	296.79	0	32	36.9	36.9	0.0	0.0	67.6	0.0	-5.1	0.0	0.0	9.9	0.0	-0.0	-35.4	-35.4
2	623269.96	5051834.55	296.79	0	63	56.1	56.1	0.0	0.0	67.6	0.1	-5.1	0.0	0.0	9.9	0.0	-0.0	-16.3	-16.3
3	623269.96	5051834.55	296.79	0	125	68.2	68.2	0.0	0.0	67.6	0.3	3.7	0.0	0.0	1.1	0.0	-0.0	-4.4	-4.4
4	623269.96	5051834.55	296.79	0	250	70.7	70.7	0.0	0.0	67.6	0.7	3.5	0.0	0.0	1.3	0.0	-0.0	-2.3	-2.3
5	623269.96	5051834.55	296.79	0	500	76.1	76.1	0.0	0.0	67.6	1.3	-0.3	0.0	0.0	5.0	0.0	-0.0	2.5	2.5
6	623269.96	5051834.55	296.79	0	1000	73.3	73.3	0.0	0.0	67.6	2.5	-1.5	0.0	0.0	6.2	0.0	-0.0	-1.5	-1.5
7	623269.96	5051834.55	296.79	0	2000	69.5	69.5	0.0	0.0	67.6	6.5	-1.5	0.0	0.0	6.3	0.0	-0.0	-9.3	-9.3
8	623269.96	5051834.55	296.79	0	4000	64.3	64.3	0.0	0.0	67.6	22.0	-1.5	0.0	0.0	6.3	0.0	-0.0	-30.1	-30.1
9	623269.96	5051834.55	296.79	0	8000	55.2	55.2	0.0	0.0	67.6	78.6	-1.5	0.0	0.0	6.3	0.0	-0.0	-95.8	-95.8

Point Source, ISO 9613, Name: "Trans6", ID: "Trans6"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	623039.34	5051747.59	304.81	0	32	36.9	36.9	0.0	0.0	63.9	0.0	-4.6	0.0	0.0	0.0	0.0	-0.0	-22.3	-22.3
2	623039.34	5051747.59	304.81	0	63	56.1	56.1	0.0	0.0	63.9	0.1	-4.6	0.0	0.0	0.0	0.0	-0.0	-3.2	-3.2
3	623039.34	5051747.59	304.81	0	125	68.2	68.2	0.0	0.0	63.9	0.2	2.8	0.0	0.0	0.0	0.0	-0.0	1.4	1.4
4	623039.34	5051747.59	304.81	0	250	70.7	70.7	0.0	0.0	63.9	0.5	3.6	0.0	0.0	0.0	0.0	-0.0	2.7	2.7
5	623039.34	5051747.59	304.81	0	500	76.1	76.1	0.0	0.0	63.9	0.9	-0.1	0.0	0.0	0.0	0.0	-0.0	11.5	11.5
6	623039.34	5051747.59	304.81	0	1000	73.3	73.3	0.0	0.0	63.9	1.6	-1.3	0.0	0.0	0.0	0.0	-0.0	9.2	9.2
7	623039.34	5051747.59	304.81	0	2000	69.5	69.5	0.0	0.0	63.9	4.3	-1.4	0.0	0.0	0.0	0.0	-0.0	2.8	2.8
8	623039.34	5051747.59	304.81	0	4000	64.3	64.3	0.0	0.0	63.9	14.4	-1.4	0.0	0.0	0.0	0.0	-0.0	-12.6	-12.6
9	623039.34	5051747.59	304.81	0	8000	55.2	55.2	0.0	0.0	63.9	51.4	-1.4	0.0	0.0	0.0	0.0	-0.0	-58.7	-58.7

Point Source, ISO 9613, Name: "Trans7", ID: "Trans7"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	622773.08	5051774.35	308.33	0	32	36.9	36.9	0.0	0.0	61.6	0.0	-4.3	0.0	0.0	0.0	0.0	-0.0	-20.5	-20.5
2	622773.08	5051774.35	308.33	0	63	56.1	56.1	0.0	0.0	61.6	0.0	-4.3	0.0	0.0	0.0	0.0	-0.0	-1.3	-1.3
3	622773.08	5051774.35	308.33	0	125	68.2	68.2	0.0	0.0	61.6	0.1	2.4	0.0	0.0	0.0	0.0	-0.0	4.0	4.0
4	622773.08	5051774.35	308.33	0	250	70.7	70.7	0.0	0.0	61.6	0.4	3.7	0.0	0.0	0.0	0.0	-0.0	5.0	5.0

Point Source, ISO 9613, Name: "Trans7", ID: "Trans7"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
5	622773.08	5051774.35	308.33	0	500	76.1	76.1	0.0	0.0	61.6	0.7	0.0	0.0	0.0	0.0	0.0	-0.0	13.8	13.8
6	622773.08	5051774.35	308.33	0	1000	73.3	73.3	0.0	0.0	61.6	1.2	-1.2	0.0	0.0	0.0	0.0	-0.0	11.6	11.6
7	622773.08	5051774.35	308.33	0	2000	69.5	69.5	0.0	0.0	61.6	3.3	-1.3	0.0	0.0	0.0	0.0	-0.0	5.9	5.9
8	622773.08	5051774.35	308.33	0	4000	64.3	64.3	0.0	0.0	61.6	11.1	-1.3	0.0	0.0	0.0	0.0	-0.0	-7.2	-7.2
9	622773.08	5051774.35	308.33	0	8000	55.2	55.2	0.0	0.0	61.6	39.7	-1.3	0.0	0.0	0.0	0.0	-0.0	-44.8	-44.8