Noise Impact Assessment

Tealing Solar Farm

13/12/2022

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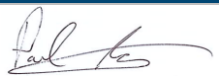
Approved By	Paul Neary	

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1. EXECUTIVE SUMMARY

1.1 This Noise Impact Assessment has been undertaken for a Proposed Development consisting of the installation and operation of a proposed solar farm and ancillary infrastructure on lands north of Ballumbie, Dundee.

1.2 The objectives of the assessment were to identify and describe any likely significant noise effects on key receptors during the operational phase of the Proposed Development.

1.3 In order to assess the potential noise impacts of the Proposed Development, the current baseline characteristics of the Application Site and the surrounding area have been identified as well as the predicted impacts of the Proposed Development and the cumulative impacts with the solar farm to the south.

1.4 A total of 76 noise sensitive receptors were included in the assessment within a Study Area of 500m of the noise generating area of the Application Site. As per the methodology section, where there are a number of residential receptors within close proximity, a representative dwelling or dwellings is/are chosen for full assessment as the impacts will not vary to any significant degree.

1.5 A simulation of noise associated with the Proposed Development was produced using SoundPlan modelling software to predict noise levels for the purpose of undertaking an ISO9613-2 assessment. Source noise levels were modelled based on a candidate noise source.

1.6 An assessment of the acoustic impact of the Proposed Development was undertaken in accordance with BS4142. The results showed Low and Negligible impacts at all receptors within the Study Area.

1.7 In addition to this, the levels at each receptor are below the Night Noise Guideline value of 40dB set out in the WHO Night-time Guidelines. This is the level recommended for the primary prevention of subclinical adverse health effects related to night noise in the population.

2. INTRODUCTION

BACKGROUND

2.1 Neo Environmental Ltd has been appointed by Sirius EcoDev (Tealing) Ltd (the "Applicant") to undertake a Noise Impact Assessment (NIA) for a proposed solar farm and associated infrastructure (the "Proposed Development") on lands north of Ballumbie, Dundee (the "Application Site").

2.2 Please refer to **Figure 1: Appendix A** for the layout of the Proposed Development.

DEVELOPMENT DESCRIPTION

2.3 The proposal is for the construction of PV panels mounted on metal frames, inverters, transformers, battery storage, substation, control buildings, storage buildings new compound, fencing, acoustic barrier, access roads, and associated infrastructure.

SITE DESCRIPTION

2.4 The area of the proposed Development (the "Application Site") lies at an elevation of approximately 99 – 251m AOD and covers a total area of c. 91.22 hectares. It is centred at approximate National Grid Reference (NGR) E 344544 N 737297 and is located c. 2.48km east of the A90 and c.250m west of Chapel Road.

2.5 Comprising of a several fields of agricultural land, the site is currently being used for arable farming. The field itself is bound by a mixture of trees, hedgerows and post-and-wire fencing and stone walls.

SCOPE OF THE ASSESSMENT

2.6 The objectives of this assessment are to identify and describe any likely significant noise effects on key receptors during the operational phase of the Proposed Development.

2.7 In order to assess the potential noise impacts of the Proposed Development, this report identifies the current baseline characteristics of the Application Site and the surrounding area, as well as the predicted impacts. This allows for the identification of potential noise impacts and recommendation of mitigation measures where appropriate.

2.8 This report is supported by the following Appendices:

- Appendix A: Figures
  - Figure 1: Noise Assessment Map

STATEMENT OF AUTHORITY

2.9 This Noise Impact Assessment has been produced by Michael McGhee and David Thomson of Neo Environmental. Having completed a civil engineering degree in 2012, Michael became a technician member of the Institute of Acoustics in 2013 and has since worked on over 100 noise impact assessments, ranging from solar and wind farms to large scale residential developments across the UK and Ireland.

2.10 David has a BSc (Hons) in physics, a MSc in sensor design and a MSc in nanoscience and nanotechnology. He is currently undertaking his Diploma in Acoustics and Noise Control.

3. LEGISLATION

3.1 This assessment has been collated and considered based on the following legislative, planning policy and guidance context:

- The Environmental Protection Act 1990[1]
- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142)[2]
- ISO9613-2 Method for Rating Industrial noise affecting mixed residential and industrial areas[3];
- World Health Organisation (WHO) Guidelines for Community Noise[4]; and
- WHO Night-time Guidelines.[5]

The Environmental Protection Act 1990

3.2 The EPA 1990 specifies mandatory powers available to Local Authorities in respect of any noise that either constitutes or is likely to cause a statutory nuisance, which is also defined in the Act. A duty is imposed on Local Authorities to carry out inspections to identify statutory nuisances, and to serve abatement notices against these. Procedures are also specified with regards to complaints from persons affected by a statutory nuisance.

BS4142:2014+A1:2019

3.3 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature which includes:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;

1 UK Government The Environmental Protection Act, 1990, Available at https://www.legislation.gov.uk/ukpga/1990/43/contents

2 BSI BS 4142+A1:2019 (2019) Methods for rating and assessing industrial and commercial sound.

3 International Standards Organisation (1996) Acoustics – Attenuation of sound during propagation outdoors, Dec 1996

4 World Health Organization (WHO), Guidelines for Community Noise, 1999

5 World Health Organization (WHO), Night Noise Guidelines for Europe, 2009

- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial Application Site.

3.4 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

ISO9613 Part 2

3.5 This International Organisation for Standardisation (ISO) standard specifies an engineering method for calculating the attenuation of outdoor sound during propagation to predict the levels of environmental noise at a distance from a variety of sources.

WHO Guidelines for Community Noise

3.6 The WHO Guidelines for Community Noise sets out specific guideline values for community noise in specific environments. The values relevant to this assessment are:

- An L_{Aeq} of 30dB within bedrooms during night time hours (8 hour period);
- An L_{Aeq} of 35dB within living rooms during day time hours (16 hour period);
- An L_{Aeq} of 50-55dB in gardens during day time hours (16 hour period); and
- An L_{Aeq} of 45 dB outside bedrooms with an open window during night time hours (8-hour period).

WHO Night Time Guidelines

3.7 The WHO Night Time Guidelines recommend updated levels lower than those found in the community noise guidelines. In respect of sleep disturbance, the guidelines recommend:

- 40 dB $L_{night,\ outside}$ Night Noise Guideline (NNG); and
- 55 dB $L_{night,\ outside}$ Interim Target (IT).

3.8 It further states:

"For the primary prevention of subclinical adverse health effects related to night noise in the population, it is recommended that the population should not be exposed to night noise levels greater than 40 dB of $L_{night,outside}$ during the part of the night when most people are in bed. The

LOAEL of night noise, 40 dB $L_{night,outside}$, can be considered a health-based limit value of the night noise guidelines (NNG) necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.

An interim target (IT) of 55 dB $L_{night,outside}$ is recommended in the situations where the achievement of NNG is not feasible in the short run for various reasons. It should be emphasized that IT is not a health-based limit value by itself. Vulnerable groups cannot be protected at this level. Therefore, IT should be considered only as a feasibility-based intermediate target which can be temporarily considered by policy-makers for exceptional local situations."

4. METHODOLOGY

BASELINE CONDITIONS

4.1 A desk-based assessment has been conducted to identify Noise Sensitive Receptors (NSRs) where it is considered that there is potential for increased noise effects due to the Proposed Development.

4.2 Residences closest to the Proposed Development were identified as the key NSRs for the purposes of this assessment. The Study Area included all receptors within 500m of the Application Site (**Figure 1: Appendix A**).

4.3 Where there are a number of residential receptors within close proximity, a representative dwelling or dwellings is/are chosen for full assessment as the impacts will not vary to any significant degree. Where small groups of receptors have been evident, the receptors on either end of the group have been analysed in detail with the worst-case impacts attributed to that receptor.

4.4 No baseline monitoring was conducted due to the relatively low levels of noise produced from solar farms. However, the effects were compared against a background noise level of 25dB, which is typical of a low noise rural night-time setting with no wind.

POTENTIAL EFFECTS

4.5 As the Proposed Development is not yet constructed, it is not possible to complete an onsite survey to measure the actual source noise levels on the Application Site. Therefore, the predicted impacts were calculated using source noise data from the manufacturer of the noise emitting equipment. The data is similar to the type anticipated to be used for the Proposed Development and therefore provided a valid method for calculating sound levels.

4.6 SoundPlan[6] noise modelling software was utilised to determine the noise impact from the Proposed Development. The software allows the user to create a three-dimensional replication of the topographic and structural detail of the assessment area. The user can characterise the ground type, and include further structural detail such as berms, walls and reflective surfaces. The user also assigns relevant Sound Power Levels (LWA) to individual items of plant taking account of percentage on time, etc. This software is industry standard.

4.7 For the purposes of this assessment the noise sources were considered as constant. However, in reality, the noise source will be constant during daylight hours once the Proposed

[6] SoundPLAN International LLC, *Soundplan Noise software, debuting in 1986*. Further information found at http://www.soundplan.eu/english/soundplan-acoustics/

Development is operational and during the night-time period, noise will only be generated from sunrise onward.

4.8 The solar panels have been included in the model as screens because they will act as noise barriers and will block some acoustic transmission paths between the noise sources and the receptors. As the site utilises single access tracker system, the panels have been modelled when they are flat to the horizon, which should be the worst-case scenario for barrier attenuation. A ray trace model within Soundplan was used as part of this assessment to assess reflections from panels that increase the noise propagation and barrier attenuation, which in turn reduces the noise propagation compared with an open field devoid of panels.

4.9 ISO9613-2[7] is an international standard which specifies an engineering method for calculating the attenuation of sound during propagation outdoors, in order to predict the levels of environmental noise at a distance from a variety of sources.

4.10 The ISO9613-2 algorithms take the octave band sound power output of the source as their acoustic input data and calculates on an octave band basis attenuation due to geometric spreading, atmospheric absorption and ground effects. This is the model which was utilised within the software model.

4.11 Where appropriate, a rating penalty was established to correct the specific sound level if a tone, impulse or other characteristic was expected to occur.

4.12 The SoundPlan software model simulates the digital ground model ("DGM"), single point receivers and noise contour lines, to generate noise contour maps for each model simulation. Noise contour maps accurately illustrate noise propagation for the Study Area and can be viewed in Figure 1 and 2: Appendix A.

IMPACT ASSESSMENT

4.13 Once the specific sound levels due to the proposed new sound source were predicted, the rating sound level was calculated, and it is this which was compared to the existing background sound level to determine the level of impact. The rating level was obtained by adding any penalties due to character that may be applicable to the predicted specific sound level.

4.14 Table 4-1 below details how the difference between the rating sound level and background sound level was used to conclude the level of impact under BS 4142, although it should be noted that any assessment is context specific.

[7] International Standards Organisation (1996) *Acoustics – Attenuation of sound during propagation outdoors*

Table 4-1: Magnitude of Impact Criteria

MAGNITUDE OF IMPACT	DEFINITION
High	Rating level is more than 5dB above the background level
Low	Rating level is less than 5dB above the background level
Negligible	Rating level is 10dB or more below the background level

5. BASELINE CONDITIONS

NOISE SENSITIVE RECEPTORS IN THE STUDY AREA

5.1 The co-ordinates of the NSRs can be found in **Table 5-1**. Note that the co-ordinates were taken from the façade of each property closest to the Application Site boundary, which were identified from available mapping sources including Google Earth.

Table 5-1: Noise Sensitive Receptors in Study Area

Name	Easting	Northing
Receptor 1	346791	739896
Receptor 2	346339	739829
Receptor 3	346303	739825
Receptor 4	346277	739812
Receptor 5	346188	739712
Receptor 6	345943	738761
Receptor 7	346615	738677
Receptor 8	345674	737987
Receptor 9	345623	737986
Receptor 10	345887	737882
Receptor 11	345368	737718
Receptor 12	345405	737710
Receptor 13	345433	737701
Receptor 14	345471	737684
Receptor 15	345874	737521
Receptor 16	345457	737212
Receptor 17	345476	737233
Receptor 18	345546	737027

Receptor 19	345591	737044
Receptor 20	346012	736963
Receptor 21	345983	736934
Receptor 22	345325	736510
Receptor 23	345516	735991
Receptor 24	345660	735921
Receptor 25	345628	735904
Receptor 26	345644	735813
Receptor 27	345671	735735
Receptor 28	345737	735722
Receptor 29	345667	735667
Receptor 30	345803	735685
Receptor 31	345755	735615
Receptor 32	345653	735566
Receptor 33	345661	735505
Receptor 34	345621	735455
Receptor 35	345628	735403
Receptor 36	345646	735265
Receptor 37	345283	735849
Receptor 38	345302	735867
Receptor 39	345269	735890
Receptor 40	345280	735908
Receptor 41	344461	735873
Receptor 42	344454	735888
Receptor 43	344625	736022
Receptor 44	344704	736014
Receptor 45	344030	736244
Receptor 46	344238	736402

Receptor 47	344415	736337
Receptor 48	344401	736363
Receptor 49	344425	736369
Receptor 50	344562	736680
Receptor 51	344467	736688
Receptor 52	344403	736693
Receptor 53	344408	736721
Receptor 54	344365	736736
Receptor 55	344241	736740
Receptor 56	344413	736785
Receptor 57	344415	736843
Receptor 58	344411	736908
Receptor 59	344412	736950
Receptor 60	344381	737009
Receptor 61	344421	737022
Receptor 62	344355	737101
Receptor 63	344334	737596
Receptor 64	344310	737609
Receptor 65	344292	737572
Receptor 66	344258	737587
Receptor 67	344750	737499
Receptor 68	344745	737541
Receptor 69	344698	737557
Receptor 70	344710	737638
Receptor 71	344775	737648
Receptor 72	344845	737597
Receptor 73	344927	737585
Receptor 74	344689	738062

Receptor 75	344550	738105
Receptor 76	344504	738105

6. POTENTIAL EFFECTS

6.1 The main sources of sound within the Proposed Solar Farm are the Solar Inverters, the Substation Transformer and the Heating Ventilation and Air Conditioning (HVAC) system for the Battery Containers. Within the Proposed Solar Farm, the solar panels themselves do not generate noise. The main noise source associated with the Proposed Solar Farm will be the 32 Battery Containers and the 38 inverters located around the site.

6.2 The Proposed Development will be in operation during daylight hours only; however, during the summer months, this will mean the noise source will be in operation during the night-time hours of between 4am and 7am. The noise levels of the transformers will change throughout the day, reaching their peak when the solar farm is generating at its maximum power, usually when the sun is high in the sky just after noon. For the purpose of this NIA, continuous operation at peak level is assumed for both day-time and night-time hours as a worst-case scenario.

6.3 Source noise levels are estimated based on research of similar projects and represent the equipment operating at maximum capacity. Predictions based on this data therefore represent a worst-case scenario and the sound levels would be expected to be less when the Proposed Development isn't operating at maximum capacity.

6.4 Table 6-1 shows A-weighted sound power levels of the noise sources which have been included in the noise model.

Table 6-1: Summary of 1/1 Octave Band Centres

Octave Band Centre Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Total
Solar Inverter	56.2	68.2	77.1	71.7	80.3	75.8	83.5	70.1	**86.6**
Substation Transformer	50.8	65.9	72.4	77.8	75	71.2	66	56.9	**81.1**
HVAC System	46.8	64.4	73.4	72.8	71	72.2	69.5	65.9	**79.3**
PCS Unit	39.8	59.9	64.4	72.8	68	78.5	50	44.1	**80.0**

6.5 Should the chosen noise source increase noise levels from that specified in this report then this would be agreed with the Council prior to the construction stage.

RESULTS

6.6 Predicted specific sound levels at nearby properties are detailed in Table 6-2 and an illustrative sound footprint for the Proposed Development is provided in Figure 1 of Appendix A.

6.7 The subjective method for determining rating penalties has been used to determine appropriate rating penalties for each receptor and assessment period. It is considered that the specific sound will not be characterised as intermittent or impulsive, therefore no penalties have been applied for these. Whilst some of the equipment may be tonal, they will not be perceptible at the NSRs in this assessment due to their distances from the Proposed Development.

6.8 Note that a 3dB façade correction is included within the SoundPlan model at each of the receptor locations.

Table 6-2: Predicted Noise Impacts at the NSRs

Receptor	Specific Sound Level ($L_{Ar,Tr}$) dB (Predicted)	Rating Penalty (dB)	Rating Level (dB)
Receptor 1	15.1	0	15.1
Receptor 2	23.7	0	23.7
Receptor 3	24.7	0	24.7
Receptor 4	25.1	0	25.1
Receptor 5	28.6	0	28.6
Receptor 6	18.3	0	18.3
Receptor 7	11.5	0	11.5
Receptor 8	22.7	0	22.7
Receptor 9	23.9	0	23.9
Receptor 10	18.1	0	18.1
Receptor 11	26.6	0	26.6
Receptor 12	25.9	0	25.9
Receptor 13	25	0	25.0
Receptor 14	24.1	0	24.1

Receptor 15	16.8	0	16.8
Receptor 16	24.9	0	24.9
Receptor 17	26.7	0	26.7
Receptor 18	17.8	0	17.8
Receptor 19	16.7	0	16.7
Receptor 20	12.7	0	12.7
Receptor 21	13.1	0	13.1
Receptor 22	21.7	0	21.7
Receptor 23	20.6	0	20.6
Receptor 24	17.1	0	17.1
Receptor 25	17.7	0	17.7
Receptor 26	16.2	0	16.2
Receptor 27	15.1	0	15.1
Receptor 28	13.9	0	13.9
Receptor 29	14.5	0	14.5
Receptor 30	12.9	0	12.9
Receptor 31	13	0	13.0
Receptor 32	13.9	0	13.9
Receptor 33	13.2	0	13.2
Receptor 34	13.1	0	13.1
Receptor 35	12.5	0	12.5
Receptor 36	9.5	0	9.5
Receptor 37	24.8	0	24.8
Receptor 38	24.4	0	24.4
Receptor 39	26	0	26.0
Receptor 40	28.1	0	28.1
Receptor 41	16	0	16.0
Receptor 42	16.3	0	16.3

Receptor 43	19.6	0	19.6
Receptor 44	21	0	21.0
Receptor 45	13.2	0	13.2
Receptor 46	16.6	0	16.6
Receptor 47	20.2	0	20.2
Receptor 48	20.1	0	20.1
Receptor 49	20.9	0	20.9
Receptor 50	26.3	0	26.3
Receptor 51	22.2	0	22.2
Receptor 52	20.2	0	20.2
Receptor 53	20.1	0	20.1
Receptor 54	19.3	0	19.3
Receptor 55	17.1	0	17.1
Receptor 56	19.9	0	19.9
Receptor 57	20.3	0	20.3
Receptor 58	19.6	0	19.6
Receptor 59	19.8	0	19.8
Receptor 60	19.9	0	19.9
Receptor 61	20.9	0	20.9
Receptor 62	21.3	0	21.3
Receptor 63	21.2	0	21.2
Receptor 64	20.6	0	20.6
Receptor 65	20.6	0	20.6
Receptor 66	19.7	0	19.7
Receptor 67	26.1	0	26.1
Receptor 68	25.2	0	25.2
Receptor 69	25	0	25.0
Receptor 70	25.6	0	25.6

Receptor 71	24.4	0	24.4
Receptor 72	23.4	0	23.4
Receptor 73	23.2	0	23.2
Receptor 74	20.9	0	20.9
Receptor 75	18.9	0	18.9
Receptor 76	18.9	0	18.9

7. IMPACT ASSESSMENT

7.1 Table 7-1 compares the predicted rating level with the adopted background noise levels of 25dB which is typical of a rural night-time setting. Although the level of noise from a solar farm will vary across the day, the day-time to night-time levels are assumed to be the same for the purposes of this report, therefore the assessment of night-time levels is seen as a worst-case scenario.

Table 7-1: Noise Impacts against the Guideline Values

Receptor	Rating Level (dB)	Baseline Noise Level (LA90) dB	Exceedance (dB)	Receptor
Receptor 1	15.1	25.0	-9.9	Low
Receptor 2	23.7	25.0	-1.3	Low
Receptor 3	24.7	25.0	-0.3	Low
Receptor 4	25.1	25.0	0.1	Low
Receptor 5	28.6	25.0	3.6	Low
Receptor 6	18.3	25.0	-6.7	Low
Receptor 7	11.5	25.0	-13.5	Negligible
Receptor 8	22.7	25.0	-2.3	Low
Receptor 9	23.9	25.0	-1.1	Low
Receptor 10	18.1	25.0	-6.9	Low
Receptor 11	26.6	25.0	1.6	Low
Receptor 12	25.9	25.0	0.9	Low
Receptor 13	25.0	25.0	0.0	Low
Receptor 14	24.1	25.0	-0.9	Low
Receptor 15	16.8	25.0	-8.2	Low
Receptor 16	24.9	25.0	-0.1	Low
Receptor 17	26.7	25.0	1.7	Low
Receptor 18	17.8	25.0	-7.2	Low

Receptor 19	16.7	25.0	-8.3	Low
Receptor 20	12.7	25.0	-12.3	Negligible
Receptor 21	13.1	25.0	-11.9	Negligible
Receptor 22	21.7	25.0	-3.3	Low
Receptor 23	20.6	25.0	-4.4	Low
Receptor 24	17.1	25.0	-7.9	Low
Receptor 25	17.7	25.0	-7.3	Low
Receptor 26	16.2	25.0	-8.8	Low
Receptor 27	15.1	25.0	-9.9	Low
Receptor 28	13.9	25.0	-11.1	Negligible
Receptor 29	14.5	25.0	-10.5	Negligible
Receptor 30	12.9	25.0	-12.1	Negligible
Receptor 31	13.0	25.0	-12.0	Negligible
Receptor 32	13.9	25.0	-11.1	Negligible
Receptor 33	13.2	25.0	-11.8	Negligible
Receptor 34	13.1	25.0	-11.9	Negligible
Receptor 35	12.5	25.0	-12.5	Negligible
Receptor 36	9.5	25.0	-15.5	Negligible
Receptor 37	24.8	25.0	-0.2	Low
Receptor 38	24.4	25.0	-0.6	Low
Receptor 39	26.0	25.0	1.0	Low
Receptor 40	28.1	25.0	3.1	Low
Receptor 41	16.0	25.0	-9.0	Low
Receptor 42	16.3	25.0	-8.7	Low
Receptor 43	19.6	25.0	-5.4	Low
Receptor 44	21.0	25.0	-4.0	Low
Receptor 45	13.2	25.0	-11.8	Negligible
Receptor 46	16.6	25.0	-8.4	Low

Receptor 47	20.2	25.0	-4.8	Low
Receptor 48	20.1	25.0	-4.9	Low
Receptor 49	20.9	25.0	-4.1	Low
Receptor 50	26.3	25.0	1.3	Low
Receptor 51	22.2	25.0	-2.8	Low
Receptor 52	20.2	25.0	-4.8	Low
Receptor 53	20.1	25.0	-4.9	Low
Receptor 54	19.3	25.0	-5.7	Low
Receptor 55	17.1	25.0	-7.9	Low
Receptor 56	19.9	25.0	-5.1	Low
Receptor 57	20.3	25.0	-4.7	Low
Receptor 58	19.6	25.0	-5.4	Low
Receptor 59	19.8	25.0	-5.2	Low
Receptor 60	19.9	25.0	-5.1	Low
Receptor 61	20.9	25.0	-4.1	Low
Receptor 62	21.3	25.0	-3.7	Low
Receptor 63	21.2	25.0	-3.8	Low
Receptor 64	20.6	25.0	-4.4	Low
Receptor 65	20.6	25.0	-4.4	Low
Receptor 66	19.7	25.0	-5.3	Low
Receptor 67	26.1	25.0	1.1	Low
Receptor 68	25.2	25.0	0.2	Low
Receptor 69	25.0	25.0	0.0	Low
Receptor 70	25.6	25.0	0.6	Low
Receptor 71	24.4	25.0	-0.6	Low
Receptor 72	23.4	25.0	-1.6	Low
Receptor 73	23.2	25.0	-1.8	Low
Receptor 74	20.9	25.0	-4.1	Low

Receptor 75	18.9	25.0	-6.1	Low
Receptor 76	18.9	25.0	-6.1	Low

7.2 The Proposed Development is predicted to have **Low** or **Negligible impacts** at all receptors within the study area. Therefore, mitigation measures are not required.

7.3 In addition to this, the levels at each receptor are found to be below the Night Noise Guideline value of 40dB set out in the World Health Organisation (WHO) Night-time Guidelines. This is the level recommended for the primary prevention of subclinical adverse health effects related to night noise in the population.

8. SUMMARY

8.1 This Noise Impact Assessment has been undertaken for a Proposed Development consisting of the installation and operation of a proposed solar farm and ancillary infrastructure on lands north of Ballumbie, Dundee.

8.2 The objectives of the assessment were to identify and describe any likely significant noise effects on key receptors during the operational phase of the Proposed Development.

8.3 In order to assess the potential noise impacts of the Proposed Development, the current baseline characteristics of the Application Site and the surrounding area have been identified as well as the predicted impacts of the Proposed Development and the cumulative impacts with the solar farm to the south.

8.4 A total of 76 noise sensitive receptors were included in the assessment within a Study Area of 500m of the noise generating area of the Application Site. As per the methodology section, where there are a number of residential receptors within close proximity, a representative dwelling or dwellings is/are chosen for full assessment as the impacts will not vary to any significant degree.

8.5 A simulation of noise associated with the Proposed Development was produced using SoundPlan modelling software to predict noise levels for the purpose of undertaking an ISO9613-2 assessment. Source noise levels were modelled based on a candidate noise source.

8.6 An assessment of the acoustic impact of the Proposed Development was undertaken in accordance with BS4142. The results showed Low and Negligible impacts at all receptors within the Study Area.

8.7 In addition to this, the levels at each receptor are below the Night Noise Guideline value of 40dB set out in the WHO Night-time Guidelines. This is the level recommended for the primary prevention of subclinical adverse health effects related to night noise in the population.

9. APPENDICES

APPENDIX A: FIGURES

- Figure 1: Noise Assessment Map