REPORT REF: 20773R01aPKrmw

NOISE IMPACT ASSESSMENT to DISCHARGE PLANNING CONDIITONS

CHANGE OF USE TO POULTRY PROCESSING PLANT - MAELOR CREAMERY, PICKHILL LANE, CROSS LANES, WREXHAM, LL13 0UE.

CLIENT: Salisbury Poultry (Midlands) Ltd
C/o Cassidy and Ashton
10 Hunters Walk
Canal Street
Chester
CH1 4EB

Report written and prepared by:

Paul Kelly MIOA — Principal Acoustics Consultant

Report checked by:

Ray Woolley MIOA — Managing Director

Date of issue:

Friday 23rd December 2016

Revision Schedule

Report	Date	Comment
20773R01PKrmw	23.12.2016	First issue
20773R01aPKrmw	09.01.2017	Second issue – Amendments further to comment received from Cassidy & Ashton

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Executive Summary

Environoise Consulting Limited have been instructed by Cassidy and Ashton on behalf of Salisbury Poultry (Midlands) Ltd to provide a noise assessment to support the discharge of planning conditions 6 and 10 of the approved planning application (ref: SES P/2015/0838).

The Maelor creamery site at Wrexham is to be converted and expanded to create a poultry processing plant. The conversion will bring additional plant to the site.

To satisfy the Wrexham County Borough Council, noise from plant and HGV deliveries at the site should be controlled so that noise at the nearest residential receptors (NSR) is no more than 5dB above the existing background noise level after the character of the new noise source is considered.

Free-field ambient and background noise levels were measured at positions representative of 3 nearby noise sensitive receptor properties. The noise surveys were done between 09.26hrs on Friday 26th and 14.56hrs on Monday 29th August 2016.

The report advises maximum plant noise limits so that Local Authority target requirements at the nearby NSRs can be met when assessed in accordance with BS4142:2014.

An assessment of plant noise has been done using SoundPLAN® noise modelling software and indicative plant details. An assessment in accordance with BS4142:2014 indicates that the level of plant noise will be in excess of Local Authority target requirements. Where recommended noise mitigation measures for a proposed condenser unit and plant building are implemented, targets requirements will be met at each NSR and Planning Condition 10 will be satisfied. Please note, further assessment maybe required where additional details for proposed plant are confirmed.

An assessment of HGV delivery / despatch noise has been done using SoundPLAN® noise modelling software and trip movements provided in the Transport Statement. An assessment in accordance with BS4142:2014 indicates that the level of HGV noise will meet Local Authority target requirements with no further mitigation measures required. Planning Condition 10 can be considered satisfied.

A noise management plan has been provided. Procedures contained within the plan seek to address potential causes of noise and ‘good practice’ methods to minimise noise disturbance at nearby properties. The plan should be implemented by Management and Planning Condition 6 is satisfied.

1 Introduction

1.1 Overview

1.1.1 Environoise Consulting Limited have been instructed by Cassidy and Ashton on behalf of Salisbury Poultry (Midlands) Ltd, to assess the noise impact of a proposed change of use of an existing site to a poultry processing plant, so that Planning Conditions 6 and 10 of the approved planning application can be discharged.

1.1.2 The Maelor Creamery site at Wrexham is to be converted and expanded to create a poultry processing plant. The conversion will bring additional plant to the site.

1.1.3 Wrexham County Borough Council has given permission for the development[1] subject to 12 conditions, two of which (conditions 6 and 10) relate to noise as follows:

Condition 6

*The development hereby granted permission shall not be used until a noise management plan has been submitted to and approved in writing by the local Planning Authority. The Plan shall include details of the measures and procedures that will be put in place to ensure noise emissions accord with the requirements of condition 09. (*Note: This is an error in the approval document as Condition 9 relates to parking and turning areas and not to noise. Condition 10 relates to noise as shown below) *All measures and procedures set out in the plan as approved shall be put in place prior to first use of the development hereby granted permission and the site shall therefore be operated in strict accordance with the noise management plan as approved.*

Condition 10

*The Rating level of any noise generated by reason of this development shall not exceed the pre-existing background noise level by more than 5 dB(A) at any time. The noise levels shall be determined at nearby noise sensitive premises and measurements and assessment shall be made in accordance with BS4142:2014 Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas. (*Note this is an incorrect title for BS 4142:2014. It should read, “Methods for rating and assessing industrial and commercial sound”)

1.2 Proposed Site Description

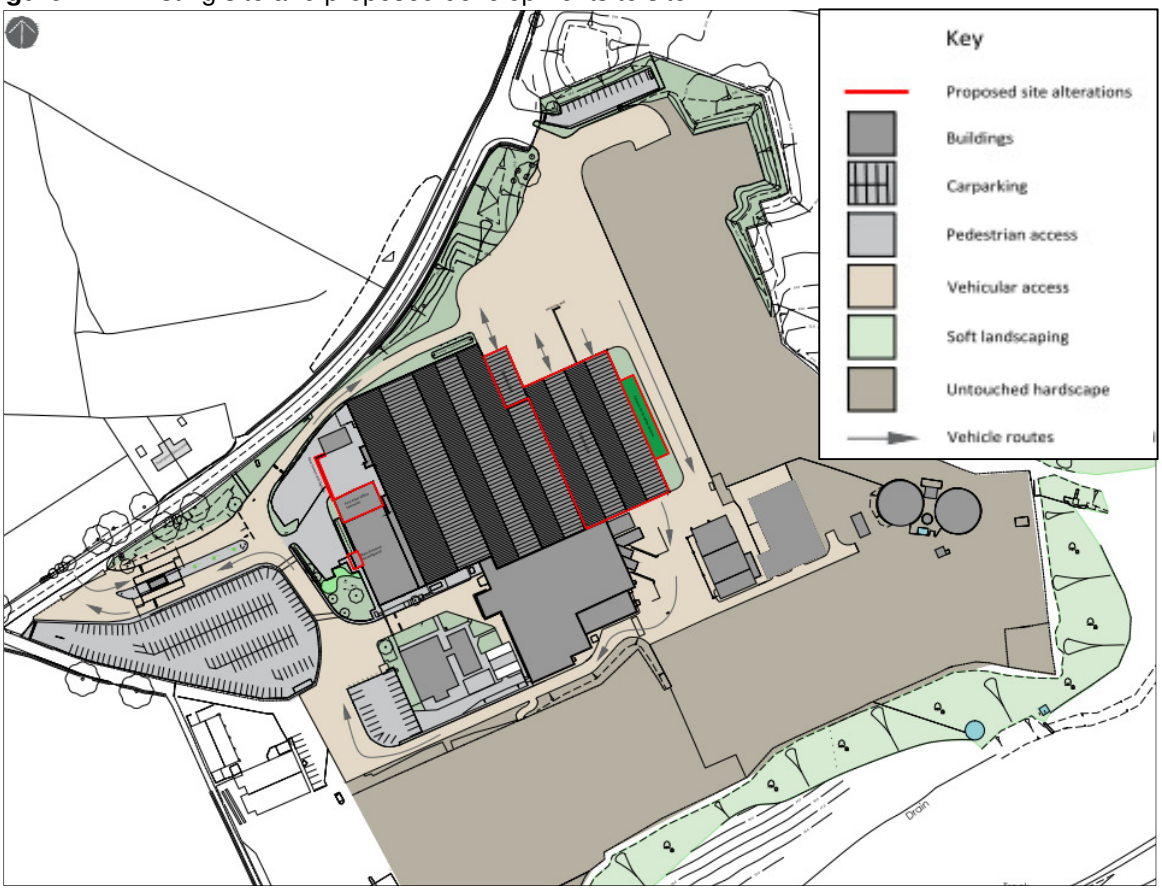
1.2.1 The development utilises some of the existing creamery buildings with the addition of extensions to the north east of the existing site, see Figure 1.1. The proposal includes the following:

- Extension for covered delivery / lairage (2,331m²).
- Extension for covered waste removal area (basement (370m²).
- Extension of office (first floor extension (145m²) under construction.
- Comprehensive re-cladding of key building exterior walls (inclusive of main building, office block and training block).
- Screen (near plant).
- Exhaust air scrubber EMMI (north elevation).

[1] Code Number SES P/2015/0838 and Planning Decision Date 01/02/2016

- Package treatment plant for domestic foul sewage
- Entrance alterations.

Figure 1.1: Existing site and proposed developments to site.



1.2.2 **Hours of Operation:** The facility will operate 7-days a week with a shift pattern over each 24-hour period.

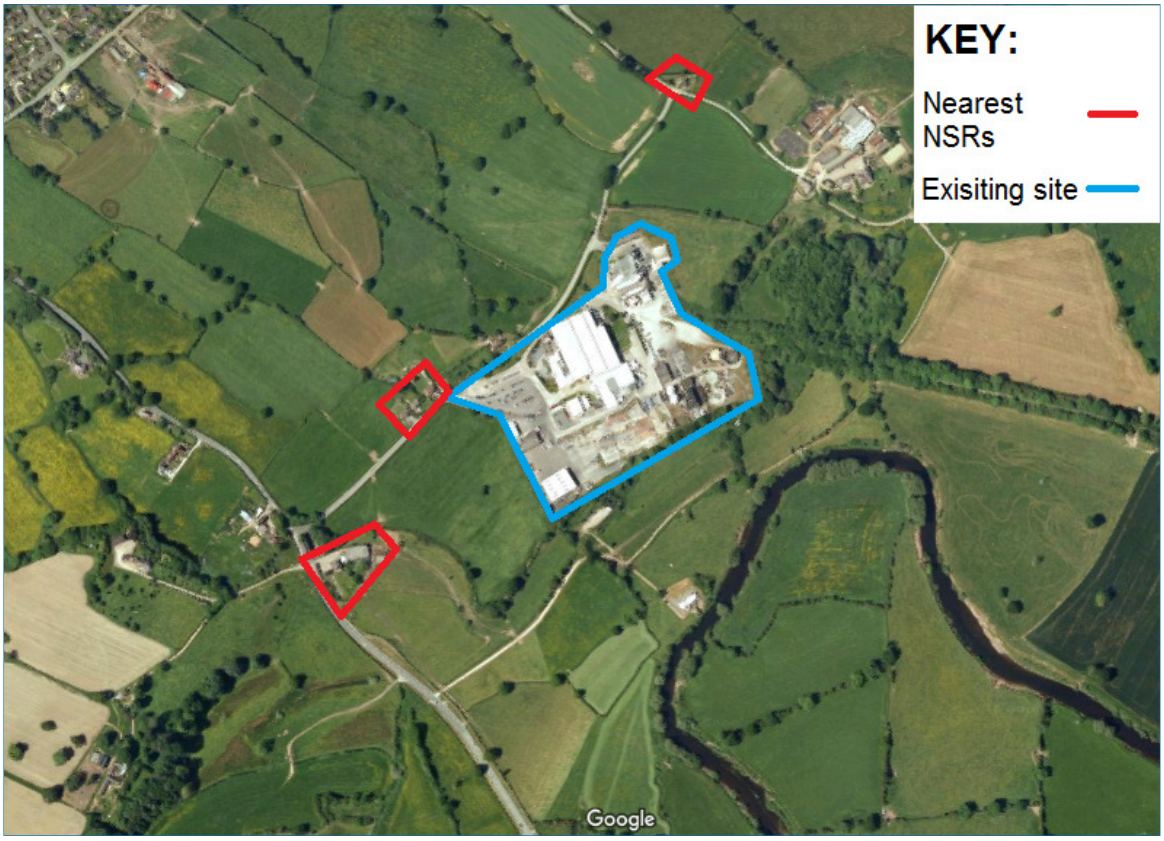
1.2.3 **Number of Staff:** When fully operational it is expected the total staff number will be in the region of 150.

1.3 Noise Sensitive Receptors

1.3.1 There are three noise sensitive receptors (NSRs) considered for assessment, as described below and indicated in Figure 1.2:

- Residential property to the west adjacent to the proposed site on Pickhill Lane approximately 28 metres from the site.
- Porthygan Farm, approximately 280m south west of the site along Pickhill Lane;
- Whitehall Cottage, a residential property located approximately 200m north of the site, on the corner of Pickhill Lane and the A525.

Figure 1.2: Site location and nearest noise sensitive receptors



1.4 Purpose of Assessment

1.4.1 The purpose of this assessment is to establish the prevailing daytime and night-time noise conditions at the nearest residential receptors (NSR) and to assess the potential noise impact of the proposals. If required, noise mitigation measures will be recommended so that the there is no significant adverse impact as a result of the proposals according to guidance given in BS4142:2014.

2 Planning Policy / Legislative Overview

2.1 Local Authority

Condition 10

*The Rating Level of any noise generated by reason of this development shall not exceed the pre-existing background noise level by more than 5 dB(A) at any time. The noise levels shall be determined at nearby noise sensitive premises and measurements and assessment shall be made in accordance with BS4142:2014 Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas. (*Note this is an incorrect title for BS 4142:2014. It should read, "Methods for rating and assessing industrial and commercial sound")

2.2 Operational Noise

Technical Advice Note 11 (TAN 11) Noise

2.2.1 A noise impact assessment is required in accordance with the Welsh Guidance document 'Technical Advice Note 11 (TAN 11) Noise' under Item B17 which recommends the use of BS4142:1990 (now superseded by *BS 4142***:** *2014* – 'Method for rating and assessing industrial and commercial sound'[i] for assessing industrial noise.

2.3 BS4142 Overview

2.3.1 The assessment of noise impact from on-site vehicle movements and loading / unloading activities is typically carried out in accordance with BS4142:2014 'Method for rating and assessing industrial and commercial sound'[i].

2.3.2 BS4142:2014 provides a method of determining the 'impact of specific sound' on dwellings due to industrial and commercial noise sources. The basis of the BS4142 standard is a comparison between the measured modal background noise level (L_{A90}) in the vicinity of residential locations and the rating level of the industrial noise source under consideration. The Rating level ($L_{Aeq,r}$) is the specific noise level plus penalties of up to 18dB added for the subjective characteristic features such as the tonality and impulsivity of the noise.

- BS4142 suggests that a difference between rating level and background noise level at the receptor of +5dB(A) is likely to be an indicator of 'an adverse impact, depending on the context'.
- A difference between Rating level and background noise level at the receptor of +10dB(A) is likely to be an indicator of 'a significant impact, depending on the context'.
- Where the Rating level of the noise source does not exceed the background noise level it is an indicator of 'a low impact, depending on the context'.

2.4 Noise Character Corrections

2.4.1 A rating penalty can be applied to account for the character of the noise, namely tonality, impulsivity and intermittency.

Tonality

2.4.2 Tonality is rated using the Joint Nordic method as listed below:

- +2dB penalty: Just perceptible.
- +4dB penalty: Clearly perceptible.
- +6dB penalty: Highly perceptible.

Impulsivity

2.4.3 The impulsivity is the rapidity of the change in sound level as listed below:

- +3dB penalty: Just perceptible.
- +6dB penalty: Clearly perceptible.
- +9dB penalty: Highly perceptible.

Other sound characteristics

2.4.4 Where the specific sound feature characteristics are neither tonal nor impulsive but distinguishable against the residual noise than a 3dB penalty can be applied

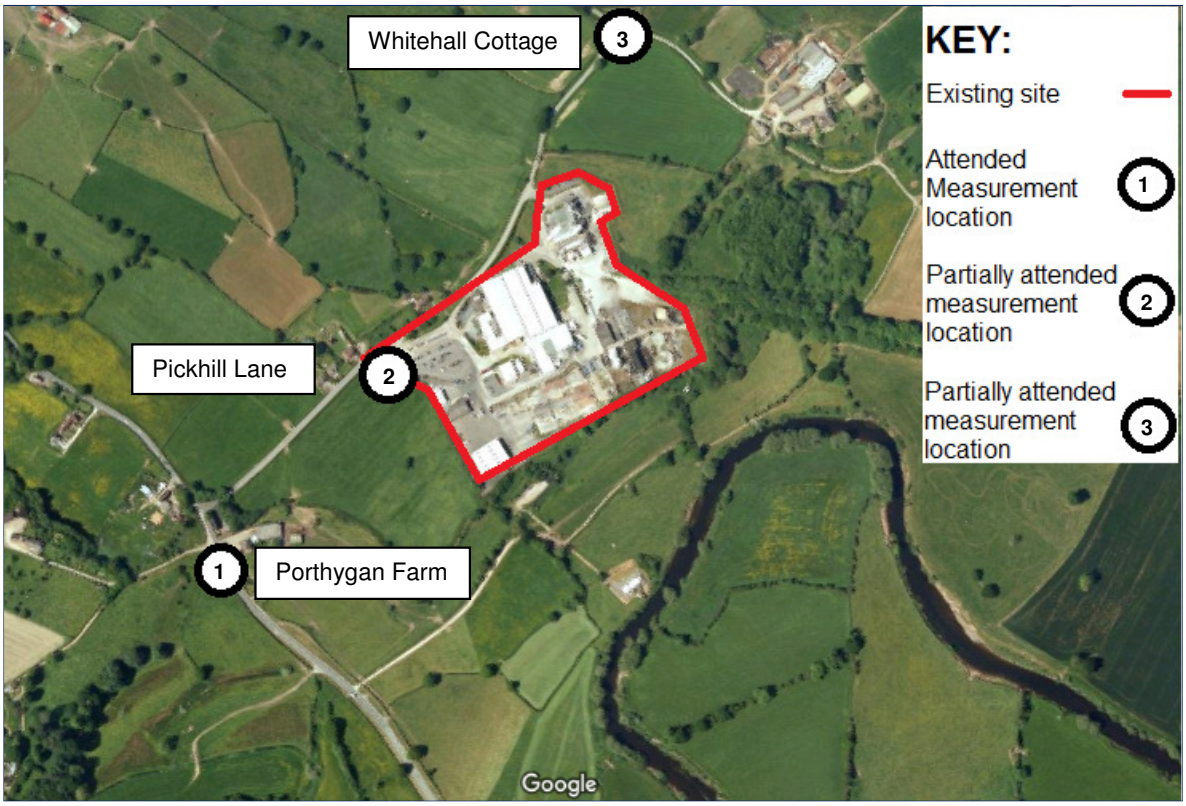
Intermittency

2.4.5 The intermittency is when the specific noise has identifiable on/off conditions where a 3dB penalty can be applied.

3 Noise Surveys

3.1.1 The site location and noise measurement positions are shown in Figure 3.1.

Figure 3.1: Site and noise measurement locations.



3.2 Partially Attended Survey

3.2.1 Noise levels were measured at two partially attended positions during the daytime and night-time between 09.26hrs on Friday 26th and 14.56hrs on Monday 29th August 2016. During attended periods of the noise survey, notes were taken of the noise climate and weather conditions.

3.2.2 Free-field noise levels were measured using a Type 1 sound level meter mounted on a pole at 2m above ground, see Table 3.1 for instrumentation details.

3.2.3 All noise level measurements were made over contiguous 15-minute periods. Overall A-weighted maximum ($L_{Amax,fast}$), ambient ($L_{Aeq,15minutes}$) and background ($L_{A90(15minutes)}$) noise levels were measured as well as associated linear octave band frequencies i.e. ($L_{max,fast}$, $L_{eq,15minutes}$ and $L_{A90(15minutes)}$).

3.2.4 Noise levels and measurement times are shown in Section 4 of this report. All noise surveys were complaint with BS7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures'.

Weather Conditions

3.2.5 The acoustics consultant was near to the site throughout the survey and the reported weather was:

- **Start of noise surveys:** 22°C, 25% cloud cover, dry, wind speed of ≤5m/s.
- **End of noise surveys:** 24^{0}C, 0% cloud cover, dry, wind speed ≤5m/s.

3.2.6 The above weather conditions were acceptable

3.3 Attended Noise Survey

3.3.1 Attended noise level measurements were done between 11.59hrs and 15.59hrs during the daytime and 23.32hrs and 01.32hrs during the night time at the NSR on the corner of Pickhill Lane and the A525.

3.3.2 Free-field noise levels were measured using a hand-held Type 1 sound level meter at a height of 1.2m, see Table 3.1 for instrumentation details.

3.3.3 Overall A-weighted maximum ($L_{Amax,fast}$), ambient ($L_{Aeq,T}$) and background ($L_{A90(T)}$) noise levels were measured as well as associated linear octave band frequencies i.e. ($L_{max,fast}$, $L_{eq,T}$ and $L_{A90(T)}$).

3.3.4 Noise levels and measurement times are shown in Section 4 of this report. All noise surveys were complaint with BS7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures'.

3.4 Weather Conditions

3.4.1 The acoustics consultant was near to the site throughout the daytime and night-time attended surveys and the reported weather was:

Daytime Survey

- **Start of noise survey:** 22°C, 25% cloud cover, dry, wind speed of ≤5m/s.
- **End of noise survey:** 24^{0}C, 0% cloud cover, dry, wind speed ≤5m/s.

Night-time Survey

- **Start of noise survey:** 17°C, 75% cloud cover, dry, wind speed of ≤5m/s.
- **End of noise survey:** 14^{0}C, 50% cloud cover, dry, wind speed ≤5m/s.

3.5 Instrumentation

3.5.1 The instrumentation used is shown in Table 3.1.

Table 3.1: Instrumentation details

Manufacturer	Equipment type	Serial number	Laboratory Calibration date
Partially attended noise survey			
Rion	NA-28 sound level meter	00501401	23rd September 2015
	NH-23 preamplifier	01440	
	UC-59 Microphone	03881	
Rion	NA-28 sound level meter	00501403	18th August 2016
	NH-23 preamplifier	01442	
	UC-59 Microphone	01845	
Rion	NC-34 calibrator with ½" adaptor	34904967	18th August 2016
Attended noise survey			
Rion	NL-52 sound level meter		9th September 2016
	NH-23 preamplifier		
	UC-59 Microphone		
Rion	NC-34 calibrator with ½" adaptor	34904967	18th August 2016

Calibration

3.5.2 The sound level meters were calibrated at the start and end of the noise surveys, there was no recorded drift greater than 0.3dB at 1 kHz and therefore no corrections to measurements are required. The calibration chain is traceable via to National Standards held at the National Physical Laboratory (NPL).

4 Noise Survey Data

4.1 Overview

4.1.1 A summary of the noise survey results are presented in Table 4.1. A time history of results is shown in Appendix B. Other data is available on request.

Table 4.1: Summary of noise results.

Measurement Position	Period	Ambient noise level range [$L_{Aeq,15minutes}$ (dB)]	Background noise level range [$L_{A90\ (15minutes)}$ (dB)]
1	Daytime (12.00 – 16.00hrs, 28th)	62 – 67	36 – 51
	Night-time (23.32 – 01.32, 28th)	31 – 64	27 – 31
2	Daytime (09.26 – 22.56hrs, 26th) (06.56 – 22.56hrs, 27th& 28th) (06.56 – 14.26hrs, 29th)	42 – 62	27 – 46
	Night-time (22.56 – 06.56, 26th, 27th & 28th)	33 – 50	30 – 38
3	Daytime (11.11 – 22.56hrs, 26th) (06.56 – 22.56hrs, 27th& 28th) (06.56 – 14.56hrs, 29th)	23 – 68	17 – 42
	Night-time (23.11 – 06.56, 26th, 27th & 28th)	19 - 53	17– 37

4.2 Background Noise Levels

Representative Value

4.2.1 BS4142:2014 requires that assessment using a 'representative' background noise level should be done and suggests that this can be found by determining the modal value of the noise data set, although other methods can be adopted.

Attended Survey

4.2.2 For the attended survey results, as the assessment is to focus on relatively short time period, we have used the lowest measured daytime and night-time background noise level as the 'representative' value.

Partially Attended Survey

4.2.3 For the partially attended surveys, the representative (modal) background noise level has been determined by calculating the modal value for each weekday (Friday & Monday) and weekend (Saturday only) daytime and night-time period.

4.2.4 Tables 4.2 and 4.3 shows the representative overall A-weighted daytime and night-time background noise values, $L_{A90,15mins}$, as well as the corresponding octave band values, $L_{90,15minutes}$.

Table 4.2: Representative weekday daytime and night-time background noise levels

Measurement Position	Weekday Period	$L_{90,15mins}$ at octave band centre frequency (Hz)							$L_{A90,15mins}$ (dB)
		63	125	250	500	1k	2k	4k	
2	Daytime (Fri 26th & Mon 29th)	39	35	30	28	30	21	12	33
	Night-time (Sun 28th - Mon 29th)	39	37	30	35	24	18	16	33
3	Daytime (Fri 26th & Mon 29th)	38	31	31	29	29	18	10	32
	Night-time (Sun 28th - Mon 29th)	43	34	34	31	23	13	10	32

Table 4.3: Representative weekend daytime and night-time background noise levels.

Measurement Position	Weekend Period	$L_{90,15mins}$ at octave band centre frequency (Hz)							$L_{A90,15mins}$ (dB)
		63	125	250	500	1k	2k	4k	
1	Daytime (12.00 – 16.00hrs, Sun 28th)	40	35	29	31	33	27	24	36
	Night-time (23.32 – 01.32, Sun 28th)	43	40	35	27	20	14	13	27
2	Daytime (Sat 27th)	37	31	29	33	24	13	11	31
	Night-time Fri 26th – Sat 27th	34	31	27	31	18	13	12	29
3	Daytime (Sat 27th)	41	31	25	24	25	17	14	29
	Night-time Fri 26th – Sat 27th	35	27	25	22	18	11	10	24

4.2.5 We have used the values in Tables 4.2 and 4.3 for assessing the noise impact from HGV deliveries and services plant.

5 Noise Model

5.1 Overview

5.1.1 The noise impact of the operational facility will be from four main activities:

- Noise break-out from internal processes.
- Noise egress from external plant.
- Noise from HGVs to and from the site.

5.2 SoundPLAN®

5.2.1 Noise propagation calculations have been done in accordance with ISO 9613-2[2] prediction methodology utilised in Version 7.3 of SoundPLAN® software[3]. The data files and parameters used to create the model are presented in Table 5.1, see also Appendix C, Figure C1.

Table 5.1 SoundPLAN noise model data files and parameters

Input Parameter	Data Source
Base landline map	File supplied Cassidy & Ashton[4]: ref: Site Plan – C3697 L03 Rev P1
Topography	File purchased from emapsite.com: - LIDAR 1m DTM
Receptor positions	Height of 1.5m
Receiver building heights	Assumed 5m (i.e. 2-storeys)
Site building heights	File supplied by Cassidy & Ashton: ref: Elevations – C3697 L07 Rev P1
Ground absorption	The ground absorption setting is 0 (i.e. hard ground such as concrete)
Reflections	Maximum order of reflection is 1
Noise sources	Internal and external plant noise data supplied by client[5]. HGV noise data used from in-house noise data.
Wind direction	Default within the ISO 9613-2 prediction methodology assumes a wind speed of 1m/s and 5m/s from source to receiver.
Relative humidity	70
Temperature	10

5.2.2 External facade construction types and door locations have been obtained from the elevation drawings. The sound reduction performances used are as follows:

[2] ISO 9613-2: Acoustics – Attenuation of Sound during propagation outdoors: Part 2 General method of Calculation
[3] By Braunsetin + Berndt GmbH.
[4] Drawings emailed to Environoise Consulting Limited by Andrew Hale, Cassidy & Ashton.
[5] Noise data emailed to Environoise Consulting Limited by Mulkh Mehta, Salisbury Poultry Ltd.

Standard Façade: (KS1000)

5.2.3 Existing buildings masonry facades are to be lined with a Kingspan KS1000 type cladding system. The sound insulation performance of these systems are typically 25dB R_w[6]. The combined sound insulation performance of these systems where applied to existing double skin brick external walls is predicted to be 55dB R_w[7]

5.2.4 The sound insulation performance of 25dB R_w has been used for the roof system for each building.

Enhanced Façade: (KS1000 inc. Dense Particle / Plasterboard Board Lining)

5.2.5 For proposed extensions, an insulated cladding system is proposed. This offers an enhanced enhanced sound insulation performance of 42dB R_w[7].

Roller Shutter Doors & External Door

5.2.6 The sound insulation performance of standard steel roller shutter doors has been assumed to be 18dB R_w.

5.2.7 The sound insulation performance of external doors to warehouse areas pertinent to the assessment has been assumed to be 25dB R_w. This performance is typical of unsealed doors.

Plant Building

5.2.8 The existing brick plant building is to be lined with a Kingspan KS1000 type cladding system. The sound insulation performance of these systems are typically 25dB R_w. The combined sound insulation performance of these systems where applied to existing double skin brick external walls is predicted to be 55dB R_w.

5.2.9 The roof element of the plant building has been assumed to be ≥150mm concrete achieving a sound insulation performance of 55dB R_w.

5.2.10 The sound insulation performance of the external doors has been assumed to be a minimum of 30dB R_w.

5.2.11 For the assessment of HGV noise, details of proposed deliveries / despatches have been provided[8] and used to determine the numbers per daytime and night-time periods.

[6] Based on data from the Kingspan Acoustic Performance Guide.
[7] Calculated using Marshall Day Acoustics Insul v8.09 sound insulation prediction software.
[8] Mayer Brown Transport Statement dated October 2014 emailed to Environoise Consulting Limited by Andrew Hale, Cassidy & Ashton.

6 Limiting Noise Levels

6.1 HGV and Plant Noise Limits

6.1.1 For the purposes of the HGV and plant noise impact assessments, Tables 6.1 and 6.2 details the highest permissible noise levels when measured at 1m from the nearest residential receptors. These are based on the representative background noise levels detailed in Tables 4.4 and 4.5 and the Local Authority (LA) requirements.

Weekday & Night

Table 6.1: Limiting HGV and Plant noise levels – Weekday and night

NSR	Period	Representative Background Noise Level dB $L_{A90,T}$	LA Requirement dB $L_{Aeq,T}$	Limiting Noise Levels dB $L_{Aeq,T}$
Pickhill Lane	Daytime (07.00 – 23.00)	33	38	38
	Night-time (23.00 – 07.00)	33	38	38
Whitehall Cottage	Daytime (07.00 – 23.00)	32	37	37
	Night-time (23.00 – 07.00)	32	37	37

Weekend Day & Night

Table 6.2: Limiting HGV and Plant noise levels - Weeknight

NSR	Period	Representative Background Noise Level dB $L_{A90,T}$	LA Requirement dB $L_{Aeq,T}$	Limiting Noise Levels dB $L_{Aeq,T}$
Porthygan Farm	Daytime (07.00 – 23.00)	36	41	41
	Night-time (23.00 – 07.00)	27	32	32
Pickhill Lane	Daytime (07.00 – 23.00)	31	36	36
	Night-time (23.00 – 07.00)	29	34	34
Whitehall Cottage	Daytime (07.00 – 23.00)	29	34	34
	Night-time (23.00 – 07.00)	24	29	29

6.1.2 It should be noted that the plant noise limits quoted in Tables 6.1 and 6.2 are the highest allowable noise levels from all proposed HGV's and fixed plant associated with the development. Care should be taken to ensure that these limits are met with all plant in operation simultaneously.

7 Plant Noise Impact Assessment

7.1 Internal & External Plant Noise

7.1.1 Plant details and associated sound pressure levels are presented in Table 7.1. Noise level data has been extrapolated to a measurement distance of 1m and used in the SoundPLAN model.

7.1.2 Plant details are indicative at this stage. Further assessment will be required once details of all plant items are confirmed. We understand that these plant items will mostly be housed internally and as such we have assumed an average internal warehouse / factory reverberant noise level of 75dB(A) in accordance with the Noise at Work Regulations 2005 (i.e. <80dB(A)).

Table 7.1 Plant details and associated sound pressure levels

Equipment	Location	Sound pressure level at 1m dB(A)
Condenser (x1)	O/S plant room building	85
Compressor (x2)	I/S plant room building	88
Motor (x2)	I/S plant room building	89
Air blowers (x2)	Effluent Treatment Plant	79
Not yet known	Internal factory noise level (assumed in accordance with Noise at Work Regulations 2005	75

7.1.3 The provided sound pressure level data has been used to help predict the noise break-out from each of the industrial buildings in the SoundPLAN model and noise egress from external plant on the site.

7.1.4 In order to do this, the situation has to be created in SoundPLAN which replicates each source position, its size and orientation across the model area, see Appendix C, Figure C2.

7.1.5 Overall A-weighted sound pressure levels were then applied as 'area' sources to each of the building surfaces, having taken into account the attenuation offered by the structure of the building cladding and weaknesses such as doors.

7.2 Noise Impact Assessment

Calculations

7.2.1 The results of the SoundPLAN plant noise assessment have been compared to the limiting plant noise limits provided in Tables 6.1 and 6.2 in order to determine compliance with Local Authority requirements and the level of noise mitigation, if required, see Tables 7.2 to 7.5. We understand[9] that proposed production hours are between 07.00 – 16.00 hours. Therefore, an assessment for the daytime (07.00 – 23.00) period has been done. There is potential for the site to operate 24 hours in the future and therefore an assessment to the night-time (23.00 – 07.00) period has also been done.

7.2.2 BS4142:2014 suggests an impulsivity and tonality feature correction of 0 to 9dB each depending on how perceptible the noise is. The combined external and internal plant noise at each NSR is likely to

[9] E-mail from Mulkh Mehta, Salisbury Poultry Ltd to Paul Kelly, Environoise Consulting Limited on 18th November 2016.

be continuous and broadband. However, for a robust assessment, we have assumed potential impulsive or tonal characteristics. Considering the existing usage of the proposed development site and the likely continuous broadband nature of the combined plant noise, we have used a correction of +3dB for 'just perceptible' impulsivity noise and 2dB for 'just perceptible' tonality noise. A total correction of +5dB (i.e. 3 + 2) has therefore been applied to the calculated specific noise levels.

Daytime - Weekday

Table 7.2: Weekday daytime plant noise impact assessment

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	21	38	25
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	5	5	5
Rating Level dB(A)	26	43	30
Limiting Noise Level dB(A)	41*	38	37
Level of Excess dB	0	5	0
Conclusion	No Mitigation Required	Mitigation Required	No Mitigation Required

*No weekday data is available and therefore the weekend day value has been used.

Daytime - Weekend

Table 7.3: Weekend daytime plant noise impact assessment

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	21	38	25
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	5	5	5
Rating Level dB(A)	26	43	30
Limiting Noise Level dB(A)	41	36	34
Level of Excess dB	0	7	0
Conclusion	No Mitigation Required	Mitigation Required	No Mitigation Required

Night-time – Weekday

Table 7.4: Weekday night-time plant noise impact assessment

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	21	38	25
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	5	5	5
Rating Level dB(A)	26	43	30
Limiting Noise Level dB(A)	32*	38	37
Level of Excess dB	0	5	0
Conclusion	No Mitigation Required	Mitigation Required	No Mitigation Required

*No weeknight data is available and therefore the weekend day value has been used.

Night-time – Weekend

Table 7.5: Weekend night-time plant noise impact assessment

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	21	38	25
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	5	5	5
Rating Level dB(A)	26	43	30
Limiting Noise Level dB(A)	32	34	29
Level of Excess dB	0	9	1
Conclusion	No Mitigation Required	Mitigation Required	Mitigation Required

7.3 Discussion

Daytime – Weekday & Weekend

7.3.1 As can be seen in Tables 7.2 and 7.3, plant noise impact at Porthygan Farm and Whitehall Cottage meets local authority target requirements and as such no mitigation measures are required for the considered plant items. However, for the dwelling on Pickhill Lane, target criteria is exceeded by up to 7dB. The excess is attributed to the external condenser unit and noise from the plant building and as such, further mitigation measures are necessary. Recommendations are provided in Section 9 of the report.

Night-time – Weekday & Weekend

7.3.2 Should proposed plant items operate into the night-time period, Table 7.4 shows that target requirements are met for both Porthygan Farm and Whitehall Cottage during the week. However as can be seen in Table 7.5, during the weekend there is an excess of 9dB at Pickhill Lane and 1dB at Whitehall Cottage.

7.3.3 The excess at Pickhill Lane is attributed to the external condenser unit and noise from the plant building and as such, further mitigation measures are necessary. Recommendations are provided in Section 9 of the report. At Whitehall Cottage, the excess is attributed to break-out noise from the extension building. An excess of 1dB is considered negligible and as such no further mitigation measures are considered necessary.

8 Delivery Vehicle Noise Assessment

8.1 Overview

8.1.1 We understand that HGV movements are to occur between 07.00 to 16.00 hours, Monday to Friday[10] with reduced movements during the weekend. The delivery / despatch process is described in detail in the Transport Statement[11] as follows:

"The delivery of produce will involve fully loaded vehicles (approximately 45 per week) arriving at the site and then departing empty. The collection of final processed products will involve a similar number of empty vehicles (approximately 45 per week) arriving at the site and then departing fully loaded. In total, it is anticipated that there would be 180 HGV movements per week associated with this operation".

"It is likely, as per the previous application, that the majority of operational vehicle activity will take place during the week (80%) with less activity (20%) at weekends. Applying this breakdown to the total number of HGV movements per week results in around 144 HGV movements between Monday and Friday, with around 29 HGV movements on an average weekend.

"Operational trips are likely to travel outside of the network peak periods and would be coordinated by site management into specific arrival slots to promote efficient operations. It is therefore considered that the trip impact during the network peak times would be minimal. Throughout the remainder of the day, the average number of HGV movements per hour is around 4 vehicles which is not considered would have an adverse impact upon the operation of the local highway network".

8.1.2 The average weekday HGV movements are shown in Table 8.1.

Table 8.1 Average weekday HGV movements.

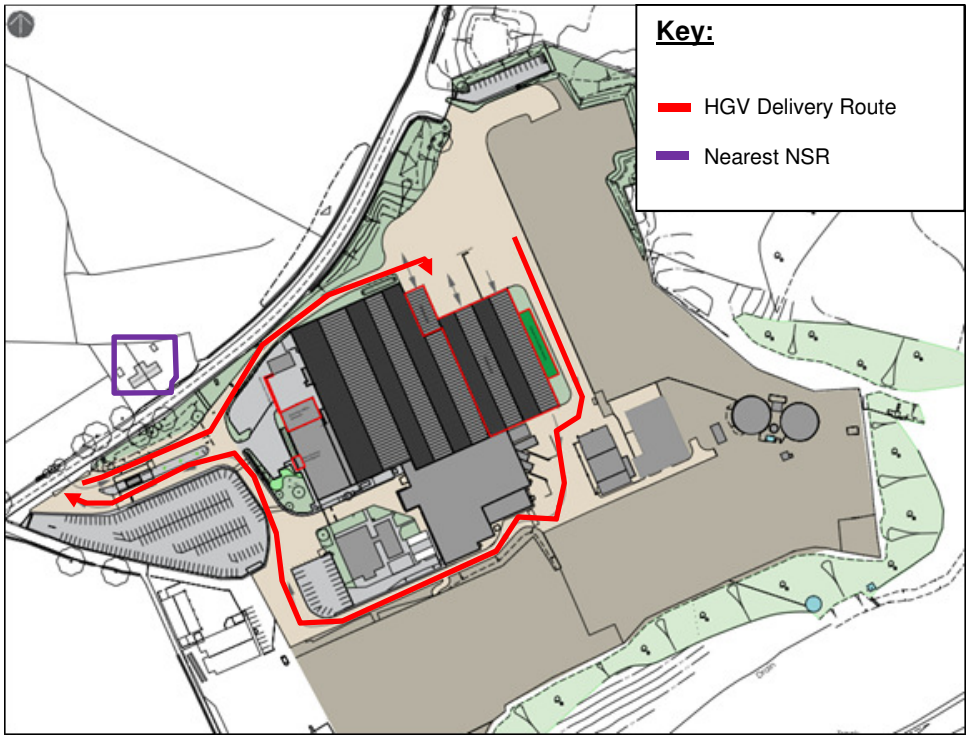
	Arrivals	Departures
Delivery of produce	7	7
Collection of final products	7	7

8.2 On-site HGV Noise

8.2.1 Deliveries and collections will occur during the daytime period along the routes as indicated in Figure 8.1.

[10] E-mail from Mulkh Mehta, Salisbury Poultry Ltd to Paul Kelly, Environoise Consulting Ltd.
[11] Transport Statement ref: NW/CA/WREXHAM.1 dated October 2014 produced by Mayer Brown.

Figure 8.1: Indicative layout of HGV paths.



8.2.2 We have based our noise assessment on the assumption that there will be no more than 2 HGV deliveries & 1 despatch in any weekday daytime 1-hour period (i.e. 3 movements). For the weekend daytime period, we have considered 1 HGV delivery and 1 despatch in any 1-hour period (i.e. 2 movements. The HGV routes have been modelled in SoundPLAN model, see Appendix C, Figure C3.

8.2.3 The calculation for determining the level of HGV noise events listed in Table 6.1 has been done using the following formulae in SoundPLAN:

$L_{Aeq,T} = L_w - 20 \times \log (R_2/R_1) + 10 \times \log (n/t)$

Where:

L_w = event noise level of event (dB)
R_1 = Noise measurement distance from source (m)
R_2 = Distance to 1m from nearest NSR (m)
n = number of events occurring in t (seconds).

8.3 Noise Impact Calculation

8.3.1 The results of the SoundPLAN on-site HGV noise assessment at the nearest NSRs has been compared to the limiting plant noise limits provided in Tables 6.1 and 6.2 in order to determine compliance with Local Authority requirements for the daytime (07.00 – 23.00) period and the level of noise mitigation, if required, see Tables 8.2 and 8.3.

8.3.2 HGV delivery noise can be considered to be impulsive. BS4142:2014 suggests an impulsivity feature correction of 0 to 9dB depending on how perceptible the noise is. For a robust assessment and

considering the existing urban / industrial noise environment and the proximity of the proposed site to the NSRs, we have considered a penalty of 6dB for 'clearly perceptible' noise.

Daytime - Weekday

Table 8.2: Daytime HGV noise impact assessment at NSRs - Weekday

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	6	31	10
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	6	6	6
Rating Level dB(A)	12	37	16
Limiting Noise Level dB(A)	41*	38	37
Level of Excess dB	0	0	0
Conclusion	No Mitigation Required	No Mitigation Required	No Mitigation Required

*No weekday data is available and therefore the weekend day value has been used.

Daytime - Weekend

Table 8.3: Daytime HGV noise impact assessment at NSRs - Weekend

	Nearest NSR		
	Porthygan Farm	Pickhill Lane	Whitehall Cottage
Specific Noise Level dB(A)	5	29	8
Acoustic Feature Correction (e.g. tonal, intermittent, impulsive noise) dB	6	6	6
Rating Level dB(A)	11	35	14
Limiting Noise Level dB(A)	41	36	34
Level of Excess dB	0	0	0
Conclusion	No Mitigation Required	No Mitigation Required	No Mitigation Required

8.3.3 As can be seen in Tables 8.2 and 8.3, the predicted Rating level of HGV delivery noise does not exceed the representative background noise level at the NSRs during the weekday and weekend periods. In accordance with BS4142:2014, this indicates a 'low impact' and complies with the Local Authority requirements. Therefore, no further mitigation measures are necessary. However, best practices should be followed so that noise is not unduly generated, see section 10.

9 Recommendations

9.1 Overview

9.1.1 Plant noise at the NSR on Pickhill Lane exceeds target requirements by up to 7dB during the daytime and up to 9dB should plant operate during the night-time period. The excess is attributed to the external condenser unit situated to the south east of the plant building enclosed by the 5m screen and from plant within the plant building.

9.1.2 To achieve noise level targets, plant noise should be reduced by 7dB for the daytime and 9dB for the night-time respectively. Recommendations for noise mitigation are provided below. Please note, further recommendations maybe required when further details of plant are known.

9.2 Condenser Unit

9.2.1 We recommend the following options for noise mitigation:

- Substitute proposed condenser unit for a 'quieter' model. A unit achieving a daytime sound pressure level of 76dBA at 1m and a night-time sound pressure level of 70dBA at 1m. Night-time noise reductions can be achieved with a condenser unit incorporating a night-mode setting.

  Alternatively,

- Attenuators or an acoustic shroud is fitted to the condenser unit achieving a minimum sound reduction of 9dBA for the daytime period and 15dBA should the unit operate during the night-time period.

9.2.2 In addition to the above, the condenser unit should be installed as close as possible to the plant building or 5m screen so that the level of shielding provided by the building / barrier is maximised.

9.3 Plant Building

9.3.1 We recommend the following noise mitigation measures for the plant building:

- The plant room door on the south façade should be rated at ≥40dB R_w with acoustic seals at the perimeter and threshold. The plant room door to the south-east façade should be rated at ≥35dB R_w again with acoustic seals at the perimeter and threshold.

  Suitable example doors achieving the required sound insulation performances can be found at: http://www.clarkdoor.com/steel-hinged.

- Vent openings should not be located on the facades directly facing the NSR on Pickhill Lane. Any vents should be on the south east facing façade overlooking the external plant enclosure.

- We have considered 3 vent openings in the façade. Based on this, each vent should be designed to maintain a sound insulation performance of ≥39dB R_w. The M&E Engineer should be consulted to specify a suitable system to achieve the required noise reductions. Such systems are likely to include acoustically louvered panels, cross-talk attenuators, and / or in-duct silencers.

Suitable example manufacturers for acoustic louvers are IAC http://www.iac-noisecontrol.com/uk/commercial-construction/air-movement/noishield-acoustic-louvres.

Suitable example manufacturers for silencers / cross-talk attenuators are Caice http://www.caice.co.uk/home/content/attenuators

10 Noise Management Plan

10.1 HGV Best Practice

10.1.1 The following advisory measures are recommended to reduce noise impacts:

- Low volume broadband white noise reversing alarms should be used.
- Reduce vehicle speed where appropriate to avoid excessive bumping and jolting particularly on more uneven surfaces around the site.
- Effective preparation and maintenance of the vehicle area surfaces to minimise potholes and other defects.
- Loading bay shutter doors gates should be closed once HGV have manoeuvred into the loading bay and engine switched off.
- When departing, HGV engines should be switched on prior to the opening of loading bay shutter doors.
- HGV engines should not be left to idle.

10.1.2 For the management of deliveries and noise, reference should be made to the Department of Transport's - Quiet Deliveries Good Practice Guidance – Key Principles and Processes for Community and Resident Groups, February 2015 document - https://www.gov.uk/government/publications/quiet-deliveries-demonstration-scheme

10.2 Fork Lift Trucks

10.2.1 The following advisory measures are recommended to reduce noise impacts:

- Surfaces on which FLTs operate are free from bumps and steps so that shocks to the fork suspension do not cause impulsive noises.
- Where practicable (i.e. between trailers and delivery points) clearly mark work-site routes for the FLTs so that rough or uneven surfaces are avoided.

10.3 Unit Management

- It is important to reduce noise impact that an open dialogue is kept with nearby residents and any concerns they have in relation to noise are dealt with and followed up.
- Employees should be made aware and instructed to minimise noise break-out from all warehouse and factory areas.
- Management of the loading bays should introduce procedures to reduce the possibility of shutter doors and plant room doors being left open, drivers slamming doors, leaving engines idling, having radios on loud and causing unnecessary noise.
- Reduce the time spent for HGV's waiting at entrance gates by opening prior to HGV arrival or immediately upon arrival to minimise the impact of noise generated by engine idling.
- Ensure items of plant are regularly maintained so that noise is not unduly generated.

11 Conclusions

11.1 Noise from Services Plant

11.1.1 Predicted noise from considered plant items will exceed Local Authority target requirements at the nearby residential property on Pickhill Lane assessed in accordance with BS 4142:2014.

11.1.2 Where recommended mitigation measures are implemented, target requirements will be met at each nearby residential property and Planning Condition 10 will be satisfied.

11.2 Noise from Deliveries

11.2.1 Predicted noise from HGV deliveries indicates that the level of noise generated will meet Local Authority target requirements at nearby residential properties assessed in accordance with BS 4142:2014. Therefore, Planning Condition 10 is satisfied.

11.3 Noise from Deliveries

11.3.1 A noise management plan has been provided. Procedures contained within the plan seek to address potential causes of noise and methods to minimise noise disturbance at nearby properties. The plan should be implemented by Management and Planning Condition 6 is satisfied.

Appendix A: Acoustic Terms

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in Pascal, Pa). Because if this wide range a noise level scale based on logarithms is used in noise measurement called the decibel (dB) scale. Audibility of sound covers a range of approximately 0 to 140 dB.

The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure noise is weighted to represent the performance of the ear. This is known as the 'A weighting' and annotated as dB (A). Table 8 lists the sound pressure level in dB (A) for common situations.

Table A1: Noise levels for common situations.

Typical noise level dB(A)	Example
0	Threshold of hearing
30	Rural area at night, still air
40	Public library, refrigerator humming at 2m
50	Quiet office, no machinery, Boiling kettle at 0.5m
60	Normal conversation
70	Telephone ringing at 2m, Vacuum cleaner at 3m
80	General factory noise level, heavy goods vehicle from pavement
90	Powered lawn motor, operators ear
100	Pneumatic drill at 5m
120	Discotheque – 1m in front of loudspeaker
140	Threshold of pain

The noise levels at a measurement point are rarely steady, even in rural areas, and vary over a range dependent upon the effects of local noise sources. Close to a busy motorway, the noise levels may vary over a range of 5 dB(A), whereas in a suburban area this may increase up to 40 dB(A) and more due to the multitude of noise sources in such areas (cars, dogs, aircraft etc.) and their variable operation. Furthermore, the range of night-time noise levels will often be smaller and the levels significantly reduced compared with daytime levels. When considering environmental noise, it is necessary to consider how to quantify the existing noise (the ambient noise) to account for these second to second variations.

Human subjects are generally only capable of noticing changes in steady levels of no less than 3 dB(A). It is generally accepted that a change of 10 dB(A) in an overall, steady noise level is perceived to the human ear as a doubling (or halving) of the noise level. (These findings do not necessarily apply to transient or non-steady noise sources such as changes in noise due to change in road traffic flow, or intermittent noise sources). The equivalent continuous A-weighted sound pressure level, L_{Aeq}, is the single number that represents the average sound energy measured over that period. The L_{Aeq} is the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period. It is commonly used to express the energy value from individual sources that vary in level over their operational cycle.

Appendix B: Noise Data

Figure B.1: Time History of measured noise levels for partially attended survey at position 2.

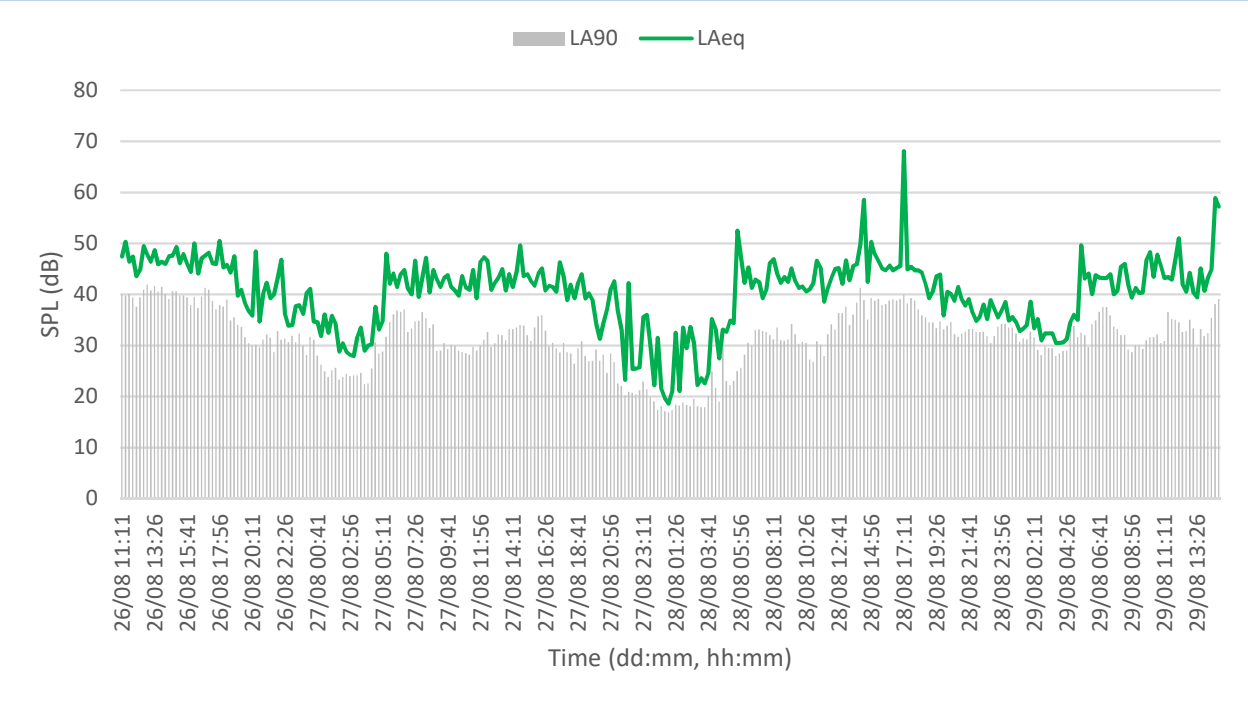


Figure B.2: Time History of measured noise levels for partially attended survey at position 3.

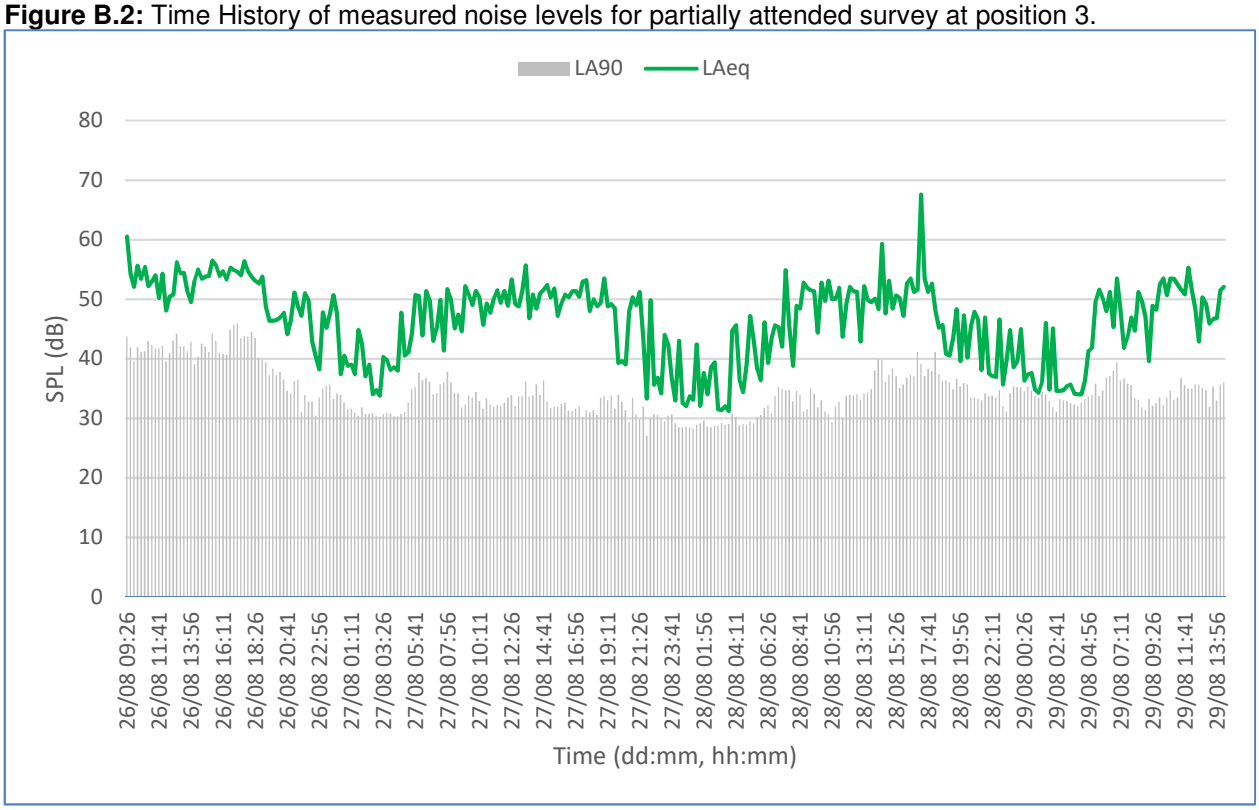


Figure B.2: Time History of measured daytime noise levels for attended survey at position 1.

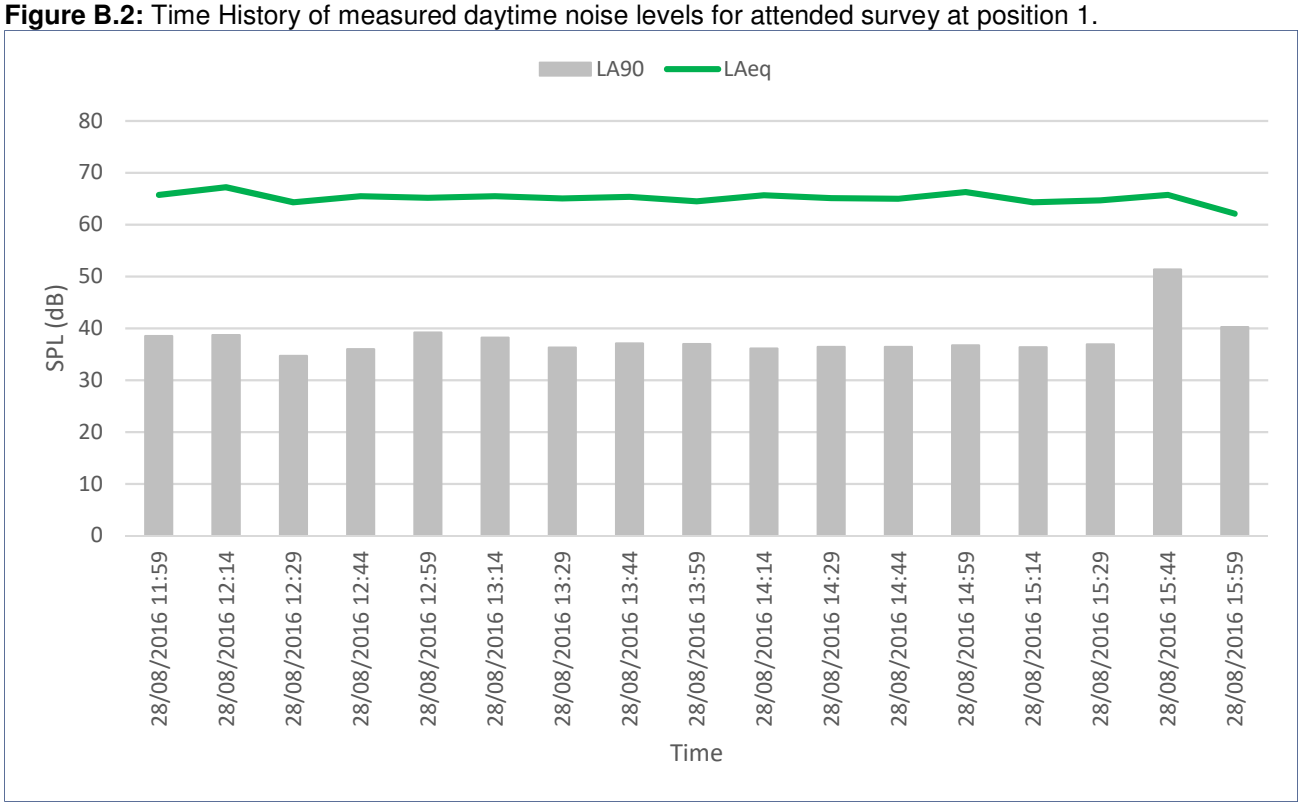
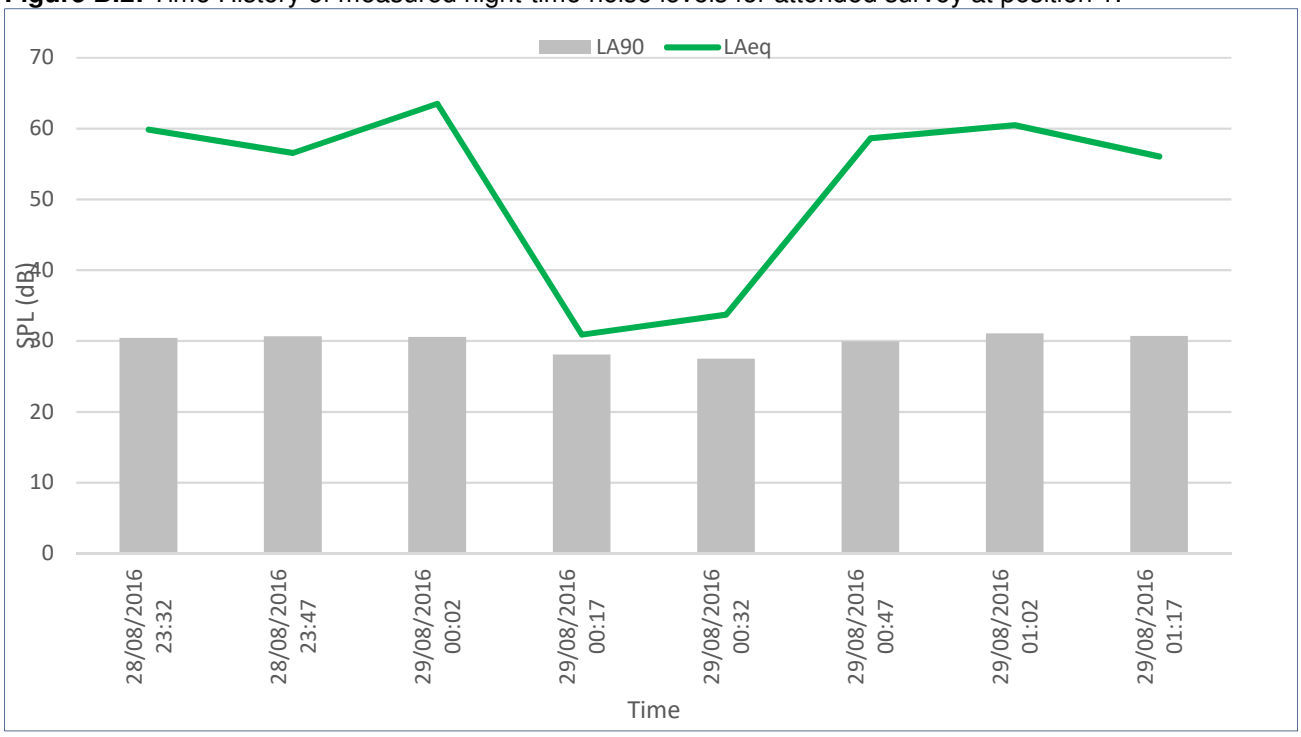


Figure B.2: Time History of measured night-time noise levels for attended survey at position 1.



References

[i] BS4142:2014 'Method for rating and assessing industrial and commercial sound

Appendix C: Noise Model

Figure C.1: SoundPLAN noise model - 3D View

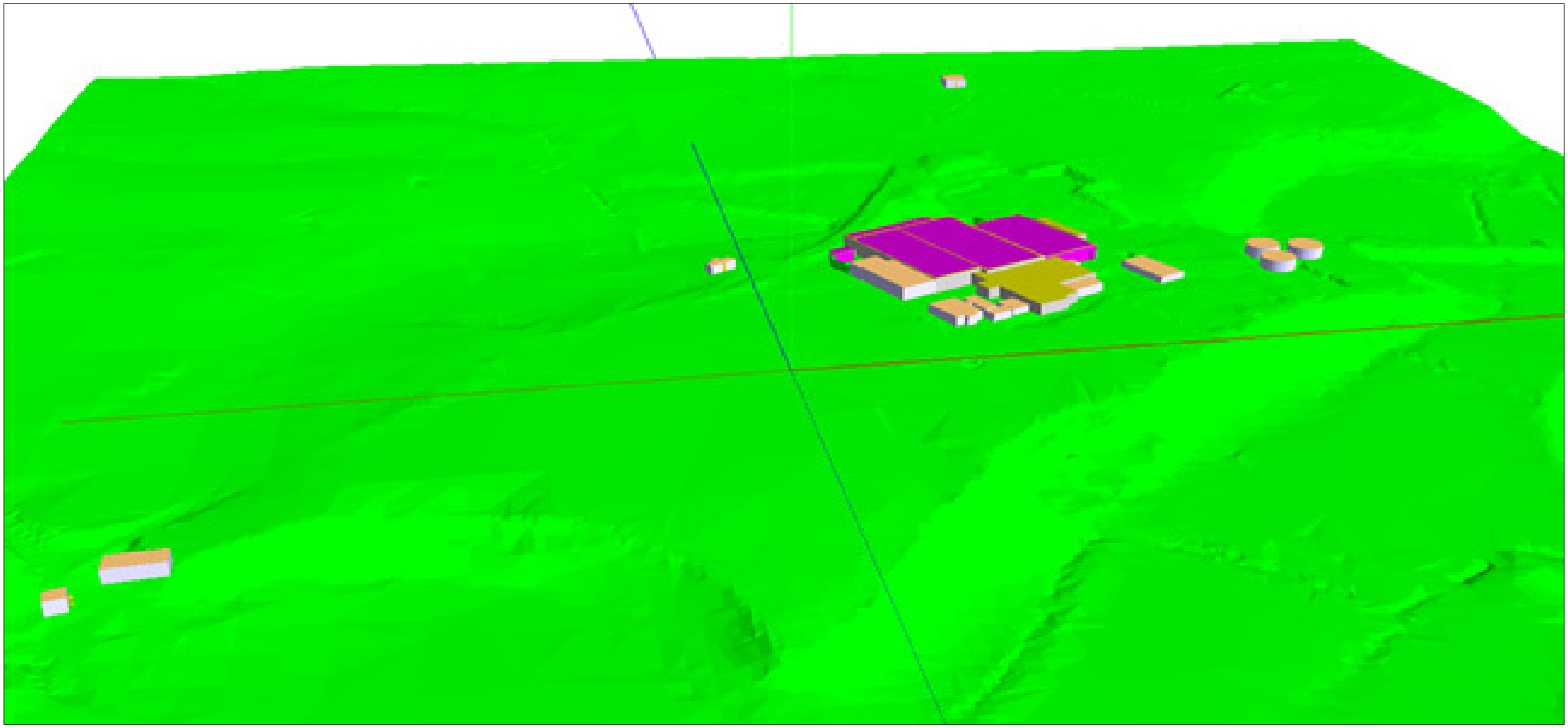


Figure C.2: SoundPLAN noise map – Plant noise

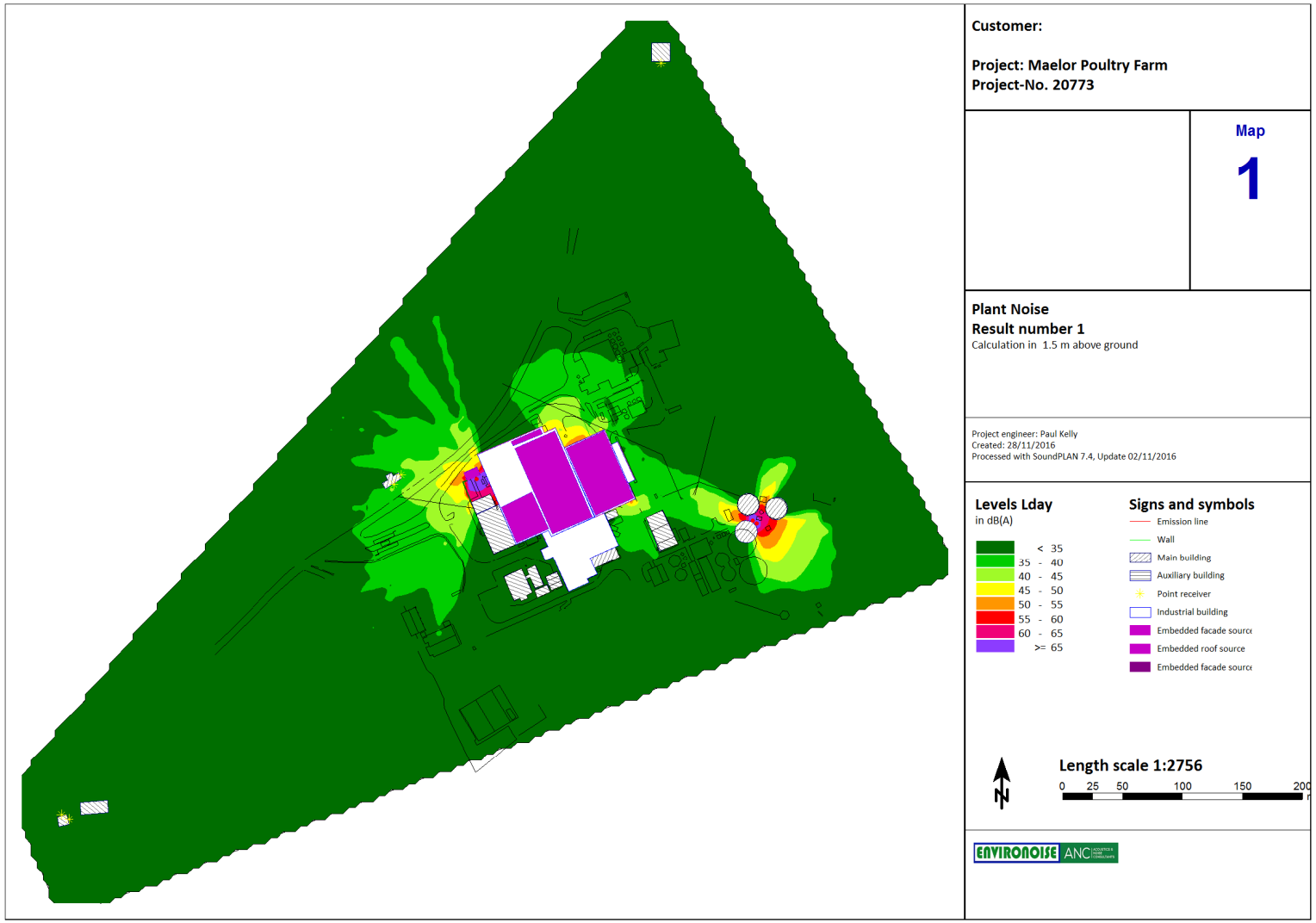


Figure C.3: SoundPLAN noise map – HGV noise