

Appendix 18

Maelor Foods Expansion, Pickhill Ln, Cross Lanes, Wrexham LL13 0UE

Noise Impact Assessment

for Salisbury Poultry Ltd, Salisbury House, Vulcan Road, Bilston, WV14 7HT

Our Reference	Your Reference	Issue Date	Author	Approver	Revision History
21705R01JBPK	-	16/03/2022	Jake Brickley AMIOA	Paul Kelly MIOA	1 st issue
21705R01aJBPK	-	18/05/2022	Jake Brickley AMIOA	Paul Kelly MIOA	2 nd issue – following comments from Maelor Foods and receipt of further plant information
21705R01bPKSW	-	10/08/2022	Paul Kelly MIOA	Sam Williams MIOA	3 rd issue – Section 6 updated following comments from Cassidy & Ashton on 14.07.2022
21705R01cJBPK	-	08/09/2022	Jake Brickley AMIOA	Paul Kelly MIOA	4 th issue – Section 4 updated following plant noise survey and further comments from Cassidy & Ashton on 31.08.2022

Executive Summary

Environoise Consulting Limited has been instructed by Salisbury Poultry Limited to do a noise impact assessment for the proposed expansion of operations at Maelor Foods, Pickhill Lane, Cross Lanes, Wrexham LL13 0UE.

The key report findings are as follows:

- A previous noise survey was undertaken between 13.00hrs, Monday 13th July and 08.45hrs, Thursday 16th July 2020 to determine background noise levels at the nearest three residential receptors ($L_{A90}(15min)$).

Plant Noise Impact

- An attended noise survey was done between 09.00hrs and 12.00hrs, Thursday 8th September 2022 to determine the ambient noise level ($L_{Aeq,T}$) of the existing condenser unit.
- The predicted level of plant noise exceeds the night-time target by 8dB at the Pickhill Lane receptor, which depending on the context, is likely to be an indication of an adverse impact. However, BS8233 internal ambient noise level targets are predicted to be met in bedrooms of the nearest NSR considering a partially opened window. On this basis, we therefore consider that plant noise is sufficiently low and further noise mitigation measures are not necessary, see section 4.
- The plant noise limit is met at both other receptors during the daytime and night-time periods.

HGV Noise Impact

- HGV noise is predicted to meet targets for the daytime (07.00 – 23.00hrs) period with no further mitigation measures required, see section 5. HGV noise during the night-time period (23.00 – 07.00hrs) will meet targets where movements are limited to one per 15-minute period (i.e., 4 per hour).
- Recommendations for HGV delivery Best Practice and Site Management have been provided so noise is not unduly generated, see section 6.

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1 Introduction

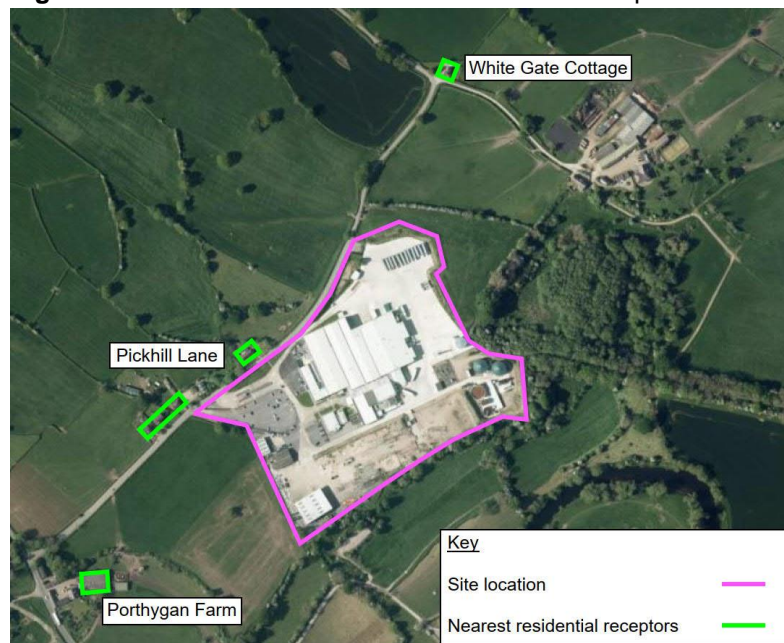
1.1 Overview

- 1.1.1 Environoise Consulting Limited has been instructed by Salisbury Poultry Limited to do a noise impact assessment for the proposed expansion of operations at Maelor Foods, Pickhill Lane, Cross Lanes, Wrexham LL13 0UE. Noise sources that require assessment are proposed fixed external plant and additional HGV deliveries.
- 1.1.2 Environoise has previously undertaken noise impact assessments and investigations at Maelor Foods, the most recent being report ref: 21426R01SWmdw in July 2020. Background noise data taken during this noise investigation has been used in this assessment.

1.2 Site Description

- 1.2.1 The site is located on Pickhill Lane, which accommodates the nearest existing residential receptors. Figure 1.1 provides the site location and nearest residential receptors (NSRs).

Figure 1.1: Site location and nearest residential receptors.



2 Criteria

2.1 Local Authority

- 2.1.1 While there are no specific conditions related to noise for this development, previous assessment (report ref: 21773R01aPKrmw) states the following condition:

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").

- 2.1.2 We have therefore based our assessment on achieving a noise level of no higher than 5dB(A) above the background noise level, considering all existing plant and HGV movements.

2.2 BS 4142+A1:2019

- 2.2.1 BS 4142:2014+A1:2019ⁱ provides a method of determining the 'impact of specific sound' on dwellings due to industrial and commercial noise sources through comparison between the measured background noise level (L_{A90}) and the noise source rating level ($L_{A,r,Tr}$) under consideration. The rating level is the specific noise level plus penalties of up to 18dB added for features to account for the character of the noise as follows:

- **Tonality:** +2dB penalty: Just perceptible; +4dB penalty: Clearly perceptible and +6dB penalty: Highly perceptible.
- **Impulsivity:** +3dB penalty: Just perceptible; +6dB penalty: Clearly perceptible and +9dB penalty: Highly perceptible.
- **Intermittency:** +3dB penalty: identifiable on/ off conditions.
- **Other:** +3dB penalty: where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent.

- 2.2.2 When comparing the rating plant noise level against the background noise level, BS 4142 provides the following noise impact descriptors:

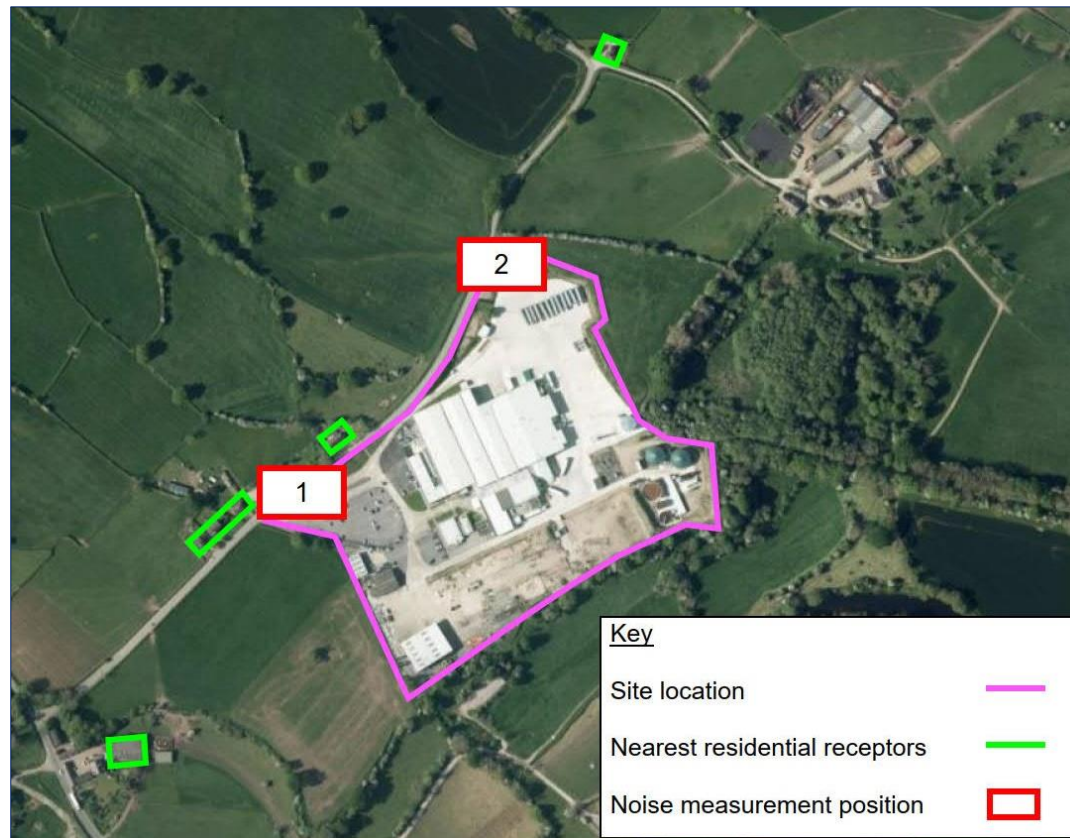
- +10dB(A) is likely to be an indicator of 'a significant impact, depending on the context'.
- +5dB(A) is likely to be an indicator of 'an adverse impact, depending on the context'.
- No excess of the background noise level is an indicator of 'a low impact, depending on the context'.

3 Baseline Noise Data

3.1 Previous Noise Survey

- 3.1.1 Unattended background noise levels were previously measured in accordance with BS4142 at two positions representative of NSRs on Pickhill Lane, Porthygan Farm and White Gate Cottage between 13.00hrs, Monday 13th July and 08.45hrs, Thursday 16th July 2020. The noise measurement positions are indicated in Figure 3.1.
- 3.1.2 We therefore consider the previous noise data to be representative of the 'present day' background noise environment.

Figure 3.1: Previous noise survey measurement positions.



3.2 Baseline Noise Survey Results

- 3.2.1 BS4142 requires the use of a 'representative' background noise level, and suggests that the modal value can be used to assess the impact of plant and HGV operations. The limiting noise levels include a 5dB increase over the modal value, which relates to the Local Authority target given in section 2.1. Results of the full measurement period can be found in Figures A1 and A2, Appendix A.

Table 3.1: Previously measured background noise levels.

Position	Measurement period	Measured background noise level [L _{A90} (15min) (dB)]		Limiting noise level [L _{Ar,Tr} (dB)]
		Range	Modal value	
1	Daytime (07.00 – 23.00hrs)	30 – 47	41	46
	Night-time (23.00 – 07.00hrs)	29 – 45	32	37
2	Daytime (07.00 – 23.00hrs)	40 – 58	50	55
	Night-time (23.00 – 07.00hrs)	39 – 52	40	45

4 Plant Noise Assessment

4.1 Proposed External Plant Items

- 4.1.1 Details of the existing and proposed additional external plant are given in Table 4.1 together with associated sound pressure levels sourced from manufacturers noise data and on-site noise level measurements. This assessment considers existing plant from a report done by Environoise in 2017 (ref: 21773R01aPKrmw). A water-cooled condenser is proposed; however, we understand that there are no moving parts and all pumps are to be housed internally¹. We therefore consider that it will be of low noise level and it has not been considered further. The key colours correlate with the existing and proposed plant locations shown in Figure 4.1.

4.2 Existing Plant Noise Survey

- 4.2.1 A noise survey to determine the ambient noise level ($L_{Aeq,T}$) of the existing Evapco ATC-1166E condenser unit was done between 09.00hrs and 12.00hrs, Thursday 8th September 2022. Short-term measurements were taken at multiple positions at a distance of 5m from the condenser unit. Measurements were taken while the unit was operating at 30% and 100% load for a robust assessment; although there was negligible difference in measured noise levels between the two. The measured sound pressure level at 5m is presented in Table 4.1.

Table 4.1: Existing and proposed external plant and sound pressure level data.

Key	Item	No. of units	Measured combined sound pressure level at 5m (dB(A))
	Evapco ATC-1166E condenser (existing)	1	70
Key	Item	No. of units	Sound pressure level per unit at 1m dB(A)
	Effluent Treatment Plant Air Blower (proposed)	2	79
	Effluent Treatment Plant Air Blower (existing)	2	

¹ Understood from email received from James Colley, Maelor Foods to Jake Brickley, Environoise Consulting on 05/09/2022.

Figure 4.1: Locations of existing and proposed external plant.



4.3 Assessment

- 4.3.1 A SoundPLAN® computer noise model of the site has been used for this assessment (see Appendix B). All plant has been considered to be operating continuously and simultaneously throughout any 1-hour daytime period and 15-minute night-time period as per BS4142.

Acoustic Features Correction

- 4.3.2 BS4142 suggests an impulsivity and tonality feature correction of 0 to 9dB each depending on how perceptible the noise is. No penalty has been applied for intermittency due to the continuous, non-varying nature of plant equipment. We also consider that noise from plant combined with be broadband at the NSRs with no perceptible tonal features. No penalty has been applied for 'intermittency' as plant is expected to run continuously without clearly identifiable 'on/off' conditions. Therefore, the rating level of plant noise is equivalent to the calculated specific noise level.
- 4.3.3 Tables 4.2 and 4.3 compare the predicted plant noise levels at the considered NSRs for the daytime and night-time period to determine compliance with the noise limits given in Table 3.1.

Table 4.2: BS4142 plant noise impact at considered NSRs – Daytime (07.00 – 23.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	45	26	29
Acoustic features correction dB	+0	+0	+0
Rating level dB(A)	45	26	29
Limiting noise level dB(A)	46	46	55
Level of excess (dB)	0 (-1)	0 (-20)	0 (-26)

Table 4.3: BS4142 plant noise impact at considered NSRs – Night-time (23.00 – 07.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	45	26	29
Acoustic features correction dB	+0	+0	+0
Rating level dB(A)	45	26	29
Limiting noise level dB(A)	37	37	45
Level of excess (dB)	+8	0 (-11)	0 (-16)

4.4 Discussion

- 4.4.1 As shown in Table 4.2, the limiting noise level target is met at all NSRs during the daytime period.
- 4.4.2 Table 4.3 shows that the predicted plant noise level at the Pickhill Lane receptor exceeds the limiting noise level during the night-time period. This is due to the existing Evapco plant. The predicted night-time excess of 8dB is greater than 5dB which depending upon the context, is likely to be an indication of an adverse impact in accordance with BS4142. The limiting noise level is met at Porthygan Farm and White Gate Cottage for the night-time period.

Context

- 4.4.3 The context is an existing and established item of plant at an industrial premises with other plant elsewhere. During the periods of the predicted excess, the noise sensitive location is indoors with open windows. Given the night-time excess, the primary concern is the potential for disturbance of

residents who could be sleeping with open bedroom windows of the Pickhill Lane NSR. BS4142 states that other guidance, such as BS8233, might also be applicable in this instance.

- 4.4.4 Consideration therefore needs to be given to the cumulative sound level within a bedroom and the character of the specific sound. The predicted plant noise level at the NSR is 45dB $L_{Aeq,T}$. The BS8233 internal ambient noise level target for bedrooms during the night-time (23.00 – 07.00hrs) is ≤ 30 dB $L_{Aeq,8hours}$ to avoid sleep disturbance. An assessment considering a typical reduction of 15dBA due to a partially open window and plant noise that is broadband and continuous with no acoustically distinguishing characteristics (as noted on site), indicates that this target will be met. On this basis, we consider that the noise is sufficiently low and further mitigation measures are not warranted.

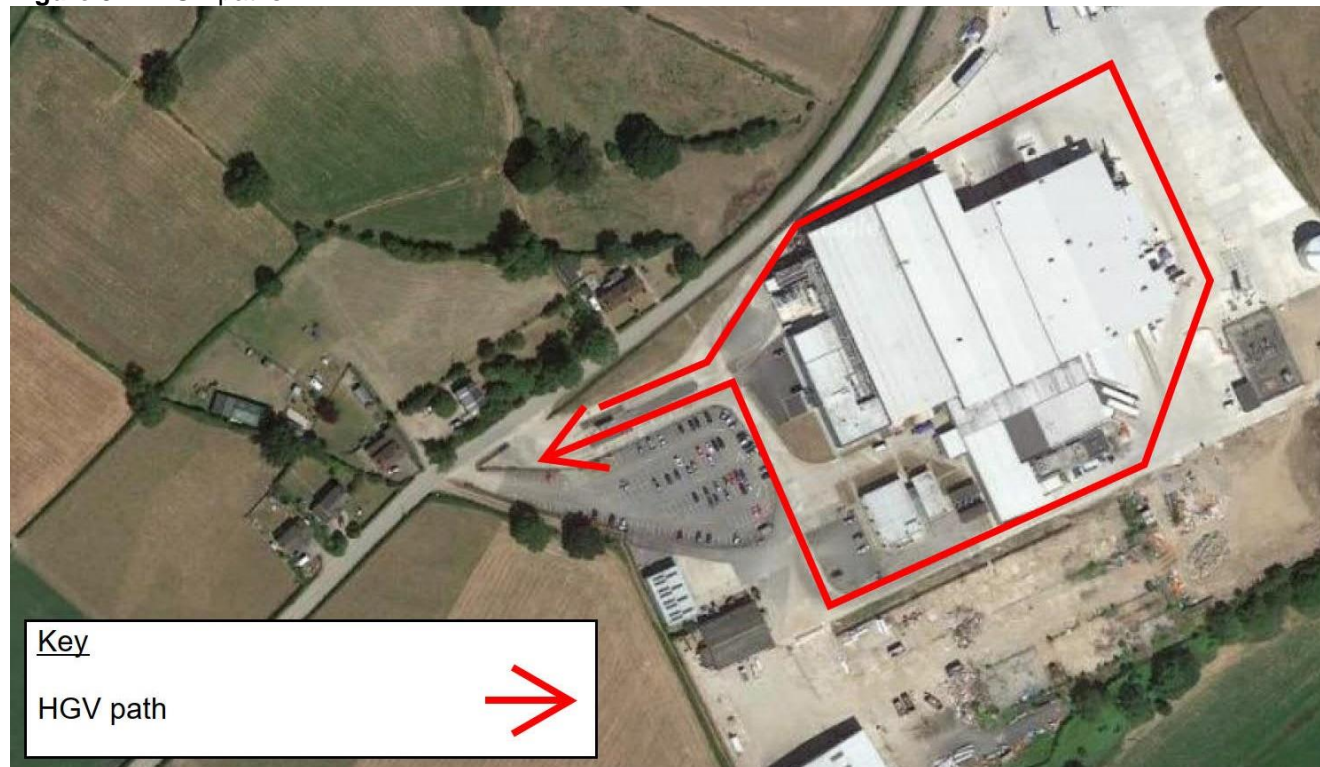
5 HGV Noise Assessment

5.1 HGV Movements

5.1.1 An average of 210 HGV movements are proposed per 20-hour working day². This approximately equates to 176 movements during a 16-hour daytime period and 44 movements during a 4-hour night-time period. We have therefore considered 11 HGV movements per hour for the daytime and 3 movements per any 15-minutes for the night-time period.

5.1.2 Figure 5.1 shows the HGV path around the site.

Figure 5.1: HGV paths.



² Confirmed in email from James Colley, Maelor Foods to Sam Williams, Environoise Consulting on 09.02.2022.

HGV Pass-Bys

- 5.1.3 The calculation for determining the level of HGV noise events has been done using the following formulae within SoundPLAN® and in-house data of HGV movement noise:

$$L_{Aeq,T} = (L_w - 20 \times \log(R) - 8) + (10 \times \log(n/t))$$

Where:

L_w = event sound power level (dB) [i.e., 103dB L_{wA}]

R = Distance of noise source to 1m from nearest NSR (m)

n = number of events occurring in t (seconds).

5.2 Assessment

- 5.2.1 Table 5.1 shows the predicted specific noise levels of HGV pass-bys at the nearest residential receptors.

Table 5.1: Calculated delivery noise levels at the considered NSRs.

NSR	Activity	Specific noise level at NSR	
		Daytime [$L_{Aeq,1hr}$ (dB)]	Night-time [$L_{Aeq,15min}$ (dB)]
Pickhill Lane	HGV pass-by	39	39
Porthygan Farm		15	15
White Gate Cottage		23	24

Acoustic Feature Corrections

- 5.2.2 HGV noise can be impulsive. Considering the industrial environment of the existing site with a number of HGV deliveries already taking place every day, we consider that additional HGV noise will be 'just perceptible' against the existing noise environment. We have therefore applied a +3dB penalty for 'impulsivity' in accordance with BS4142.
- 5.2.3 The calculated noise levels in Table 5.1 have been compared to the operational hours noise limits in Table 3.1 to determine the level of delivery noise impact for the daytime and night-time periods, see Tables 5.2 and 5.3 respectively.

Table 5.2: BS4142 delivery noise impact assessment – Daytime (07.00 – 23.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	39	15	23
Acoustic feature correction (i.e. impulsive noise) dB	+3	+3	+3
Rating level dB(A)	42	18	26
Limiting noise level dB(A)	46	46	55
Level of excess (dB)	0 (-4)	0 (-28)	0 (-29)

Table 5.3: BS4142 delivery noise impact assessment – Night-time (23.00 – 07.00hrs).

	NSR		
	Pickhill Lane	Porthygan Farm	White Gate Cottage
Specific noise level dB(A) at NSR	39	15	24
Acoustic feature correction (i.e., impulsive noise) dB	+3	+3	+3
Rating level dB(A)	42	18	27
Limiting noise level dB(A)	37	37	45
Level of excess (dB)	+5	0 (-19)	0 (-18)

5.3 Discussion

- 5.3.1 As shown in Table 5.2, the limiting noise level target is met at all NSRs during the daytime.
- 5.3.2 Table 5.3 shows that the limiting noise level is exceeded by 5dB at Pickhill Lane during the night-time, Targets are met for Porthygan Farm and White Gate Cottage during the night-time.
- 5.3.3 Recommended noise mitigation measures are detailed in section 6.

6 Recommendations

6.1 Noise Mitigation Measures

- 6.1.1 We recommend the following mitigation measures are implemented so that HGV noise can achieve the targets. The recommendations are mainly driven by predicted noise from operations during the night-time period where background noise levels are lower:

HGV Movements

- Night-time - The target excess of 5dB(A) at the Pickhill Lane receptor during the night-time (23.00 – 07.00hrs) can be sufficiently mitigated where HGV movements are limited to 1 per any 15-minute period (i.e., 4 per hour) between 23.00 and 07.00hrs.
- Daytime - The recommended night-time limit approximately equates to 16 HGV movements during the 4-hour night-time period of the 20-hour working day. On this basis, the number of daytime (16-hour) movements to meet the required average 220 movements is 194. This equates to 12 movements per hour (up by 1 from 11 considered in section 5.1.1) which results in a negligible increase to the predicted noise and impact at the NSRs assessed in Table 5.2.

6.2 HGV Best Practice

- 6.2.1 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>
- 6.2.2 The following measures are recommended to reduce noise impacts:
- Low volume broadband white noise reversing alarms are recommended.
 - Limit delivery vehicle speed to 5mph 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.

6.3 Site Management

- 6.3.1 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. Management of the Unit must introduce procedures within a Noise Management Plan to reduce the possibility of workers slamming doors, shouting and causing unnecessary noise.

Appendix A: Noise Survey Data

Figure A1: Time history noise data – Position 1.

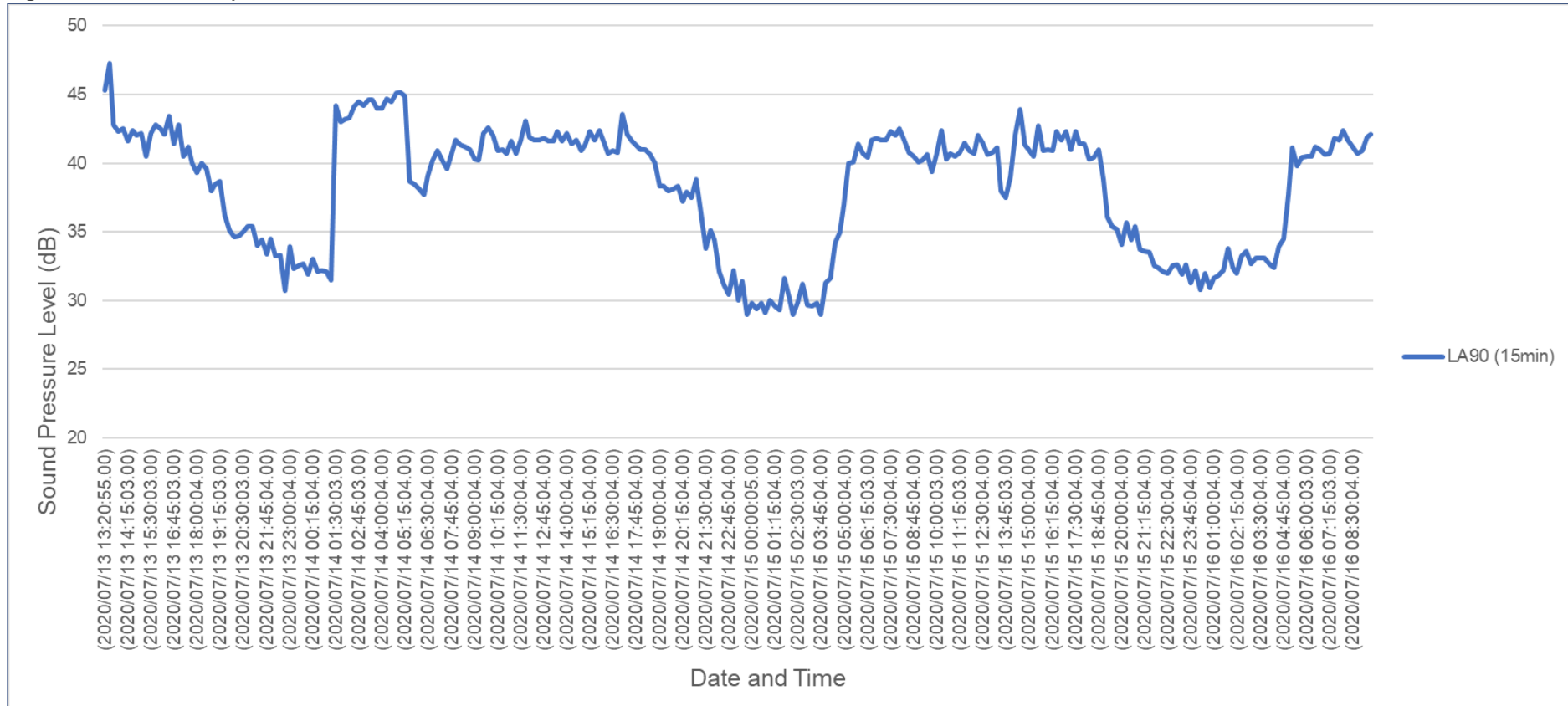
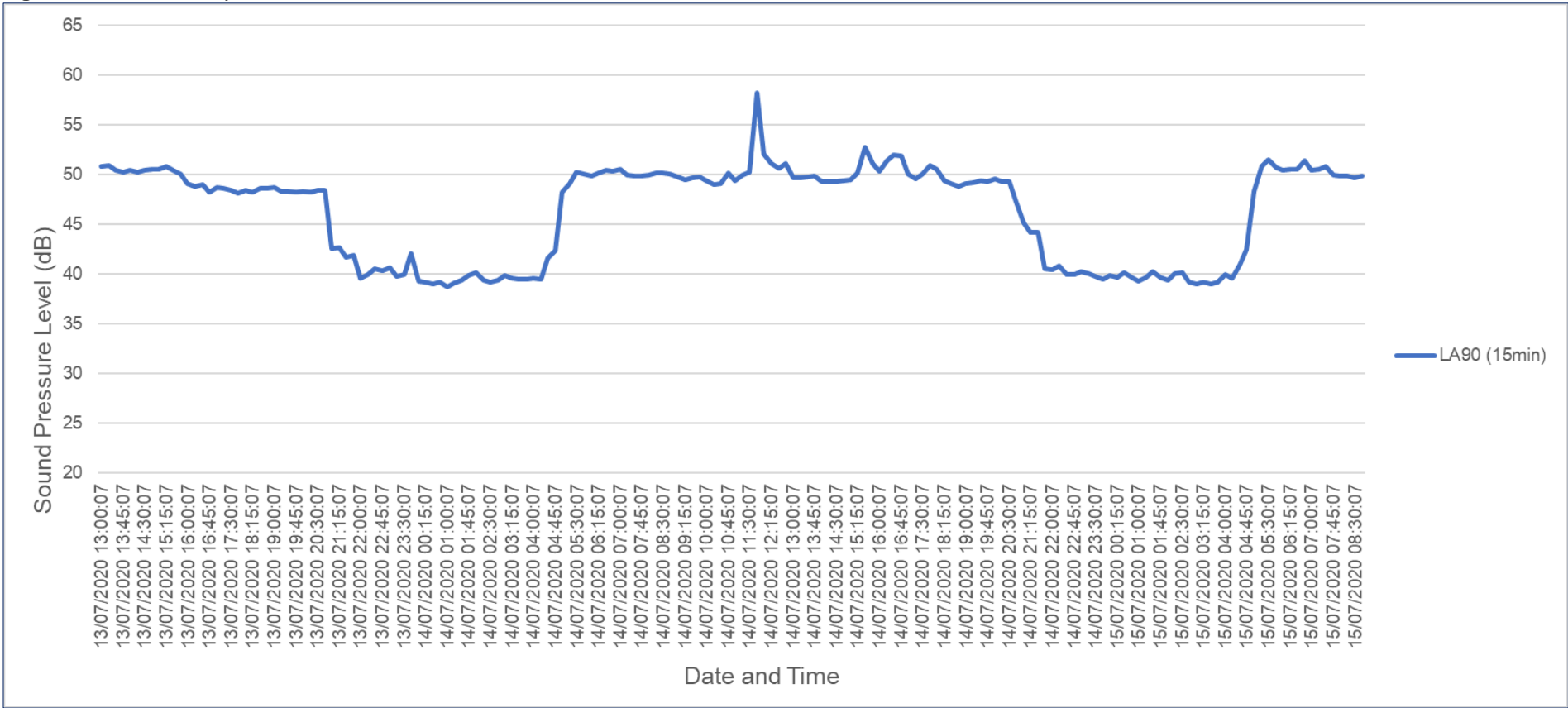
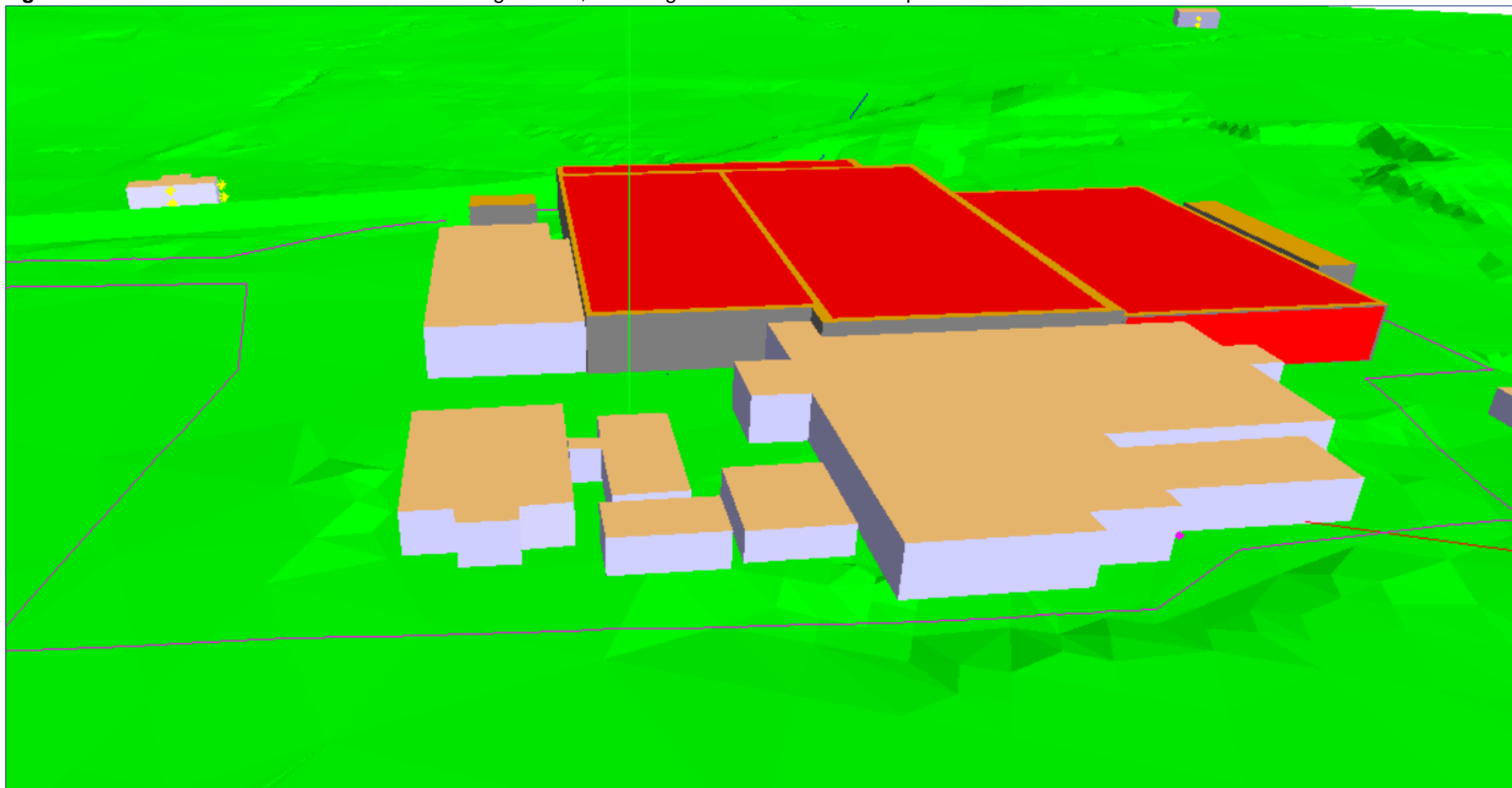


Figure B2: Time history noise data – Position 2.



Appendix B: SoundPLAN® Model

Figure B1: 3D view of SoundPLAN® model showing the site, including nearest residential receptors.



References

ⁱ BS4142:2014+A1:2019: 'Methods for rating and assessing industrial and commercial sound'