MILLER GOODALL
ACOUSTICS AND AIR QUALITY

# NOISE ASSESSMENT

**on behalf of**

## STONEGATE FARMERS LTD

**for the site at**

## VALLEY FARM, HEMINGBY LANE, HORNCASTLE, LINCOLNSHIRE

## REPORT DATE: 26 MARCH 2018

## REPORT NUMBER: 101685


**Miller Goodall Ltd**
**Ground Floor**
**Ashworth House**
**Deakins Business Park**
**Blackburn Road**
**Egerton**
**Bolton**
**Lancashire**
**BL7 9RP**

**Tel: 01204 596166**

**www.millergoodall.co.uk**

Company registration number 5201673


ANC | ACOUSTICS & NOISE CONSULTANTS

# Summary

A noise assessment was undertaken to predict the potential impact of a proposed chicken rearing development at Valley Farm, Lincoln.

Using CadnaA modelling software, predictions of noise from the operation of ventilation units, HGV deliveries and backup generators at the proposed development were undertaken to assess the potential impact of noise on existing residential receptors in the vicinity of the site.

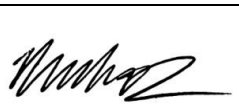
Measurements were made at the proposed development site to identify the pre-development background sound levels. Manufacturer's data for the ventilation and generator plant equipment was supplemented with MGL's own data for the delivery noise.

Ventilation plant will run throughout the night, with delivery hours and testing of the backup generators proposed to take place between the hours of 07:00 and 16:00. The BS4142 assessment for all noise sources predicts a low impact given the context of the proposed site.

It has been shown that no mitigation is required and it is considered that the development may proceed without any risk of adverse acoustic impact.

Recommended best practice measures have been discussed in Section 9 of this report to further reduce any potential noise impacts coming from the site during the construction and operation phases of the proposed development. These best practice measures should be implemented within the noise management plans that would form part of a Construction Environmental Management Plan (CEMP) and Environmental Management Plan (EMP) for the site pursuant to a planning condition.

**Record of changes**

| | | | |
|---|---|---|---|
| Prepared By | Michael Rickard AMIOA | Reviewed By | Jo Miller MIOA |
| Signed |  | Signed | |
| Date | 26 March 2018 | Date | 26 March 2018 |

| Version | Date | Change | Initials |
|---|---|---|---|
| 1 | 22 December 2017 | Final issue | MR |
| 2 | 26 March 2018 | Noise management plan/CEMP | MR |

# Contents

**Summary** ..... **1**
**Contents** ..... **2**
**1 Introduction** ..... **3**
**2 Site Description** ..... **3**
**3 Proposed Development** ..... **3**
**4 Policy Context** ..... **3**
4.1 Noise Policy Statement for England ..... 3
4.2 National Planning Policy Framework ..... 4
4.3 Planning Practice Guidance – Noise ..... 5
**5 Local Authority Consultation** ..... **6**
**6 Acoustic Standards and Guidance** ..... **6**
6.1 BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound' ..... 6
**7 Noise Survey** ..... **7**
7.1 Measurements of Existing Noise Sources ..... 7
7.2 Monitoring Results ..... 9
**8 Impact of Noise from the Proposed Development** ..... **12**
8.1 Noise Modelling ..... 12
8.2 BS 4142: 2014 Assessment ..... 13
**9 Best Practice Measures** ..... **16**
**10 Conclusions** ..... **18**
**APPENDICES** ..... **20**
**Appendix 1: Site Location Plan** ..... **21**
**Appendix 2: Proposed Site Layout** ..... **22**
**Appendix 3a: CadnaA – Night Time Plant (23:00 – 07:00): 4m High Grid** ..... **23**
**Appendix 3b: Daytime HGV Deliveries & Ventilation (07:00 – 16:00): 1.5m High Grid 24**
**Appendix 3c: CadnaA – Daytime Generators and Ventilation (07:00 – 16:00): 1.5m High Grid** ..... **25**
**Glossary of Terms** ..... **26**

# 1 Introduction

1.1 Miller Goodall Ltd has, on behalf of Stonegate Farmers Ltd, undertaken a noise assessment in respect of the impact of noise from the proposed new chicken rearing units on nearby existing sensitive receptors.

# 2 Site Description

2.1 The site is located at Valley Farm, Hemingby Lane, Horncastle, Lincolnshire. The site location is shown in Appendix 1 and the site layout is shown in Appendix 2.

2.2 The site is located approximately 1 km north of Horncastle. Agricultural land surrounds the site to the north, east and west.

# 3 Proposed Development

3.1 The site is an existing poultry farm with eight units. The proposed development includes adding four new poultry units alongside the existing six units. The units will increase the total capacity from 96,000 birds to 168,480 birds. The site will be accessed from the existing access point.

3.2 The introduction of new noise sources associated with the proposed development is limited to roof mounted extract ventilation plant on each of the units.

3.3 HGV deliveries and collections will also occur periodically through a typically week, however these are deemed less significant due to the fact that such activities are already occurring at the existing site.

3.4 The potential impact of the above noise sources at the nearest noise sensitive receptor (NSR) has been assessed according to BS 4142:2014 methodology detailed later in this report.

# 4 Policy Context

## 4.1 Noise Policy Statement for England

4.1.1 The Noise Policy Statement for England (NPSE[1]), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse effects on health and quality of life;
- mitigate and minimise adverse effects on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

[1] Noise Policy Statement for England, Defra, March 2010

4.1.2 The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

4.1.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

"…all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development".

4.1.4 Importantly, the NPSE goes on to state:

"This does not mean that such adverse effects cannot occur".

4.1.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available"

4.1.6 It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

## 4.2 National Planning Policy Framework

4.2.1 The National Planning Policy Framework (NPPF[2]) was published in March 2012. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise"[3].

4.2.2 Paragraph 109 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) "preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land stability".

4.2.3 The NPPF goes on to state in Paragraph 123 "planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including thorough use of conditions;

[2] National Planning Policy Framework, DCLG, March 2012

[3] Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land use since they were established, and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value".

4.2.4 The NPPF document does not refer to any other documents regarding noise other than NPSE.

## 4.3 Planning Practice Guidance – Noise

4.3.1 As of March 2014, a Planning Practice Guidance[4] for noise was issued which provides additional guidance and elaboration on the NPPF. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

4.3.2 In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

"…the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation".

4.3.3 Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

4.3.4 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

"Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed".

[4] Planning Practice Guidance – Noise, http://planningguidance.planningportal.gov.uk/blog/guidance/noise/, 06 March 2014

4.3.5 The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

# 5 Local Authority Consultation

5.1 A consultation request was sent to East Lindsey District Council (ELDC) on 29 November however unfortunately we have not received a response from their environmental health department.

# 6 Acoustic Standards and Guidance

## 6.1 BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'

6.1.1 BS 4142: 2014[5] provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014. The key aspects of the Standard are summarised below.

6.1.2 The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

6.1.3 The Specific Noise Level - the noise level produced by the source in question at the assessment location - is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

6.1.4 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context,*
- *The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.*

[5] BS 4142:2014 Methods for rating and assessing industrial and commercial sound

6.1.5 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

> *An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.*

6.1.6 The 2014 edition of BS 4142 also introduces a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

# 7 Noise Survey

## 7.1 Measurements of Existing Noise Sources

7.1.1 Noise measurements were undertaken at a location representative of the nearest noise sensitive receptor in accordance with BS 7445-1: 2003[6] by Gareth Willox of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (<0.1 dB). Details of the equipment used are shown in Table 1, below.

**Table 1: Noise monitoring equipment**

| Equipment Description | Type Number | Manufacturer | Serial No. | Date Calibrated | Calibration Certification Number |
|---|---|---|---|---|---|
| Class 1[7],[8] Integrating Real Time 1/3 Octave Sound Analyser | NOR 140 | Norsonic | 1404354 | 18/08/17 | U26425 |
| Microphone | NOR 1225 | Norsonic | 112830 | 18/08/17 | 26424 |
| Class 1 Calibrator[9] | NOR 1251 | Norsonic | 31313 | 18/08/17 | U24576 |
| Outdoor microphone housing | 41AL S | GRAS | 85564 | 21/12/2016 | -23403 |

7.1.2 Noise monitoring was undertaken at the times specified in Table 2, below. Weather conditions were determined both at the start and on completion of the survey. It is considered that meteorological conditions were appropriate for environmental noise measurements.

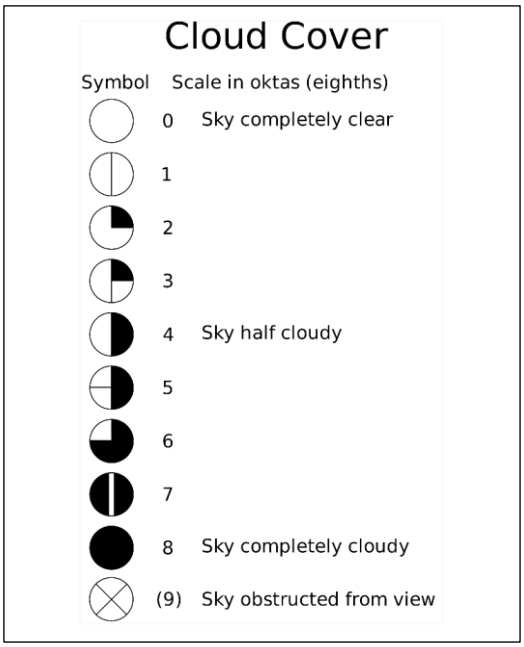
[6] BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

[7] IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

[8] IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

[9] IEC 60942 (2003) Electroacoustics – Sound calibrators

**Table 2: Dates, times and weather conditions during noise measurements**

| Measurement Locations | Date/Time | Weather conditions | | |
|---|---|---|---|---|
| | | Description | At Start of Survey | On Completion |
| MP1 | 27/11/17, 16:00 to 28/11/17, 14:30 | Temperature: | 2 ºC | 5 ºC |
|  | | Precipitation: | Dry | Dry |
| | | Cloud cover (oktas – see opposite): | 4 | 1 |
| | | Any fog/snow/ice? | No | No |
| | | Any damp roads/wet ground? | No | No |
| | | Wind speed: | 5 $m.s^{-1}$ | < 5 $m.s^{-1}$ |
| | | Wind direction: | W | |
| | | Any conditions that may cause temp. inversion (e.g. calm nights with no cloud): | No | No |



7.1.3 Measurements were taken to include middle of the night and early morning periods when activity from the proposed site is likely to have the largest impact. Measurements were made under free-field conditions at a height of 1.5 m above the ground.

7.1.4 The measurement location is indicated on Figure 1.

**Figure 1: Survey measurement position and nearest NSR**

7.1.5 At the beginning and end of the survey the noise climate was observed to consist of faint and distant traffic/agricultural vehicle noise and occasional noise from overhead aircrafts.

## 7.2 Monitoring Results

7.2.1 A summary of the broadband measurement data is provided in Table 3 below. All data are sound pressure levels in dB re 20 μPa. The 1 second noise levels have not been presented in this report but are kept on file for future reference.

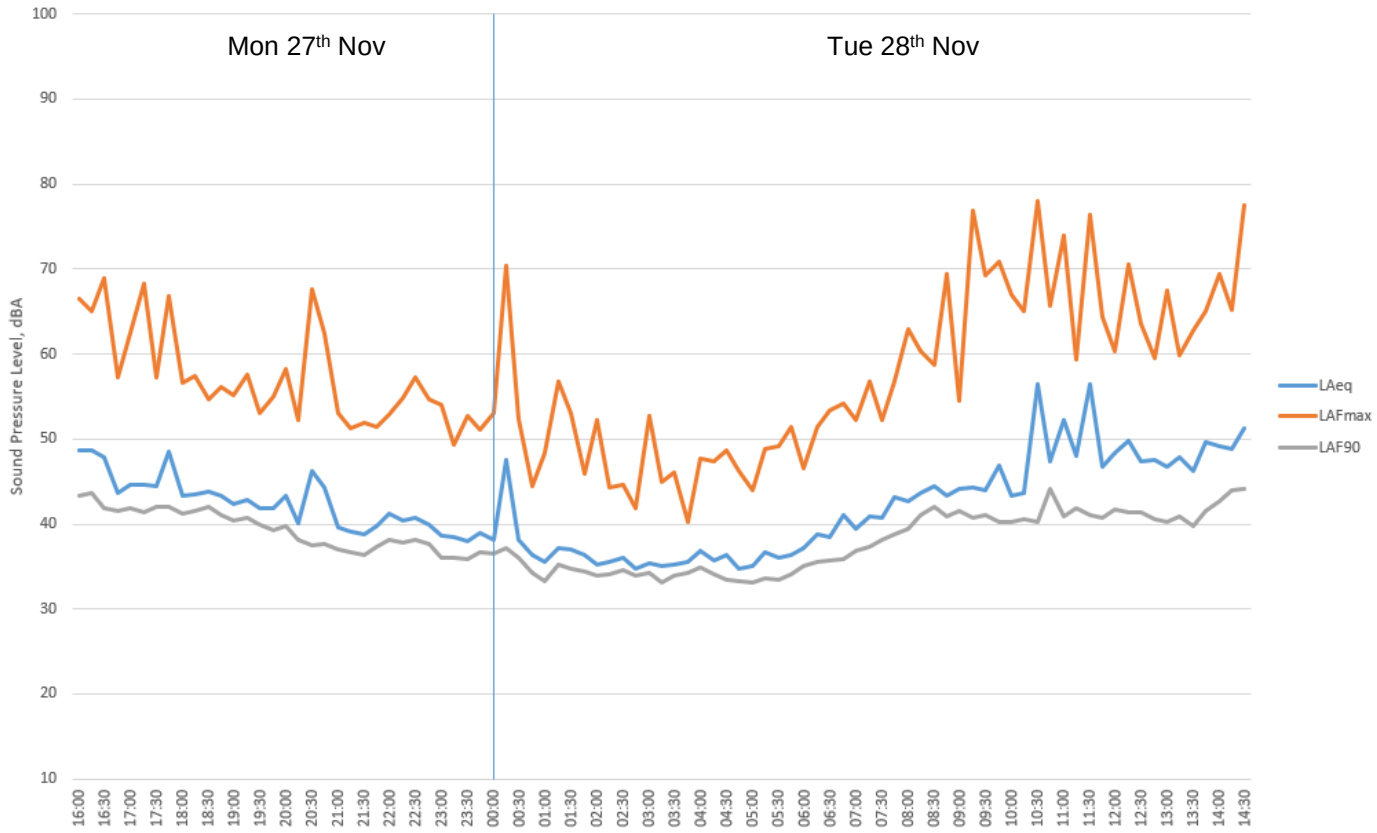
**Table 3: Summary of noise measurements**

| Period | Start | Elapsed Time (hr:min) | $L_{Aeq,T}$ (dB) | $L_{AFmax}$ (dB) | $L_{AF90,T}$ (dB) |
|---|---|---|---|---|---|
| Daytime | 16:00 | 01:00:00 | 48 | 69 | 42 |
| | 17:00 | 01:00:00 | 46 | 68 | 42 |
| | 18:00 | 01:00:00 | 44 | 57 | 41 |
| | 19:00 | 01:00:00 | 42 | 58 | 40 |
| | 20:00 | 01:00:00 | 44 | 68 | 38 |
| | 21:00 | 01:00:00 | 39 | 53 | 37 |
| | 22:00 | 01:00:00 | 41 | 57 | 38 |
| Night time | 23:00 | 01:00:00 | 39 | 54 | 36 |
| | 00:00 | 01:00:00 | 43 | 70 | 36 |
| | 01:00 | 01:00:00 | 37 | 57 | 34 |
| | 02:00 | 01:00:00 | 35 | 52 | 34 |
| | 03:00 | 01:00:00 | 35 | 53 | 34 |
| | 04:00 | 01:00:00 | 36 | 49 | 34 |
| | 05:00 | 01:00:00 | 36 | 51 | 33 |
| | 06:00 | 01:00:00 | 39 | 54 | 36 |
| Daytime | 07:00 | 01:00:00 | 41 | 57 | 38 |
| | 08:00 | 01:00:00 | 44 | 69 | 41 |
| | 09:00 | 01:00:00 | 45 | 77 | 41 |
| | 10:00 | 01:00:00 | 51 | 78 | 41 |
| | 11:00 | 01:00:00 | 53 | 76 | 41 |
| | 12:00 | 01:00:00 | 48 | 71 | 41 |
| | 13:00 | 01:00:00 | 48 | 68 | 40 |

7.2.2 Each measurement period consisted of sequential 15 minute samples which therefore allowed the variation in noise level over time to be assessed. This data was subsequently used to determine a 'typical' $L_{A90}$ background sound level, considered suitably representative of the nearest NSR, against which to assess the potential impact of noise sources at the proposed site.

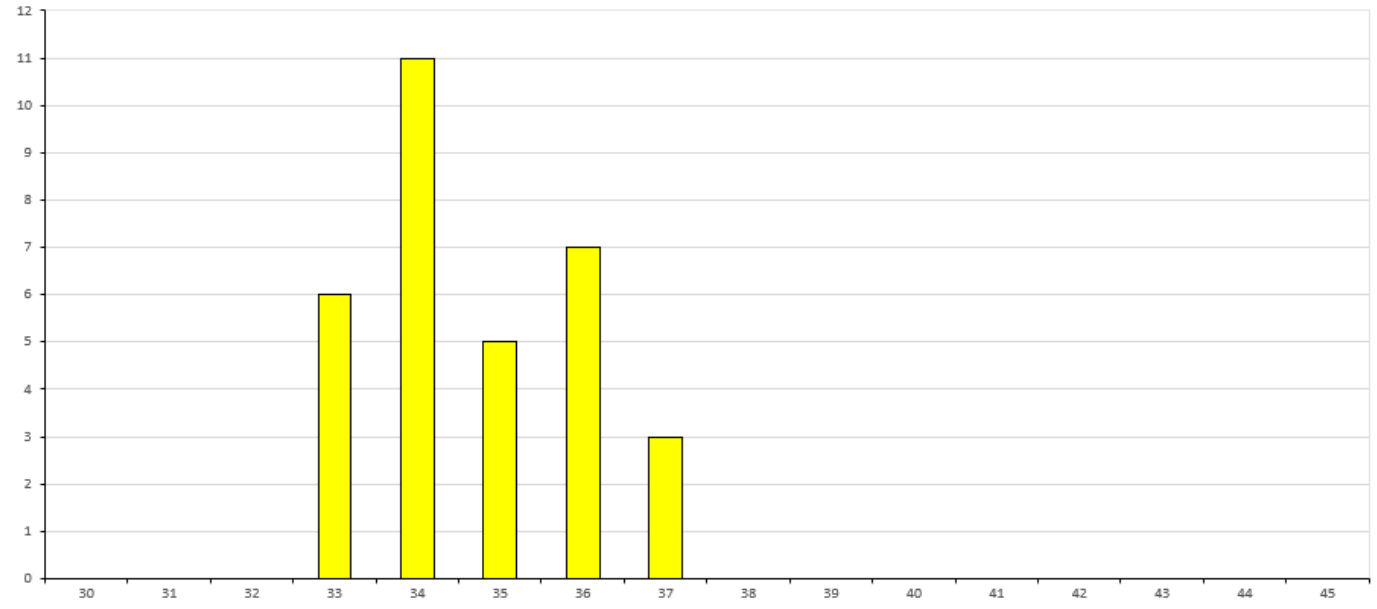
7.2.3 The level versus time history plot for MP1 is presented for the full duration of the monitoring survey in Figure 1.

**Figure 1: Time History of Measurements (27-28/11/17)**



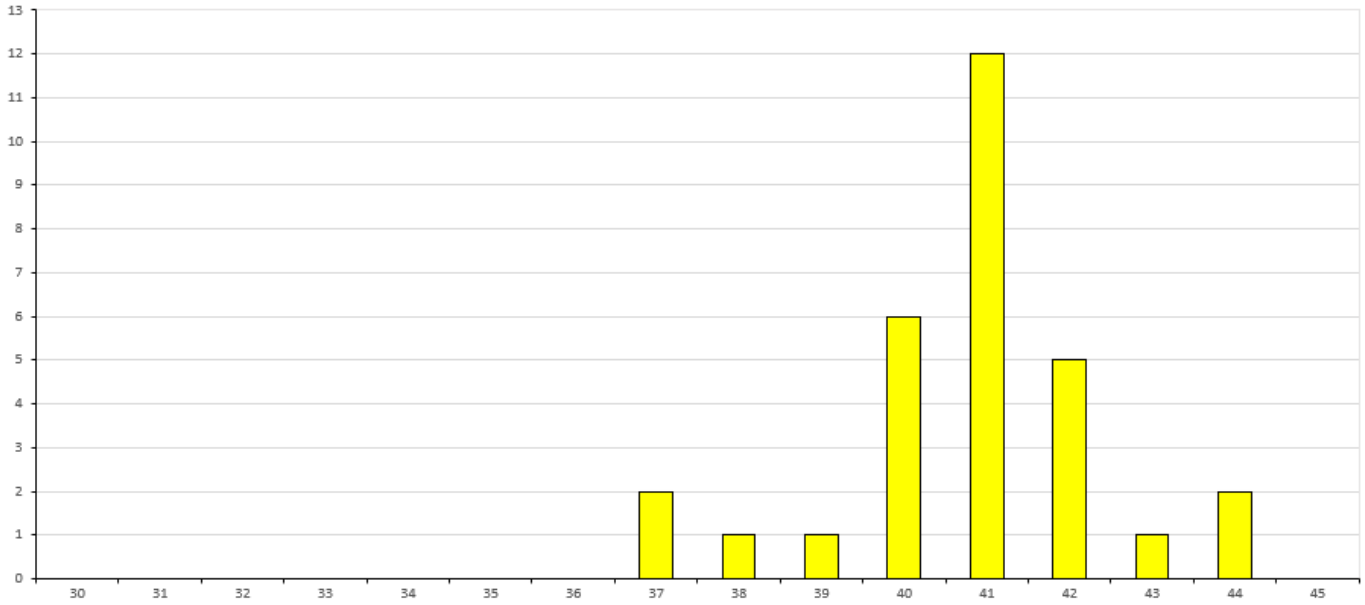

7.2.4 The background sound levels for the assessment periods of interest were derived for the daytime and night time periods corresponding to likely hours of operation of the external ventilation plant, generators and HGV deliveries.

**Figure 2: Night time Background Sound Level Histogram, $L_{A90,15min}$**



7.2.5 Based on the above, the representative night time background sound level is deemed to be 34 dB $L_{A90,15min}$.

**Figure 3: Daytime Background Sound Level Histogram (07:00 – 14:30), $L_{A90,15min}$**




7.2.6 Based on the above, the representative daytime background sound level is deemed to be 41 dB $L_{A90,15min}$ for daytime (i.e. 07:00 – 16:00).

# 8 Impact of Noise from the Proposed Development

## 8.1 Noise Modelling

8.1.1 Predicted noise levels at sensitive receptors was carried out using CadnaA software package.

8.1.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Emapsite. This was used to determine road positions, building footprint areas and relative locations. Building height information was based on site observations. Topography was not included in the design of the model as the proposed site is flat with little variation in terrain height.

8.1.3 The following parameters were assigned to the model:

- Propagation model: ISO 9613[10]
- Default ground absorption: 1 (porous soil)
- Two orders of reflection
- Buildings are reflecting (smooth, non-structured facade)

8.1.4 The octave band source data for ventilation plant shown in Table 11 were imported directly into the model. This data was obtained from Stonegate and Big Dutchman International GmbH.

[10] ISO 9613-2: 1996 Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation

**Table 11: Noise source data used within CadnaA**

| Description | dBA |
|---|---|
| FUMUS ($L_w$)* | 70 |
| Back-up generator ($L_w$) | 88 |

* Worst-case noise level (depends on operating duty - variable depending on conditions [can be as low as 64 dBA])

8.1.5 Data obtained during measurements of articulated HGV noise by MGL Ltd were used to assess the impact of HGV delivery noise at the proposed site.

8.1.6 The measurements were undertaken during a typical delivery from a 40 foot articulated HGV.

8.1.7 Noise sources included; tail lift operation, the loading of crates inside the trailer, the crates being wheeled into a store and then being returned to the trailer and secured; refrigeration unit operating; banging of HGV doors.

8.1.8 A summary of the broadband measurement data is provided in Table 5 below.

**Table 5: Summary of noise measurements from large HGV delivery**

| Description | Elapsed Time (min:sec) | $L_{Aeq,T}$ (dB) | $L_{AFmax}$ (dB) | $L_{AFmin}$ (dB) | $L_{F90,T}$ (dB) |
|---|---|---|---|---|---|
| Unloading noise with main cab engine and refrigeration switched off. Measured 3 m from side of tailgate | 13:20 | 65 | 90 | 42 | 49 |
| Noise from trailer refrigeration unit, main cab engine switched off. Measured at 3 m from side of engine cab. | 00:33 | 73 | 76 | 71 | 72 |

8.1.9 Octave band data collected concurrently with broadband levels was utilised within the noise model. This data is held on file and may be supplied upon request.

8.1.10 In order to provide a worst-case assessment, the modelling has assumed that the delivery lasts for the full one hour assessment period.

8.1.11 Screen shots from the noise model indicating the noise contours and the highest predicted broadband $L_{Aeq}$ noise levels at the nearest noise sensitive receivers are shown in Appendices 3a, 3b and 3c.

## 8.2 BS 4142: 2014 Assessment

8.2.1 A BS 4142 noise impact assessment has been undertaken in order to assess the potential noise impact at the most affected location of the proposed development site and is detailed in this section of the report.

8.2.2 The following scenarios were assessed:

- Scenario 1 – Between 23:00 – 07:00: Ventilation running continuously for the 15 minute assessment period.

- Scenario 2 – Between 07:00 – 16:00: Ventilation units running continuously and an HGV delivery unloading / loading lasting the entire 1 hour assessment period. Trailer refrigeration unit switched on for 5 minutes.

- Scenario 3 – Between 07:00 – 16:00: Ventilation units running continuously and generators undertaking tests lasting 30 minutes of the 1 hour assessment period.

8.2.3 The BS 4142 assessment for daytime and night time assessments are shown in Table, 6, 7 and 8 below:

**Table 6: BS 4142:2014 Noise Impact Assessment: Ventilation Plant noise 23:00 – 07:00, Ventilation Running Continuously**

| Results | | Relevant Clauses of BS 4142:2014 | Commentary |
|---|---|---|---|
| Background Sound Level | $L_{AF90,15mins}$ = 34 dB | 8.1.2<br>8.3 | Typical background sound level between 23:00 – 07:00 |
| Assessment made during the night-time, so the reference interval is 15 min | | 7.2 | |
| Specific Sound Level | $L_{Aeq,15mins}$ = 28 dB | 7.3.3 eqn(2) | Determined from CadnaA model |
| Acoustic feature correction | 0 dB | 9.2 | Modern, low-noise plant to be installed. No audible tones are considered likely |
| Rating Level | (28 + 0) dB = 28 dB | | |
| Excess of Rating Level over Background Sound Level | (28 – 34) dB = -6 dB | | -6 dB excess |
| Assessment indicates likelihood of low impact | | 11 | |
| Context | | 11<br>8.5 | Very low specific sound level |
| Uncertainty of the assessment | Fans assumed at maximum duty during night time (unlikely) | 10 | Could be up to >5 dB more favourable as ventilation rates likely to be lowest at night time |

8.2.4 It can be seen from the above table that the noise impact of ventilation plant associated with the chicken coups, based on the BS 4142:2014 methodology, indicates a low impact during the night time periods at the most affected location.

**Table 7: BS 4142:2014 Noise Impact Assessment: Delivery & Ventilation Plant noise 07:00 – 16:00**

| Results | | Relevant Clauses of BS 4142:2014 | Commentary |
|---|---|---|---|
| Background Sound Level | $L_{AF90,1hour}$ = 41 dB | 8.1.2<br>8.3 | Representative background sound level between 07:00 – 16:00 |
| Assessment made during the day time (after 07:00), so the reference interval is 1 hour | | 7.2 | |
| Specific Sound Level | $L_{Aeq,1hour}$ = 41 dB | 7.3.3 eqn(2) | Determined from CadnaA model |
| Acoustic feature correction | +3 dB | 9.2 | Penalty applied to account for impulsivity characteristic of loading noise. Subjectively expected to be just perceptible at the assessment location |
| Rating Level | (41 + 3) dB = 44 dB | | |
| Excess of Rating Level over Background Sound Level | (44 – 41) dB = +3 dB | | +3 dB excess |
| Assessment indicates likelihood of low to adverse impact | | 11 | |
| Context | | 11<br>8.5 | Considered low impact as deliveries are infrequent and of relatively short duration. Similar noise is experienced at present. |
| Uncertainty of the assessment | Estimated +/- 2 dB | 10 | Likely more favourable as noise source data includes noise from roller cages which will not be used on this site |

8.2.5 The results show that the main noise source contributing to the specific sound level is the delivery activities and the contribution from ventilation is very low at 28 dB $L_{Aeq,T}$. The initial estimate of noise impact based on the BS 4142 methodology indicates an adverse level of impact during the daytime. However given that deliveries are already occurring at the site, are relatively infrequent and only occur during the less sensitive daytime period, a low impact is predicted, given the context.

**Table 8: BS 4142:2014 Noise Impact Assessment: Generator Test & Ventilation Plant noise 07:00 – 23:00**

| Results | | Relevant Clauses of BS 4142:2014 | Commentary |
|---|---|---|---|
| Background Sound Level | $L_{AF90,1hour}$ = 41 dB | 8.1.2<br>8.3 | Representative background sound level between 07:00 – 16:00 |
| Assessment made during the day time (after 07:00), so the reference interval is 1 hour | | 7.2 | |
| Specific Sound Level | $L_{Aeq,1hour}$ = 33 dB | 7.3.3 eqn(2) | Determined from CadnaA model |
| Acoustic feature correction | +0 dB | 9.2 | Penalty applied to account for intermittency characteristic of generator noise. Subjectively expected to be just perceptible at the assessment location |
| Rating Level | (33 + 3) dB = 36 dB | | |
| Excess of Rating Level over Background Sound Level | (36 – 41) dB = -5 dB | | -5 dB excess |
| Assessment indicates likelihood of low impact | | 11 | |
| Context | | 11<br>8.5 | Generators are tested once a week for less than 15 minutes and once a month for 30 minutes |
| Uncertainty of the assessment | Estimated +/- 2 dB | 10 | Measurement variations |

8.2.6 Table 8 shows that the that the estimate of noise impact due to periodic testing of the generators based on BS:4142 methodology indicates a low impact.

# 9 Best Practice Measures

9.1.1 In order to reduce any impact further it would be beneficial to consider the practical means by which noise from the site can be controlled and mitigated during both the construction and operation phases of the development. The recommendations provided below should be implemented within noise management plans which would be developed for the CEMP and EMPs for the project pursuant to a planning condition.

***Recommended Best Practice Measures for Construction Phase Noise***

- Develop and implement a noise management plan (NMP) to be prepared as part of the CEMP, which may include measures to control other emissions, approved by the Local Authority;

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for noise issues on the site boundary. This may be the environment manager/engineer or the site manager; and
- Record all noise complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause noise emissions, either on- or off- site, and the action taken to resolve the situation in the log book;
- Plan site layout so that machinery and noise causing activities are located away from receptors, as far as is possible;
- Semi-static equipment is to be sited and oriented as far as is reasonably practicable away from noise sensitive receptors and will have localised screening if deemed necessary;
- Where necessary, any permanent noise barriers (i.e. earth bunding, site hoardings etc) would be constructed as early as possible in the construction programme;
- Modern, silenced and well maintained plant will be used at all times, conforming to standards set out in the EU Directives;
- Percussive plant will be avoided where alternative non-percussive plant is available for a given task;
- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Large concrete pours (for which an extension of working hours may be necessary) will commence as early as possible within normal working hours so that activities can be completed within normal working hours as far as possible;
- Where possible, mains electricity to be used instead of generators;
- If piling is required, the preferred method of piling is bored piling. However, percussive piling shall be considered where ground conditions preclude the use of other methods or where sheet piling is required for temporary works, and prior agreement should be sought from the local authority;
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable noise control techniques such as barriers or bunds;
- Use of radios or other amplified devices are controlled so that it does not cause a noise nuisance;
- Personnel will be instructed on Best Practice Mitigation Measures to reduce noise and vibration as part of their site induction training.

***Recommended Best Practice Measures for Operation Phase Noise***

- Develop and implement a noise management plan (NMP) to be prepared as part of the EMP, which may include measures to control other emissions, approved by the Local Authority;

- Always site HGV loading and offloading as far away from neighbouring houses as possible. If line-of-site can be blocked between the two using on-site buildings this should be taken advantage of whenever possible;
- HGV drivers should be instructed not to use exhaust brakes on the site;
- HGV engines should be turned off during deliveries whenever possible;
- HGV refrigeration units should only run for as long as necessary to maintain the required internal temperatures;
- Materials should be supported for the full height when being put down during loading and offloading – they should never be dropped where unnecessary noise would result;
- Maintain all equipment on site in good working order with a regular service schedule and replace any faulty/broken equipment immediately;
- Any new equipment that is purchased or obtained to replace old should be as quiet or quieter than the equipment it is replacing;
- Workers should be instructed not to create additional noise by excessive and unnecessary yelling;
- Personnel will be instructed on Best Practice Mitigation Measures to reduce noise as part of their employment training;
- Working methods should be periodically reviewed with a view to reducing noise from site activities – improved procedures to be followed by all personal as part of the NMP.

# 10 Conclusions

10.1 A noise assessment was undertaken to predict the potential impact of a proposed development consisting of adding four poultry units alongside six existing units to increase the total capacity from 96,000 birds to 168,480 birds, at Valley Farm.

10.2 Using CadnaA modelling software, predictions of noise from the operation of ventilation units, generators and HGV deliveries at the proposed development were undertaken to assess the potential impact of noise on existing residential receptors in the vicinity of the site.

10.3 Measurements were made at the proposed development site to identify the pre-development background noise levels. Manufacturer's data for the ventilation and generator plant equipment was supplemented with MGL's own data for the delivery noise.

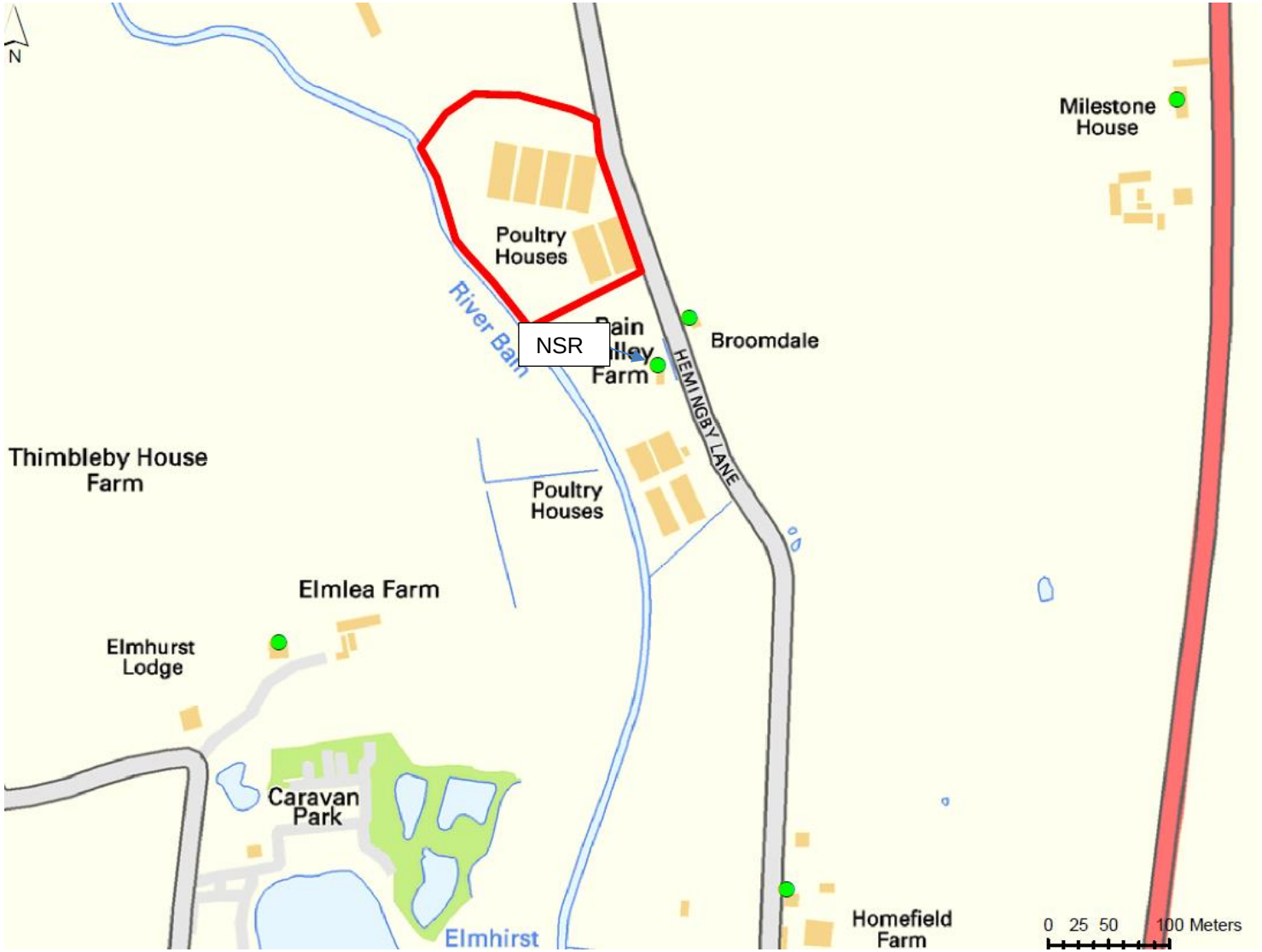
10.4 Ventilation plant will run throughout the night, with delivery hours and testing of the backup generators proposed to take place between the hours of 07:00 and 16:00. The BS4142 assessment for all noise sources predicts a low impact given the context of the proposed site.

10.5 It has been shown that no mitigation is required and it is considered that the development may proceed without any risk of adverse acoustic impact.

10.6 Recommended best practice measures have been discussed in Section 9 of this report to further reduce any potential noise impacts coming from the site during the construction and operation phases of the proposed development. These best practice measures should be implemented within the noise management plans that would form part of a Construction Environmental Management Plan (CEMP) and Environmental Management Plan (EMP) for the site pursuant to a planning condition.

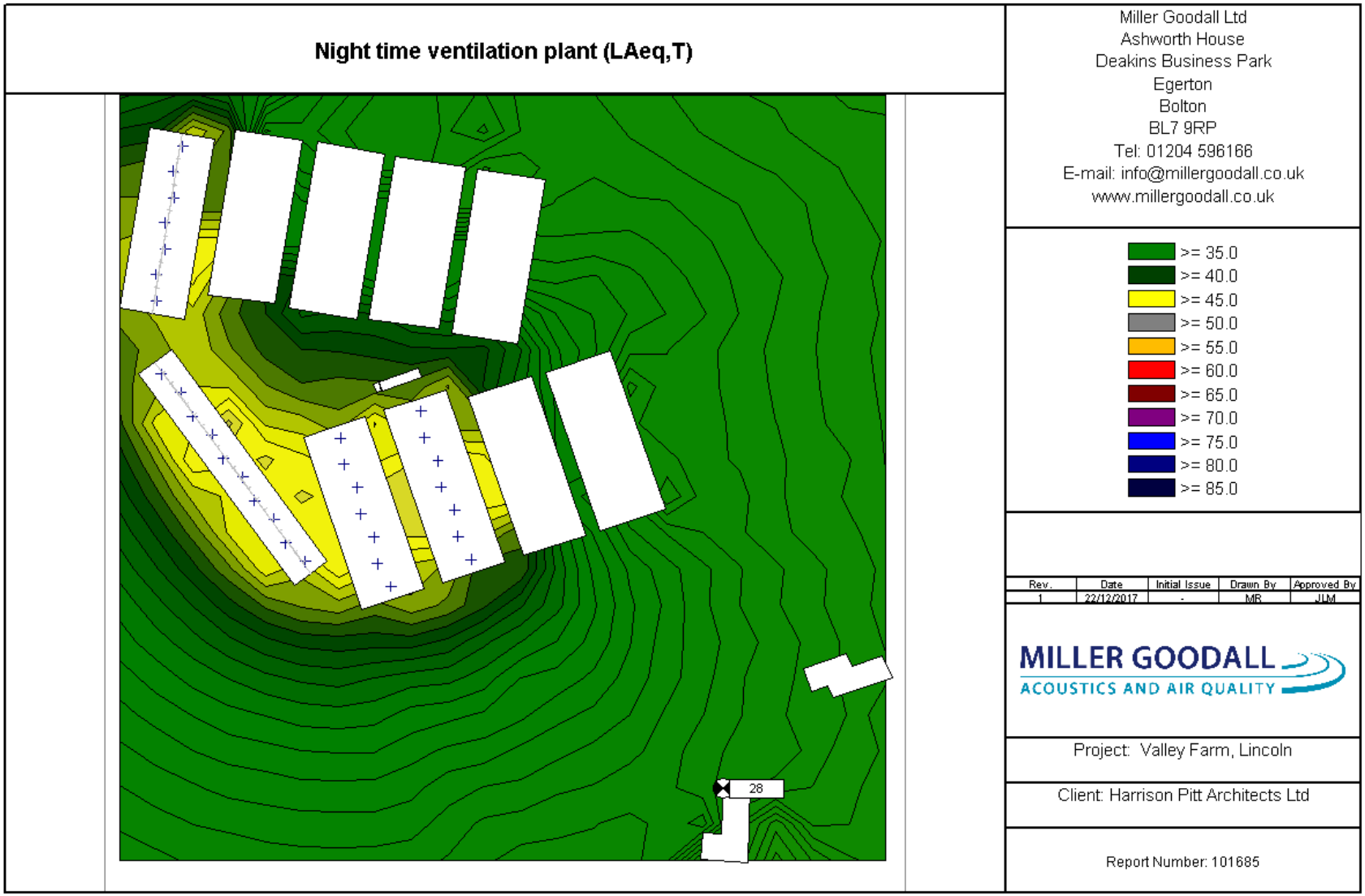
# APPENDICES

# Appendix 1: Site Location Plan

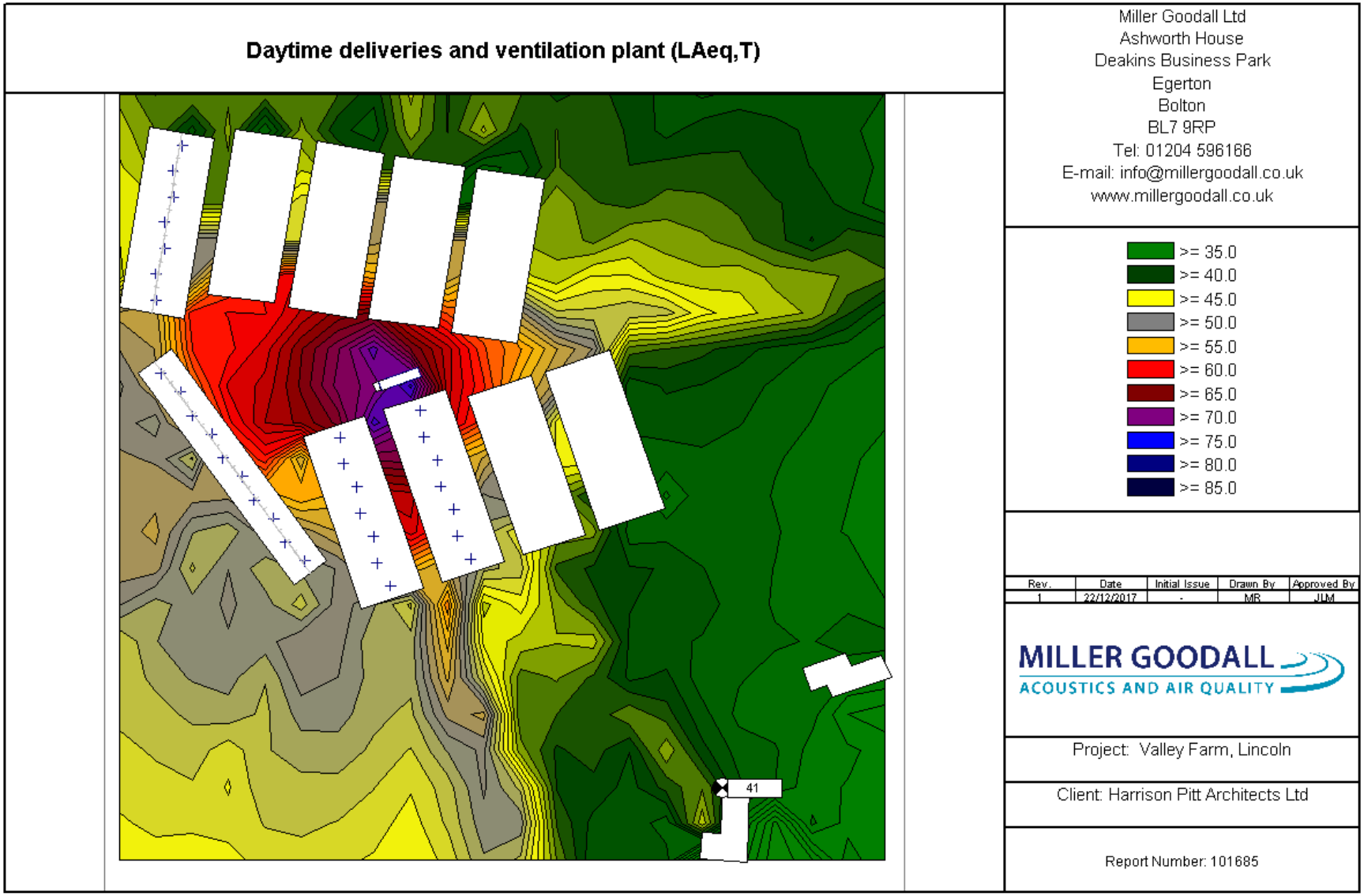


# Appendix 2: Proposed Site Layout

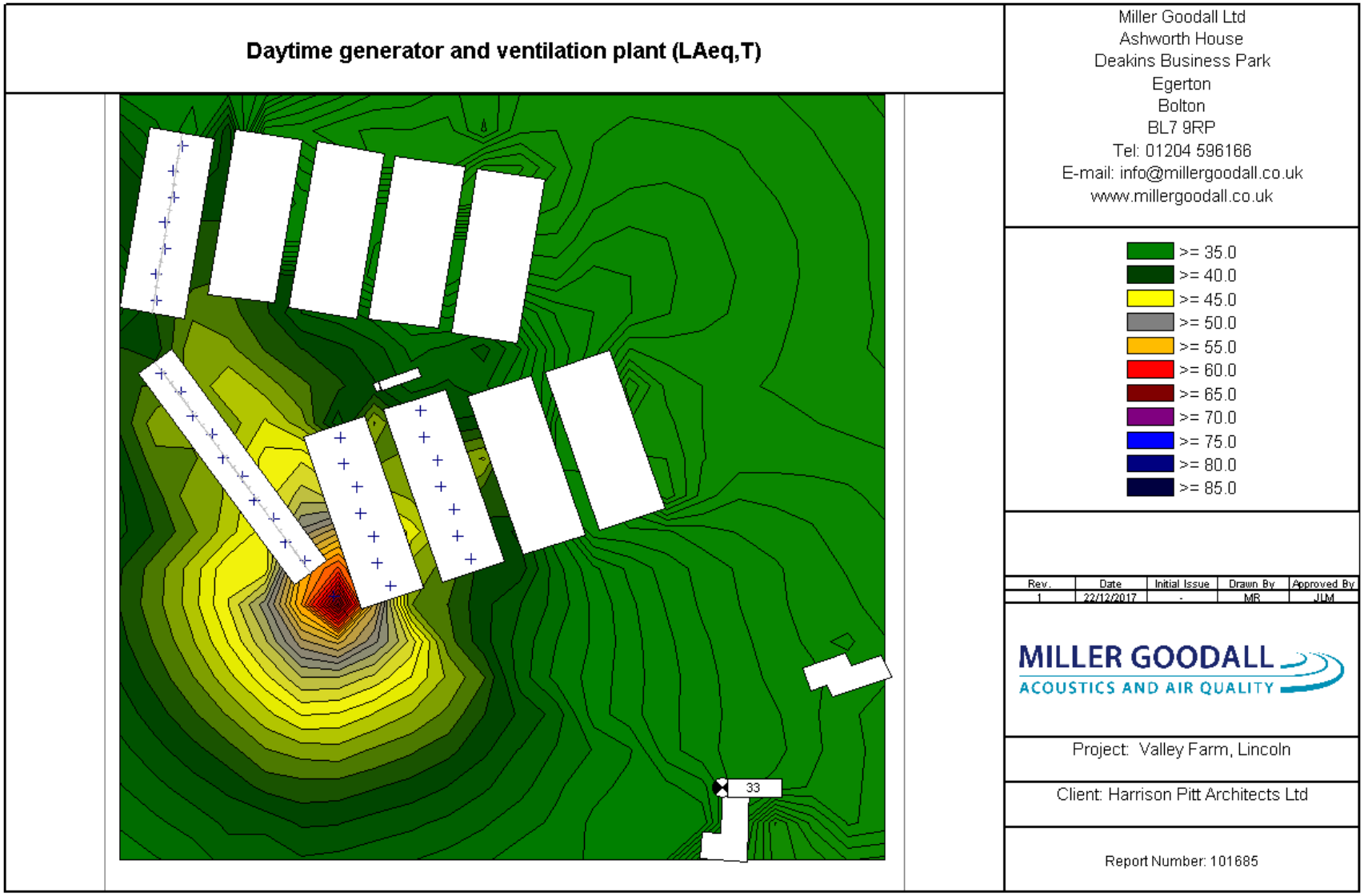
# Appendix 3a: CadnaA – Night Time Plant (23:00 – 07:00): 4m High Grid



# Appendix 3b: Daytime HGV Deliveries & Ventilation (07:00 – 16:00): 1.5m High Grid



# Appendix 3c: CadnaA – Daytime Generators and Ventilation (07:00 – 16:00): 1.5m High Grid




Miller Goodall Ltd
Ashworth House
Deakins Business Park
Egerton
Bolton
BL7 9RP
Tel: 01204 596166
E-mail: info@millergoodall.co.uk
www.millergoodall.co.uk

# Glossary of Terms

**Decibel (dB)** The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 µPa, the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

**dB $L_A$** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB $L_A$ broadly agree with an individual's assessment of loudness. A change of 3 dB $L_A$ is the minimum perceptible under normal conditions, and a change of 10 dB $L_A$ corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB $L_A$; normal conversation about 60 dB $L_A$ at 1 meter; heavy road traffic about 80 dB $L_A$ at 10 meters; the level near a pneumatic drill about 100 dB $L_A$.

**$L_{A90,T}$** The A weighted noise level exceeded for 90% of the specified measurement period ($T$). In BS 4142: 1997 it is used to define background noise level.

**$L_{Aeq,T}$** The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period ($T$). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

**$L_{Amax}$** The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.

**NOEL** No observed effect level: the level of noise exposure below which no effect at all on health or quality of life can be detected.

**LOAEL** Lowest observed adverse effect level: the level of noise exposure above which adverse effects on health or quality of life can be detected.

**SOAEL** Significant observed adverse effect level: the level of noise exposure above which significant adverse effects on health or quality of life can be detected.

MILLER GOODALL
ACOUSTICS AND AIR QUALITY