

CORY BROTHERS TERMINAL

NOISE IMPACT ASSESSMENT

Bespoke Environmental Permit Application

Operator: Cory Brothers Limited

Address: ABP West Bank, Wherstead Road, Ipswich
IP2 8NB

For: Cory Brothers Limited

By: Chris Wood MSc MIOA

Permit Ref. Unknown

Our Ref. 333_01R_1-0_CWA

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1. INTRODUCTION AND SUMMARY

- 1.1 Chris Wood Acoustics has been commissioned to undertake a noise impact assessment to support an application to the Environment Agency for a bespoke permit for **Cory Brothers Terminal**, at **ABP West Bank, Wherstead Road, Ipswich IP2 8NB** (also known as the Port of Ipswich West Bank Terminal).
- 1.2 The Cory Brothers Terminal currently operates under a **S2 Exemption** that allows for storage of 15,000 tonnes of metals at any one time, with a current throughput **equivalent to 180,000 tonnes per year**.
- 1.3 **The application is for an increase in the overall allowance to 250,000 tonnes**; an increase of 70,00 tonnes (equal to 39% in round terms). No changes are proposed in terms of the site boundary, activities or equipment.
- 1.4 Key to note, therefore, is that: the site is already operational, undertaking the same activities as it would under the proposed allowances; and the site is generally away from, and screened from, residential receptors, with no history of complaints, whilst part of a wider industrial area. The normal hours of the site are 07:30-17:30 Monday to Friday, thus avoiding potentially more noise-sensitive evening, night-time and weekend periods.
- 1.5 It is understood from aerial imagery that the site has been in similar use (including by others) since c2015.
- 1.6 The assessment presented herein has been undertaken in accordance with **BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound** and the Environment Agency's guidance. It is the Environment Agency's position that sites should be assessed against conditions as if it didn't exist, and not just in terms of any changes to existing conditions, but where the relevant contextual factors will be considered when determining the potential significance of sound emissions in practice and the decision whether to approve the application.
- 1.7 The site/area has been visited on a single occasion, and sound level measurements have been made on the site and in the vicinity of the nearest residential receptors. The site visits and measurements reveal that the site was operating appropriately, and thus in a controlled and expected manner. The handling of waste metals is, however, inherently loud, whereby sound emissions beyond the site boundary are inevitable. In this instance, however, the sound audible in the vicinity of the properties is limited.
- 1.8 The site operations revolve around the export of scrap metals, whereby deliveries are received by lorries, and the metals stored in various piles in readiness for export. The main activity on site as a result is the use of a handler to sort and stockpile the delivered metals.
- 1.9 In terms of the busiest hours in a typical day, the requested increase in tonnage will have no effect, but rather the site could be as busy more often. Since, however, the site was found to be minimally audible in the vicinity of the nearest properties, despite being a busy period, this should not make a material difference in terms of the risk of noise impact.
- 1.10 In terms of soundscape at the nearest properties, this is largely dominated by a mix of local and distant road traffic noise, together with the frequent vehicle movements on the Port of Ipswich West Bank Terminal estate access road (with relatively few associated with the application site) and various activities on other sites within the estate (in particular associated with the movement of shipping containers, with reversing alarms a common feature). Seagulls were also heard at times in the distance.

- 1.11 Consequently, together with the intervening screening, there is limited scope for the sound from the site to be impactful. Indeed, when the site was audible, it was generally barely so. This is a strong indication that assessment isn't required; however, for completeness, together with measurements undertaken on and off the site, the activities on site have been measured in proximity, and the potential significance considered in light of the guidance in **BS 4142** using a digital acoustic model.
- 1.12 Even based on typical worst case conditions, the site sound levels (accounting for any relevant characteristics) are expected to be below the background sound levels typically, whereby no more than a low impact would be expected. In practice, given the higher ambient sound levels, and the nature of the location and soundscape, it is considered that there would be no impact even in terms of worst case scenarios.
- 1.13 Accordingly, based on the wording in the **National Planning Policy Framework's** guidance, and since the site may be audible at times, if only barely so, it is considered that there should be **No Observed Adverse Effect**, whereby "Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."
- 1.14 No specific steps are recommended by the author, but where, in any case, the site will be operated based on the separate Noise Management Plan in order to keep sound emissions to a practicable minimum.
- 1.15 Accordingly, it is considered that noise need not be a barrier to the Environment Agency approving the permit application.
- 1.16 This report is set out as follows: Statements of the surveyor and author's credentials are presented in **Section 2**. Policy and assessment requirements are presented in **Section 3**. Descriptions of the site and nearest receptors are given in **Section 4**. The baseline survey and on-site measurement details and results are given in **Sections 5** and **6**. **Section 7** presents the assessment of the operational sound levels in keeping with the guidance in **BS 4142**. **Section 8** presents discussion on control measures, whilst conclusions and next steps, where applicable, are given in **Section 9**. A glossary of terms is presented as **Appendix A**, details of the national noise policy is given in **Appendix B**, and the sound level measurement equipment calibration certificates are presented in **Appendix C**.

2. STATEMENT OF QUALIFICATIONS, COMPETENCY, PROFESSIONAL MEMBERSHIPS AND EXPERIENCE

- 2.1 The survey and the preparation of this report have been undertaken by Mr Chris Wood. Chris has over 30 years' relevant experience in acoustics, sound, noise and vibration. He is a Corporate Member of the Institute of Acoustics (MIOA), and has the Diploma and Master of Science Degree from the IOA in Acoustics and Noise Control. He has undertaken a number of surveys and assessments for similar schemes, and for many other industrial and commercial schemes, whilst following the relevant guidance.

3. POLICY AND ASSESSMENT REQUIREMENTS

NATIONAL POLICY

- 3.1 The current national policy regarding “noise” is presented in **Appendix B**. Since the associated documentation doesn’t include detailed assessment methodology or criteria, it is still necessary to refer to applicable guidance documents, as presented below. However, the **National Planning Policy Framework (NPPF)** does include helpful descriptions in terms examples of outcomes based on different levels of noise exposure, which have been referred to in this report.

ENVIRONMENT AGENCY REQUIREMENTS

NOISE AND VIBRATION MANAGEMENT: ENVIRONMENTAL PERMITS (UPDATED 31 JANUARY 2022)

- 3.2 The Environment Agency, together with the Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency, has produced the guidance **Noise and vibration management: environmental permits** (Updated 31 January 2022) to help holders and potential holders of permits apply for, vary, and comply with their permits.

- 3.3 It includes the following statements:

Operators must prevent significant pollution and also comply with the requirements to use ‘appropriate measures’ (Waste Framework Directive 2018/851) or ‘best available techniques’ (BAT) to prevent or minimise noise pollution.

Noise impact assessments should be carried out to an appropriate standard and by competent personnel, for example, holders of either an Institute of Acoustics... Diploma in Acoustics and Noise Control... Certificate of Competence in Environmental Noise Measurement...

‘BS 4142: Methods for rating and assessing industrial and commercial sound’... must be used ...to quantify the level of environmental noise impact from industrial processes.

- 3.4 The following four steps are outlined:

Step 1: desktop risk assessment

Step 2: off-site monitoring survey

Step 3: source assessment

Step 4: BAT or appropriate measures justification

- 3.5 For the most part, following the guidance in **BS 4142**, as outlined further below, is the main requirement. In terms items specific to the Environment Agency guidance, there is reference under **Step 3** to the following:

- Unacceptable level of audible or detectable noise. It is stated that, “The closest corresponding BS 4142 descriptor is ‘significant adverse impact’ (following consideration of the context).”
- Audible or detectable noise. “The closest corresponding BS 4142 descriptor is ‘adverse impact’ (following consideration of the context).”
- No noise, or barely audible or detectable noise. “The closest corresponding BS 4142 descriptor is ‘low impact or no impact’ (following consideration of context).”

- 3.6 Also specific to the EA guidance, Step 4 briefly covers the requirement to demonstrate BAT (best available techniques) or appropriate measures, which are interchangeable terms within the guidance. It is stated that, “The BAT justification is the critical part of any noise impact assessment submitted to the environment agencies.” Indeed, whilst not covered by **BS 4142**, this is a natural and important extension to the **BS 4142** assessment.

3.7 The guidance goes onto cover the following topics to some extent. The relevance in this instance is noted as follows:

- **Noise impact on other species.** Understandably, the guidance is limited in this regard, and where the assessment of which is outside the scope of **BS 4142**. There is anticipated to be little, if any, need for an assessment in this regard.
- **Vibration impact assessments.** We see no reason for vibration to be an issue under normal operational conditions, and so this is not considered further.
- **How the context affects an assessment.** The advice, which is similar to that in **BS 4142** in any case, is considered within the assessment presented in **Section 7**.
- **Dealing with uncertainty.** The advice, which is, again, similar to that within **BS 4142**, is considered within the assessment presented in **Section 7**.
- **Soundscape assessment.** This is not to be confused with the assessment of tranquillity, which is not mentioned in the guidance, and not considered relevant here. Soundscape is defined as the “acoustic environment as perceived or experienced and/or understood by a person or people, in context”¹. The aim being to fully describe and/or account for all sounds present when considering the outcome from a human perspective. This should, however, be adequately covered by considering “context” as part of the **BS 4142** assessment, whereby it is not considered necessary to cover this separately.
- **Noise conditions in permits.** There are no noise conditions applicable to the site at this time.
- **Appropriate measures to meet permit conditions.** This section includes generic good practice guidance on appropriate measures to reduce or control noise. This was considered as part of the preparation of the separate Noise Management Plan.
- **Noise management plans (NMP).** Advice is provided on preparing a NMP. The NMP for the site has been prepared by others.
- **Engaging with neighbours.** Advice is provided on engaging with neighbours, including in terms of responding to complaints. This is not relevant to this report, but where the advice on responding to complaints is followed in the Noise Management Plan.
- **Monitoring.** A brief overview of the monitoring methods is provided. As above, this is accounted for in the Noise Management Plan.
- **Suggested noise impact assessment (NIA) report structure.** The advice is reflected in the structure of this report, with the required information having been provided.

3.8 Notably, being based around the **BS 4142** methodology, where conditions are to be judged on a case-by-case basis, no sound level thresholds or other acoustic-based criteria are presented in the Environment Agency guidance. We are aware, however, of example cases where background levels were exceeded by up +20 dB, which were considered acceptable by the Environment Agency at the time in context.

METHOD IMPLEMENTATION DOCUMENT (MID) FOR BS 4142

3.9 In addition to the above, the Environment Agency published **Method implementation document (MID) for BS 4142 (MID4142)** in March 2023 (updated December 2023), which “explains how to use 'BS 4142 Method for rating and assessing industrial and commercial sound' when monitoring sound for an environmental permit.” This has been followed as far as considered necessary for the preparation of this report.

BAT REFERENCE DOCUMENTS

3.10 The above Environment Agency guidance requires consideration of BAT (best available techniques), which is the consideration of the available techniques best for preventing or minimising emissions and impacts on the environment. In this regard, the European Commission (EC) produces BAT reference documents (BREFs) for installations.

¹ BS ISO 12913-1 Acoustics — Soundscape — Part 1: Definition and conceptual framework

3.11 Applicable to this site, there are BREFs for ferrous and non-ferrous metals processing, refs. BREFBATC (11.2022) and BREFBATC (06.2016), respectively. Brief, generic guidance is provided in the latter, covered in the Environment Agency guidance in any case, whilst the following table is provided in the former (referred to in the BREF as BAT 33). The table is preceded by the statement: “In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below.”

Table 3.1: BAT 33 table from BREFBATC (11.2022)

Technique		Description	Applicability
a.	Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between the emitter and the receiver, by using buildings as noise screens and by relocating the exits or entrances of the buildings.	For existing plants, the relocation of equipment and the exits or entrances of the buildings may not be applicable due to a lack of space and/or excessive costs.
b.	Operational measures	These include techniques such as: <ul style="list-style-type: none"> — inspection and maintenance of equipment; — closing of doors and windows of enclosed areas, if possible; — equipment operation by experienced staff; — avoidance of noisy activities at night, if possible; — provisions for noise control, e.g. during production and maintenance activities, transport and handling of feedstock and materials. 	Generally applicable.
c.	Low-noise equipment	This includes techniques such as direct drive motors, low-noise compressors, pumps and fans.	
d.	Noise and vibration control equipment	This includes techniques such as: <ul style="list-style-type: none"> — noise reducers; — acoustic and vibrational insulation of equipment; — enclosure of noisy equipment (e.g. scarfing and grinding machines, wire drawing machines, air jets); — building materials with high sound insulation properties (e.g. for walls, roofs, windows, doors). 	Applicability to existing plants may be restricted by a lack of space.
e.	Noise abatement	Inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings).	Only applicable to existing plants, as the design of new plants should make this technique unnecessary. For existing plants, the insertion of obstacles may not be applicable due to a lack of space.

3.12 The above represents good practice guidance, therefore, but where, perhaps to be expected, no specific guidance, criteria or examples are given. Key, however, is the recognition that space and cost constraints are to be taken into account.

BS 4142:2014+A1:2019 METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

- 3.13 As per the title, **BS 4142** provides methods for rating and assessing sound/noise of an industrial or commercial nature in relation to residential premises. The assessment methodology evaluates the “**specific sound level**” of each industrial or commercial sound source, corrects, where required, for distinguishable features to derive the “**rating level**”, and compares this with the “**background sound level**”.
- 3.14 The advice is that the background sound level ($L_{AF90,T}$) should be derived from continuous measurement of normally not less than 15 minute intervals over the period of interest, and that it should not be the lowest level, but representative of typical conditions at the noise-sensitive receiver(s) relevant to the period(s) of operation.
- 3.15 The specific sound level ($L_S = L_{Aeq,Tr}$) is obtained (by measurement or calculation) over a reference period of 1 hour in terms of the daytime (07:00 to 23:00) and 15 minutes during the night-time (23:00 to 07:00).
- 3.16 The rating level ($L_{Ar,Tr}$) is the specific sound level corrected to account for any acoustic features present in the sound in question, as experienced at the receptor, such as distinguishable, discrete, continuous note (a whine, hiss, screech or hum etc.) or distinct impulses (bangs, clatters or thumps etc.). Where no correction is warranted, the rating level is equal to the specific sound level.
- 3.17 The “**subjective method**” to calculate the rating level incorporates the following corrections (particularly appropriate for new sources that cannot be measured in-situ):
- up to +6 dB due to tonality, subjectively this might be +2 for a tone that is just perceptible, +4 where it is clearly perceptible and +6 where it is highly perceptible;
 - up to +9 dB for impulsivity, subjectively this might be +3 for impulsivity that is just perceptible, +6 where it is clearly perceptible and +9 where it is highly perceptible; and
 - up to +3 dB for other acoustic features that are neither tonal nor impulsive, though readily distinctive at the receptor.
- 3.18 An “**initial estimate**” of the impact of the specific sound is calculated by subtracting the background sound level from the rating level. The following advice applies:
- a) Typically, the greater this difference, the greater the magnitude of the impact.
 - b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - d) 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.
- 3.19 Key is the statement “**depending on context**”, since the significance of the sound in question depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. 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.

3.20 Where the initial estimate of the impact needs to be modified due to the context, the assessment should take into account all pertinent factors, including:

- the absolute level of sound;
- the character and level of the residual sound compared to the character and level of the specific sound; and
- the sensitivity of the receptor and whether dwellings will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

3.21 Helpfully, **BS 4142** includes some example assessments, one of which includes the following statement:

...the residual acoustic environment varies considerably with time, which also tends to mask sound from the source, reducing its relative significance...

3.22 An assessment, therefore, is effectively in two parts. The first part results in an initial indication of the impact, which is subsequently considered in terms the context unique to the situation at hand; and where this second part may require consideration of alternative guidance and metrics. Alternatively, the context can be considered upfront and a specific threshold (or set of thresholds) determined accordingly in place of the default values presented in points a) to d) quoted above.

BS 8233 GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

3.23 The core method in **BS 4142** (outlined above) compares the sound in question with the background conditions (i.e. part one of an assessment). When it comes to part two – taking into account context – it is in keeping with the **BS 4142** guidance to also consider the significance of the absolute level of the commercial/industrial sound. This is typically done in terms of the absolute noise thresholds given in **BS 8223**. This provides guideline values for internal and external noise levels for dwellings.

3.24 It states that, “In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4.” This table is reproduced as Table 4.2 below.

Table 3.2: BS 8233 indoor ambient noise levels for dwellings

Activity	Location	07-23 (Daytime)	23-07 (Night-time)
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

3.25 For habitable rooms, the lower guideline value is 35 dB $L_{Aeq,16h}$ during the daytime period, and where the value for bedrooms at night is 30 dB $L_{Aeq,8h}$. Assuming a partially open window providing 15 dB (during use for cooling, for example), the equivalent external level/limit would be in the order of 50 dB during the daytime period and 45 dB during the night-time period. This is a free-field level unaffected by any façade-reflected sound.

3.26 In respect of sound levels within outdoor amenity areas, the guidance in **BS 8233** suggests that, “it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments...”

3.27 **BS 8233** does caution that the internal guideline values are for sources without a specific character, and that where any such characteristics are present, “lower noise levels might be appropriate.” Accordingly, when it comes to internal conditions and commercial/industrial sound of any nature, some reduction in the standard values would be considered prudent, subject to context, but where sufficient attenuation would likely be achieved by closing windows should the occupants prefer to do so. Either way, external levels of no more than 50 dB during the day can be seen to be relatively low, with 55 dB being acceptable in noisier environments.

GUIDANCE SUMMARY

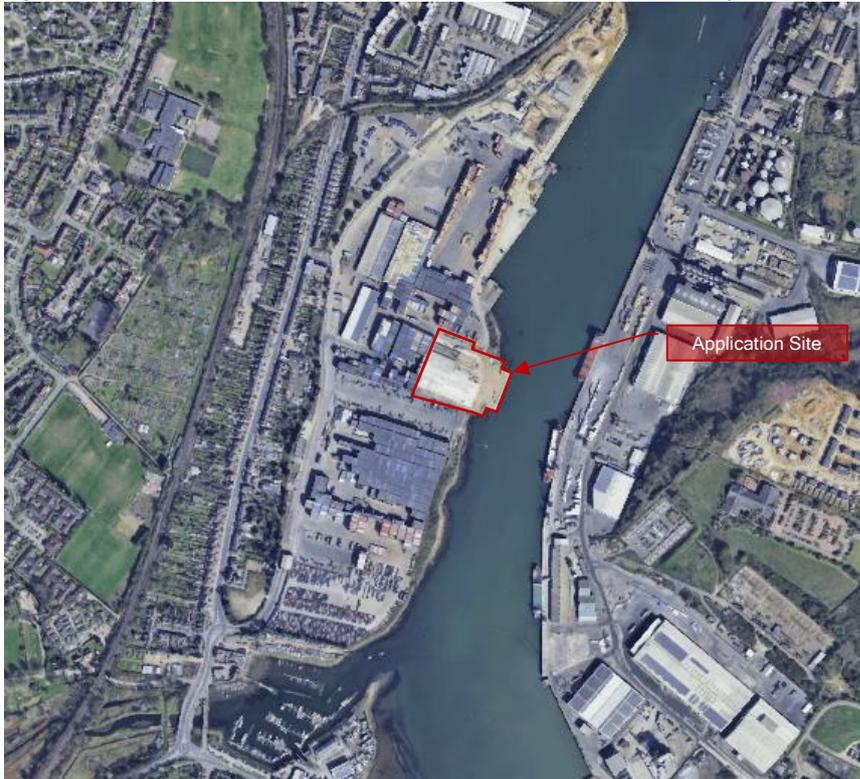
- 3.28 Based on the guidance in **BS 4142** for an “initial estimate of impact”, a rating level the same as the background sound level is an indication of a low impact, depending on the context.
- 3.29 Whilst, based on the guidance in **BS 8233**, as referenced in **BS 4142**, external levels of no more than 55 dB during the day would meet the upper external noise criteria for dwellings.
- 3.30 Ultimately, therefore, the judgement of noise impact/the potential significance of sound depends on a combination of the background sound level(s), the site-specific contextual factors and/or the absolute sound levels. Accordingly, these are considered in **Section 7**.

4. THE SITE AND ENVIRONS

THE SITE AND NEAREST RECEPTOR LOCATIONS

- 4.1 The site and nearest noise-sensitive receptors are shown in the figures below. Note, the operations on site are described in the following subsection.

Figure 4.1: Cory Brothers Limited site location and wider area (north is up)



Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics).

Figure 4.2: Cory Brothers Limited site location and local area (north is up)



Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics).

Figure 4.3: 3D aerial image from the east of the site, looking west (towards the nearest properties)



Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics).

Note: The images are out of date in terms of the site at the time of writing, with a number of stock piles of metal now in place. See the site photographs later in this report. There appears to have been a brief pause in the use of the site during c2024/25, with the site used for similar purposes from c2015.

Figure 4.4: 3D aerial image from the west of the site and nearest properties, looking east (towards the site)



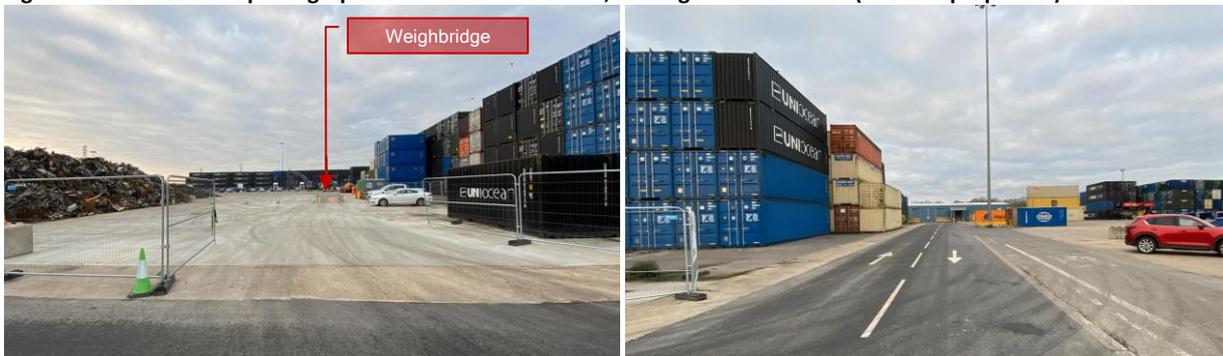
Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics).

Figure 4.5: 3D aerial image from the west of the site and nearest properties, looking SE



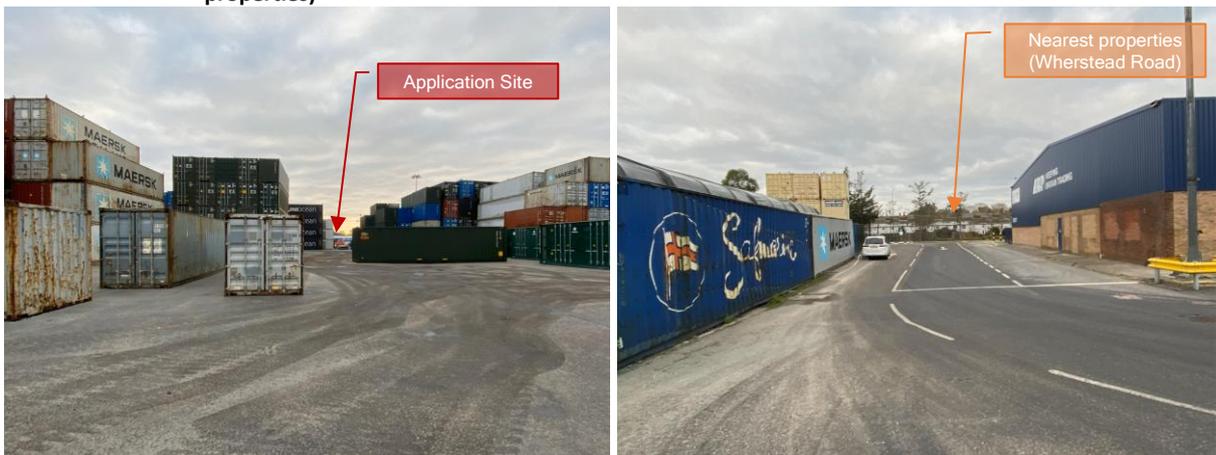
Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics).

Figures 4.6 and 4.7: Site photographs from the site entrance, looking south and west (towards properties)



Source: Chris Wood Acoustics (images captured 18 November 2025)

Figures 4.8 and 4.9: Site photographs of the site from the bend in the access road to site, looking east and west (towards properties)



Source: Chris Wood Acoustics (images captured 18 November 2025)

Figures 4.10 and 4.11: Site photographs of the estate road behind the properties, looking north and south



Source: Chris Wood Acoustics (images captured 18 November 2025)

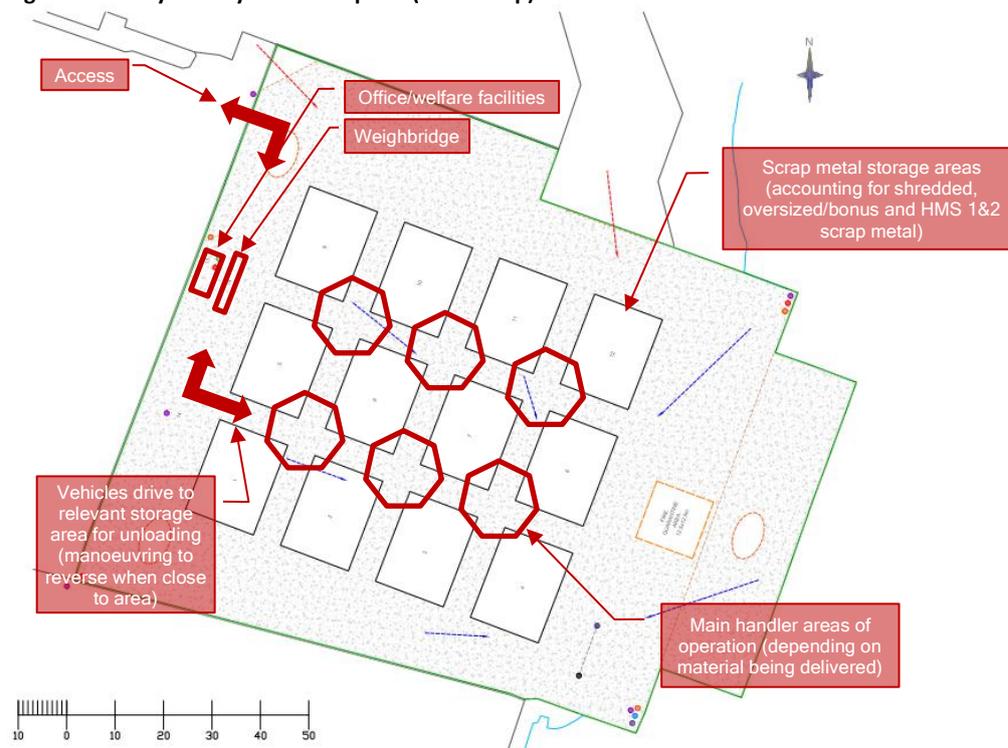
- 4.2 It can be seen that the site is more than 250 m from the nearest properties, with the majority of the site screened by large stacks of containers. The topography is largely flat, with site and nearest properties at more or less the same height. Most of the properties are 2-storeys, but where there is the identified group of townhouses/apartment block(s) that are 3-storeys. These, in particular, however, do not have a line of sight to the site, in any case. The stacks of containers are effectively a permanent feature, and, therefore, can be relied upon in terms of acoustic effects they result in.

THE SITE OPERATIONS

EXISTING OPERATIONS

- 4.3 The general operation of the site is described in **Section 1**. The key areas and items of plant are listed below and their location indicated in **Figure 4.6** (see also the site photographs presented in **Section 6**):

Figure 4.12: Key activity areas and plant (north is up)



Source: Environmental Compliance Specialists Limited (annotated by Chris Wood Acoustics).

- 4.4 There are around 10 deliveries per day (between 7.30 am and 4.30 pm Mondays to Fridays), with around six straightaway, then the rest at any time during the remainder of the day. The vehicles drive on to the weighbridge before being directed to the relevant storage area, where they manoeuvre to reverse and deliver the material via rear doors to the container and hydraulically raising the container, puller forward as the material leaves the container. This results in the usual sounds associated with the metals interacting (with each other, and, to a lesser extent, the container and the site floor), but where the event is relatively brief (less than a minute in total, including some pauses as the material tends to come up in batches as the incline increases).
- 4.5 The handler then moves the material to the relevant pile, resulting in more metal on metal sounds as the metal is gather in the grab attachment and lowered onto the pile. The material is stockpiled pending export.
- 4.6 There is no processing on site.

PROPOSED OPERATIONS

- 4.7 In upping the annual tonnage allowance from (effectively) 180,000 to 250,000, there could, naturally, be more deliveries and collections (by boat), and with the plant in more regular use, but where this is unlikely to change the conditions in terms of the site's current busy times. In any case, in the absence of different plant or activities, there will be no change in the nature of the conditions overall.
- 4.8 Viewing it simply, if all activity on site were to increase by a factor of $250,000/180,000$ (i.e. 1.39), the increase in overall sound level would be less than 1.5 dB. Even if the site were the dominant sound source, which it isn't, such a change (without any character change) is highly unlikely to be noticeable. With the site not being dominant, therefore, there is considered to be no risk of the change resulting in a material difference.

5. BASELINE SOUND LEVEL MEASUREMENTS

TIMING, LOCATION AND EQUIPMENT DETAILS

- 5.1 In order to describe the existing acoustic environment at the noise-sensitive receptors, largely attended sound levels measurements were made during the morning of Tuesday 18th November 2025. The number and duration of measurements is considered sufficient and proportional under the circumstances, whilst being undertaken during a suitable period of weather (during, otherwise, an extended period of less suitable conditions).
- 5.2 The positions are shown in the figures below. Two sound level meters were used, whereby concurrent measurements could be made at different locations. One meter was located at Position 1 for the majority of the time, with the other used for measurements on and off the site.
- 5.3 The positions were selected based on what was possible and appropriate at the time. Position 1 was selected as being accessible, secure enough to leave the equipment unattended, and somewhat representative of the nearest properties (being set back from the access road). Indeed, the presence of the access road was a key factor in terms of the measurements, with the properties set back from this to varying degrees (whereby measurements close to the road wouldn't necessarily be representative), with the properties, themselves, not readily accessible.
- 5.4 Looking at **Figure 5.1** below, it would seem that, given the gap between the containers (where the cars are parked), measurements to the south would have (also) been logical. This was not viewed to be the case when on location, however, with a combination of no getting away from the access road (with its regular movements), and also some light construction activities further along the access road. It is also the case that the majority of activities on the application site occur towards the centre, and thus screened from all properties. There is also some additional screening on site due to the stockpiles, but where, conversely, there is some reflected sound from the containers. Either way, in addition to the survey, the site operations are considered with the aid of a digital 3D acoustic model (see **Section 7**).

Figure 5.1: Baseline sound level measurement locations (north is up)



Source: Imagery ©2025 Google (annotated by Chris Wood Acoustics)

Note: what3words provided in brackets

Figures 5.2 and 5.3: Position 1 (looking east towards the site and north towards the nearest properties)



Source: Chris Wood Acoustics (images captured 18 November 2025)

Figure 5.4: Position 2 (behind 381A Wherstead Road (mix of offices and residential))



Source: Chris Wood Acoustics (image captured 18 November 2025)

Figures 5.5 and 5.6: Position 3 (close to access road, looking east along access to site, and west towards properties)



Source: Chris Wood Acoustics (images captured 18 November 2025)

Figures 5.7 and 5.8: Position 4 (on land behind gardens, looking east towards site, and west towards properties)



Source: Chris Wood Acoustics (images captured 18 November 2025)

- 5.5 As can be seen, the microphones were protected with windshields, and where all positions were in ‘free-field’ conditions (i.e. generally away from acoustically reflective surfaces, other than the ground), and c1.5 m above the local ground.
- 5.6 The equipment details are presented in **Table 5.1** below, and where the meters were set to store the 15-minute L_{Aeq} (“ambient”), L_{AF90} (“background”) and L_{AFmax} (“maximum”) levels, together with the corresponding unweighted frequency spectra in the one-third octave-bands between 20 Hz and 20,000 Hz. The sound pressure levels (L_{Aeq} and L_{eq} in one-third octave-bands) were also obtained at a resolution of 1 second.
- 5.7 Each measurement chain was field-calibrated before the survey using an acoustic calibrator to generate a level of 114.0 dB at 1 kHz. The level was checked at the end of the survey. The drift in levels were less than 0.1 dB in all instances, which is not significant. The meters and calibrator hold valid laboratory calibration certificates, as presented **Appendix B**.

Table 5.1: Survey equipment details

Equipment (ID / Positions)	Make & Model	Serial No.
Sound level meter (SLM1 / Positions 2-4 and the on site positions)	Svantek 971A	121136
Microphone / Preamplifier	ACO 7152 / Svantek SV 18A	84699 / 113784
Sound level meter (SLM2 / Position 1)	Svantek 971A	131651
Microphone / Preamplifier	ACO 7152 / Svantek SV 18A	85537 / 139344
Sound level calibrator	SV33B	140764

WEATHER CONDITIONS

- 5.8 The period of monitoring was selected due to the suitable weather conditions (during an otherwise changeable period, in keeping with the time of year). The weather was as per the forecasts, which were as follows (based on forecasts on the BBC website at the time).

Table 5.2: Summary of daytime weather conditions

Date (Nov. '25)	General description (according to BBC website)	Predominant wind direction and speed (mph)	Temperature (degrees Celsius)	Rain?
Tue 20	Sunny intervals and a gentle breeze	07-09:00:  09:00 onward: 	2-6	None

- 5.9 In the absence of rain, there are no potential effects in this regard to consider.

- 5.10 In terms of wind speeds, which can affect the microphone directly and/or result in sound from trees, for example, these were sufficiently low, and certainly below 11 mph, which is equivalent to the limit of 5 m/s recommended in **BS 4142**. Accordingly, the data are not be adversely affected in this regard.
- 5.11 In terms of wind direction, which can influence the propagation of sound from major sources, especially over large distances, it can be seen that, with the site to the east of the properties, the direction was largely away from the properties. In terms of sound from the site, therefore, the conditions may not reflect worst case conditions, but which can be accounted for in the assessment. In terms of the conditions otherwise, known as the ambient and background conditions, since these would largely be influenced by the road traffic on Wherstead Road and the estate access road, which are local to the properties and thus unlikely to be significantly affected by wind direction (or other meteorological conditions that influence sound propagation), these are expected to be sufficiently representative of typical conditions.
- 5.12 It is also the case that since the wind direction was north-westerly, which, in terms of the location of sound sources, shouldn't be too different from the prevailing westerly and south-westerly conditions. In other words, the measured levels are likely to represent the prevailing conditions. Whilst opposite conditions may result in more sound from the site, they would also result in more sound from other sites, with notable operations on the other side of the river (River Orwell).

OBSERVATIONS

- 5.13 Activity from the site was largely inaudible in the vicinity of the properties, as opposed to movements on the access road (with limited flow associated with the site itself, but regular movements associated with wider operation of the estate) and from closer sites on the estate, with regular use of plant to lift and carry containers (with associated reversing and/or lifting alarms).
- 5.14 In addition to which was the sound from local and distant road traffic, plus birdsong, and trains and seagulls in the distance. At one point, for a period of less than 10 minutes, there was a pulsating 'whir' in the distance (not from site), seemingly from the east-southeast, with a prominent tone within the 63 Hz one-third octave band.
- 5.15 The only sound audible in the vicinity of the properties, largely experienced from along the access road, was the occasional metal 'crash' sounds as the handler relocated a certain pile of heavy/large metal pieces. The location of which happen to line up with a gap in the containers along the east-west running section of the site access road (towards measurement position 3). This was understood to be an atypical activity in terms of location and material, with the more 'normal' such activities generally quieter and better screened, and, indeed, seemingly inaudible close to the properties.
- 5.16 Given the general lack of audibility of sound from the site, together with the mixed nature of the location and soundscape, it is considered that there is limited risk of an adverse noise impact.

MEASURED SOUND LEVELS AND ASSOCIATED NOTES

- 5.17 The results of the measurements at positions 1-4 are presented in the table below. Measurements at position 2 (behind the offices/property) were stopped when light works started to be undertaken on the building. Position 4 was adopted instead. Whilst measurements at position 1 were stopped when work started at the neighbouring commercial yard (where the parking area is identified in **Figure 4.2**).

Table 5.3: Main results from off site measurements (Tuesday 18 November 2025)

Position	Start time	Dur. 'T' (min)	L _{Aeq,T} (dB)	L _{AF90,T} (dB)	Notes
1. Behind commercial building, in line with rear of nearest properties gardens (to the north)	07:30	15:00	57	52	This position was only attended at times, between undertaking the measurements below and those on site. However, the soundscape (and thus the contributing sounds) was largely consistent throughout the area, with the main distinguishing factor (between locations) the proximity to the estate access road, on which HGV and other plant movements were a regular feature. Accordingly, the notes below would largely apply to the relevant time period associated with the levels at this position.
	07:45	15:00	58	51	
	08:00	15:00	57	51	
	08:15	15:00	58	52	
	08:30	15:00	58	51	
	08:45	15:00	58	51	
	09:00	15:00	58	50	
	09:15	15:00	57	50	
	09:30	15:00	58	50	
	09:45	15:00	56	49	
	10:00	15:00	59	50	
10:15	15:00	58	52		
2. Within the courtyard/ parking area behind 381A Wherstead Road	08:50	10:00	53	50	Distant road traffic, regular HGV movements on access road, container lifter movements, reversing alarms in distance, seagulls
	09:00	15:00	56	50	
	09:15	15:00	54	50	
3. Along access road, looking along road towards site	09:38	11:20	65	55	Known to be during a delivery to site, but with no resultant sound. Some metal 'crash' sounds were just audible, though, as, separately, the handler relocated heavy/large metal pieces. Regular HGV and plant movements on the access road.
	10:15	05:00	67	55	No sound from site.
4. On land behind gardens	10:50	15:00	57	49	Regular HGV movements on access road, container lifter movements (including reversing alarms), can just hear occasional metals sounds when all else is quiet, including reflected from containers.
	11:05	15:00	55	49	
	11:20	15:00	55	49	

Note: The cells for each value have been condition-formatted in Excell to show the range in levels.

- 5.18 It can be seen that the levels at position 1 were reasonably consistent, with the L_{Aeq} levels typically slightly higher than positions 2 and 4, likely due to greater proximity to the estate access road. But where the L_{AF90} (background) levels are more similar, suggesting limited variation throughout the area.
- 5.19 Naturally, the highest levels were measured at position 3, along the access road, and with the movements sufficiently regular that the L_{AF90} levels were also higher than elsewhere.
- 5.20 From this data, it would seem safe to conclude that the ambient and background sound levels at the nearest properties are typically no less than 53 dB (L_{Aeq,T}) and 49 dB (L_{AF90,T}), and more like around 55 dB and 50 dB, typically.

6. ACTIVITY SOUND LEVEL MEASUREMENT

- 6.1 In addition to the baseline data presented above, brief measurements were undertaken in proximity to the main activities and sources. The monitoring serves a dual purpose of obtaining data that could be used in acoustic modelling, where required, and to observe how the activities were being performed and the plant operated.
- 6.2 The results are presented overleaf. Based on the estimated distances between the microphone and the nearest part of the plant/source(s) in question, and assuming hemispherical wave radiation, the equivalent A-weighted sound power levels (L_{AW}) have been determined. In this way, the relative sound emissions from the various sources can be compared. It should be borne in mind that these are just estimates, however, and where some measurements were influenced by other sources in the background. Whilst the perceived sound level in practice, and the potential for noise impact, will depend on factors including the nature of the sound and the duration of occurrence.
- 6.3 The equivalent frequency data are presented following the overall dBA levels.

Table 6.1: Summary of on site activity measurement results

ID/Description	Site photo	Dur. T (mm:ss)	L _{Aeq,T} (dB)	Main distance (m)	L _{AW} (dB)
Lorry unloading (with bleeper lifting alarm) (at 9 m)		04:15	86	9	113
Lorry unloading (at 9 m)		06:05	81	9	108
Loader shovelling (with white noise alarm, plus scraping ground) (at 6 m)		01:05	91	7	114
Handling moving heavy metals between piles (at 13 m)		07:04	84	13	115
Handler moving a more typical weight metals (at 15 m)		02:17	80	15	112
Handler moving forward (with white noise alarm)		00:58	71	12	101

Table 6.2: Linear (un-weighted) sound levels in one-third octave-bands (and equivalent dBA level) from the activity measurements

ID/Position/Source/Description	20 Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	20 kHz	dBA
Lorry unloading (with bleeper lifting alarm) (at 9 m)	64	72	72	71	74	70	70	71	69	71	71	74	75	76	76	76	77	77	76	76	76	76	74	73	71	69	68	66	63	59	53	86
Lorry unloading (at 9 m)	59	67	72	70	76	78	75	73	71	69	70	69	67	67	67	67	67	68	69	70	71	71	71	71	70	69	68	66	64	60	55	81
Loading shovelling (with white noise alarm, plus scraping ground) (at 6 m)	69	71	73	74	78	75	75	75	73	74	75	76	77	79	79	79	80	81	80	80	80	80	79	78	77	75	73	72	69	65	60	91
Handling moving heavy metals between piles (at 13 m)	63	60	63	63	63	66	68	70	69	71	71	72	72	74	75	75	75	76	75	74	73	71	70	68	65	62	59	55	50	44	61	84
Handler moving a more typical weight metals (at 15 m)	61	66	61	67	69	61	63	66	66	66	66	64	65	64	63	62	62	64	66	67	69	70	71	71	71	70	69	67	65	61	56	80
Handler moving forward (with white noise alarm)	60	64	59	62	68	60	60	63	65	62	62	61	65	63	60	61	60	63	63	62	60	60	58	55	53	50	48	46	44	41	34	71

Note: The measurements were taken at different distances, whereby the levels (per activity) are not necessarily directly comparable. See the L_{AW} (sound power levels) in **Table 6.1** for a better means of comparison.

7. NOISE IMPACT ASSESSMENT

INTRODUCTION

- 7.1 Given that it was possible to witness the activities in proximity to the nearest receptors, and where it is the author's experienced opinion that an adverse noise impact is unlikely, further assessment is not considered entirely necessary. However, for completeness, to account for differences in screening from the containers and locations the author did not have access to, further assessment has been undertaken, nonetheless.

ACOUSTIC MODEL CONSTRUCTION

- 7.2 To construct a 3D acoustic model of the site and surrounding area, the proprietary software 'IMMI' has been used. The topography has been determined from open-source LiDAR DTM data at 1 m resolution.
- 7.3 An aerial image from Mapbox and the buildings from OpenStreetMap were imported into the model. The buildings were assigned as acoustically reflective and given a suitable height based on on-site observations and views within Google Maps. The containers were added by hand based on a combination of the latest Google aerial imagery and observations on site, and assigned as acoustically reflective. The model was set to account for two orders of reflections.
- 7.4 To account for the largely hard ground between the site and receptors, a global setting of 0.25 (coefficient) was assumed (i.e. 75% acoustically hard coverage). No account is taken for screening from the stockpiles on site, which would be a feature for much of the activities.
- 7.5 Point sources were added into the model to represent the main plant and activities, with the details as per **Table 7.1** below. They are in terms of the typical worst case scenario of the operation of handler moving metals, with four different locations considered. Whilst the use of the loader resulted in a slightly higher estimated sound power level, it is generally used less and with a lower source height. Likewise in terms of the unloading, which were brief events. Whilst the handling of the harder metals witnessed is not a typical occurrence.

Table 7.1: Adopted worst case site activity details for the acoustic model

Activity (X, Y Coordinates *)	Location	Height	Sound power level, L_{AW}	On-time	On-time corrected L_{AW}
Handler moving metals at position 1 (616542.60, 242579.51)	See Figs 7.1 & 7.8	2 m	112 dB	25 %	106 dB
Handler moving metals at position 1 (616533.32, 242554.98)					
Handler moving metals at position 1 (616567.11, 242570.23)					
Handler moving metals at position 1 (616556.51, 242545.70)					

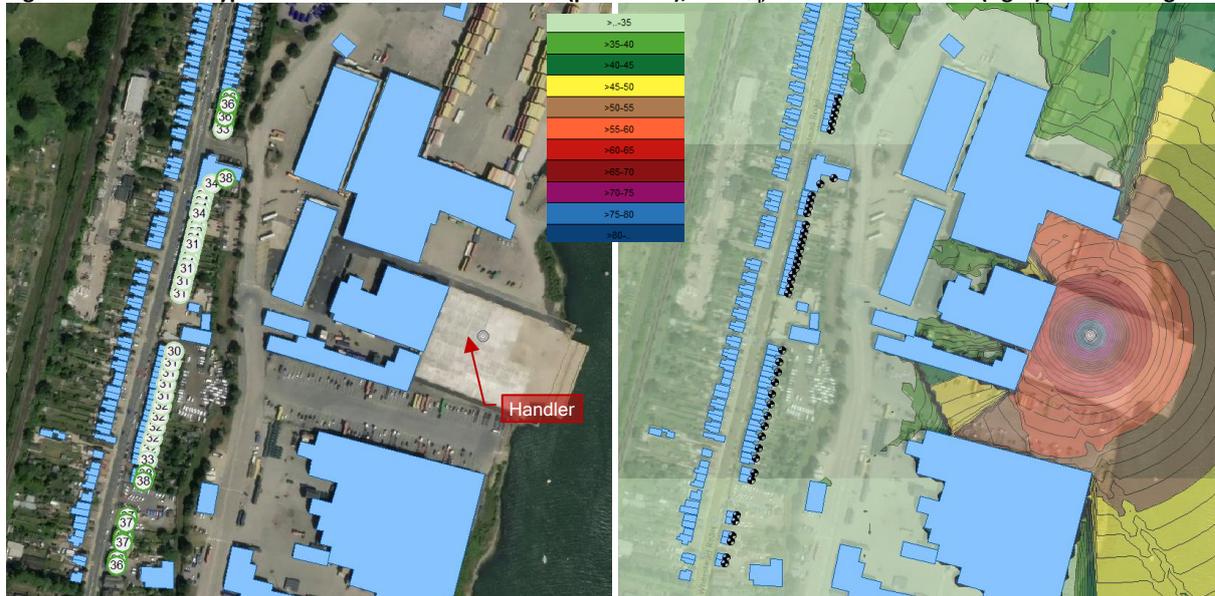
* Coordinate system/datum: British Transverse Mercator coordinates/OSGB36.

NOISE MODEL RESULTS (CALCULATED SPECIFIC SOUND LEVELS)

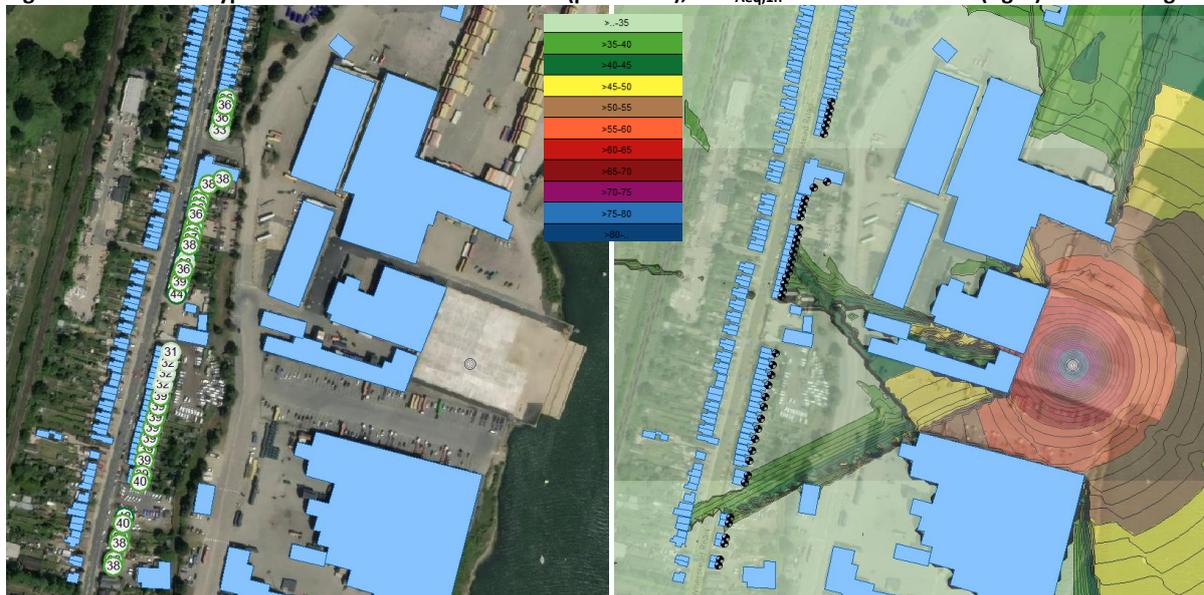
- 7.6 The model was run to calculate the resultant single-figure, A-weighted sound pressure levels in accordance with the procedures within **ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors**, considered equivalent to the typical specific sound levels. In terms of meteorological conditions, 15°C and 70% relative humidity were adopted, together with moderate downwind conditions as worst case. Since the site is to the east of the dwellings, and the prevailing wind directions are westerly and south-westerly, such that the wind is blowing towards the site and not the dwellings for the majority of the time, this is a worst case assumption.
- 7.7 Calculation points were entered into the model to represent the nearest properties, at 1.5 m and 4.5 m above ground level (or, in terms of the 3-storey townhouses/apartment block, 4.5 m and 7.5 m).

7.8 The calculated sound levels are presented in **Figures 7.1 and 7.8** overleaf. The plots show the spread of sound from the site, as well as the values at the aforementioned locations. When reviewing the contours and values, it should be borne in mind that they only show sound from the site, and not from any other background or ambient sources. They also do not contain any account for any character to the sound. This is addressed separately in order to determine the equivalent rating levels.

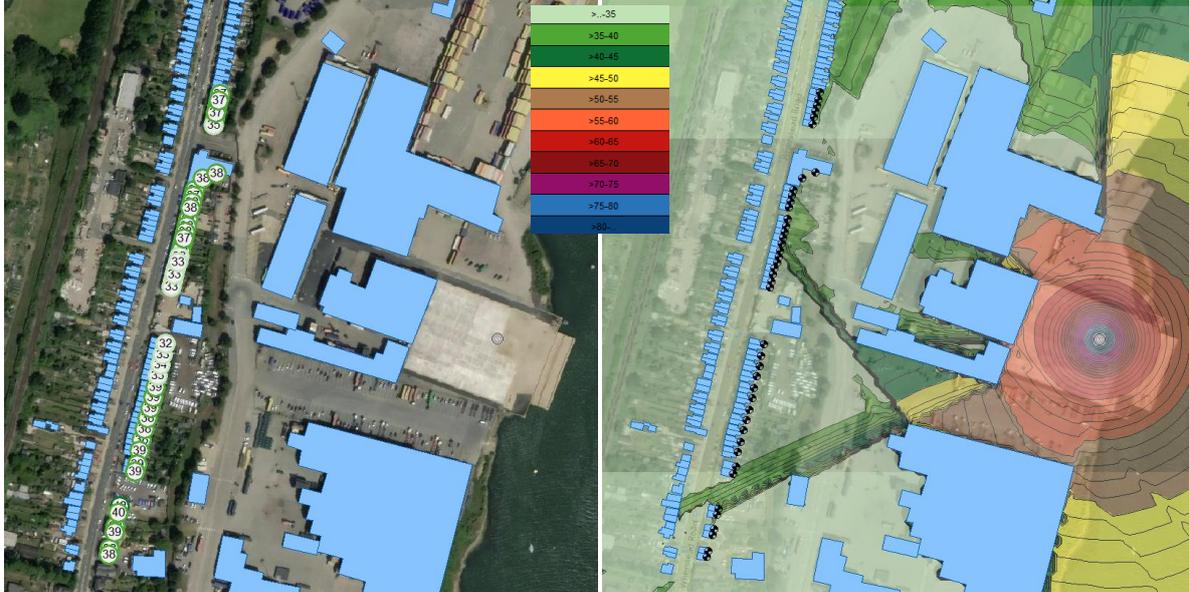
Figures 7.1 and 7.2: Typical worst-case site sound levels (position 1), dB $L_{Aeq,1h}$ at 1.5 m and 4.5 m (right) and 1.5 m agl



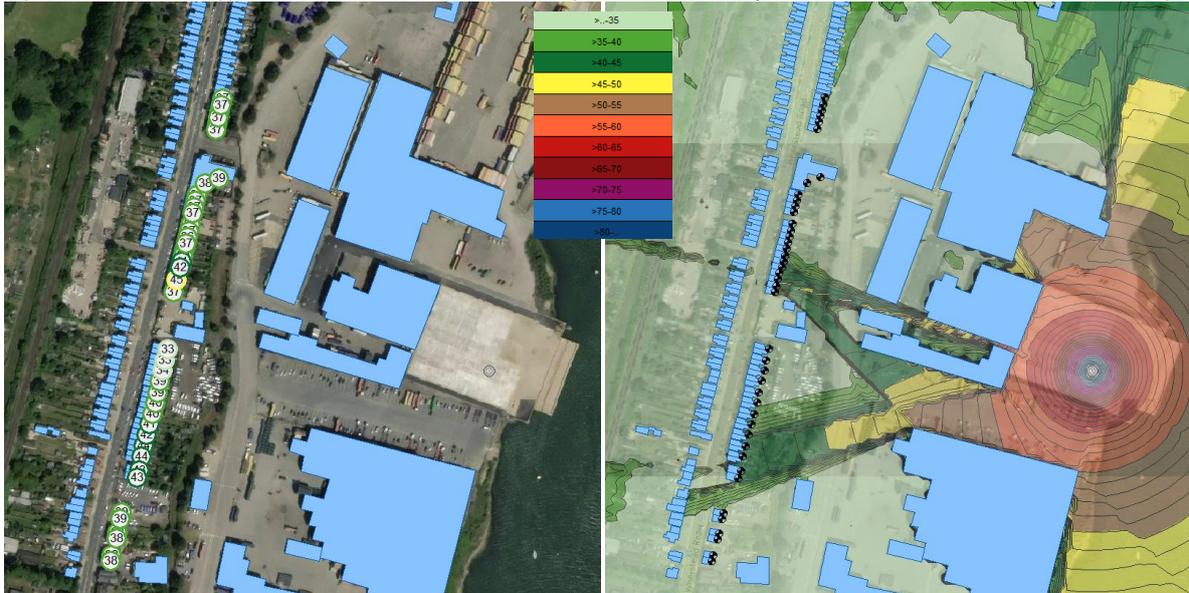
Figures 7.3 and 7.4: Typical worst-case site sound levels (position 2), dB $L_{Aeq,1h}$ at 1.5 m and 4.5 m (right) and 1.5 m agl



Figures 7.5 and 7.6: Typical worst-case site sound levels (position 3), dB $L_{Aeq,1h}$ at 1.5 m and 4.5 m (right) and 1.5 m agl



Figures 7.7 and 7.8: Typical worst-case site sound levels (position 4), dB $L_{Aeq,1h}$ at 1.5 m and 4.5 m (right) and 1.5 m agl



7.9 The results at the receptors are summarised in the following table.

Table 7.2: Summary of typical worst case calculated specific sound levels, dB

Receptors	Receiver height	Range in calculate specific sound level, $L_{Aeq,1h}$			
		Handler position 1	Handler position 2	Handler position 3	Handler position 4
All (as covered within the model)	1.5 m	29-37	30-42	31-39	32-45
	4.5 m	30-38	31-44	32-42	33-45
	7.5 m	34-38	38	38	38-39

7.10 The calculated sound levels are considered in terms the **BS 4142** assessment methodology below, starting with determining the initial estimates of impact, subject to context.

INITIAL ESTIMATES

7.11 The initial assessment in accordance with **BS 4142** is presented in the table below.

Table 7.3: BS 4142 initial assessment based on the typical worst-case scenario specific sound levels, dB

Receiver height	Highest specific sound level, $L_{Aeq,1h}$	Character correction	Rating level, $L_{Ar,1h}$	Background sound level	Difference
Ground floor	45	3 ¹	48	50 ²	-2
First floor	45		48		-2
Second floor	39		42		-8

1 Given any sound from site was generally only just perceptible, a small correction is considered appropriate, with 3 dB adopted as considered a reasonable approach.

2 Based on the results presented in **Table 5.3**, and where **BS 4142** advises against using the lowest value. It should be noted that since conditions at first level are also considered, it is likely the background conditions would have been slightly higher than measured at ground floor level.

7.12 It can be seen that in all instances the rating level is below the adopted background sound level. According to **BS 4142**, “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.” Context is considered further below.

CONTEXT AND FINAL APPRAISAL

7.13 In terms of context, **BS 4142** recommends that consideration be given to:

- 1) the absolute level of sound;
- 2) the character and level of “residual sound” compared to the character and level of the specific sound; and
- 3) the sensitivity of the receptor and whether design measures are in place that secure good acoustic conditions (such as façade insulation treatment).

7.14 In terms of the first point, it is discussed following **Table 4.2** (as per the targets in **BS 8233**) that external levels of 50 dB would typically be considered sufficiently low for residential amenity (in terms of both outside and inside conditions). Whilst the advice is that a lower limit might be appropriate where the sound in question contains a specific character, at up to 45 dB, the specific sound levels are somewhat lower than the 50 dB threshold.

7.15 The “residual sound” referenced in the second point relates to the ambient ($L_{Aeq,T}$) sound conditions in the absence of the site activities, where both the “level” and “character” are of interest. In terms of level, it is was judged from **Table 5.3** that the residual conditions typically in the vicinity of the properties were around 55 dB. Such levels are significantly above the specific sound levels presented above, thus confirming that sound from the site would not be a prominent feature.

7.16 In terms of character of the residual sound, this is certainly a mitigating factor on account of all the wider estate-related activities, in particular the regular HGV movements on the access road.

7.17 The third point applies where the receptors in question are more or less sensitive to noise than would typically be the case. Whilst it would seem unlikely the houses have been built with the sound from the estate in mind, with sound levels typically reasonable for residential amenity (i.e. at around 55 dB ($L_{Aeq,T}$), clearly there should be an expectation of sounds of a commercial or industrial nature most of the time.

- 7.18 Overall, therefore, given the rating levels are below the background sound levels typically, and well below both the **BS 8233** lower threshold for external amenity and the residual conditions, it is considered that the controlled operation of the site should not result in a significant adverse noise impact. Whilst, based on the wording in the **NPPF's PPG-N** (see **Table B.1 of Appendix B**), it is considered that there should be **No Observed Adverse Effect**, whereby "Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."
- 7.19 Accordingly, no specific noise control measures are considered necessary, but where, in any case, the site will be operated based on a separate Noise Management Plan in order to keep sound emissions to a practicable minimum.

UNCERTAINTY

- 7.20 In all assessments, it is good practice to consider uncertainty, which can arise from a number of different aspects of an assessment. There is a degree of uncertainty associated with: the instrumentation itself; the use of instrumentation; the source data; the sound propagation model, where applicable; and, of course, the subjective response of recipients.
- 7.21 In terms of the measured sound levels, uncertainty due to instrumentation error has been kept to a minimum by the use of the highest standard of field-based instrumentation, and by ensuring that all instrumentation is calibrated before and after each measurement period and is within accepted calibration intervals.
- 7.22 In terms of the baseline data, the management of uncertainty has included carrying out attended measurements during suitable weather conditions, whilst clearly presenting and reviewing the data.
- 7.23 Regarding the acoustic modelling, great care has been taken in the model's construction, with the data and assumptions regarding the existing plant items and activities being based on detailed on-site measurements and observations, with a large number of photographs and videos having been taken for reference. The calculations err on the side of worst case for a number of reasons, including the assumption of downwind conditions (contrary to prevailing conditions).
- 7.24 Regarding subjective response, the guidance adopted for the assessment is based on the subjective response of the majority of the population, with care taken to consider relevant contextual factors. Account has also been taken for upper floor sound levels.
- 7.25 On the basis of the above, therefore, whilst the magnitude of uncertainty cannot be quantitatively defined, it is considered that sufficient measures have been taken to minimise this to an acceptable degree.

8. BEST AVAILABLE TECHNIQUES (BAT)

- 8.1 With the use of modern plant, and with activities seemingly being well-controlled during the site visit, it would appear that the BAT approach is being followed.
- 8.2 It terms of site layout, this largely ensures that the activities are screened from the receptors, and where there is space enough such that the delivery lorries only need to reverse short distances when unloading. They can drive forwards on and off the weighbridge in both directions. Whilst the screening from the containers is not complete in all instances, and where there is reflected sound in some instances, this is not within the operator's control. Given the lack of risk of material noise impact, however, this situation is considered acceptable.
- 8.3 Accordingly, no specific measures are proposed, but where general management control measures are presented within the separate Noise Management Plan in order to keep sound emissions to a practicable minimum.

9. CONCLUSION AND NEXT STEPS

- 9.1 As far as the author has been able to determine, the site is adopting BAT and operating appropriately with respect to sound emissions, and where there is no reason to suspect this won't be the case in the future.
- 9.2 Furthermore, for the vast majority of the time, it would appear the site is inaudible at the nearest dwellings, and only briefly and barely audible on occasion. The author sees no reason why this would change significantly based on the application.
- 9.3 The author does not believe that, especially in context, the resultant sounds and associated sound levels should result in a significant noise impact. Indeed, in terms of the wording in the NPPF's PPG-N (see **Table B.1 of Appendix B**), it is considered that there should be **No Observed Adverse Effect**, whereby "Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."
- 9.4 In light of the above, no specific steps are recommended by the author, but where, in any case, the site will be operated based on the separate Noise Management Plan in order to keep sound emissions to a practicable minimum.
- 9.5 Accordingly, it is considered that noise should not be a barrier to the permit being granted as proposed.

APPENDIX A: GLOSSARY

Sound can be measured by a sound level meter or other measuring system. Noise is related to a human response, and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive.² Care has been taken in this document to use the most relevant of these terms (whereby 'sound' is used predominantly); however, in most reference documents, and, indeed, generally, 'sound' and 'noise' are used interchangeably. Consequently, just because the term 'noise' is used, doesn't necessarily mean a negative effect exists or will occur, and the context of the accompanying text should be taken into account.

Normal human hearing is able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble), and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain).

The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify sound in a manner that approximates the response of the human ear, a weighting mechanism is used, which reduces the importance of lower and higher frequencies in a similar manner to human hearing.

The weighting mechanism that best corresponds to the response of the human ear (though not necessarily perfectly) is the 'A'-weighting scale. This is widely used for environmental sound measurement, and the levels are denoted as dBA, dB(A) or L_{Aeq} , L_{Amax} etc. according to the metric being measured or determined (see the Definitions below).

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dBA increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dBA is generally regarded as the minimum difference needed to perceive a change under normal listening conditions. Where other changes occur (associated with the change in sound level), such as additional vehicle movements on a road, which can be seen, then these may result in changes in sound level being more noticeable than they might otherwise be.

Further to such visual clues, and any other non-acoustical factors that affect people's response (such as personal characteristics, and social, residential or environmental factors), the subjective response to a sound is dependent not only upon the sound pressure level and component frequencies, but also its intermittency. Consequently, various metrics have been developed to try and correlate people's attitudes to different sounds with the sound level and its fluctuations. The metrics used in this document, as per the relevant guidance, are defined below.

- ✦ Airborne sound: Sound that reaches the point of interest by propagation through air.
- ✦ Ambient sound: Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.
- ✦ A-weighting, dB(A): The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
- ✦ Background sound: Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
- ✦ BAT (best available techniques). Means the available techniques that are the best for preventing or minimising emissions and impacts on the environment. The European Commission (EC) produces Best Available Technique reference documents or BREF notes. They contain BAT for some installations. The Environment Agency (EA) see BAT as equivalent to the term 'appropriate measures', whilst it could also be seen as equivalent to best practicable means (BPM), defined in Part III of the **Environmental Protection Act 1990** as: "'Practicable' means reasonably practicable in terms of local conditions/circumstances, the current state of technical knowledge, and financial implications."
- ✦ Calibration: The measurement system/ chain should be periodically calibrated, within a laboratory, against traceable calibration instrumentation, to either National Standards or as UKAS-Accredited, as required. The

² Taken from the Foreword to BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*.

calibration of the system should also be checked in the field using a portable calibrator before and after each short term measurements, and periodically for longer term monitoring.

- ✦ **Class 1:** The Class of a sound level meter describes its accuracy as defined by the relevant international standards – Class 1 is more accurate than Class 2. The older standard **IEC 60651** referred to the grade as "Type", whereas the new standard **IEC 61672** refers to it as the "Class". The most accurate meters used in the field (as opposed to a laboratory) are Class 1. Class 2 meters can be used in some instances; however, Chris Wood Acoustics use Class 1 meters by default, as required by **BS 4142**, for example.
- ✦ **Context:** The circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood. When considering context, pertinent factors include: the absolute level of sound; the character and level of the residual sound compared to the character and level of the specific sound; evidence on human response to the sound; and the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.
- ✦ **Decibel (dB):** A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds (s_1 and s_2) is given by $20 \log_{10}(s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20 \mu\text{Pa}$.
- ✦ **Dwelling:** A building used for living purposes. A mobile home used for permanent living should be included in an assessment. If calculations are being conducted for compensation purposes, then some mobile homes are dealt with under the Highways Noise Payments and Moveable Homes Regulations.
- ✦ **EA (Environment Agency):** The EA is an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs (Defra). Within England, it is responsible for: regulating major industry and waste; treatment of contaminated land; water quality and resources; fisheries; inland river, estuary and harbour navigations; conservation and ecology; and managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.
- ✦ **Façade/ Façade Level:** At a distance of 1 m in front of a large sound reflecting object such as a building façade. According to **BS 8233:2014**, "Façade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the façade." The Calculation of Road Traffic Noise (1988) uses 2.5 dB, whilst **BS 5228-1:2009+A1:2014** recommends 3 dB. Owing to the latter examples, together with other historical documents, it is more usual to apply 3 dB.
- ✦ **Fast time-weighting (F):** Averaging time used in sound level meters. Defined in BS EN 61672-2:2013 Electroacoustics. Sound level meters. Pattern evaluation tests.
- ✦ **Hertz (Hz):** The unit of Frequency or Pitch of a sound. One hertz equals one cycle per second. 1 kHz = 1000 Hz, 2 kHz = 2000 Hz, etc.
- ✦ **IOA:** The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration. It was formed in 1974 from the amalgamation of the Acoustics Group of the Institute of Physics and the British Acoustical Society (a daughter society of the Institution of Mechanical Engineers). It is a nominated body of the Engineering Council, offering registration at Chartered and Incorporated Engineer levels.
- ✦ **$L_{AF90,T}$:** The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time fast time-weighting (F). Generally used to describe the 'background' sound conditions.
- ✦ **L_{AFmax} :** The maximum A-weighted sound pressure level during a given time period. L_{max} is sometimes used for the assessment of occasional loud sounds, which may have little effect on the overall L_{eq} noise level, but could still affect the sound environment. Unless described otherwise, it is measured using the fast time-weighting (F).

- ✦ $L_{eq,T}$: A sound level index called the equivalent continuous sound level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded. Where the value is A-weighted, it will be presented as ' $L_{Aeq,T}$ ' or ' $dBA_{Leq,T}$ ', otherwise it should be an un-weighted (or linear) value.
- ✦ Octave/ octave band: Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit. E.g. the 1000 Hz octave band contains sound energy at all frequencies from 707 to 1414 Hz.
- ✦ Point source: A sound source whose dimensions are small compared to the propagation distances involved. Due to the Inverse Square Law, the sound level pressure level decreases by 6 dB every time the distance between the measurement point and the source is doubled.
- ✦ Rating Level, $L_{Ar,Tr}$: The equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$, see also Specific Level) of the sound, plus any adjustment for the characteristic features of the sound.
- ✦ Residual Sound: ambient sound remaining at the assessment location when the specific sound source is suppressed (or absent) to such a degree that it does not contribute to the ambient sound.
- ✦ Sound power level, L_W : Sound power measured on a decibel scale, relative to a reference value of 10 12 W.
- ✦ Sound pressure level (sound level), L_p : The sound level is the sound pressure relative to a standard reference pressure of 20 μPa (20×10^{-6} Pascals) on a decibel scale.
- ✦ Specific sound level, $L_s = L_{Aeq,Tr}$: Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr .
- ✦ Specific sound source: Sound source being assessed.

APPENDIX B: NATIONAL NOISE POLICY

B.1 NATIONAL POLICY

The national policy of relevance comprises the Noise Policy Statement for England (NPSE, 2010) and the online National Planning Policy Framework (NPPF, regularly updated) and its associated planning practice guidance on “Noise” (also regularly updated). The guidance is necessarily generic and primarily geared towards local authorities preparing their own policies and associated guidance. The documents are described below.

B.1.1 Noise Policy Statement for England (NPSE, 2010)

The **NPSE** is the Government’s overarching statement on noise policy for England, and applies to all forms of noise other than occupational noise, setting out the long-term vision of Government noise policy, which is to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

Which is supported by the following noise policy aims:

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

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.”

When discussing the meaning of “significant adverse” and “adverse” within an “**Explanatory Note**”, the **NPSE** states:

“There are two established concepts from toxicology that are currently being applied to noise impacts for example, by the World Health Organisation. They are

“NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

“LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected.”

To which the **NPSE** added the following related concept:

“SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur.”

The **Explanatory Note** continues:

“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

The **NPSE** concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three aims listed above. Logically, it starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL, when “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.” The final aim envisages proactive management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

B.1.2 National Planning Policy Framework (NPPF, 2024)

First published in 2012, and most recently updated in December 2024, the **NPPF** sets out the Government's planning policies for England, and how these are expected to be applied. Noise is referenced within the **NPPF** as follows. These are effectively the **NPPF's** policies on noise.

"187. Planning policies and decisions should contribute to and enhance the natural and local environments by:

"...e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans..."

"198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

"a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁷²..."

Reference number 72 of the above quotation points to the **Explanatory Note** to the **NPSE** (see above).

The following policy is also relevant to noise.

"200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

As mentioned above, the Government has published accompanying web-based planning guidance for a number of categories, including noise (see below).

B.1.3 NPPF Planning Practice Guidance, Noise (PPG-N, 2019)

Following initial release in 2014, the **planning practice guidance** now forms part of the **NPPF**, referred to as "relevant planning practice guidance", which includes guidance on the category of "Noise". The guidance is often referred to as **PPG-Noise**, **PPG-N** or **PPG(N)**.

In keeping with the **NPSE** and **NPPF**, no values (in dB) are presented; however, plenty of guidance is provided as to the issues to consider in assessing noise and determining suitable thresholds. Whilst, in keeping with this report, reference is made to **BS 8233**.

A "noise exposure hierarchy table" is provided, which summarises the noise exposure hierarchy based on the likely average response of those affected, and is reproduced below. It includes "examples of outcomes" relevant to the NOEL, LOAEL and SOAEL effect thresholds described in the **NPSE**. These outcomes are in descriptive form; there is no numerical definition of the NOEL, LOAEL and SOAEL.

Table B.1: Noise exposure hierarchy table (as per PPG-N)

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

It is left to other guidance documents (e.g. [BS 4142](#) and [BS 8233](#)) and professional opinion to determine thresholds where required.

APPENDIX C: CALIBRATION CERTIFICATES

SLM1

CALIBRATION CERTIFICATE

Issued By AcSoft Limited Calibration Laboratory

Date Of Issue: 25-07-2025

Certificate No: 1512917-1

Calibrated By: W. Jay

Approved By: W. Jay



CUSTOMER

Chris Wood Acoustics
31 Kedleston Drive
Orpington
Kent
BR5 2DP

INSTRUMENT DETAILS

Manufacturer: SVANTEK
Model: SV971A
Serial No.: 121136
Firmware Version: 1.12.2
Description: Sound Level Meter
Performance Class: 1
Type Approved to IEC 61672-1:2013: No
(If Yes, there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013)

SENSOR DETAILS

Manufacturer:	ACO	SVANTEK
Model:	7152	SV18A
Serial No.:	84699	113784
Description:	Microphone	Preamplifier

P/O NUMBER

N/A

DATE RECEIVED

24-07-2025

DATE CALIBRATED

25-07-2025

CALIBRATION RESULTS

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class Y specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

REPORTED RESULTS

The results contained in this Certificate refer only to the measurements made at the time of test for the instrument detailed above. These results do not reflect the instrument's ability to maintain calibration.

Page 1 of 8

This calibration was performed by AcSoft Ltd, 11 Abbey Court, Fraser Road,
Priory Business Park, Bedford, MK44 3WH
T: 01234 639550 W: www.acsoft.co.uk E: sales@acsoft.co.uk

(AP 12/05/2014 Issue No. 0)

Note: First page presented only for brevity

SLM2

CALIBRATION CERTIFICATE

Issued By AcSoft Limited Calibration Laboratory

Date Of Issue: 25-07-2025

Certificate No: 1512917-2

Calibrated By: W. Jay

Approved By: W. Jay



CUSTOMER

Chris Wood Acoustics
31 Kedleston Drive
Orpington
Kent
BR5 2DP

INSTRUMENT DETAILS

Manufacturer: SVANTEK
Model: SV971A
Serial No.: 131651
Firmware Version: 112.2
Description: Sound Level Meter
Performance Class: 1

Type Approved to IEC 61672-1:2013: No

(If Yes, there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013)

SENSOR DETAILS

Manufacturer:	ACO	SVANTEK
Model:	7152	SV18A
Serial No.:	85537	139344
Description:	Microphone	Preamplifier

P/O NUMBER

N/A

DATE RECEIVED

24-07-2025

DATE CALIBRATED

25-07-2025

CALIBRATION RESULTS

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class Y specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

REPORTED RESULTS

The results contained in this Certificate refer only to the measurements made at the time of test for the instrument detailed above. These results do not reflect the instrument's ability to maintain calibration.

Page 1 of 8

This calibration was performed by AcSoft Ltd, 11 Abbey Court, Fraser Road,
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(AP 12/05/2024 Issue No. 5)

Note: First page presented only for brevity

Calibrator

CALIBRATION CERTIFICATE

Issued By AcSoft Limited Calibration Laboratory
Date Of Issue: 30-06-2025 **Certificate No:** 1512700-1
Calibrated By: W. Jay
Approved By: W. Jay



CALIBRATION CERTIFICATE

Issued By AcSoft Limited Calibration Laboratory
Date Of Issue: 30-06-2025 **Certificate No:** 1512700-1



CUSTOMER
 Chris Wood Acoustics
 31 Kedleston Drive
 Orpington
 Kent
 BR5 2DP

INSTRUMENT DETAILS
Manufacturer: SVANTEK
Model: SV33B
Serial No.: 140764
Description: Acoustic Calibrator accuracy class 1 with nominal level of 114 dB, and nominal frequency of 1000 Hz

P/O NUMBER N/A
DATE RECEIVED 27-06-2025
DATE CALIBRATED 30-06-2025

ENVIRONMENTAL CONDITIONS
Temperature: 19.7 °C
Humidity: 36 %rh
Pressure: 101.6 kPa

CALIBRATION RESULTS The calibrator submitted for testing has successfully completed the Periodic tests of IEC 60942:2003 (BS EN 60942:2003) (Annex B), for class 1 sound calibrators, for the environmental conditions under which the tests were performed.

REPORTED RESULTS The results contained in this Certificate refer only to the measurements made at the time of test for the instrument detailed above. These results do not reflect the instrument's ability to maintain calibration.

MEASUREMENT TRACEABILITY

The instrument under test was calibrated using the following equipment:
 Svantek SV30A Acoustic Calibrator, ACS023, Certificate No. 06397/1
 GRAS 40AG Reference Microphone, ACS009, Certificate No. 06448/2
 LAB-EL LB-706B Thermo-Barometer, ACS029, Certificate No. 1148624

Page 1 of 2

This calibration was performed by AcSoft Ltd, 11 Abbey Court, Fraser Road,
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NOTES

- The information appearing on this certificate has been compiled specifically for this instrument. This calibration certificate is produced with traceable and advanced equipment which permit comprehensive quality assurance verification of all data supplied herein.
- The measurements in this document are traceable to GUM (Central Office of Measures) Poland
- This calibration certificate shall not be reproduced except in full, without written permission from AcSoft Ltd.

CALIBRATION RESULTS ARE AS FOLLOWS:

SPL

Measured Level dB	Deviation From Nominal dB	Uncertainty dB	Tolerance (dB)	
			class 1	class 2
114.04	0.04	0.15	±0.25	±0.4

Frequency

Measured Frequency Hz	Deviation From Nominal Hz	Uncertainty Hz	Tolerance (%)	
			class 1	class 2
999.99	-0.01	0.1	±0.7 (±7Hz)	±1.7 (±17Hz)

THD+N

Measured Distortion %	Uncertainty %	Tolerance (%)	
		class 1	class 2
0.37	0.1	2.5	3.0

Page 2 of 2

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REPORT END