ENVIRONMENTAL NOISE

Bakkavor (Boston)
March 2026

THE WORKSAFE EXPERTS

This report has been compiled for Bakkavor (Boston), and on behalf of EEUK Group by the following competent consultant

Name: Neelsai Rajesh Sharma (Occupational Hygiene Consultant)

Signature: .....

Date: 09th April 2026

This report has been reviewed for Bakkavor (Boston), and on behalf of EEUK Group by the following competent consultant

Name: Nicholas Gregory

Signature: ..... Date: 9th April 2026

Client contact:	Dayle Rowson
Address:	Chapel Road, Boston, Lincolnshire, PE22 9PN
Telephone:	01205 333000
Email:	dayle.rowson@bakkavor.com

EEUK Group Ltd
Wood House,
Etruria Road,
Hanley,
Staffordshire,
ST1 5NQ
T: 01782 667820
E: help@eeukltd.com
www.eeukltd.com

Contents

SECTION

Glossary of Terms

Executive Summary

1. Introduction
2. Legislation and Guidance
3. Equipment & Strategy
4. Site Observations and Comments
5. Discussion of Results
6. Conclusions
7. References

Environmental Noise Measurement Sheets

Calibration Certificates

Certificates of Competency

Glossary of terms

Ambient Sound

Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far

[BS4142]

Attenuation

A reduction in the intensity of a sound signal.

A-weighting

The sound pressure level determined when using the frequency-weighting network A. The A-weighting network modifies the electrical response of a sound level meter so that the sensitivity of meter varies with frequency in approximately the same way that the sensitivity of the human hearing system.

The human ear has a non-linear frequency response, it is less sensitive at low and high frequencies and most sensitive in the range 1 to 4 kHz. The A-weighting is applied to measured or calculated sound pressure levels so that these levels correspond more closely to the response of the human ear. A-weighted sound levels are often denoted as dB(A).

Decibel dB

Unit level which denotes the ratio between two quantities that are proportional to power. The number of decibels corresponding to the ratio of two amounts of power is 10 times the logarithm to the base 10 of this ratio.

A linear numbering scale used to define a logarithmic amplitude scale, thereby compressing a wide range of amplitude values to a small set of numbers.

A unit that indicates that a quantity has a certain level above some pre-defined reference value.

The unit of measurement used for sound pressure levels. The scale is logarithmic rather than linear. The threshold of hearing is 0dB and the threshold of pain is 120dB. In practical terms these limits are seldom experienced and typical levels lie within the range 30dB (a quiet night time level in a bedroom) to 90dB (at the kerbside of a busy city street).

Equivalent Continuous A-Weighted Sound Pressure Level, LAeq,T

Value of the A-weighted sound pressure level in decibels of a continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time...

[BS4142]

Maximum Sound Level, $L_{pA,max}$

The highest value of the A-weighted sound pressure level that occurs during a given event or time period. The time weighting should be specified.

[BS5228]

Measurement Time Interval, T_m

Total time over which measurements are taken

[BS4142]

Percentile Level (Statistical Sound Level Indices L_{AN}, L_{A90})

L_{AN} is the dB(A) level exceeded N% of the time, measured on a sound level meter with the Fast (F) time weighting e.g. L_{A90} the dB(A) level exceeded for 90% of the time is commonly used to estimate background noise level. L_{A10} the level exceeded for 10% of the time is commonly used in the assessment of road traffic noise.

Rating Level, $L_{Ar,Tr}$

Specific sound level plus any adjustment for the characteristic features of the sound

[BS4142]

Reference Time Interval, T_r

Specified interval over which the specific sound level is determined

[BS4142]

Residual Sound

Ambient sound remaining at the assessment location when the specified sound source is suppressed to such a degree that it does not contribute to the ambient sound

Sound Pressure Level, L_p

- The level of the pressure of the sound above the intentionally accepted reference value of 20 µPa ($2x10^{-5}$ N/m^2) which corresponds to the pressure of the quietest sound an average person can hear at the frequency of 1000Hz. It is a quantity that can be measured, thus the intensity of a sound can be derived from it.
- The sound pressure level is a measure of a dynamic variation in atmospheric pressure. The pressure at a point in space minus the static pressure at that point.
- A value equal to 20 times the logarithm to the base 10 ratio of the ration of the root-mean-square pressure of a sound to a reference pressure, which is normally taken to be $20x10^{-5}$ N/m^2

Sound Power Level L_w

The sound power level of a sound source in decibels is 10 times the logarithm to the base 10 of the ratio of sound power radiated by the source to a reference power. The reference power is 1 picowatt ($1x10^{-12}$watt).

The sound power level is the fundamental measure of the total sound energy radiated by the source per unit time.

A value equal to 10 times the logarithm to the base 10 of the ratio of the total acoustic power emitted by a source to a reference power, which is normally taken to be 10^{-12}watt

Specific Sound Source

Sound source being assessed

[BS4142]

Executive Summary

EEUK Group was commissioned by Bakkavor (Boston) to undertake an environmental noise survey at their facility in Boston, Lincolnshire. The survey was conducted on the 31st March 2026 and reflects the conditions prevailing at the time.

The BS4142:2014 assessment indicates that at the property located at 01: NSR 1 Chapel Road, 02: Passage area of abandoned houses and 03: Outside Noise Sensitive Receptor (NSR) right opposite to the front end boundary, the site-generated noise is predicted to have a **significant adverse impact** during the day. This is primarily due to the constant hum of chilled trailer units and intermittent high-noise events such as HGV docking and reverse sirens.

While road traffic from Chapel Road provides some masking, the constant industrial hum from the facility remains a dominant feature of the local soundscape and mainly due to the loading bay located right opposite to these NSRs.

Several monitoring locations across the site exhibited significant noise contributions as outlined below:

- **At the HGV Waiting Area and Front Boundary (L1):** Significant noise levels were observed, dominated by the constant hum from electric generators of approximately six chilled trailers. Intermittent high-level noise was recorded from HGV movements and high-noise chilled carrier lorries entering the site.
- **At the Southern and South-Western Perimeter (L3 & L4):** Noise levels are influenced by the distant but constant hum of the wastewater treatment plant and aeration cones. While the 15m raised bank provides screening, the height of the aeration units and the equalisation of the bank with the road level at the south-west corner allow noise to migrate beyond the boundary.
- **At the Yard and Tray Storage Area (L2):** A lower ambient impact was observed due to the topographical shielding and physical barriers provided by high-density storage of wooden pallets and plastic trays, which effectively break the line-of-sight to noise sources.
- **At the Employee Car Park and Assembly Point (L7 & L8):** Consistent high-dominant noise levels were recorded from stationed fan chiller units and overhead ducting. The proximity of these sources to the boundary near NSR 1 contributes significantly to the cumulative noise impact on the nearest residents.

The assessment indicates that the primary sources of noise-related complaints originate from yard operations, specifically HGV reverse sirens, FLT fork impacts, and the constant hum of chilled lorries units. The observation that some vehicles arrive during restricted night-time hours (22:00–06:00) suggests that site arrival protocols and operator behaviours are key factors in the observed noise impact. Furthermore, the high-level ducting and fan chiller units near the smoking shelter represent a continuous noise source that lacks sufficient acoustic screening.

Using the predicted daytime noise levels at the noise sensitive receptors, the World Health Organisation (WHO) Guidelines for general outdoor noise of 50dB during the daytime would be exceeded at the properties bordering the site.

The following recommendations offer practical solutions for reducing the potential impact of site generated noise at the nearest receptor locations based on the site measurements, observations and outcome of any assessments undertaken:

To further reduce and manage site noise levels, the following noise control measures are recommended:

- **Switch to electric trailer power: Ensure all refrigerated trailers use electric hook-ups on arrival to eliminate diesel generator noise.**
- **Upgrade and maintain equipment: Replace older chiller units with quieter models and install vibration isolation to reduce mechanical noise.**
- **Install acoustic controls on plant: Use duct attenuators, silencers, or enclosures to reduce dominant noise from fans, ducting, and refrigeration units.**

- Introduce effective noise barriers: Where needed, install acoustic screens or barriers at the site boundary to limit direct noise to receptors.
- Strengthen night-time controls: Continue to enforce the 22:00–06:00 no-activity policy and improve scheduling to prevent late-night disturbances.
- Improve yard operations: Repair uneven surfaces and ensure engines/chillers are turned off when not in use to reduce impact and idling noise.
- Reduce operational impact noise: Train staff and drivers to minimise dropping materials, use quieter handling methods, and adopt broadband reverse alarms instead of tonal beepers.

Introduction

1.1 In order to provide an assessment of the noise on the site boundary, Bakkavor (Boston) commissioned Environmental Essentials (UK) Ltd to undertake an environmental noise survey around their premises in Boston.

1.2 The objectives of the survey were to:

- **Conduct an environmental noise survey on the site boundary and residential properties.**
- **Establish the noise levels on the site boundary during the day time.**
- **Establish representative background levels at the residential noise sensitive receptors.**
- **Undertake a BS 4142:2014 +A1:2019 assessment to determine the likelihood of the site generated noise having an adverse or significant adverse impact at the residential noise sensitive receptors.**
- **Establish methods to mitigate the impact of the site generated noise.**

1.3 The survey was undertaken by Neelsai Sharma of Environmental Essentials (UK) Ltd on the 31st March 2026 and reflects the conditions prevailing at the time.

Legislation, Standards and Guidelines

National Planning Policy Framework

The Planning Policy Guidance Note PPG24 *'Planning and Noise'* published in 1994 outlined the considerations to be taken into account by local authorities in determining planning applications both for noise sensitive developments and for those activities which will generate noise.

The Guidance acknowledged that noise can have a significant effect on the environment and on the quality of life enjoyed by individuals and communities. However, it advises that while the planning system should be used to minimise the adverse impact of noise, planning authorities should not place unreasonable restrictions on development, or add unduly to the costs and administrative burdens of business.

This Planning Policy Guidance Note has been replaced by the National Planning Policy Framework, published in 2012.

The National Planning Policy Framework *(NPPF)* sets out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

Throughout the NPPF is the presumption in favour of sustainable development.

The presumption is subject to two exceptions. First it will not apply where any adverse impacts of allowing

development would *"significantly and demonstrably"* outweigh the benefits when assessed against the policies in the NPPF as a whole. Secondly, the presumption will not apply where specific policies in the NPPF – such as those relating to green belt or national parks – indicate that development should be restricted.

With regards to noise, the NPPF notes that:

"The planning system should contribute to and enhance the natural and local environment by...

- **preventing both new and existing development from contributing to or being out at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability"**

"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 through the use of conditions;**
- **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 uses since they were established; and**
- **identify and protect areas tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."**

BS 4142:2014

British Standard 4142:2014 *Methods for rating and assessing industrial and commercial sound* describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

a) **sound from industrial and manufacturing processes;**

b) **sound from fixed installations which comprise mechanical and electrical plant and equipment;**

c) **sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and**

d) **sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that fro train or ship movements on or around an industrial and/or commercial site.**

BS4142 defines the following terms for describing existing and future noise levels:

- **Ambient Sound Level, $L_a = L_{Aeq,T}$**

  Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far, at the assessment location over a given time interval, *T*

- **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 time interval, T_r

- **Residual Sound Level, $L_r = L_{Aeq,T}$**

  Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, *T*

- **Background Noise Level, $L_{A90,T}$**

  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 weighting F and quoted to the nearest whole number of decibels

The standard states that, when possible, the background sound level should be measured at the assessment location. It should be ensured that the measurement time interval is of sufficient duration to obtain a representative value of the background sound level.

BS4142 notes that where it is not possible to determine the specific sound level directly by measurement, it may be appropriate to determine the specific sound level by a combination of measurement and calculation.

Certain acoustic features can increase the significance of impact over the basic comparison between the specific sound level and the background sound level.

Subjectively and where appropriate, such as for instances where a new, proposed sound cannot be measured, the specific sound level should be corrected if a tonal or impulsive characteristic is expected to be present.

- **Tonality**

  Just perceptible, apply a penalty of 2dB

  Clearly perceptible, apply a penalty of 4dB

  Highly perceptible, apply a penalty of 6dB

- **Impulsivity**

  Just perceptible, apply a penalty of 3dB

  Clearly perceptible, apply a penalty of 6dB

  Highly perceptible, apply a penalty of 9dB

For other sound characteristics which are not tonal or impulsive but readily distinguishable, a penalty of 3dB can be applied.

Where a specific sound is intermittent and readily distinctive, a penalty of 3dB can be applied.

If the subjective method is not sufficient for assessing the audibility or prominence of tones or impulsive sounds, identification can be made using the one-third octave method and a correction of 6dB added if present.

When making an assessment the impact of a specific sound, an initial estimation is made by subtracting the measured background sound level from the rating level. Typically, the greater the difference, the greater the magnitude of impact:

- **A difference of around +10dB or more is likely to be an indication of a significant adverse impact**
- **A difference of around +5dB is likely to be an indication of an adverse impact**
- **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**

Environmental Protection Act 1990

Chapter 43 of the Environmental Protection Act 1990 (EPA) makes provision for the improved control of pollution, including noise, arising from any industrial, commercial or activities of any other nature whatsoever.

Specifically, the EPA re-enacts the provisions of the Control of Pollution Act 1974; it restates the law defining statutory nuisances and improves the summary procedures for dealing with them.

Section 80 of the EPA empowers local authorities to deal with statutory nuisances when they occur. The level at which a noise is deemed to be a statutory noise nuisance is not defined in the EPA, this is left to the judgement of individual local authorities. The EPA also grants the right to private citizens to bring a court case against the owner/operator of a noise source.

With regards to the term 'nuisance' there is no specific definition in the Act, so the tests as at common law apply. A definition often used in Court is *"A nuisance is a material interference with a person's use or enjoyment of their land or property"*.

Case law supports the view that factors such as mature of noise, time of day or night it occurs, day of the week on which it occurs, how long it occurs for, how often it occurs and the character of the area in which it occurs should be taken into account when deciding whether the inference is material, as well as whether those affected are overly sensitive or whether they represent the "Man on the Clapham Omnibus".

In court proceedings for an offence, it is a defence to prove that 'best practicable means' were used to prevent or counteract the effects of noise. Under 79(9), 'best practicable means' is to be interpreted by reference to the following provisions:

- **"practicable" means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;**
- **the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;**
- **the test is to apply only so far as compatible with any duty imposed by law;**
- **the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances.**

World Health Organisation Document "Guidelines for Community Noise"

The World Health Organisation (WHO) published the document "Guidelines for Community Noise" in 2000. This states that general outdoor noise levels of below 50dB L_{Aeq} during the day are desirable to prevent 'moderate' community annoyance. The guidance and also recommends the L_{Aeq} should not exceed 30dB indoors if negative effects on sleep are to be avoided.

World Health Organisation Document "Night Noise Guidelines for Europe"

The World Health Organisation (WHO) published their "Night Noise Guidelines for Europe" in 2009. These guidelines are applicable to the Member States of the European Region, and may be considered as an extension to, as well as an update of, the previous WHO *Guidelines for Community Noise* (1999).

It states an $L_{night,outside}$ of 40dB should be the target of the night noise guidelines (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly. Where 40dB is not feasible in the short run for various reasons, an interim target of 55dB $L_{night,outside}$.

The guidelines also state that the correction for inside levels to outside levels should be 21dB, as this takes into account that even in well insulated houses, windows may be open for a large part of the year.

British Standard BS8233: 2014

The scope of BS8223: 2014 *Guidance on sound insulation and noise reduction for buildings* is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

The Standard suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests that within bedrooms, an internal noise level of 30 dB $L_{Aeq,T}$ is a good standard, whilst 35 dB $L_{Aeq,T}$ is a reasonable standard. For living areas in the daytime, the Standard recommends 30 dB $L_{Aeq,T}$ as a good standard and 40 dB $L_{Aeq,T}$ as being a reasonable standard. BS8233 also states that individual noise events should not exceed 45 dB L_{Amax} in bedrooms at night.

Equipment and Strategy

3.1 Measurements were made using the following equipment:

- **CEL 633C Sound Level Meter (serial number 2670889)**
- **CEL 120/1 Acoustic Calibrator (serial number 1012367)**

3.2 The Sound Level Meter was calibrated using the Acoustic Calibrator to a level of 114dB at a frequency of 1Khz immediately prior to use and upon completion of the survey. No variation in calibration signal occurred (>0.2dB).

3.3 Casella CEL undertook an external UKAS accredited calibration of the Sound Level Meter in September 2025 and the Acoustic Calibrator in August 2025. Copies of the calibration certificates are presented in Appendix B.

3.4 The weather conditions during the survey were fine, dry, approximately 60% cloud cover wind speeds generally below 5m/s and air temperature of 16°C-18°C.

3.5 A representative of the client selected the noise monitoring locations around the site and the locations for the assessment are as follows:

- **L1- HGV waiting area (Front side)**
- **L2- Tray storage and wooden pallet storage area**
- **L3– South west corner**
- **L4– Yard area (opposite two big silos)**
- **L5- Back side – central boundary behind two large black silo**
- **L6- Side corner- close to the slaughter house**
- **L7- Employee's car park boundary**
- **L8- Boundary close to the assembly point**

3.6 Off-site measurements to establish the background noise levels were taken at the following locations:

- **01: NSR at Chapel Road**
- **02: Passage area of abandoned house**
- **03: Outside NSR right opposite to the front end boundary**
- **04: Green lane near Chapel road (Background)***

3.7 Measurements have been taken in the "free-field" where possible, 3.5m away from any reflective surfaces and the Sound Level Meter was positioned on a tripod at approximately 1.5m high above the ground. Where possible all interferences have been excluded from the assessment by the use of the pause function or by post processing of the data.

3.8 During the site day, readings at both the on-site and off-site monitoring locations took the form of consecutive fifteen-minute measurements.

3.9 The background noise level was measured off-site in the absence of any site generated noise for one consecutive 15-minute measurement during the day. The background noise measurements were taken along Green lane, closest to the Chapel road and approximately 620 metres from L2- Tray storage and wooden pallet storage area as noise from Northwood Tissue was inaudible at this location and was deemed to be representative of a typical background level in the surrounding area.

Site Observations and Comments

4.1 Bakkavor (Boston) are based in Boston, PE22 9PN and produce fresh prepared foods (ready meals, pasta dishes, deli products, salads, etc.).

4.2 The site is located along Chapel Road in Old Leake, near Boston, Lincolnshire, situated within a complex transitional environment where large-scale industrial operations meet a predominantly flat agricultural landscape. Despite the rural-industrial character, the area includes residential pockets, specifically the properties along Chapel Road and abandoned houses, which sit in direct proximity to the constant HGV movements, refrigerated trailer hums, and fixed plant noise originating from the facility.

4.3 Site Topography and Noise Environment:

The site's highest noise generating area was the continuous operation of chilled trollies within loading bay, which were slightly positioned downwards. Towards the front of this loading bay was a large elevation metal structure which resonated the noise. The site also had site boundaries, in the form of wooden fencing and towards the abandoned house, it was in the form of cemented boundaries, although these boundaries were approximately 3m heighted.

The facility operates on a 24/7 basis. While the client noted that busiest periods occur during the week and that mitigation measures such as electric Forklift Trucks (FLTs), electric-powered chilled trailers, and door controls are utilised, this assessment was intentionally conducted during a "worst-case scenario" period as most of the loading bays were equipped with chilled trollies during the assessment. This was specifically chosen to evaluate the impact on the nearest sensitive receptor towards front end of the site, following recent noise complaints.

4.4 Observed Noise Sources

The acoustic environment is influenced by a variety of on-site operational sources and external ambient factors. The primary noise sources identified during the survey include:

- Logistics and HGV Activity: Significant noise is generated within the HGV waiting area and front boundary. This is characterised by a constant hum from electric generators on chilled trailers (typically six trailers at the time of assessment). While diesel generators are rarely used (reportedly once a month or less), the electric units still produce a significant hum. The entry and movement of high-noise chilled carrier lorries and vehicles passing over uneven ground in the yard further elevate the noise levels. Operations are notably more limited during night-time hours (10:00 PM to 6:00 AM), though occasional vehicle arrivals (e.g., between 11:00 PM and 11:30 PM) still occurs.
- Fixed Plant and Infrastructure: A dominant and constant high-level noise is generated by the stationed fan chiller units (located near the smoking shelter) and the overhead ducting system. The ventilation system above the processing area and various motors, fans, and pumps in open areas contribute to the consistent industrial hum. Additionally, constant low-frequency noise is emitted by the wastewater treatment plant, specifically from the aeration cones.
- Forklift Operations: High FLT traffic was observed during the daytime. Sources of impact noise include forks hitting the ground, waste tipping operations into skips, and the frequent activation of reverse sirens as HGVs park into warehouse bays.
- External and Ambient Contributions: The receptors are also affected by road traffic noise from Chapel Road and Fell Road, as well as noise from trailers passing nearby the passage of abandoned houses. Secondary industrial noise is also present in the form of ducting at the adjacent slaughterhouse factory, however, this noise was not audible at the front end NSRs. Natural sounds, such as intermittent bird chirping, were noted across all locations, though they were often secondary to the dominant industrial and traffic sources.

4.5 Measurement Site Observations

Specific observations were recorded at each measurement point to contextualise the data. At the front boundary and HGV waiting area (L1), the noise environment was dominated by the hum of electric generators and intermittent high-noise FLT movements. At the employee car park boundary (L7), the noise was dictated by the proximity to fan chillers and overhead ducting, with a clear line of sight to a receptor approximately 100 meters away.

Toward the backside central boundary (L5), the constant hum was attributed to the silo area and ducting, mixed with distant traffic. Near the slaughterhouse factory corner (L6), the external facility's ducting became a primary source, though the distant hum from the subject site remained audible. In contrast, locations like the tray and wooden pallet storage area (L2) benefitted from acoustic shielding provided by high pile-ups of pallets and trays, resulting in lower ambient site noise. Measurements at NSR 1 (01) and the outside boundary (03) confirmed that the dominant impacts for residents are the HGV movements, reverse sirens, and the constant hum from parked chilled lorries within the site.

Discussion of Results

5.1 From information supplied by representatives of the Client, Environmental Essentials (UK) Ltd considers the measured levels on the day of the assessment to be representative of normal operational conditions.

5.2 It should be noted however that the working environment can change on a daily basis.

5.3 The noise survey recorded the following levels, as shown in Table 1:

Table 1

Site Boundary (daytime), dB

	S. No.	L_{Aeq}	L_{A90}	L_{Amax}	L_{Amin}	Comments
L1- HGV waiting area (Front side)	*379*	**60**	56.5	72	54	Dominant noise from 6 chilled trailers (electric generators) creating a significant hum. Intermittent high-level noise from Forklift Truck (FLT) movements and reverse sirens. Includes high-noise entry of one chilled carrier lorry.
L2- Tray storage and wooden pallet storage area	*380*	**47**	41	67	39	Low ambient site noise and low hum from the warehouse chilled lorry area. Masked/shielded by high piles of pallets and plastic trays. Occasional bird chirping.
L3– Southwest corner	*381*	**45**	41.5	63	38	Characterised by distant noise from the wastewater treatment plant and distant bird chirping. Intermittent FLT reverse sirens audible.
L4– Yard area (opposite two big silos)	*382*	**49**	47	64	45	Constant low hum originating from the wastewater treatment plant. Occasional bird chirping.
L5- Back side – central boundary behind two large black silo	*383*	**46**	44	56	43	Constant hum from the silo area, likely attributed to ducting noise. Distant traffic noise and bird chirping also present.
L6- Side corner- close to the slaughter house	*384*	**47**	45	66	43	Primary noise from external ducting at the adjacent slaughterhouse factory. Distant hum from the subject site and bird chirping.
L7- Employee's car park boundary	*385*	**52**	51	77	50	Constant, dominant high-level noise from stationed fan chiller units (near smoking shelter) and overhead ducting. Includes noise from the wastewater treatment plant and intermittent FLT reverse sirens.
L8- Boundary close to the assembly point	*386*	**51**	47	75	45	Dominant, constant noise from the trailer area (electric generators). Intermittent road traffic noise from Chapel Road.

Table 2

Offsite Measurements (daytime), dB

	S. No.	L_{Aeq}	L_{A90}	L_{Amax}	L_{Amin}	Comments
01: NSR at Chapel Road	*376*	**52**	45	73	41	Mix of bird chirping, HGV reverse sirens, and a constant hum from parked lorries at the factory. General road traffic noise from Chapel Road. FLT movements and reverse sirens audible from the site.
02: Passage area of abandoned house	*377*	**55**	43	77	41	Road traffic noise from Chapel Road and Fell Road. Constant hum from the factory, intermittent bird chirping, and noise from trailers passing nearby.
03: Outside NSR right opposite to the front-end boundary	*378*	**57**	53	69	48	Dominant noise environment comprised of HGV movements within the site and noise from parked "cold" lorries (refrigeration units). Accompanied by bird chirping.
04: Green lane near Chapel Road (Background)*	*387*	53	**36**	75	32	General intermittent traffic noise with occasional bird chirping.

**Measurement location deemed as representative of the background sound level at all NSRs during the day as site noise inaudible.*

5.4 In order to predict the noise levels at the nearest receptor, the following equation was used:

$$L_{P2} = L_{P1} - 20 \log(r_2/r_1)$$

where, r_1 is the distance from source to measurement location; and

r_2 is the distance from source to receptor

Note: The equation assumes direct point source propagation from source to receptor and assumes no effects from meteorological conditions or ground effects which could attenuate noise levels. It should be noted that ground effects are expected to be minimal due to the height of the noise source relative to the first floor of the receptor locations. Additionally, no obstructing objects such as foliage have been considered as part of the calculations, as although there are trees and foliage between source and receptor, the attenuating effects from these obstructions are deemed to be negligible. Therefore, the results presented in the report are likely to present a worst case scenario of impact as a precautious approach. Should the client wish to obtain more accurate results through complex computer modelling then advice should be sought from an acoustic specialist.

Table 3:

Predicted Noise Levels L_{Aeq} at the Nearest Receptor (day)

Nearest Noise Sensitive Receptor	Measured Level at Closest Site Boundary (L_{P1})	Source to Measurement Location (metres)	Source to Receptor (metres)	Barrier Attenuation due to screening effect (dB)	Predicted Level at Receptor (L_{P2})
01: NSR at Chapel Road	60	75	100	5	**53**
02: Passage area of abandoned house	47	89	77	5	**43**
03: Outside NSR right opposite to the front end boundary	60	75	95	0	**58**

BS 4142:2014+A1:2019 Assessment

5.5 BS4142 infers that for a given excess of the rating level over the background level, the likelihood of complaints are as follows:

Table 4: BS 4142:2014+A1:2019 likelihood of complaints

Excess	Interpretation of likelihood of complaints
≥10dB	An indication of a significant adverse impact.
≥ 5dB	An indication of an adverse impact.
≥ 0dB ≥5 dB	An indication that it is unlikely that the specific sound source will have an adverse impact or a significant adverse impact.
<0dB	An indication that the specific sound source will have a low impact.

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Table 5: BS 4142:2014+A1:2019 assessment (daytime), dB(A)

Receptor Location	Measured background level L_{A90}	Predicted noise level at receptor	Penalty for tonality	Penalty for intermittency	Rating level (L_r)	Rating level over background
01: NSR at Chapel Road	36	**53**	+2	-	**55**	+19
02: Passage area of abandoned houses	36	**43**	+2	-	**45**	+11
03: Outside NSR right opposite to the front end boundary	36	**58**	+4	-	**62**	+26

5.6 The table above presents the measured background noise levels and the predicted rating levels at each noise sensitive receptor (NSR) locations during day time.

- **01: NSR at Chapel Road:** The rating level of 55 dB(A) is 19 dB(A) above the measured L_{A90} background level of 36 dB(A), this indicates that the specific sound source will have a significant adverse impact. A penalty for tonality of +2dB has been added as the noise from loading bays was just perceptible.
- **02: Passage area of abandoned houses:** The rating level of 45 dB(A) is 11 dB(A) above the measured L_{A90} background level of 36 dB(A), which also indicates significant adverse impact, if in future any residents occupy the house. A penalty for tonality of +2dB has been added as the noise from loading bays was just perceptible.
- **03: Outside NSR right opposite to the front-end boundary** The rating level of 62 dB(A) is 26 dB(A) above the measured L_{A90} background level of 36 dB(A), which suggests that the site noise would have a significant adverse impact, whenever it will be occupied. A penalty for tonality of +4dB has been added as the noise from loading bays was clearly perceptible.

WHO Guidelines

5.7 The World Health Organisation (WHO) published the document "Guidelines for Community Noise" in 2000. This states that general outdoor noise levels of below 50dB L_{Aeq} during the day are desirable to prevent 'moderate' community annoyance.

5.8 The guidance also recommends the L_{Aeq} should not exceed 30dB indoors if negative effects on sleep are to be avoided.

5.9 The numerical values used for the WHO assessment are the predicted noise levels at receptor obtained from Table 3. They are unimpacted by the BS4142 assessment adjustments for tonality etc.

5.10 From the predicted levels at the nearest receptor during the daytime, the assessment indicates that the resulting outdoor predicted L_{Aeq} of between 53 dB and 58 dB is **above** the recommended 50 dB during the daytime which is desirable to prevent 'moderate' community annoyance.

Conclusions

6.1 The BS4142:2014 assessment indicates that at the property located at 01: NSR 1 Chapel Road, 02: Passage area of abandoned houses and 03: Outside NSR right opposite to the front end boundary the site-generated noise is predicted to have a **significant adverse impact** during the day. This is primarily due to the constant hum of chilled trailer units and intermittent high-noise events such as HGV docking and reverse sirens.

6.2 While road traffic from Chapel Road provides some masking, the constant industrial hum from the facility remains a dominant feature of the local soundscape and mainly due to the loading bay located right opposite to these NSRs.

6.3 Several monitoring locations across the site exhibited significant noise contributions as outlined below:

- **At the HGV Waiting Area and Front Boundary (L1):** Significant noise levels were observed, dominated by the constant hum from electric generators of approximately six chilled trailers. Intermittent high-level noise was recorded from HGV movements and high-noise chilled carrier lorries entering the site.
- **At the Southern and South-Western Perimeter (L3 & L4):** Noise levels are influenced by the distant but constant hum of the wastewater treatment plant and aeration cones. While the 15m raised bank provides screening, the height of the aeration units and the equalisation of the bank with the road level at the south-west corner allow noise to migrate beyond the boundary.
- **At the Yard and Tray Storage Area (L2):** A lower ambient impact was observed due to the topographical shielding and physical barriers provided by high-density storage of wooden pallets and plastic trays, which effectively break the line-of-sight to noise sources.
- **At the Employee Car Park and Assembly Point (L7 & L8):** Consistent high-dominant noise levels were recorded from stationed fan chiller units and overhead ducting. The proximity of these sources to the boundary near NSR 1 contributes significantly to the cumulative noise impact on the nearest residents.

6.4 The assessment indicates that the primary sources of noise-related complaints originate from yard operations, specifically HGV reverse sirens, FLT fork impacts, and the constant hum of chilled lorries units. The observation that some vehicles arrive during restricted night-time hours (22:00–06:00) suggests that site arrival protocols and operator behaviours are key factors in the observed noise impact. Furthermore, the high-level ducting and fan chiller units near the smoking shelter represent a continuous noise source that lacks sufficient acoustic screening.

6.5 Using the predicted daytime noise levels at the noise sensitive receptors, the World Health Organisation (WHO) Guidelines for general outdoor noise of 50dB during the daytime would be exceeded at the properties bordering the site.

6.6 The following recommendations offer practical solutions for reducing the potential impact of site generated noise at the nearest receptor locations based on the site measurements, observations and outcome of any assessments undertaken:

Control at Source:

- **Logistics and Refrigeration: Where possible, continue to prioritise the use of electric hook-ups for chilled trailers. As a significant hum was noted from the six parked trailers, ensure all units are switched to electric standby mode immediately upon arrival to avoid diesel generator use, which the client indicated significantly worsens noise levels.**

- Equipment Procurement: If practicable, consider replacing older, noisier chiller units with newer models that have improved noise reduction technology. Ensure that chiller units are well-maintained to minimise mechanical noise. If not already done, mount chiller units on vibration isolation pads to reduce noise transmission through the structure.
- Handling Materials: Replace metal-edged trays or bins with high-grade plastic alternatives where possible. This will reduce the high-frequency impact noise generated during tray storage and pallet movements observed.

Extraction, Ducting, and Plant (Location 385 Focus):

- Acoustic Attenuation: As a constant, dominant high-level noise was observed from the stationed fan chiller units and overhead ducting near the smoking shelter, investigate the installation of acoustic attenuators or circular silencers within the ductwork.
- Acoustic Enclosures: Evaluate the feasibility of erecting a soundproof curtain system blocking direct noise from refrigerated lorries to the NSR.
- Noise barriers: If the above is not feasible, consider erecting a high-performance acoustic enclosure or localised noise barrier at the front site boundary. This is critical given the impact of direct noise exposure.



- Vibration Isolation: Ensure all duct mounting brackets and heavy plant (including the wastewater treatment pumps) are fitted with anti-vibration rubber mounts to prevent structural vibration from radiating through the building skin or the ground.
- Wastewater Treatment Area: Given the scale of the aeration cones and their elevation above the perimeter bank, investigate the feasibility of installing acoustic shrouds or variable speed drives (VSDs) to reduce the constant low hum during periods of lower processing demand.

Yard Operations and HGV Management:

- Night-time Restrictions: Continue the good practice of enforcing the 22:00–06:00 "no-run" policy for lorries. The observation of a vehicle arrival at 23:30 suggests a requirement for improved gatehouse management and scheduling to prevent sleep disturbance at nearby NSRs.
- Work practice: Minimise unnecessary noise by turning the chiller units off when not in use. Additionally, when empty lorries are waiting to be loaded in the waiting area, train drivers to turn off their engines.
- Surface Maintenance: Repair the uneven ground in the yard areas. The survey noted HGVs and FLTs passing over uneven surfaces, which generates significant "body slap" and transient impact noise that is highly audible at the boundary.
- Reverse Alarms: Where safety permits, replace traditional tonal "beeping" reverse sirens with broadband "white-noise" alarms. Tonal sirens were a dominant feature in the assessment and are particularly intrusive to residents during quiet night-time periods.

Forklift Truck (FLT) Handling:

- Impact Noise Reduction: Train FLT operators to avoid dropping forks onto the concrete yard (observed during the daytime survey) and to prevent the "clatter" associated with rapid waste tipping into skips.

Building Management and Site Layout:

- Closure of Openings: Ensure that all site doors (specifically near the HGV bays) remain closed when not in use to contain internal site noise.

Noise Management and Monitoring:

- **Formal Noise Management Plan (NMP): Establish a formal NMP focusing on Best Available Techniques. This plan should include a protocol for handling noise complaints from NSR 1 and a log of all high-noise events.**
- **Regular Preventative Maintenance: Implement a program specifically monitoring for mechanical wear in the fan chillers, ducting, and aeration pumps. Faulty bearings or fan imbalances contribute to the "significant hum" noted in the survey and should be addressed promptly.**

References

National Planning Policy Framework, 2012

British Standard 4142:2014 *Methods for rating and assessing industrial and commercial sound*

Environmental Protection Act 1990

World Health Organisation *Guidelines for Community Noise* 2000

World Health Organisation *Night Noise Guidelines for Europe* 2009

British Standard 8223: 2014 *Guidance on sound insulation and noise reduction for buildings*

Environmental Noise Measurement Locations




O1
O3
O2
L2
L1
L8
L3
L7
L4
L5
L6
3D

Calibration Certificates

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Certificate of Conformity and Calibration



Instrument Model:- CEL-633B
Serial Number 2670689
Firmware revision V006-05

Microphone Type:- CEL-251
Serial Number 7124

Preamplifier Type:- CEL-495
Serial Number 003808

Instrument Class/Type:- 1

Applicable standards:-

IEC 61672: 2013 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- The test sequences performed in this report are in accordance with the current Sound level meter *Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:- 23 °C
50 %RH
996 mBar

Test Engineer:- Stephen Adams
Date of Issue:- September 1, 2025

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

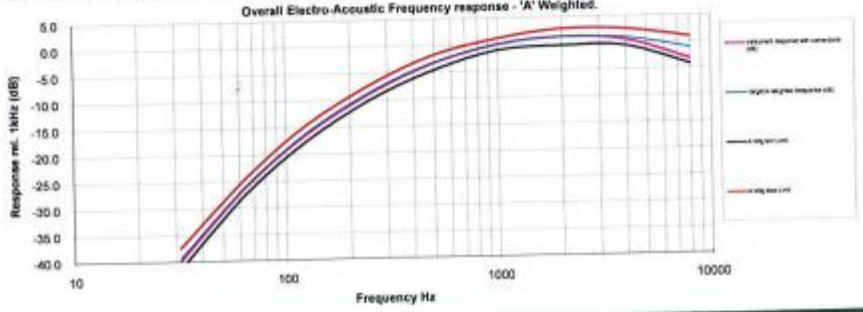
Test Summary:-

Self Generated Noise Test	All Tests Pass
Electrical Signal Test Of Frequency Weightings	All Tests Pass
Frequency & Time Weightings At 1 kHz	All Tests Pass
Level Linearity On The Reference Level Range	All Tests Pass
Toneburst Response Test	All Tests Pass
C-peak Sound Levels	All Tests Pass
Overload Indication	All Tests Pass
Acoustic Tests	All Tests Pass

Combined Electro-Acoustic Frequency Response - A Weighted

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



Casella UK
Regent House, Wolseley Road, Kempston, Bedford, MK42 7JY, United Kingdom
Tel: +44 (0) 1234 844100
E-mail: info@casellasolutions.com

Casella C/o TSI Incorporated
500 Cardigan Road, Shoreview, MN 55126, USA
Tel: +1 651-490-2860
E-mail: Answers@tsi.com

Casella India
TSI Instruments India Pvt Ltd, Office no 1203, 12th floor, Eros corporate park, IMT, Manesar, Sector 2, Gurugram, Haryana 122050, India
Tel: +91 124 4465171
E-mail: sparshpal@casellasolutions.com

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Certificate of Conformity and Calibration

Customer:	Environmental Essentials UK LTD
Instrument:	CEL-120/2
Serial Number:	1012367
Job Number:	32175
Date of Issue:	13-Aug-2025
Engineer:	S. Adams

Traceable Equipment:

Reference Calibrator	EQ11086
DVM type Fluke 45	EQ00023

Test Conditions:

Ambient Temperature	23.0	°C
Ambient Humidity	48.0	%RH
Ambient Pressure	1009	mBar

Results:

	Level 1	Level 2	Frequency
Initial Reading	114.00 dB	N/A dB	1.0000 kHz
Final Reading	114.00 dB	N/A dB	1.0000 kHz

Uncertainty:

Level	±	0.15	dB
Frequency	±	0.5	Hz

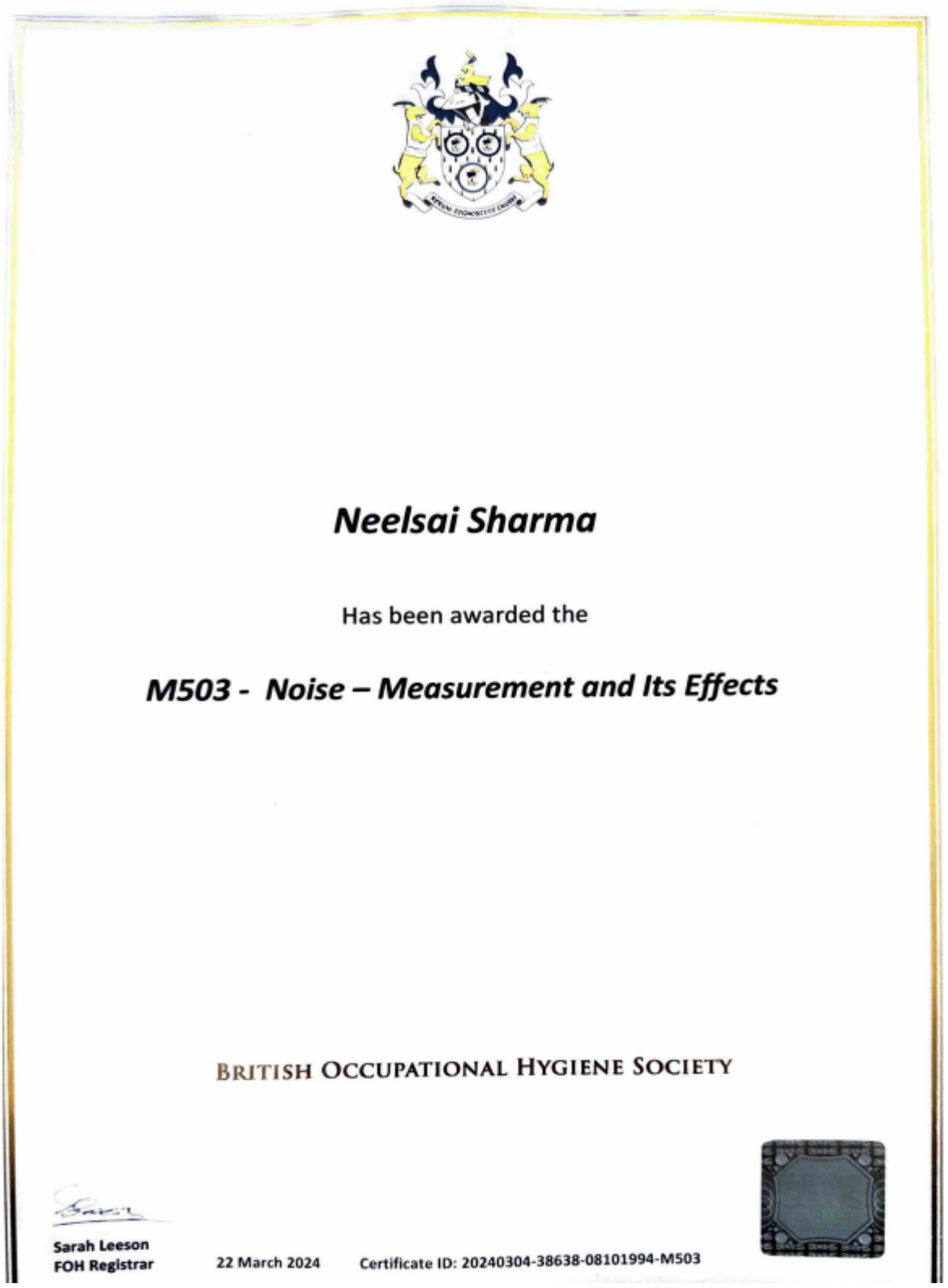
This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.
Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2015 quality procedures.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
This certificate may not be reproduced other than in full, except with prior written approval of the issuing laboratory.

Casella UK
Regent House, Wolseley Road,
Kempston, Bedford
MK42 7JY
United Kingdom
Tel: +44 (0)1234 844100
Email: info@casellasolutions.com

Casella C/o TSI Incorporated
500 Cardigan Road
Shoreview
MN 55126
USA
Tel: +1 651-490-2860
Email: Answers@tsi.com

Casella India
TSI Instruments India Pvt Ltd
Office no 1203, 12th floor,
Eros corporate park, IMT,
Manesar, Sector2, Gurugram,
Haryana 122050, India
Tel: +91 124 4465171
E-mail:rajeshjoshi@casellasolutions.com

Certificates of Competency



Neelsai Sharma

Has been awarded the

M503 - Noise – Measurement and Its Effects

BRITISH OCCUPATIONAL HYGIENE SOCIETY

Sarah Leeson
FOH Registrar

22 March 2024

Certificate ID: 20240304-38638-08101994-M503