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GODSTONE DEPOT, OXTED RD, GODSTONE

NOISE IMPACT ASSESSMENT

Technical Report: R10614-1 Rev 0

Date: 10th May 2024



For: MTS Environmental Ltd
Filwood Green Business Park
1 Filwood Park Lane
Bristol
BS4 1ET

24 Acoustics Document Control Sheet

Project Title: Godstone Depot, Oxted Rd, Godstone – Noise Impact Assessment

Report Ref: R10614-1 Rev 0

Date: 10th May 2024

| | Name | Position | Signature | Date |
|---------------------------------------|--|----------------------|--|-------------|
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| For and on behalf of 24 Acoustics Ltd | | | | |

Document Status and Approval Schedule

| Revision | Description | Prepared By | Reviewed By | Approved By |
|-----------------|--------------------|--------------------|--------------------|--------------------|
| 0 | Approved for issue | Kiel Edwards | Reuben Peckham | Reuben Peckham |
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1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been instructed by MTS Environmental Ltd, on behalf of Ringway Highways, to undertake an assessment of noise from proposed asphalt manufacturing operations at Godstone Depot, Oxted Road in Godstone, Surrey.
- 1.2 This report presents the results of the assessment, following site visits, investigations and background noise surveys undertaken between the 3rd and 8th May 2024.
- 1.3 All sound pressure levels quoted in this report are in dB relative to 20 μ Pa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION AND PROPOSALS

- 2.1 The site is located to the outskirts of Godstone in Surrey County Council's existing highway depot. The depot is currently used to store highway maintenance vehicles and salt for road gritting.
- 2.2 The A25 lies to the north of the site with a sewage works further north. Farmland lies to the south and east of the site. A veterinary clinic is located within the depot site, adjacent to the main entrance off the A25 to the north.
- 2.3 The most sensitive residential properties near to the site are described below and identified in Figure 1.
- Receptor 1: 1 Oxted Road, approximately 160m west of the site;
 - Receptor 2: 28 to 32 Dewlands, approximately 150m southwest of the site;
 - Receptor 3: Greenways Cottage, approximately 350, Southeast.
- 2.4 The proposals will allow asphalt and inert materials to be processed/recycled into road paving products on site. This will comprise the use of a loading shovel and crusher as well as a manufacturing unit. Deliveries of bitumen and PFA (Pulverised Fly Ash) will be bought to site via HGVs, with approximately 10 HGV movements per day (5 in, 5 out).
- 2.5 The manufacturing process will be year-round. Crushing activities will operate on a campaign basis, with schemes delivered with prior notification to local residents. Crushing operations will last from 3 to 4 days per campaign, with approximately 5 campaigns per year.

2.6 The proposed hours of operation at the site are 08:00 to 18:00 Monday to Friday. Occasional weekend operations are proposed on an advance notice basis which may have differing operational hours to weekday operations (to account for residential amenity) but will not be outside of 08:00 to 18:00 hours. On this basis, the assessment assumes a weekend operational period of 08:00 to 18:00.

2.7 Figure 1 shows the site location and surrounding area. Figure 2 shows the proposed site layout.

3.0 CRITERIA

3.1 The following represents current relevant guidance in relation to the proposed operations.

Environment Agency Guidance

3.2 EA guidance "Noise and vibration management: environmental permits" [Reference 1] provides guidance on how the agency will assess noise, how to manage noise and in particular how to carry out a noise impact assessment in the context of an environmental permit.

3.3 The guidance refers to BS 4142 to assess noise from industrial processes. It describes how the level of impact relates to BS 4142 descriptors and this is summarised below.

- *Unacceptable level of audible or detectable noise – this level of noise means that significant pollution is being or is likely to be caused at a receptor and you must take further action to reduce or stop operations. The closest corresponding BS 4142 descriptor is 'significant adverse impact'.*
- *Audible or detectable noise – this level of noise means that noise pollution is being (or is likely to be) caused at a receptor – your duty is to use appropriate measures to prevent or minimise noise. You are not in breach if you are using appropriate measures. The closest corresponding BS 4142 descriptor is 'adverse impact'.*
- *No noise, or barely audible or detectable noise – this level of noise means that no action is needed beyond basic appropriate measures. The closest corresponding BS 4142 descriptor is 'low impact or no impact' following consideration of context. The agency may decide that taking action to minimise noise is a low priority.*

BS 4142:2014+A1:2019 - Methods for Rating Industrial and Commercial Sound

- 3.4 BS 4142:2014+A1:2019 [Reference 2] provides a method for rating the effects of industrial and commercial sound on residential areas.
- 3.5 The standard advocates a comparison between the representative measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction should be applied.
- 3.6 The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact, also depending on the context. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact (depending upon the context).

4.0 ASSESSMENT METHODOLOGY

- 4.1 The following assessment methodology has been used:
- i. A background noise survey has been undertaken to determine existing levels of background noise at locations representative of the nearest residential properties to the site;
 - ii. An acoustic model of the proposed operations has been developed. This has predicted the operational noise level at the nearest residential properties;
 - iii. An assessment of the likely noise impact associated with the proposals has been undertaken, in accordance with BS 4142:2014+A1:2019.

5.0 ENVIRONMENTAL NOISE MEASUREMENTS

Methodology

- 5.1 Background noise surveys were undertaken between the 3rd to 8th May 2024. Long term measurements were undertaken to the western boundary of the site, as described below:
- Location 1: To the west of the site, nearest boundary with properties on Dewlands, at a height of 3m above local ground level in free-field conditions (OSBG Ref: TQ 35356 51912).

- 5.2 Further attended measurements were undertaken to the east of the site, near receptor 3 (Greenways Cottage), described below:
- Location 2: To the southeast of the site, adjacent to Greenways Cottage's rear garden, at a height of 2.5m above local ground level in free-field conditions (OSBG Ref: TQ 35733 51728).
- 5.3 Background noise measurements at Location 2 were undertaken during daytime hours on the 8th May 2024.
- 5.4 The instrumentation was setup to monitor background noise levels and store data in 5-minute intervals of the overall A-weighted L_{eq} , L_{max} and L_{90} using fast time weighting. The equipment was configured to record octave band data and audio (location 1 only) to assist in identification of noise sources throughout the survey. The following instrumentation was used:
- 2 x Rion NL52 Class 1 accuracy sound level meters;
 - Rion NC74 acoustic calibrator;
 - Norsonic 1251 acoustic calibrator.
- 5.5 Calibration of the equipment was checked before and on completion of the measurements and no drift was recorded. Noise measurements were made in accordance with BS 7445: 1991 'Description and measurement of environmental noise Part 2 – Acquisition of data pertinent to land use' [Reference 3]. Calibration certificates for the above equipment are shown in Appendix B.
- 5.6 A Davis weather station was installed to the site's western boundary (OSBG Ref: TQ 35355 51889) as shown in Figure 1. The weather station was active for the duration of the surveys to record and log wind speed, direction and precipitation. All periods with weather unsuitable for background noise monitoring (average wind speeds above 5 m/s and/ or precipitation) were removed from the analysis. The recorded meteorological data is shown in Appendix C.

Results

- 5.7 The measured background noise levels are summarised in Tables 1 and 2 and shown graphically in Appendix D. It is understood that the application site was closed down during the measurements and, therefore, measurements were not affected by noise from existing site operations.

| Measurement Location 1 (Western Site Boundary) | |
|---|---|
| Date (May 2024) | Typical Background Noise Level (08:00 to 18:00 hours) dB LA90 1 hour |
| Friday 3rd | 47 |
| Saturday 4th | 42 |
| Sunday 5th | 42 |
| Monday 6th | 51 |
| Tuesday 7th | 48 |
| Wednesday 8th | 45 |

Table 1 - Location 1 - Measured Background Noise Levels

| Measurement Location 2 – 8th May 2024 (Adjacent to Receptor 3 – Greenways Cottage) | |
|---|--|
| Time | Typical Background Noise Level dB LA90 1 hour |
| 11:00 – 11:30 | 45 |
| 11:30 – 12:00 | 46 |
| 12:00 – 12:30 | 46 |

Table 2 - Location 2 - Measured Background Noise Levels

- 5.8 A detailed analysis of the concurrent measurement results at locations 1 and 2 has determined a negligible difference in the measured noise levels between both locations. Therefore, measured noise levels at Location 1 are considered representative of noise levels at all nearest noise sensitive properties.
- 5.9 Following the above analysis, a weekday background noise level of 48 dB LA90 1 hour is considered representative at the nearest receptor locations.
- 5.10 Weekend operations will be arranged with notice only and timings will consider neighbouring residential amenity and likely be different from weekday operational hours. However, to provide a robust assessment, a weekend operational period of 08:00 to 18:00 hours has been assumed and a representative background noise level of 42 dB LA90 1 hour has been used in the assessment.
- 5.11 24 Acoustics determines the representative background noise level to be the average minus one standard deviation.

Source-term Noise Data

- 5.12 The proposed plant will include the manufacturing unit (Make: RECOFOAM), crusher, loading shovel, excavator, diesel generator and telehandler.
- 5.13 Manufacturer's noise data for the proposed RECOFOAM unit is not currently available. Additionally, unit selections for a range of plant have yet to be finalised. Therefore, the assessment had utilised noise data provided in BS 5228 [Reference 4] for similar plant, as described in Table 3.

| Plant Item | Sound Pressure Level (dB) at 10m |
|--------------------|---|
| Manufacturing Unit | 81 |
| Crusher | 84 |
| Excavator | 86 |
| Diesel Generator | 65 |
| Telehandler | 71 |

Table 3 - Plant Noise Data, BS 5228

- 5.14 Noise data for the proposed wheeled loading shovels have been sourced from 24 Acoustics' library database of similar existing operations, summarised below:
- Loading Shovel: Liebherr 566 loader moving product, providing a sound power level of 103 dBA.
- 5.15 For the calculation of noise from HGV movements (from deliveries of bitumen and PFA) to the receptor locations from the site's access road, a source noise level of 72 dB $L_{Aeq,T}$ at 4m for a slow-moving HGV has been used, with reference to 24 Acoustics' library database from measurements on similar sites.
- 5.16 Single octave band data for the above noise sources is shown in Appendix E.

6.0 NOISE ASSESSMENT

Proposed Operations

- 6.1 The proposed operations will include the processing of asphalt requiring the use of crushers, a wheeled loading shovel, excavator, generator, telehandler and a manufacturing unit.

- 6.2 The operations will primarily be carried out during weekdays with occasional weekend operations undertaken at prior notice only.
- 6.3 To provide a worst case analysis of the proposals, a scenario comprising full operation of the manufacturing plant, generator and crusher for a 1-hour period has been used in the assessment. Based on observations of other similar sites, a loading procedure on-time of 30 mins per hourly period has been used for the wheeled loading shovel, excavator and telehandler.
- 6.4 Based on the expected tonnage of material in use at the site (10000 tonnes per annum) up to 10 HGV movements (5 in, 5 out) would be expected per day. HGV's will deliver to the site during the proposed operational hours only (08:00 to 18:00 hours) and will utilise the existing site access road, as shown in Figure 1.
- 6.5 The likely locations of the proposed plant are described below and included in the noise model:
- Crusher: To the northern section of the site, near the material stockpiles;
 - Manufacturing Unit: To the north of the site, near the storage bays;
 - Excavator and Wheeled Loader: To the north of the site, to serve the crusher and manufacturing unit;
 - Telehandler: To the south of the site, near the skip storage area;
- 6.6 It is recommended that the generator is located to the western boundary of the site, near the adjacent double height building, in order to provide an optimised level of screening to residential properties. The recommended generator location is shown in Figure 2.

Acoustic Model

- 6.7 The source-term noise data and proposed operations described above have been used to populate an acoustic model of the site. IMMI 30 noise mapping software has been used following the methodology of ISO 9613 [Reference 5] to determine the noise levels from each relevant source at the receptor locations, taking into account the effects of geometric divergence, screening and ground/atmospheric absorption. The model factors an ambient air temperature of 10 Celsius with 70% relative humidity and a G=0.5 for ground absorption at account for the mixture of soft and hard ground in the area.

6.8 Resultant cumulative noise levels from all proposed plant at the receptor locations are shown in Table 4.

| Receptor Location | Cumulative Plant Noise Level dB LAeq 1 hour |
|--------------------------|--|
| 1 | 48 |
| 2 | 50 |
| 3 | 43 |

Table 4 - Noise Modelling Results – Receptor Location Cumulative Plant Noise Levels

Assessment

6.9 A comparison of the predicted rating noise levels, relative to the representative background noise level at each receptor location has been carried out in accordance with BS 4142 with the results shown in Tables 5, 6 and 7.

6.10 Due to the relatively high ambient noise levels in the area (compared to the predicted noise plant levels), screening and distances involved between the site and receptor locations, unfavourable noise characteristics from the proposed operations are considered unlikely to be perceptible at the receptor locations, hence a rating correction is not considered necessary.

| | Receptor 1 - 1 Oxted Road | |
|------------------------------------|--|--|
| | Weekday Operational Period 08:00 to 18:00 hours | Weekend Operational Period 08:00 to 18:00 hours |
| Specific Source Noise Level | 48 dB LAeq 1 hour | 48 dB LAeq 1 hour |
| Rating Level | 48 dB | 48 dB |
| Background Sound Level | 48 dB LA90 1 hour | 42 dB LA90 1 hour |
| Difference | 0 dB | + 6 |

Table 5 - Noise Modelling Results – Receptor Location 1 Plant Noise Levels

| | Receptor 2 - 28 to 32 Dewlands | |
|------------------------------------|--|--|
| | Weekday Operational Period 08:00 to 18:00 hours | Weekend Operational Period 08:00 to 18:00 hours |
| Specific Source Noise Level | 50 dB LAeq 1 hour | 50 dB LAeq 1 hour |
| Rating Level | 50 dB | 50 dB |
| Background Sound Level | 48 dB LA90 1 hour | 42 dB LA90 1 hour |
| Difference | + 2 | + 8 |

Table 6 - Noise Modelling Results – Receptor Location 2 Plant Noise Levels

| | Receptor 3 - Greenways Cottage | |
|------------------------------------|--|--|
| | Weekday Operational Period 08:00 to 18:00 hours | Weekend Operational Period 08:00 to 18:00 hours |
| Specific Source Noise Level | 43 dB LAeq 1 hour | 43 dB LAeq 1 hour |
| Rating Level | 43 dB | 43 dB |
| Background Sound Level | 48 dB LA90 1 hour | 42 dB LA90 1 hour |
| Difference | - 5 | + 1 |

Table 7 - Noise Modelling Results – Receptor Location 3 Plant Noise Levels

6.11 The assessment outcomes are indicative of an adverse impact at Receptors 1 and 2 during weekend operations, depending on context (see below).

Context

6.12 Under BS 4142, consideration must be given to the context of the site and proposals.

6.13 In this instance, noise arising from the proposals will be similar in character to the existing use of the larger site and other industrial uses in the vicinity.

6.14 Additionally, the daytime only operations reduce the risk of noise disturbance.

6.15 It is relevant to consider the advance notice and infrequent nature of the weekend proposals. This will ensure that noise impact is kept to a minimum and, with the proposed continued engagement with the local community, any noise related concerns can be raised and addressed in a considerate and timely manner.

6.16 Based on the above, it is considered that the proposals will not be out of character for the area.

Uncertainty

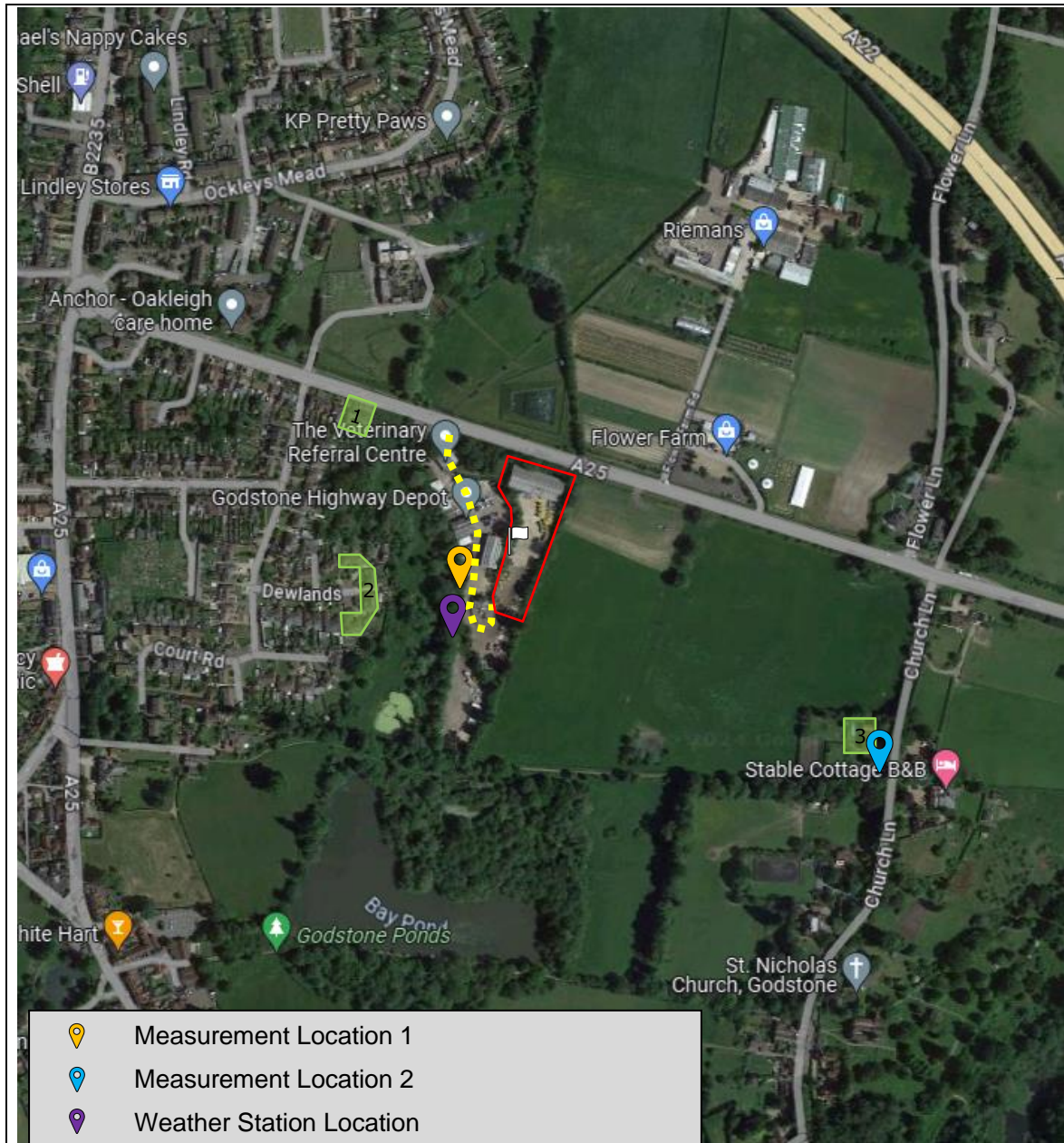
- 6.17 All reasonable measures have been undertaken to ensure minimal uncertainty in the measurement procedures and assessment. This includes:
- Representative background noise levels determined during periods of suitable weather conditions;
 - Measurement equipment fully calibrated to national standards and traceable with on-site calibration checks undertaken before and after the measurement exercises;
 - Calculations undertaken using proprietary software including the calculation methodology of ISO 9613;
 - High resolution topographical data utilised in the acoustic model to ensure accurate topography of the site and surrounding area.
- 6.18 Based on the above, uncertainty associated with the assessment has been reduced to a minimum.










7.0 CONCLUSIONS


- 7.1 24 Acoustics has been instructed by MTS Environmental Ltd, on behalf of Ringway Highways, to undertake a noise assessment in relation to proposed asphalt recycling operations at Godstone Depot.
- 7.2 The assessment has been carried out following background noise measurements undertaken at the site and, following the production of an acoustic model of the proposed operations.
- 7.3 Results are indicative of an adverse impact at some receptors at some times. However, when assessed in accordance with BS 4142 and considering the context of the site and proposals, noise arising from the proposed operations will employ reasonable and practicable measures to reduce noise to a minimum and will not be out of character for the area.

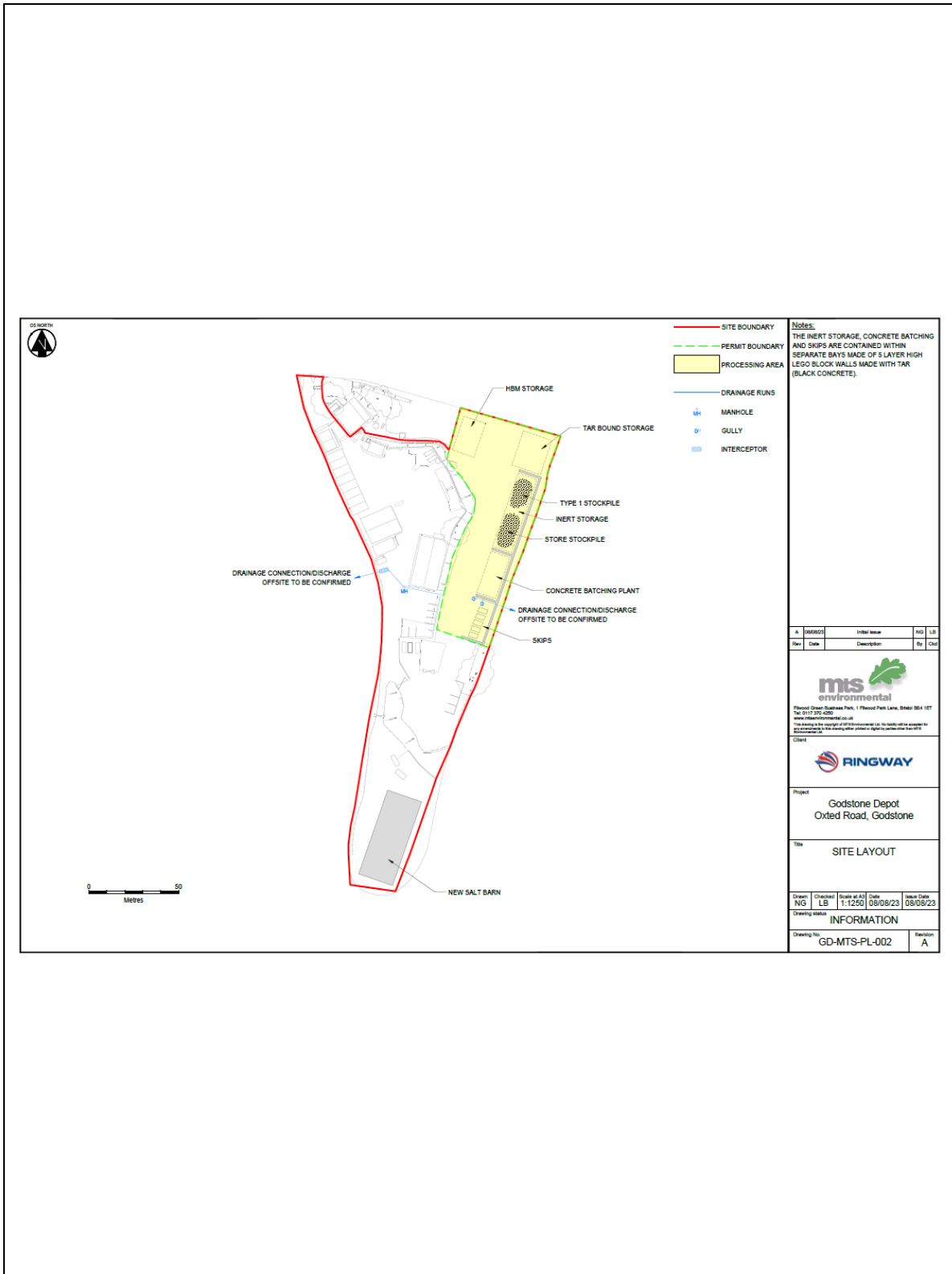
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1. Environment Agency Guidance "Noise and Vibration Management: Environmental Permits", updated Jan 2022
2. British Standards Institution. British Standard 4142:2014+A1:2019. Methods for Rating and Assessing Industrial and Commercial Sound, 2014.
3. British Standards Institution. BS 7445: 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use' 1991.
4. British Standards Institution. BS 5228: 'Code of practice for noise and vibration control on construction and open sites, part 1 - noise' 2009+A1:2014.
5. International Standards Organisation. ISO 9613. Acoustics - Propagation of Environmental Noise, 1997.

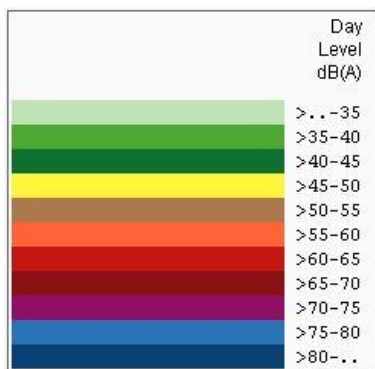
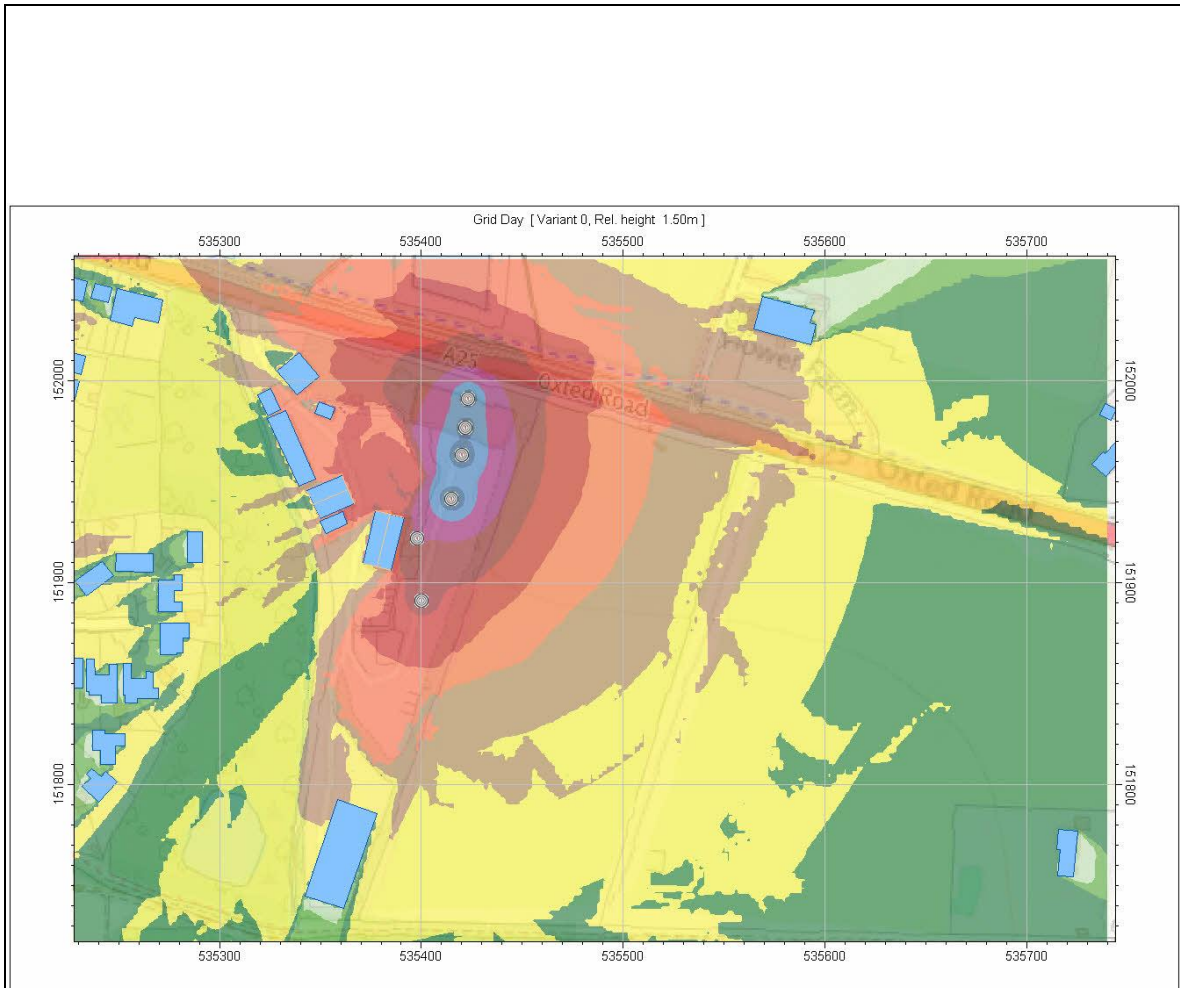



| | |
|---|---|
|  | Measurement Location 1 |
|  | Measurement Location 2 |
|  | Weather Station Location |
|  | Receptor Location 1 (1 Oxted Road) |
|  | Receptor Location 2 (28 to 32 Dewlands) |
|  | Receptor Location 3 (Greenways Cottage) |
|  | Site Access Road |
|  | Permit Site Location |
|  | Recommended Generator Location |

| | | | | |
|-----------------------------------|----------------------|---|--|---|
| Project: Godstone Depot | | Title: Site, Receptor and measurement Locations | |  |
| DWG No: Figure 1 | Scale: N.T.S. | Rev: - | | |
| Date: May 2024 | Drawn By: KE | Job No: 10614 | | |



| | | | |
|-----------------------------------|-------------------------------------|----------------------|---|
| Project: Godstone Depot | Title: Proposed Site plan | |  |
| DWG No: Figure 2 | Scale: N.T.S. | Rev: - | |
| Date: May 2024 | Drawn By: KE | Job No: 10614 | |



| | | | | |
|-----------------------------------|----------------------|---|--|---|
| Project: Godstone Depot | | Title: Proposed Operations, Site Noise Contours, 1.5m, dB LAeq 1 hour | |  24Acoustics |
| DWG No: Figure 3 | Scale: N.T.S. | Rev: - | | |
| Date: May 2024 | Drawn By: KE | Job No: 10614 | | |

APPENDIX A – SOUND INSULATION TERMINOLOGY

The Decibel, dB

The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic and, as such, it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed (0.0002Pa to 20Pa) to a more manageable range of numbers. The threshold of hearing occurs at approximately 0dB and the threshold of pain is around 120dB.

Noise

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous,

steady sound that, within a specified time interval, T , has the same mean square sound pressure as a sound under consideration whose level varies with time”.

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – CALIBRATION CERTIFICATES

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
+44 (0)23 8155 5020 hello@nvcal.co.uk



IEC 61672-3:2006 Calibration

Procedures from IEC 61672-3:2006 were used to perform the periodic tests on **19th October 2023** for the following sound level meter:

Rion NL-52, serial number 00420766

The following tests were undertaken:

| | |
|---|------|
| Acoustical signal tests of a frequency weighting | PASS |
| Electrical signal tests of frequency weightings | PASS |
| Frequency and time weightings at 1 kHz | PASS |
| Long-term stability | PASS |
| Level linearity on the reference level range | PASS |
| Level linearity including the level range control | PASS |
| Toneburst response | PASS |
| Peak C sound level | PASS |
| Overload indication | PASS |

Calibration result


Sound level meter: Rion NL-52, serial 00420766

Performance Specification: IEC 61672-3:2006 Class 1

Date: 19th October 2023

Certificate Number: C00449

PASS

Approved Signatory: 

Notes

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Device Details

| Item | Manufacturer | Model | Serial |
|-------------------|--------------|-------|----------|
| Sound level meter | Rion | NL-52 | 00420766 |
| Microphone | Rion | UC-59 | 03575 |
| Pre-amplifier | Rion | NH-25 | 20815 |

Test Notes

Calibration check frequency: 1 kHz
 Reference sound pressure level: 94 dBA
 Indicated level before adjustment: 94.2 dBA
 Indicated level after adjustment: 94.0 dBA
 Sensitivity after adjustment: n/a
 Static pressure: 97.6 - 97.7 kPa
 Air temperature: 22.1 - 22.1 °C
 Relative Humidity: 63.9 - 64.3 %
 Configuration of SLM: No microphone extension cable used
 Power source: Internal batteries
 Instruction manual: Instruction Manual for NL-42/NL-52 (provided by manufacturer)
 Source of correction data: Instruction Manual
 SLM software version: NL-52: 2.0
 Calibration engineer: MH

Self-generated noise

| | Self-generated noise level (dB) for frequency weighting | | |
|-------------------------|---|------|------|
| | A | C | Z |
| Electrical input device | 11.1 | 13.4 | 18.5 |
| Expanded uncertainty | 0.1 | 0.2 | 0.2 |

This test laboratory does not undertake self-generated noise measurements with the microphone capsule installed

Test Equipment

| Item | Manufacturer | Model | Serial | Date Calibrated |
|---------------------|-----------------|----------|------------|-----------------|
| Signal Generator | Audio Precision | SYS-2722 | SYS2-31891 | 13-Feb-23 |
| Signal Generator | TTi | TG1010 | 055468 | 25-Jan-23 |
| Acoustic Calibrator | Brüel & Kjær | 4226 | 2288484 | 23-Jan-23 |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because 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 requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
 The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
 +44 (0)23 8155 5020 hello@nvcal.co.uk



IEC 61672-3:2006 Calibration


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Rion NL-52, serial number 00620966

The following tests were undertaken:

| | |
|---|------|
| Acoustical signal tests of a frequency weighting | PASS |
| Electrical signal tests of frequency weightings | PASS |
| Frequency and time weightings at 1 kHz | PASS |
| Long-term stability | PASS |
| Level linearity on the reference level range | PASS |
| Level linearity including the level range control | PASS |
| Toneburst response | PASS |
| Peak C sound level | PASS |
| Overload indication | PASS |

| | |
|--|------|
| Calibration result | |
| Sound level meter: Rion NL-52, serial 00620966 Performance Specification: IEC 61672-3:2006 Class 1 Date: 17th October 2022 Certificate Number: C00404 | PASS |

Approved Signatory: 

Notes

No information on the uncertainty of measurement, required by 11.7 of IEC 61672-3:2006, of the adjustment data given in the instruction manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was published in the instruction manual or made available by the manufacturer or supplier. The uncertainty of measurement of the adjustment data has therefore been assumed to be numerically zero for the purpose of this periodic test. If these uncertainties are not actually zero, there is a possibility that the frequency response of the sound level meter may not conform to the requirements of IEC 61672-1:2002.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Device Details

| Item | Manufacturer | Model | Serial |
|-------------------|--------------|-------|----------|
| Sound level meter | Rion | NL-52 | 00620966 |
| Microphone | Rion | UC-59 | 17048 |
| Pre-amplifier | Rion | NH-25 | 21007 |

Test Notes

Calibration check frequency: 1 kHz
 Reference sound pressure level: 94 dBA
 Indicated level before adjustment: 94.1 dBA
 Indicated level after adjustment: 94.0 dBA
 Sensitivity after adjustment: n/a
 Static pressure: 101.5 – 101.6 kPa
 Air temperature: 20.3 – 20.5 °C
 Relative Humidity: 63.0 – 63.9 %
 Configuration of SLM: No microphone extension cable used
 Power source: Internal batteries
 Instruction manual: Instruction Manual for NL-42/NL-52 (provided by manufacturer)
 Source of correction data: Instruction Manual
 SLM software version: 1.8
 Calibration engineer: MH

Self-generated noise

| | Self-generated noise level (dB) for frequency weighting | | |
|-------------------------|---|------|------|
| | A | C | Z |
| Electrical input device | 9.2 | 11.8 | 16.1 |
| Expanded uncertainty | 0.1 | 0.1 | 0.4 |

This test laboratory does not undertake self-generated noise measurements with the microphone capsule installed

Test Equipment

| Item | Manufacturer | Model | Serial | Date Calibrated |
|---------------------|-----------------|----------|------------|-----------------|
| Signal Generator | Audio Precision | SYS-2722 | SYS2-31891 | 19-Jan-22 |
| Signal Generator | TTi | TG1010 | 055468 | 24-Jan-22 |
| Acoustic Calibrator | Brüel & Kjær | 4226 | 2288484 | 14-Jan-22 |

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, 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 requirements of IEC 61672-1:2002 because 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 requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Calibration Certificate

Calibration undertaken by Noise and Vibration Calibration Services Ltd
 The Old Kennels Building, 3 Bassett Avenue, Southampton, SO16 7DP
 +44 (0)23 8155 5020 hello@nvcal.co.uk



IEC 60942:2003 Calibration

Periodic tests were performed in accordance with procedures from Annex B of IEC 60942:2003 (using the Insert Voltage Technique) on 5th January 2024 for the following sound calibrator:

Rion NC-74, serial number 34425550

Calibration result

Sound Calibrator: Rion NC-74, serial 34425550 **PASS**
 Performance Specification: IEC 60942:2003 Class 1
 Date: 5th January 2024
 Certificate Number: C00458

Approved Signatory: 

Test results

| | | | |
|------------|----------|--------------|--------------|
| Level | 93.83 | dB re 20 µPa | +/- 0.091 dB |
| Frequency | 1002.781 | Hz | +/- 0.01 Hz |
| Distortion | 1.46 | % | +/- 0.052 % |

Notes

As public evidence was available, from a testing organisation (PTB) responsible for approving the result of pattern evaluation tests, to demonstrate that the model of sound calibrator fully confirmed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to confirm to all the class 1 requirements of IEC 60942:2003.

This certificate provides traceability of measurement to the SI system of units and to units of measurements realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Test Notes

Static pressure: 99.9 - 99.9 kPa
 Air temperature: 20.2 - 20.7 °C
 Relative Humidity: 50.9 - 51.4 %
 Adapter used: Yes – 1/2" adapter supplied with sound calibrator
 Power source: Batteries
 Calibration engineer: MH

Test Equipment

| Item | Manufacturer | Model | Serial | Date Calibrated |
|----------------------------|-----------------|------------------------|------------|-----------------|
| Signal Analyser | Audio Precision | SYS-2722 | SYS2-31891 | 13-Feb-23 |
| Microphone Power Supply | Brüel & Kjær | NEXUS Type 2690-0S2 | 2503766 | n/a |
| Microphone | Brüel & Kjær | Type 4192 | 1784315 | 21-Oct-23 |
| Preamplifier | Brüel & Kjær | Type 2669 | 1811376 | 21-Oct-23 |

Notes

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor (k=2), providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with the Guide to the Expression of Uncertainty in Measurement (published by the International Organisation for Standards).

APPENDIX C – METEOROLOGICAL DATA

| Date | Time | Temp °C | Wind Speed m/s | Wind Dir | Rain mm |
|------------|-------|---------|----------------|----------|---------|
| 03/05/2024 | 10:00 | 10.1 | 1.3 | E | 0 |
| 03/05/2024 | 10:15 | 9.8 | 0.9 | E | 0 |
| 03/05/2024 | 10:30 | 9.7 | 1.3 | E | 0 |
| 03/05/2024 | 10:45 | 9.8 | 1.3 | E | 0 |
| 03/05/2024 | 11:00 | 9.8 | 1.3 | E | 0 |
| 03/05/2024 | 11:15 | 9.9 | 0.4 | E | 0 |
| 03/05/2024 | 11:30 | 10.1 | 0.4 | E | 0 |
| 03/05/2024 | 11:45 | 10 | 0.9 | E | 0 |
| 03/05/2024 | 12:00 | 10.2 | 0.4 | E | 0 |
| 03/05/2024 | 12:15 | 10.3 | 0.9 | E | 0 |
| 03/05/2024 | 12:30 | 10.5 | 0.4 | E | 0 |
| 03/05/2024 | 12:45 | 10.6 | 1.3 | E | 0 |
| 03/05/2024 | 13:00 | 10.8 | 0.9 | E | 0 |
| 03/05/2024 | 13:15 | 11.2 | 0.9 | E | 0 |
| 03/05/2024 | 13:30 | 11.5 | 0.9 | E | 0 |
| 03/05/2024 | 13:45 | 11.6 | 0.9 | E | 0 |
| 03/05/2024 | 14:00 | 11.7 | 0.9 | E | 0 |
| 03/05/2024 | 14:15 | 11.8 | 0.9 | E | 0 |
| 03/05/2024 | 14:30 | 11.8 | 0.4 | E | 0 |
| 03/05/2024 | 14:45 | 12.2 | 0.9 | E | 0 |
| 03/05/2024 | 15:00 | 12.5 | 0.9 | E | 0 |
| 03/05/2024 | 15:15 | 12.4 | 0.9 | E | 0 |
| 03/05/2024 | 15:30 | 12.8 | 0.4 | E | 0 |
| 03/05/2024 | 15:45 | 12.8 | 0.9 | E | 0 |
| 03/05/2024 | 16:00 | 13 | 0.4 | E | 0 |
| 03/05/2024 | 16:15 | 13 | 0.4 | E | 0 |
| 03/05/2024 | 16:30 | 13.1 | 0.4 | E | 0 |
| 03/05/2024 | 16:45 | 13.6 | 0.4 | E | 0 |
| 03/05/2024 | 17:00 | 13.7 | 0 | E | 0 |
| 03/05/2024 | 17:15 | 13.6 | 0.4 | E | 0 |
| 03/05/2024 | 17:30 | 13.6 | 0 | E | 0 |
| 03/05/2024 | 17:45 | 13.3 | 0 | E | 0 |
| 03/05/2024 | 18:00 | 13.4 | 0 | WNW | 0 |
| 03/05/2024 | 18:15 | 13.1 | 0.4 | E | 0 |
| 03/05/2024 | 18:30 | 12.9 | 0.4 | E | 0 |
| 03/05/2024 | 18:45 | 13 | 0.4 | E | 0 |
| 03/05/2024 | 19:00 | 12.9 | 0.4 | E | 0 |
| 03/05/2024 | 19:15 | 12.7 | 0.9 | E | 0 |
| 03/05/2024 | 19:30 | 12.5 | 0.4 | E | 0 |
| 03/05/2024 | 19:45 | 12.3 | 0 | E | 0 |
| 03/05/2024 | 20:00 | 12.1 | 0 | E | 0 |
| 03/05/2024 | 20:15 | 11.6 | 0 | W | 0 |
| 03/05/2024 | 20:30 | 11.2 | 0 | W | 0 |
| 03/05/2024 | 20:45 | 10.9 | 0 | --- | 0 |
| 03/05/2024 | 21:00 | 10.7 | 0 | W | 0 |
| 03/05/2024 | 21:15 | 10.4 | 0 | --- | 0 |
| 03/05/2024 | 21:30 | 10.2 | 0 | --- | 0 |

| | | | | | |
|------------|-------|------|---|-----|---|
| 03/05/2024 | 21:45 | 10 | 0 | --- | 0 |
| 03/05/2024 | 22:00 | 9.8 | 0 | W | 0 |
| 03/05/2024 | 22:15 | 9.4 | 0 | --- | 0 |
| 03/05/2024 | 22:30 | 9.2 | 0 | --- | 0 |
| 03/05/2024 | 22:45 | 9.1 | 0 | W | 0 |
| 03/05/2024 | 23:00 | 8.7 | 0 | --- | 0 |
| 03/05/2024 | 23:15 | 8.3 | 0 | --- | 0 |
| 03/05/2024 | 23:30 | 8 | 0 | --- | 0 |
| 03/05/2024 | 23:45 | 7.8 | 0 | --- | 0 |
| 04/05/2024 | 00:00 | 7.5 | 0 | --- | 0 |
| 04/05/2024 | 00:15 | 7.2 | 0 | --- | 0 |
| 04/05/2024 | 00:30 | 7 | 0 | --- | 0 |
| 04/05/2024 | 00:45 | 7 | 0 | --- | 0 |
| 04/05/2024 | 01:00 | 7.1 | 0 | --- | 0 |
| 04/05/2024 | 01:15 | 7.3 | 0 | --- | 0 |
| 04/05/2024 | 01:30 | 7.4 | 0 | --- | 0 |
| 04/05/2024 | 01:45 | 7.4 | 0 | --- | 0 |
| 04/05/2024 | 02:00 | 7.7 | 0 | --- | 0 |
| 04/05/2024 | 02:15 | 7.9 | 0 | --- | 0 |
| 04/05/2024 | 02:30 | 8.3 | 0 | W | 0 |
| 04/05/2024 | 02:45 | 8.6 | 0 | --- | 0 |
| 04/05/2024 | 03:00 | 8.6 | 0 | W | 0 |
| 04/05/2024 | 03:15 | 8.5 | 0 | WNW | 0 |
| 04/05/2024 | 03:30 | 8.3 | 0 | WNW | 0 |
| 04/05/2024 | 03:45 | 8.3 | 0 | --- | 0 |
| 04/05/2024 | 04:00 | 8.4 | 0 | NW | 0 |
| 04/05/2024 | 04:15 | 8.3 | 0 | W | 0 |
| 04/05/2024 | 04:30 | 8.3 | 0 | --- | 0 |
| 04/05/2024 | 04:45 | 8.2 | 0 | --- | 0 |
| 04/05/2024 | 05:00 | 7.9 | 0 | --- | 0 |
| 04/05/2024 | 05:15 | 7.5 | 0 | --- | 0 |
| 04/05/2024 | 05:30 | 7.1 | 0 | --- | 0 |
| 04/05/2024 | 05:45 | 6.7 | 0 | W | 0 |
| 04/05/2024 | 06:00 | 6.9 | 0 | --- | 0 |
| 04/05/2024 | 06:15 | 7.3 | 0 | WNW | 0 |
| 04/05/2024 | 06:30 | 7.3 | 0 | --- | 0 |
| 04/05/2024 | 06:45 | 7.4 | 0 | --- | 0 |
| 04/05/2024 | 07:00 | 7.5 | 0 | --- | 0 |
| 04/05/2024 | 07:15 | 7.8 | 0 | --- | 0 |
| 04/05/2024 | 07:30 | 8.2 | 0 | --- | 0 |
| 04/05/2024 | 07:45 | 8.4 | 0 | --- | 0 |
| 04/05/2024 | 08:00 | 8.6 | 0 | --- | 0 |
| 04/05/2024 | 08:15 | 8.9 | 0 | --- | 0 |
| 04/05/2024 | 08:30 | 9.3 | 0 | --- | 0 |
| 04/05/2024 | 08:45 | 9.6 | 0 | WNW | 0 |
| 04/05/2024 | 09:00 | 9.4 | 0 | WNW | 0 |
| 04/05/2024 | 09:15 | 9.7 | 0 | WNW | 0 |
| 04/05/2024 | 09:30 | 10.1 | 0 | WNW | 0 |

| | | | | | |
|------------|-------|------|-----|-----|-----|
| 04/05/2024 | 09:45 | 11.1 | 0 | WNW | 0 |
| 04/05/2024 | 10:00 | 12.6 | 0 | WNW | 0 |
| 04/05/2024 | 10:15 | 12.7 | 0.4 | WNW | 0 |
| 04/05/2024 | 10:30 | 13.4 | 0 | NW | 0 |
| 04/05/2024 | 10:45 | 13.9 | 0 | WNW | 0 |
| 04/05/2024 | 11:00 | 13.8 | 0.4 | WNW | 0 |
| 04/05/2024 | 11:15 | 14.2 | 0 | WNW | 0 |
| 04/05/2024 | 11:30 | 14.3 | 0 | NW | 0 |
| 04/05/2024 | 11:45 | 14.3 | 0 | WSW | 0 |
| 04/05/2024 | 12:00 | 13.8 | 0 | NW | 0 |
| 04/05/2024 | 12:15 | 13.9 | 0 | WNW | 0 |
| 04/05/2024 | 12:30 | 13.9 | 0 | WSW | 0 |
| 04/05/2024 | 12:45 | 14 | 0 | NW | 0 |
| 04/05/2024 | 13:00 | 14.1 | 0 | --- | 0 |
| 04/05/2024 | 13:15 | 13.9 | 0 | NW | 0 |
| 04/05/2024 | 13:30 | 13.9 | 0 | NW | 0 |
| 04/05/2024 | 13:45 | 13.9 | 0 | --- | 0 |
| 04/05/2024 | 14:00 | 13.8 | 0 | --- | 0 |
| 04/05/2024 | 14:15 | 13.9 | 0 | --- | 0 |
| 04/05/2024 | 14:30 | 14 | 0 | --- | 0 |
| 04/05/2024 | 14:45 | 14.2 | 0 | --- | 0 |
| 04/05/2024 | 15:00 | 14.7 | 0 | --- | 0 |
| 04/05/2024 | 15:15 | 15.2 | 0 | --- | 0 |
| 04/05/2024 | 15:30 | 16 | 0 | --- | 0 |
| 04/05/2024 | 15:45 | 16.2 | 0 | NW | 0 |
| 04/05/2024 | 16:00 | 16.8 | 0 | NW | 0 |
| 04/05/2024 | 16:15 | 17.3 | 0 | WNW | 0 |
| 04/05/2024 | 16:30 | 16.7 | 0 | NW | 0 |
| 04/05/2024 | 16:45 | 16.2 | 0 | NW | 0 |
| 04/05/2024 | 17:00 | 15.3 | 0 | WNW | 0 |
| 04/05/2024 | 17:15 | 14.7 | 0 | NW | 0 |
| 04/05/2024 | 17:30 | 14.1 | 0 | WSW | 0 |
| 04/05/2024 | 17:45 | 13.4 | 0 | WNW | 0 |
| 04/05/2024 | 18:00 | 12.7 | 0 | W | 0.2 |
| 04/05/2024 | 18:15 | 12.5 | 0 | --- | 0 |
| 04/05/2024 | 18:30 | 12.2 | 0 | --- | 0.2 |
| 04/05/2024 | 18:45 | 11.9 | 0 | --- | 0 |
| 04/05/2024 | 19:00 | 11.7 | 0 | --- | 0 |
| 04/05/2024 | 19:15 | 11.9 | 0 | --- | 0 |
| 04/05/2024 | 19:30 | 12.8 | 0 | --- | 0 |
| 04/05/2024 | 19:45 | 13.4 | 0 | --- | 0 |
| 04/05/2024 | 20:00 | 12.9 | 0 | --- | 0 |
| 04/05/2024 | 20:15 | 12.2 | 0 | --- | 0 |
| 04/05/2024 | 20:30 | 11.5 | 0 | --- | 0 |
| 04/05/2024 | 20:45 | 11.1 | 0 | --- | 0 |
| 04/05/2024 | 21:00 | 10.4 | 0 | --- | 0 |
| 04/05/2024 | 21:15 | 9.9 | 0 | --- | 0 |
| 04/05/2024 | 21:30 | 9.4 | 0 | --- | 0 |

| | | | | | |
|------------|-------|------|---|-----|---|
| 04/05/2024 | 21:45 | 8.9 | 0 | --- | 0 |
| 04/05/2024 | 22:00 | 8.6 | 0 | --- | 0 |
| 04/05/2024 | 22:15 | 8.2 | 0 | --- | 0 |
| 04/05/2024 | 22:30 | 7.9 | 0 | --- | 0 |
| 04/05/2024 | 22:45 | 7.8 | 0 | --- | 0 |
| 04/05/2024 | 23:00 | 7.4 | 0 | --- | 0 |
| 04/05/2024 | 23:15 | 7.1 | 0 | --- | 0 |
| 04/05/2024 | 23:30 | 6.9 | 0 | --- | 0 |
| 04/05/2024 | 23:45 | 6.8 | 0 | --- | 0 |
| 05/05/2024 | 00:00 | 6.6 | 0 | --- | 0 |
| 05/05/2024 | 00:15 | 6.3 | 0 | --- | 0 |
| 05/05/2024 | 00:30 | 6.1 | 0 | --- | 0 |
| 05/05/2024 | 00:45 | 6.1 | 0 | --- | 0 |
| 05/05/2024 | 01:00 | 5.8 | 0 | --- | 0 |
| 05/05/2024 | 01:15 | 5.6 | 0 | --- | 0 |
| 05/05/2024 | 01:30 | 5.6 | 0 | --- | 0 |
| 05/05/2024 | 01:45 | 5.3 | 0 | --- | 0 |
| 05/05/2024 | 02:00 | 5.2 | 0 | --- | 0 |
| 05/05/2024 | 02:15 | 5 | 0 | --- | 0 |
| 05/05/2024 | 02:30 | 5 | 0 | --- | 0 |
| 05/05/2024 | 02:45 | 4.8 | 0 | --- | 0 |
| 05/05/2024 | 03:00 | 4.7 | 0 | --- | 0 |
| 05/05/2024 | 03:15 | 4.8 | 0 | --- | 0 |
| 05/05/2024 | 03:30 | 4.6 | 0 | --- | 0 |
| 05/05/2024 | 03:45 | 4.6 | 0 | --- | 0 |
| 05/05/2024 | 04:00 | 4.3 | 0 | --- | 0 |
| 05/05/2024 | 04:15 | 4.3 | 0 | --- | 0 |
| 05/05/2024 | 04:30 | 4.1 | 0 | --- | 0 |
| 05/05/2024 | 04:45 | 3.9 | 0 | --- | 0 |
| 05/05/2024 | 05:00 | 3.8 | 0 | --- | 0 |
| 05/05/2024 | 05:15 | 3.8 | 0 | --- | 0 |
| 05/05/2024 | 05:30 | 3.4 | 0 | --- | 0 |
| 05/05/2024 | 05:45 | 3.6 | 0 | --- | 0 |
| 05/05/2024 | 06:00 | 3.7 | 0 | --- | 0 |
| 05/05/2024 | 06:15 | 3.5 | 0 | --- | 0 |
| 05/05/2024 | 06:30 | 3.8 | 0 | --- | 0 |
| 05/05/2024 | 06:45 | 4.6 | 0 | --- | 0 |
| 05/05/2024 | 07:00 | 5.7 | 0 | --- | 0 |
| 05/05/2024 | 07:15 | 8.1 | 0 | --- | 0 |
| 05/05/2024 | 07:30 | 8.9 | 0 | --- | 0 |
| 05/05/2024 | 07:45 | 10.4 | 0 | W | 0 |
| 05/05/2024 | 08:00 | 12.1 | 0 | WNW | 0 |
| 05/05/2024 | 08:15 | 13.9 | 0 | WNW | 0 |
| 05/05/2024 | 08:30 | 13.9 | 0 | NW | 0 |
| 05/05/2024 | 08:45 | 15.2 | 0 | WNW | 0 |
| 05/05/2024 | 09:00 | 15.3 | 0 | WNW | 0 |
| 05/05/2024 | 09:15 | 15.8 | 0 | WNW | 0 |
| 05/05/2024 | 09:30 | 16.1 | 0 | WNW | 0 |

| | | | | | |
|------------|-------|------|---|-----|---|
| 05/05/2024 | 09:45 | 16.1 | 0 | WNW | 0 |
| 05/05/2024 | 10:00 | 16.4 | 0 | WNW | 0 |
| 05/05/2024 | 10:15 | 16.3 | 0 | WNW | 0 |
| 05/05/2024 | 10:30 | 16.5 | 0 | WNW | 0 |
| 05/05/2024 | 10:45 | 16.9 | 0 | NW | 0 |
| 05/05/2024 | 11:00 | 16.7 | 0 | NW | 0 |
| 05/05/2024 | 11:15 | 16.7 | 0 | WNW | 0 |
| 05/05/2024 | 11:30 | 16.6 | 0 | WNW | 0 |
| 05/05/2024 | 11:45 | 16.4 | 0 | NW | 0 |
| 05/05/2024 | 12:00 | 16.2 | 0 | NW | 0 |
| 05/05/2024 | 12:15 | 16.3 | 0 | NW | 0 |
| 05/05/2024 | 12:30 | 16.9 | 0 | NW | 0 |
| 05/05/2024 | 12:45 | 16.9 | 0 | WNW | 0 |
| 05/05/2024 | 13:00 | 16.4 | 0 | NW | 0 |
| 05/05/2024 | 13:15 | 16.2 | 0 | NW | 0 |
| 05/05/2024 | 13:30 | 15.7 | 0 | NW | 0 |
| 05/05/2024 | 13:45 | 15.3 | 0 | NW | 0 |
| 05/05/2024 | 14:00 | 15 | 0 | NW | 0 |
| 05/05/2024 | 14:15 | 14.7 | 0 | NW | 0 |
| 05/05/2024 | 14:30 | 14.6 | 0 | NW | 0 |
| 05/05/2024 | 14:45 | 14.3 | 0 | NW | 0 |
| 05/05/2024 | 15:00 | 13.9 | 0 | NW | 0 |
| 05/05/2024 | 15:15 | 14.3 | 0 | NW | 0 |
| 05/05/2024 | 15:30 | 14.6 | 0 | NW | 0 |
| 05/05/2024 | 15:45 | 14.2 | 0 | NW | 0 |
| 05/05/2024 | 16:00 | 14.3 | 0 | NW | 0 |
| 05/05/2024 | 16:15 | 14.6 | 0 | NW | 0 |
| 05/05/2024 | 16:30 | 14.4 | 0 | WNW | 0 |
| 05/05/2024 | 16:45 | 14.6 | 0 | WNW | 0 |
| 05/05/2024 | 17:00 | 14.3 | 0 | WNW | 0 |
| 05/05/2024 | 17:15 | 14 | 0 | --- | 0 |
| 05/05/2024 | 17:30 | 13.8 | 0 | NW | 0 |
| 05/05/2024 | 17:45 | 14.4 | 0 | NW | 0 |
| 05/05/2024 | 18:00 | 14.8 | 0 | --- | 0 |
| 05/05/2024 | 18:15 | 14.7 | 0 | WNW | 0 |
| 05/05/2024 | 18:30 | 14.7 | 0 | NW | 0 |
| 05/05/2024 | 18:45 | 14.9 | 0 | NW | 0 |
| 05/05/2024 | 19:00 | 14.9 | 0 | NW | 0 |
| 05/05/2024 | 19:15 | 14.6 | 0 | NW | 0 |
| 05/05/2024 | 19:30 | 14.3 | 0 | --- | 0 |
| 05/05/2024 | 19:45 | 14.1 | 0 | NW | 0 |
| 05/05/2024 | 20:00 | 13.7 | 0 | --- | 0 |
| 05/05/2024 | 20:15 | 13.4 | 0 | --- | 0 |
| 05/05/2024 | 20:30 | 13.1 | 0 | NW | 0 |
| 05/05/2024 | 20:45 | 12.9 | 0 | --- | 0 |
| 05/05/2024 | 21:00 | 12.7 | 0 | --- | 0 |
| 05/05/2024 | 21:15 | 12.3 | 0 | --- | 0 |
| 05/05/2024 | 21:30 | 11.7 | 0 | --- | 0 |

| | | | | | |
|------------|-------|------|---|-----|-----|
| 05/05/2024 | 21:45 | 11.1 | 0 | --- | 0 |
| 05/05/2024 | 22:00 | 10.5 | 0 | --- | 0 |
| 05/05/2024 | 22:15 | 9.9 | 0 | --- | 0 |
| 05/05/2024 | 22:30 | 9.4 | 0 | --- | 0 |
| 05/05/2024 | 22:45 | 8.9 | 0 | --- | 0 |
| 05/05/2024 | 23:00 | 8.6 | 0 | --- | 0 |
| 05/05/2024 | 23:15 | 8.3 | 0 | --- | 0 |
| 05/05/2024 | 23:30 | 8.2 | 0 | --- | 0 |
| 05/05/2024 | 23:45 | 7.8 | 0 | --- | 0 |
| 06/05/2024 | 00:00 | 7.7 | 0 | --- | 0 |
| 06/05/2024 | 00:15 | 7.6 | 0 | --- | 0 |
| 06/05/2024 | 00:30 | 7.6 | 0 | --- | 0 |
| 06/05/2024 | 00:45 | 7.8 | 0 | --- | 0 |
| 06/05/2024 | 01:00 | 7.8 | 0 | --- | 0 |
| 06/05/2024 | 01:15 | 7.9 | 0 | --- | 0 |
| 06/05/2024 | 01:30 | 8.1 | 0 | --- | 0 |
| 06/05/2024 | 01:45 | 8.2 | 0 | --- | 0 |
| 06/05/2024 | 02:00 | 8.1 | 0 | --- | 0 |
| 06/05/2024 | 02:15 | 7.8 | 0 | --- | 0 |
| 06/05/2024 | 02:30 | 8.2 | 0 | --- | 0 |
| 06/05/2024 | 02:45 | 7.9 | 0 | --- | 0 |
| 06/05/2024 | 03:00 | 7.9 | 0 | --- | 0 |
| 06/05/2024 | 03:15 | 7.9 | 0 | --- | 0 |
| 06/05/2024 | 03:30 | 7.9 | 0 | --- | 0 |
| 06/05/2024 | 03:45 | 8.1 | 0 | --- | 0 |
| 06/05/2024 | 04:00 | 8.3 | 0 | --- | 0 |
| 06/05/2024 | 04:15 | 8.4 | 0 | --- | 0 |
| 06/05/2024 | 04:30 | 8.6 | 0 | --- | 0 |
| 06/05/2024 | 04:45 | 8.8 | 0 | --- | 0 |
| 06/05/2024 | 05:00 | 8.9 | 0 | --- | 0 |
| 06/05/2024 | 05:15 | 9.1 | 0 | --- | 0 |
| 06/05/2024 | 05:30 | 9.3 | 0 | NW | 0 |
| 06/05/2024 | 05:45 | 9.4 | 0 | --- | 0 |
| 06/05/2024 | 06:00 | 9.5 | 0 | --- | 0 |
| 06/05/2024 | 06:15 | 9.9 | 0 | NW | 0 |
| 06/05/2024 | 06:30 | 10.1 | 0 | --- | 0 |
| 06/05/2024 | 06:45 | 10.2 | 0 | --- | 0 |
| 06/05/2024 | 07:00 | 10.3 | 0 | --- | 0 |
| 06/05/2024 | 07:15 | 10.3 | 0 | --- | 0 |
| 06/05/2024 | 07:30 | 10.4 | 0 | --- | 0 |
| 06/05/2024 | 07:45 | 10.4 | 0 | --- | 0 |
| 06/05/2024 | 08:00 | 10.5 | 0 | --- | 0 |
| 06/05/2024 | 08:15 | 10.6 | 0 | --- | 0 |
| 06/05/2024 | 08:30 | 10.7 | 0 | --- | 0 |
| 06/05/2024 | 08:45 | 10.8 | 0 | --- | 0.4 |
| 06/05/2024 | 09:00 | 10.9 | 0 | WNW | 0.2 |
| 06/05/2024 | 09:15 | 11.2 | 0 | WNW | 0.2 |
| 06/05/2024 | 09:30 | 11.4 | 0 | WNW | 0.2 |

| | | | | | |
|------------|-------|------|-----|-----|-----|
| 06/05/2024 | 09:45 | 11.4 | 0 | W | 0.4 |
| 06/05/2024 | 10:00 | 11.4 | 0 | WNW | 0 |
| 06/05/2024 | 10:15 | 11.8 | 0 | W | 0 |
| 06/05/2024 | 10:30 | 12 | 0 | W | 0 |
| 06/05/2024 | 10:45 | 11.9 | 0 | W | 0 |
| 06/05/2024 | 11:00 | 11.9 | 0 | WNW | 0 |
| 06/05/2024 | 11:15 | 11.8 | 0 | W | 0.6 |
| 06/05/2024 | 11:30 | 11.7 | 0 | W | 0.6 |
| 06/05/2024 | 11:45 | 11.7 | 0 | W | 0.8 |
| 06/05/2024 | 12:00 | 11.6 | 0 | WNW | 0.2 |
| 06/05/2024 | 12:15 | 11.7 | 0 | NNW | 0.2 |
| 06/05/2024 | 12:30 | 11.9 | 0 | NNE | 1.2 |
| 06/05/2024 | 12:45 | 11.8 | 0 | NE | 0.6 |
| 06/05/2024 | 13:00 | 11.7 | 0 | NE | 1 |
| 06/05/2024 | 13:15 | 11.7 | 0 | ENE | 0.6 |
| 06/05/2024 | 13:30 | 11.6 | 0 | ENE | 0.4 |
| 06/05/2024 | 13:45 | 11.6 | 0 | ENE | 0 |
| 06/05/2024 | 14:00 | 11.7 | 0 | E | 0 |
| 06/05/2024 | 14:15 | 11.9 | 0 | E | 0 |
| 06/05/2024 | 14:30 | 12.1 | 0 | E | 0.2 |
| 06/05/2024 | 14:45 | 12.3 | 0 | WNW | 0.2 |
| 06/05/2024 | 15:00 | 12.2 | 0 | ENE | 0 |
| 06/05/2024 | 15:15 | 12.4 | 0 | WNW | 0 |
| 06/05/2024 | 15:30 | 12.7 | 0 | E | 0 |
| 06/05/2024 | 15:45 | 12.9 | 0 | ENE | 0 |
| 06/05/2024 | 16:00 | 13.1 | 0 | NNE | 0 |
| 06/05/2024 | 16:15 | 13.1 | 0 | WNW | 0.4 |
| 06/05/2024 | 16:30 | 13.2 | 0 | WNW | 0.4 |
| 06/05/2024 | 16:45 | 13.3 | 0 | W | 0.4 |
| 06/05/2024 | 17:00 | 13.1 | 0 | WNW | 0.8 |
| 06/05/2024 | 17:15 | 13.1 | 0 | WNW | 0.6 |
| 06/05/2024 | 17:30 | 13.1 | 0 | --- | 0.2 |
| 06/05/2024 | 17:45 | 13.1 | 0 | NW | 0 |
| 06/05/2024 | 18:00 | 13.1 | 0 | WNW | 0 |
| 06/05/2024 | 18:15 | 13.1 | 0 | WNW | 0 |
| 06/05/2024 | 18:30 | 13.1 | 0 | W | 0 |
| 06/05/2024 | 18:45 | 13.2 | 0 | NW | 0 |
| 06/05/2024 | 19:00 | 13.3 | 0 | W | 0.2 |
| 06/05/2024 | 19:15 | 13.3 | 0 | WNW | 0 |
| 06/05/2024 | 19:30 | 13.2 | 0 | NW | 0 |
| 06/05/2024 | 19:45 | 13.1 | 0 | W | 0 |
| 06/05/2024 | 20:00 | 12.8 | 0 | W | 0 |
| 06/05/2024 | 20:15 | 12.7 | 0 | W | 0 |
| 06/05/2024 | 20:30 | 12.6 | 0 | NW | 0 |
| 06/05/2024 | 20:45 | 12.6 | 0 | WNW | 0 |
| 06/05/2024 | 21:00 | 12.4 | 0.4 | WNW | 0 |
| 06/05/2024 | 21:15 | 12.3 | 0 | NW | 0 |
| 06/05/2024 | 21:30 | 12.3 | 0 | WNW | 0 |

| | | | | | |
|------------|-------|------|---|-----|---|
| 06/05/2024 | 21:45 | 12.2 | 0 | W | 0 |
| 06/05/2024 | 22:00 | 12.2 | 0 | --- | 0 |
| 06/05/2024 | 22:15 | 12.2 | 0 | WSW | 0 |
| 06/05/2024 | 22:30 | 12.1 | 0 | W | 0 |
| 06/05/2024 | 22:45 | 12.1 | 0 | NW | 0 |
| 06/05/2024 | 23:00 | 12.1 | 0 | W | 0 |
| 06/05/2024 | 23:15 | 12.1 | 0 | W | 0 |
| 06/05/2024 | 23:30 | 12.1 | 0 | WNW | 0 |
| 06/05/2024 | 23:45 | 12 | 0 | WNW | 0 |
| 07/05/2024 | 00:00 | 12 | 0 | WSW | 0 |
| 07/05/2024 | 00:15 | 12 | 0 | WSW | 0 |
| 07/05/2024 | 00:30 | 12 | 0 | NW | 0 |
| 07/05/2024 | 00:45 | 12 | 0 | WNW | 0 |
| 07/05/2024 | 01:00 | 12 | 0 | NW | 0 |
| 07/05/2024 | 01:15 | 11.9 | 0 | WSW | 0 |
| 07/05/2024 | 01:30 | 11.9 | 0 | W | 0 |
| 07/05/2024 | 01:45 | 11.9 | 0 | WNW | 0 |
| 07/05/2024 | 02:00 | 11.8 | 0 | W | 0 |
| 07/05/2024 | 02:15 | 11.8 | 0 | WNW | 0 |
| 07/05/2024 | 02:30 | 11.7 | 0 | WNW | 0 |
| 07/05/2024 | 02:45 | 11.6 | 0 | NW | 0 |
| 07/05/2024 | 03:00 | 11.6 | 0 | WNW | 0 |
| 07/05/2024 | 03:15 | 11.5 | 0 | WNW | 0 |
| 07/05/2024 | 03:30 | 11.4 | 0 | WSW | 0 |
| 07/05/2024 | 03:45 | 11.3 | 0 | WSW | 0 |
| 07/05/2024 | 04:00 | 11.3 | 0 | WNW | 0 |
| 07/05/2024 | 04:15 | 11.2 | 0 | WSW | 0 |
| 07/05/2024 | 04:30 | 11.1 | 0 | WSW | 0 |
| 07/05/2024 | 04:45 | 11 | 0 | NW | 0 |
| 07/05/2024 | 05:00 | 10.9 | 0 | --- | 0 |
| 07/05/2024 | 05:15 | 10.9 | 0 | --- | 0 |
| 07/05/2024 | 05:30 | 10.7 | 0 | --- | 0 |
| 07/05/2024 | 05:45 | 10.4 | 0 | --- | 0 |
| 07/05/2024 | 06:00 | 10.1 | 0 | --- | 0 |
| 07/05/2024 | 06:15 | 10.1 | 0 | --- | 0 |
| 07/05/2024 | 06:30 | 10.3 | 0 | --- | 0 |
| 07/05/2024 | 06:45 | 10.6 | 0 | NW | 0 |
| 07/05/2024 | 07:00 | 10.9 | 0 | W | 0 |
| 07/05/2024 | 07:15 | 11.4 | 0 | WSW | 0 |
| 07/05/2024 | 07:30 | 12.7 | 0 | --- | 0 |
| 07/05/2024 | 07:45 | 13.9 | 0 | --- | 0 |
| 07/05/2024 | 08:00 | 14.7 | 0 | --- | 0 |
| 07/05/2024 | 08:15 | 15.2 | 0 | W | 0 |
| 07/05/2024 | 08:30 | 15.4 | 0 | WNW | 0 |
| 07/05/2024 | 08:45 | 16.1 | 0 | WNW | 0 |
| 07/05/2024 | 09:00 | 16.4 | 0 | WNW | 0 |
| 07/05/2024 | 09:15 | 16.9 | 0 | WNW | 0 |
| 07/05/2024 | 09:30 | 16.6 | 0 | WNW | 0 |

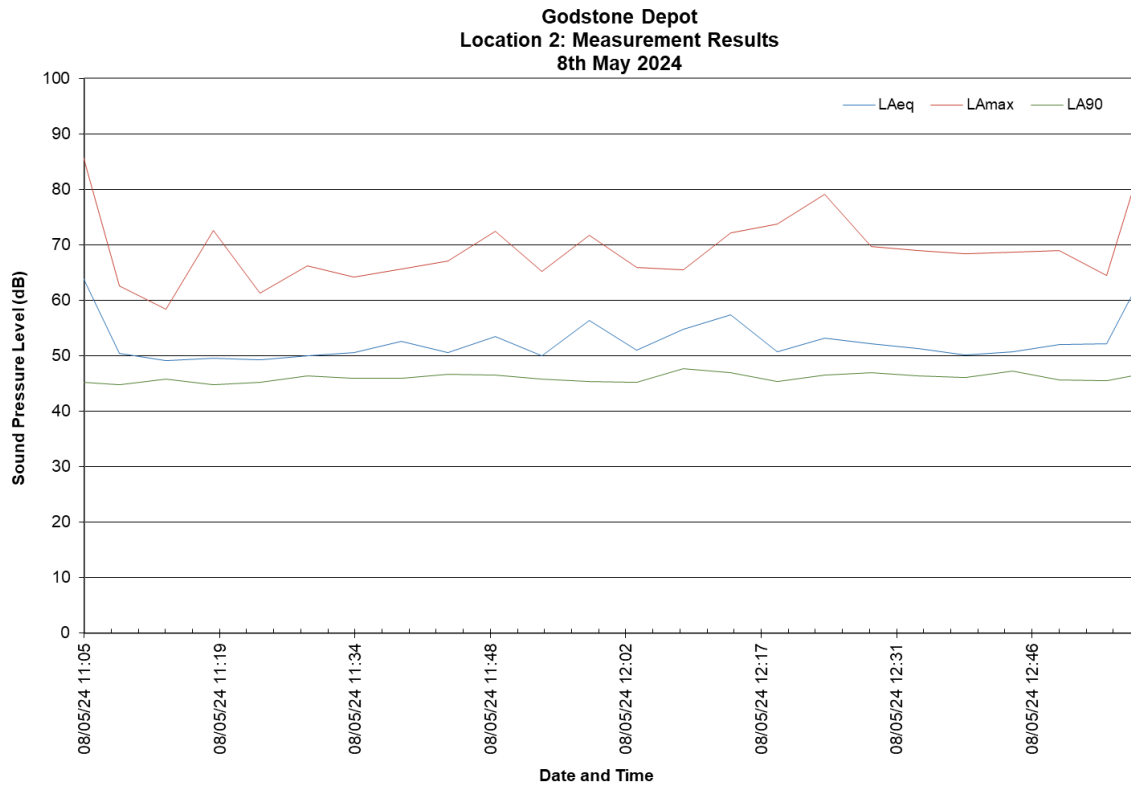
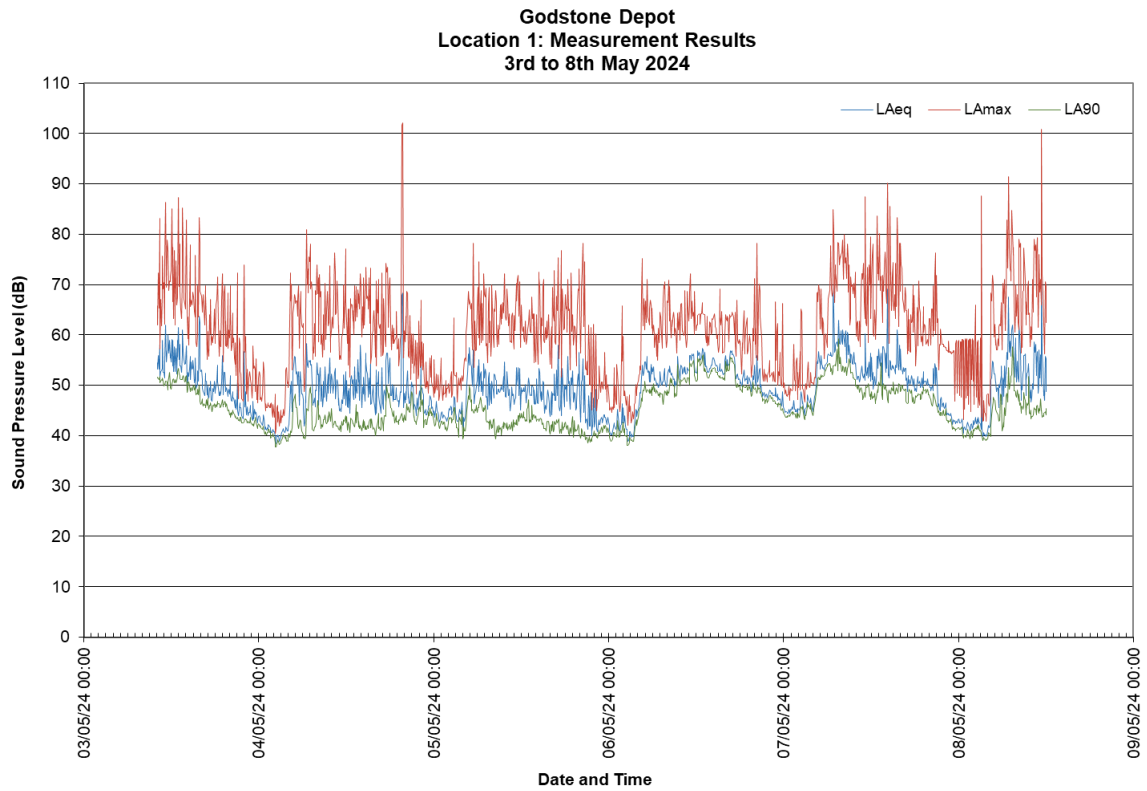
| | | | | | |
|------------|-------|------|-----|-----|---|
| 07/05/2024 | 09:45 | 16.7 | 0 | WNW | 0 |
| 07/05/2024 | 10:00 | 17.2 | 0 | WNW | 0 |
| 07/05/2024 | 10:15 | 17 | 0.4 | WNW | 0 |
| 07/05/2024 | 10:30 | 17.3 | 0 | WNW | 0 |
| 07/05/2024 | 10:45 | 17.9 | 0 | WNW | 0 |
| 07/05/2024 | 11:00 | 17.9 | 0 | NW | 0 |
| 07/05/2024 | 11:15 | 17.9 | 0 | WNW | 0 |
| 07/05/2024 | 11:30 | 17.7 | 0.4 | NW | 0 |
| 07/05/2024 | 11:45 | 17.9 | 0.4 | WSW | 0 |
| 07/05/2024 | 12:00 | 17.9 | 0.4 | W | 0 |
| 07/05/2024 | 12:15 | 18.3 | 0 | WNW | 0 |
| 07/05/2024 | 12:30 | 18.7 | 0.4 | NW | 0 |
| 07/05/2024 | 12:45 | 18.6 | 0.4 | WNW | 0 |
| 07/05/2024 | 13:00 | 18.8 | 0.4 | NW | 0 |
| 07/05/2024 | 13:15 | 19.3 | 0 | NW | 0 |
| 07/05/2024 | 13:30 | 19.1 | 0 | WSW | 0 |
| 07/05/2024 | 13:45 | 19.1 | 0 | W | 0 |
| 07/05/2024 | 14:00 | 18.7 | 0 | WNW | 0 |
| 07/05/2024 | 14:15 | 18.6 | 0 | WNW | 0 |
| 07/05/2024 | 14:30 | 18.6 | 0 | NW | 0 |
| 07/05/2024 | 14:45 | 18.8 | 0 | ESE | 0 |
| 07/05/2024 | 15:00 | 18.9 | 0 | WSW | 0 |
| 07/05/2024 | 15:15 | 18.8 | 0 | W | 0 |
| 07/05/2024 | 15:30 | 19.1 | 0 | NW | 0 |
| 07/05/2024 | 15:45 | 19 | 0.4 | NW | 0 |
| 07/05/2024 | 16:00 | 19.3 | 0 | NW | 0 |
| 07/05/2024 | 16:15 | 19 | 0 | E | 0 |
| 07/05/2024 | 16:30 | 18.7 | 0 | W | 0 |
| 07/05/2024 | 16:45 | 18.6 | 0 | NW | 0 |
| 07/05/2024 | 17:00 | 18.5 | 0 | WNW | 0 |
| 07/05/2024 | 17:15 | 18.9 | 0 | NW | 0 |
| 07/05/2024 | 17:30 | 18.3 | 0 | SW | 0 |
| 07/05/2024 | 17:45 | 18.1 | 0 | NW | 0 |
| 07/05/2024 | 18:00 | 18.4 | 0 | W | 0 |
| 07/05/2024 | 18:15 | 18.6 | 0 | NW | 0 |
| 07/05/2024 | 18:30 | 18.2 | 0 | NW | 0 |
| 07/05/2024 | 18:45 | 17.8 | 0 | --- | 0 |
| 07/05/2024 | 19:00 | 17.6 | 0 | --- | 0 |
| 07/05/2024 | 19:15 | 17.3 | 0 | W | 0 |
| 07/05/2024 | 19:30 | 17.1 | 0 | NW | 0 |
| 07/05/2024 | 19:45 | 16.8 | 0 | WSW | 0 |
| 07/05/2024 | 20:00 | 16.4 | 0 | W | 0 |
| 07/05/2024 | 20:15 | 16.1 | 0 | --- | 0 |
| 07/05/2024 | 20:30 | 15.8 | 0 | --- | 0 |
| 07/05/2024 | 20:45 | 15.4 | 0 | WSW | 0 |
| 07/05/2024 | 21:00 | 15.1 | 0 | WSW | 0 |
| 07/05/2024 | 21:15 | 14.8 | 0 | --- | 0 |
| 07/05/2024 | 21:30 | 14.4 | 0 | WNW | 0 |

| | | | | | |
|------------|-------|------|---|-----|---|
| 07/05/2024 | 21:45 | 13.8 | 0 | --- | 0 |
| 07/05/2024 | 22:00 | 13.1 | 0 | --- | 0 |
| 07/05/2024 | 22:15 | 12.4 | 0 | --- | 0 |
| 07/05/2024 | 22:30 | 11.9 | 0 | --- | 0 |
| 07/05/2024 | 22:45 | 11.3 | 0 | --- | 0 |
| 07/05/2024 | 23:00 | 10.8 | 0 | --- | 0 |
| 07/05/2024 | 23:15 | 10.8 | 0 | --- | 0 |
| 07/05/2024 | 23:30 | 10.4 | 0 | --- | 0 |
| 07/05/2024 | 23:45 | 10.3 | 0 | --- | 0 |
| 08/05/2024 | 00:00 | 9.9 | 0 | --- | 0 |
| 08/05/2024 | 00:15 | 9.5 | 0 | --- | 0 |
| 08/05/2024 | 00:30 | 9.4 | 0 | --- | 0 |
| 08/05/2024 | 00:45 | 9.2 | 0 | --- | 0 |
| 08/05/2024 | 01:00 | 8.8 | 0 | --- | 0 |
| 08/05/2024 | 01:15 | 8.6 | 0 | --- | 0 |
| 08/05/2024 | 01:30 | 8.3 | 0 | --- | 0 |
| 08/05/2024 | 01:45 | 8.2 | 0 | --- | 0 |
| 08/05/2024 | 02:00 | 7.9 | 0 | --- | 0 |
| 08/05/2024 | 02:15 | 7.7 | 0 | --- | 0 |
| 08/05/2024 | 02:30 | 7.6 | 0 | --- | 0 |
| 08/05/2024 | 02:45 | 7.7 | 0 | --- | 0 |
| 08/05/2024 | 03:00 | 7.9 | 0 | --- | 0 |
| 08/05/2024 | 03:15 | 8.4 | 0 | --- | 0 |
| 08/05/2024 | 03:30 | 8.9 | 0 | --- | 0 |
| 08/05/2024 | 03:45 | 9.1 | 0 | --- | 0 |
| 08/05/2024 | 04:00 | 9.3 | 0 | --- | 0 |
| 08/05/2024 | 04:15 | 9.4 | 0 | --- | 0 |
| 08/05/2024 | 04:30 | 9.7 | 0 | --- | 0 |
| 08/05/2024 | 04:45 | 9.7 | 0 | --- | 0 |
| 08/05/2024 | 05:00 | 9.7 | 0 | --- | 0 |
| 08/05/2024 | 05:15 | 9.6 | 0 | --- | 0 |
| 08/05/2024 | 05:30 | 9.4 | 0 | --- | 0 |
| 08/05/2024 | 05:45 | 9.3 | 0 | --- | 0 |
| 08/05/2024 | 06:00 | 9.4 | 0 | WNW | 0 |
| 08/05/2024 | 06:15 | 9.4 | 0 | WNW | 0 |
| 08/05/2024 | 06:30 | 9.4 | 0 | WSW | 0 |
| 08/05/2024 | 06:45 | 9.6 | 0 | WSW | 0 |
| 08/05/2024 | 07:00 | 9.7 | 0 | --- | 0 |
| 08/05/2024 | 07:15 | 9.9 | 0 | --- | 0 |
| 08/05/2024 | 07:30 | 10.1 | 0 | --- | 0 |
| 08/05/2024 | 07:45 | 10.3 | 0 | --- | 0 |
| 08/05/2024 | 08:00 | 10.9 | 0 | W | 0 |
| 08/05/2024 | 08:15 | 11.8 | 0 | WNW | 0 |
| 08/05/2024 | 08:30 | 13 | 0 | WNW | 0 |
| 08/05/2024 | 08:45 | 14.2 | 0 | --- | 0 |
| 08/05/2024 | 09:00 | 15.6 | 0 | --- | 0 |
| 08/05/2024 | 09:15 | 16.5 | 0 | --- | 0 |
| 08/05/2024 | 09:30 | 15.6 | 0 | NW | 0 |

| | | | | | |
|------------|-------|------|-----|-----|-----|
| 08/05/2024 | 09:45 | 15.8 | 0 | WNW | 0 |
| 08/05/2024 | 10:00 | 16.1 | 0 | WNW | 0 |
| 08/05/2024 | 10:15 | 16.5 | 0 | NW | 0 |
| 08/05/2024 | 10:30 | 16.9 | 0 | WNW | 0 |
| 08/05/2024 | 10:45 | 16.4 | 0 | NW | 0 |
| 08/05/2024 | 11:00 | 17.3 | 0 | WNW | 0 |
| 08/05/2024 | 11:15 | 17.2 | 0 | WNW | 0 |
| 08/05/2024 | 11:30 | 17.1 | 0 | WNW | 0 |
| 08/05/2024 | 11:45 | 17.3 | 0 | W | 0 |
| 08/05/2024 | 12:00 | 17.6 | 0 | WNW | 0 |
| 08/05/2024 | 12:15 | 17.7 | 0 | W | 0 |
| 08/05/2024 | 12:30 | 18.2 | 0.4 | WNW | 1.4 |

Figure B2: Meteorological Record During Long Term Measurements – 3rd to 8th May 2024

APPENDIX D – BACKGROUND NOISE SURVEY RESULTS



APPENDIX E – SOURCE-TERM NOISE DATA

| Proposed Plant - BS 5228 Single Octave Band (Hz) Plant Sound Pressure Levels (dB) at 10m | | | | | | | | | dBA |
|--|------|-------|-------|-------|------|------|------|------|-----|
| Unit | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | |
| Manufacturing Unit | 84 | 82 | 79 | 79 | 74 | 74 | 71 | 64 | 81 |
| Excavator | 81 | 80 | 80 | 83 | 82 | 79 | 76 | 73 | 86 |
| Diesel Generator | 57 | 71 | 65 | 61 | 60 | 56 | 52 | 44 | 65 |
| Telehandler | 85 | 79 | 69 | 67 | 64 | 62 | 56 | 47 | 71 |
| Crusher | 86 | 84 | 84 | 81 | 78 | 75 | 71 | 66 | 84 |

Figure D1: BS 5228 Single Octave Band Plant Sound Pressure Levels at 10m

| Wheeled Loader - Single Octave Band (Hz) Sound Power Levels (dB) | | | | | | | | | dBA |
|--|------|-------|-------|-------|------|------|------|------|-----|
| 31.5Hz | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | |
| 101 | 99 | 107 | 102 | 100 | 97 | 95 | 93 | 86 | 103 |

Figure D2: Wheeled Loader Single Octave Band Sound Power Levels

| Slow Moving HGV - Single Octave Band (Hz) Sound Power Levels (dB) | | | | | | | | | dBA |
|---|-------|--------|--------|--------|-------|-------|-------|-------|-----|
| 31.5 Hz | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1 kHz | 2 kHz | 4 kHz | 8 kHz | |
| 99 | 107 | 102 | 100 | 97 | 95 | 93 | 86 | 82 | 101 |

Figure D3: HGV Single Octave Band Sound Power Levels