

Noise Impact Assessment for Planning Purposes

Job No: 2209067

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Report Status: Final

Prepared for: Merthyr Motor Auctions
Redbarrel House
Pant Road
Dowlais
Merthyr Tydfil
CF48 3SH

Site address: Merthyr Motor Auctions
Redbarrel House
Pant Road
Dowlais
Merthyr Tydfil
CF48 3SH

Acoustics & Noise Limited

55 Malpas Road, Newport, South Wales, NP20 5PJ

TEL: +44(0)1633-850880

FAX: +44(0)1633-850882

www.acousticsandnoise.co.uk

office@acousticsandnoise.co.uk



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Prepared by	Chris McDonagh	Chris McDonagh	Chris McDonagh		Chris McDonagh
Signature					
Checked by	Paul Trew	Paul Trew	Paul Trew		Paul Trew
Signature					
Authorised by	Paul Trew	Paul Trew	Paul Trew		Paul Trew
Signature					
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BRIEF FOR CONSULTANCY:

This report has been prepared by Acoustics & Noise Limited, Newport, South Wales, for Merthyr Motor Auctions under the instructions of Anna Cheyney c/o Herbert R Thomas Ltd (Planning).

Purchase Order No:

OBJECTIVES:

To investigate the sound levels being experienced at Merthyr Motor Auctions, Pant Road, Dowlais, CF48 3SH and to carry out an assessment of the potential for adverse impact arising from the proposed usage of the Lower Yard.

Where applicable recommend mitigation to meet the impact criteria.

NON-TECHNICAL SUMMARY:

The applicant seeks a variation of planning condition E of APP6410/C/95/508749 to vary hours of use, specifically relating to the lower yard area of the site at Merthyr Motor Auctions, Pant Road, Dowlais, CF48 3SH.

The applicant seeks a variation of the above to enable access to the lower yard for the storage of vehicles for the minimum number of hours required on two auction evenings per week. This modest variation would facilitate the physical auction and protect the business going forward.

The results of a baseline noise survey and 3D acoustic modelling techniques are used to predict the impact from noise emissions from the movement of up to 30 vehicles from the main yard onto the lower yard. These movements will predominantly occur during the initial auction period of 19:00 – 20:00 hours with the vehicles remaining parked until collected the following day (after 08:00 hrs). However, there may be rare occasions whereby a sold vehicle may need to be returned to the main yard to be collected and driven away that evening, hence the requirement to extend the use of the lower yard to 22:30 hours to account for such rare events.

Any ancillary noise events associated with the proposed use of the lower yard would be described as random, unpredictable and transient in nature and not considered to be a nuisance in law and are therefore not considered relevant to this assessment in the context of the primary noise described above.

The results of the modelling exercise are used to assess the significance of any potential noise impact from the proposed development following the guidelines from the Institute of Environmental Management and Assessment (IEMA).

Any impact is described in terms of the difference in acoustic environment before and after the implementation of the proposals (also known as the magnitude of change or Noise Impact). Once the magnitude of impact is determined, the consequences, if any, can be described by considering whether a change caused by the modified acoustic environment has occurred or whether there has been a perceived change in quality of life due to the change of character of the area. Finally, it is important to evaluate the Noise Effect to determine whether or not that impact is significant.

The results of this assessment conclude that there will be a negligible change in the acoustic climate at all sensitive receptors. There will be no discernible effect on any receptor and the significance of impact is described as '*not significant*' in accordance with the IEMA guidelines.

1.0 DESCRIPTION OF SITE

- 1.1 The site sits immediately to the south of the existing main yard and Auction Hall of Merthyr Motor Auctions, Pant Road, Dowlais, CF48 3SH (MMA).
- 1.2 The lower yard consists of a strip of land, varying in width, located to the south of the main yard. On entering the site from the main yard (either on foot or vehicle) there is a tarmacked access way that slopes from North down to South (for around 20m). The remainder of the site is predominately flat. To the south west corner there is an access gate (very seldom used) on to Llewellyn Street.
- 1.3 To the north of the site lies the (gated) MMA main yard and auction hall complex, to the east of the site lies a fenced public footway beyond which sits an area of open land that was formally the Ifor Works. To the south lies the fenced public footway and beyond a small strip of open land also in the ownership of MMA, that backs on to the business/ commercial premises of Victoria Street. To the west lie the residential properties of Llewellyn Street.
- 1.4 Vehicular and pedestrian access to the lower yard is gained via the main yard. There is an alternative access to the south of the site though this is very seldom used as stated above.
- 1.5 The acoustic climate at the site is characterised by road traffic using the neighbouring roads including the A465.
- 1.6 A satellite view of the assessment area is presented in Appendix 2.

2.0 DISCUSSION

- 2.1 The applicant seeks a variation of planning condition E of APP6410/C/95/508749 to vary hours of use, specifically relating to the Lower Yard area of the site.
- 2.2 The Lower Yard is primarily used to store commercial vehicles and its use is currently covered by the following restrictive condition:

Condition E

'no activity shall take place on the site before 08.00 hours or after 18.30 hours on weekdays and Saturdays, nor at any time on Sundays or Public Holidays (the sole exception to this condition being in the event of a transporter arriving whilst the auction activities are being undertaken in the upper yard, such transporter shall be permitted to enter the lower yard for the purposes of parking only).'

- 2.3 The applicant seeks a variation of the above to enable access to the lower yard for the storage of vehicles for the minimum number of hours required on two auction evenings per week. This modest variation would facilitate the physical auction and protect the business going forward. A proposed condition wording is provided below:

'No activity shall take place on the site outside of the hours of 08.00-22.30 on a Monday and Thursday, 08.00-18.30 on a Tuesday, Wednesday, Friday and Saturday and not at all on Sunday'.

- 2.4 Acoustics and Noise Ltd were engaged by Herbert R Thomas to undertake a noise impact assessment for the above to demonstrate that noise emissions will not result in an adverse noise impact in accordance with local and national planning policy.

2.5 DESCRIPTION OF PROPOSED ACTIVITIES

- 2.5.1 Regular motor auctions currently run each week on Monday and Thursday evenings, commencing at 19:00 hours. Auction proceedings are completed within a 2.5 hour time frame from the commencement of the auction. MMA staff complete administration tasks and final movements of vehicles within 1.5 hours of the auction close and secure the site for the evening.

- 2.5.2 The majority of activity is restricted to the main yard and auction hall. Vehicles are prepared and stored in designated zones on the main yard, arranged in rows of vehicles according to their size (small, medium and large vans). Once the auction is underway, vehicles are driven from each of the designated zones and on through to the auction house for auction.
- 2.5.3 Due to the physical constraints on the main yard and the requirement to move vehicles in a safe and efficient manner, it is not currently possible to return all vehicles to their original location once auctioned, hence the need to use the lower yard for vehicle storage.
- 2.5.4 To facilitate the smooth operation of the auction and minimise the number of vehicles moved to the lower yard, enough space for a 'free row' needs to be created within each of the zones.
- 2.5.5 Initially, once through the auction house, the vehicle will be then driven to the lower yard, where it will remain parked until the following morning (8am onwards). The driver will then walk back to his zone and pick up the next vehicle to move on to the auction hall. This process is repeated until enough vehicles have been moved through the auction hall and onto the lower yard to create a 'free row' within each of the zones.
- 2.5.6 Once a 'free row' is created within each zone, it will then be possible to return an auctioned vehicle to its original zone on the main yard.
- 2.5.7 Dependent on stock levels at each auction, up to 30 vehicles will need to be moved through the auction and onto the lower yard before the requisite space is made available.
- 2.5.8 MMA have indicated that the time taken for a single vehicle to pass through the auction process averages 2 minutes. Therefore, all 30 vehicles will be moved onto the lower yard during a single 1-hour period.
- 2.5.9 The movement of these 30 vehicles onto the lower yard has the potential to cause a noise impact at neighbouring noise sensitive receptors. There may be rare occasions at the end of the auction, whereby a sold vehicle may need to be returned to the main yard to be collected and driven away that evening, hence the

requirement to extend the use of the lower yard to 22:30 hours to account for such rare events.

- 2.5.10 No other activities on the lower yard are proposed during the requested extended operational hours of 18:30 – 22:30 hours. The on-site valeting facility closes for the day at 18:00 hours.

2.6 NOISE SENSITIVE RECEPTOR LOCATIONS

- 2.6.1 The nearest sensitive receptors are identified as the residential dwelling located along Llewellyn Street at the western boundary to the lower yard.

- 2.6.2 The rear of these properties are between 10 and 20 metres from the primary route that vehicles will use when moving within the lower yard.

2.7 DESCRIPTION OF PRIMARY NOISE SOURCES

- 2.7.1 The primary noise source under consideration in this assessment is the movement of up to 30 vehicles onto the lower yard during the initial period of each auction which occurs on a Monday and Thursday evening every week.

- 2.7.2 These vehicles will travel along the site road at the western boundary to the site with parking areas located to the east of the road.

- 2.7.3 It is anticipated that these movements will be completed within a single 1-hour period during the initial stages of the auction between 19:00 – 20:00 hours.

2.8 CONSIDERATION OF POTENTIAL ANCILLARY NOISE SOURCES

- 2.8.1 Legislation on environmental noise covers two main areas:

- *Noise nuisance*
- *Control of emissions from plant and machinery*

- 2.8.2 Even though the slightest noise is often considered to be a nuisance to the layman if it annoys them, the legal definition is more restricted. This is inevitable, as where a nuisance at law exists, the law provides a remedy to the person affected by the nuisance. It is impracticable to provide a remedy against every noise that an individual finds objectionable.

- 2.8.3 There are three types of nuisance that may be considered:

- **Public or common nuisance** – an unlawful act causing inconvenience or damage to the life of the public at large.
- **Private nuisance** – an act connected with the use of land which causes an unlawful interference to another person's use and enjoyment of their land. A single act can never be a private nuisance, there must be either repetition or a continuing state of affairs.
- **Statutory nuisance** – an act which has been designated a nuisance by statute.

2.8.4 It has been established in the courts [1, 2, 3] that temporary or transient noise will not generally be accepted as a nuisance.

2.8.5 The proposed use of the lower yard is for the parking and storage of auctioned vehicles overnight. Other than the driving and parking of up to 30 vans during a single 1 hour period during two auction evenings per week, the lower yard use and movements remain within the confines of 08:00hrs to 18:30 hrs on 5 days per week (and not at all on Sunday).

2.8.6 Any ancillary noise events associated with the proposed use of the lower yard would be described as random, unpredictable and transient in nature.

2.8.7 As discussed above, temporary or transient noise is not considered to be a nuisance in law and therefore not relevant to this assessment. This report only considers the primary noise impact associated with the movement of the vans into the lower yard.

2.9 ASSESSMENT CRITERIA

2.9.1 Noise is an inevitable consequence of a mature and vibrant society. Most new developments, regardless of their scale, will generate noise which has the potential to affect people in terms of their health and quality of life.

2.9.2 Although standards and guidance about noise are available, they have not been specifically developed to assist with the process of undertaking a noise impact assessment. To assist in the process, the Institute of Environmental Management and Assessment (IEMA) have released guidelines detailing the process of assessing noise impacts [8].

- 2.9.3 Any impact is described in terms of the difference in acoustic environment before and after the implementation of the proposals (also known as the magnitude of change or Noise Impact). Once the magnitude of impact is determined, the consequences of any impact, or Noise Effect, can be described by considering any change in annoyance caused, whether a change in the degree of intrusion or disturbance caused by the modified acoustic environment has occurred or whether there has been a perceived change in quality of life due to the change of character of the area.
- 2.9.4 Finally, it is important to evaluate the Noise Effect to determine whether or not that impact is significant.
- 2.9.5 Planning Policy Wales [4] states *'All proposed developments should be designed, wherever possible, to prevent adverse effects to amenity, health and the environment. As a minimum, measures should be implemented to limit or constrain any effects that may occur'*.
- 2.9.6 IEMA [8] describes an adverse impact in terms of a sliding scale between *'Negligible'* through to *'Severe'*, dependant on the magnitude of the change in noise levels as a result of the proposed development. A change in noise level of less than 3 dB is described as a *'negligible'* impact which is not significant, whereas a change of greater than 10 dB is described as *'severe'* which would be significant.
- 2.9.7 Therefore, to avoid an adverse effect to the amenity of the neighbouring sensitive receptors, the proposed development should ensure that the noise levels at any receptor do not increase by more than 3 dB.

3.0 DETERMINATION OF NOISE LEVELS

3.1 ASSESSMENT TIME PERIOD, t

3.1.1 When carrying out environmental noise impact assessments, the time period for quantifying any impact is typically set out in applicable standards and guidance documents.

3.1.2 The internationally recommended measure for the description of environmental noise is the equivalent continuous A-weighted sound pressure level, $L_{Aeq,t}$ where t is the time period of interest. Current guidance and practice define typical values of t to be 16 hours to represent the daytime period (07:00 – 23:00) and 8 hours to represent the night time period (23:00 – 07:00).

3.1.3 When describing noise from short periods of activity, the full extent of any perceived impact from the noise source may not always be apparent when utilising a longer period $L_{Aeq,t}$. It is more likely that the full impact from any short-term event will be effectively masked when averaging out the noise levels over the full time period, t .

3.1.4 Under these conditions, it may be more appropriate to use a shorter time period to fully quantify any perceived impact.

3.1.5 For the purposes of this assessment, a shorter period of $t = 1$ hour was used to describe the baseline and activity noise levels to reflect the relatively short duration of the noise source and enable a robust assessment of any likely impact at times when the vehicles are moving through the lower yard.

3.2 REPRESENTATIVE BASELINE NOISE LEVELS

3.2.1 Baseline noise levels refer to the noise environment in an area prior to the introduction of a new noise source that may affect it.

3.2.2 A baseline noise survey was carried out within the lower yard at the rear of the nearest sensitive receptors. No auction activities were taking place during the survey and the results provide a robust representation of the acoustic environment at the sensitive receptors in the absence of any auction activity and prior to the

introduction of the proposed development. Details of the survey are presented in Appendix 1 with the results detailed in Appendix 3.

- 3.2.3 The acoustic climate in the area is characterised by road traffic noise.
- 3.2.4 For the purposes of this assessment, the measured data is further analysed to determine the hourly values during the relevant assessment period of 18:30 – 22:30 hours. A representative value is obtained from a statistical analysis of the relevant data.
- 3.2.5 The baseline noise levels summarised in Table 1 below are to be used to inform this assessment.

Table 1 – Representative Baseline Noise Levels

	Residual Noise Level L_{Aeq,1hr} (dB)	Background Noise Level L_{A90,1hr} (dB)
Representative Value	42	36

- 3.3 **PROPOSED LOWER YARD ACTIVITY NOISE LEVELS**
- 3.3.1 At the time of the baseline survey, four medium sized vans were moved from the lower yard to the upper yard at approximately 11:00 hours. The measurement includes getting into the vehicle and shutting door, starting engine and pulling away to represent all of the significant noise sources during the proposed operation. The noise emissions from this activity were measured and corrected to account for measurement distance and the influence of the background noise (see Appendix 3).
- 3.3.2 The calculated emission level was used to define the moving point source representing the movement of vehicles throughout the lower yard along the designated route within the lower yard.
- 3.3.3 The noise source emissions for the moving point source are summarised in Table 2 below.

Table 2 – Calculated Noise Emissions for Vehicle Movement Within Lower Yard

	Sound Power Level L_{WA} (dB)
Moving Point Source	78

3.4 PROPOSED LOWER YARD ACTIVITY NOISE PROPAGATION

- 3.4.1 A 3D acoustic model was constructed to predict the noise propagation from the proposed vehicle movements to the surrounding sensitive receptors. Details of the modelling are presented in Appendix 4 with the results presented in Appendix 5 as a colour coded noise contour map to highlight any areas where a potential noise impact could occur.

4.0 IMPACT ASSESSMENT

4.1 As a matter of best practice, this assessment has been undertaken with reference to relevant guidance on noise. Summary descriptions of the guidance is presented in Appendix 6.

4.2 The aim of this assessment is to determine the effect of any change in the acoustic environment arising from the proposed development. The noise impact is defined as the difference in the acoustic environment before and after the implementation of the proposed development. Also known as the magnitude of change, the noise impact reflects any change in noise level, other acoustic characteristics/features, and the relationship of the resulting noise level to any standard benchmarks.

4.3 NOISE IMPACT

4.3.1 The representative baseline noise level was determined to be 42 dB $L_{Aeq,1hr}$. It should be noted that as no auction activities were ongoing during the baseline survey that this represents a 'worst-case' condition whereby the baseline noise levels would be at their lowest (without auction activity) and any noise from the proposed use of the lower yard would have the greatest impact.

4.3.2 When the activity noise level is at least 10 dB below the existing noise level at a sensitive receptor there will be no increase in noise level as a result of proposed development.

4.3.3 Therefore, in this case, noise from the vehicle movements in the lower yard will need to be lower than 32 dB $L_{Aeq,1hr}$ to avoid an increase to the existing noise level at a sensitive receptor.

4.3.4 The results of the modelling of the noise propagation from the vehicle movements in the lower yard are presented in Appendix 5 as a colour coded noise contour map. Areas where the activity noise emissions are lower than 32 dB $L_{Aeq,1hr}$ are coloured green for ease of identification.

4.3.5 With reference to the noise contour map, it is clear that at the majority of sensitive receptors are located within the green areas and therefore no increase in the existing noise climate will occur as a result of the proposed use of the lower yard.

- 4.3.6 Where there is no increase in noise levels as a result of introducing a new noise source, there will be no discernible effect on the receptor. The magnitude of impact is described as negligible.
- 4.3.7 However, the contour map identifies a single property where the rear of the property lies within the red zone which indicates a potential noise impact.
- 4.3.8 The model was updated to include a noise receiver located at the rear of the impacted property to calculate the free-field noise level at this location. The result of the modelling indicates that the absolute noise level attributed to the proposed movement of vehicles in the lower yard is 38 dB $L_{Aeq,1hr}$.
- 4.3.9 The proposed use of the lower yard would result in the cumulative noise levels at this receptor increasing to $42 + 38 = 43$ dB $L_{Aeq,1hr}$ which is a 1 dB increase over the existing noise levels.
- 4.3.10 An increase in noise level of 1 dB is considered negligible based solely on the noise level difference. However, when considering any potential noise effect of this change, it is essential that other factors are taken into consideration such as the absolute noise level, frequency of occurrence, nature of the noise, and its relationship with any relevant guideline levels on noise.
- 4.4 **NOISE EFFECT**
- 4.4.1 There are no objective criteria that defines when an adverse effect will occur. However, the World Health Organisation (WHO) guidance provides guideline noise levels that relate to specific environments and identified health effects. Each value is set at the lowest levels that affect health such as annoyance and sleep disturbance and were derived from annoyance studies.
- 4.4.2 The W.H.O. guidelines [6] state that *"to protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq} "*.
- 4.4.3 With reference to the above, it is reasonable to infer that an adverse effect would occur if the resultant ambient noise levels following implementation of the development exceed the above guideline values during the relevant time period.

- 4.4.4 The cumulative noise level at the impacted property is 7 dB below the WHO guideline value and therefore an adverse effect does not occur in accordance with the aims of PPW.
- 4.4.5 In addition, good acoustic standards would still be achievable inside the noise sensitive receptor even if windows remain partially open for ventilation.
- 4.4.6 If we assume that a partially open window provides a sound reduction of 15 dB between outside to inside [6], then the internal noise level attributable to the proposed development would be 28 dB $L_{Aeq,1hr}$ during the evening inside the dwelling. Noise levels this low would be typical of those in a quiet library and no material change in behaviour would be expected for the majority of people.
- 4.4.7 The proposed activity involves the movement of a small number of vehicles within the lower yard. The existing acoustic climate is already characterised by noise from vehicles using the surrounding roads. The character of the existing acoustic climate will not change as a result of the proposed development and would not be expected to result in a perceived change in the quality of life for the occupants of the dwelling.
- 4.4.8 The proposed activities are restricted to motor auction evenings which will occur on two evenings per week. The movements of the vehicles are anticipated to be completed within a single 1-hour period on each of the evenings.
- 4.4.9 In light of the above, there will be no discernible effect on any receptor as a result of the development proposal.
- 4.5 **SIGNIFICANCE OF EFFECT**
- 4.5.1 As described above, the calculated noise emissions from the proposed development, whilst potentially resulting in an small increase in ambient noise levels at a single sensitive receptor, remain significantly below the WHO guideline values ensuring good acoustic conditions are achievable inside the dwelling even if windows are partially open for ventilation purposes.
- 4.5.2 As the relatively low noise emissions are expected to be limited to 1-hour periods occurring on two evenings per week, no material change in behaviour or attitude

would be expected from the nearby residents e.g. turning up the television, having to speak more loudly or closing the windows. The acoustic character of the area will be unchanged with no perceived change in quality of life.

- 4.5.3 Noise from the proposed vehicle movements would not be intrusive, and the significance of the noise effect is described as '*not significant*' in accordance with the IEMA guidelines [8].

5.0 CONCLUSIONS

- 5.1 This report presents details of an assessment of the potential noise impact during the proposed movement of a small number of vehicles on the lower yard at Merthyr Motor Auctions.
- 5.2 Any ancillary noise events associated with the proposed use of the lower yard would be described as random, unpredictable and transient in nature and not considered to be a nuisance in law. These transient events are not considered relevant to this assessment in the context of the primary noise described above.
- 5.3 The assessment indicates that there will be a negligible change in the acoustic climate at all sensitive receptors. There will be no discernible effect on any receptor and the significance of impact is described as '*not significant*' in accordance with the IEMA guidelines.

P.A.T. 24/03/23
M.Sc., I.Eng., M.I.O.A.,
M.Inst.SCE., M.A.E.S.

Appendix 1 Baseline Noise Survey Details

A1.0 BASELINE NOISE SURVEY DETAILS

- A1.1.1 The meter was calibrated at the start of the measurement procedure and checked after each set of measurements. No significant deviation i.e. > 0.5 dB was recorded.
- A1.1.2 The survey commenced at 18:11 hours on 18th January 2023 for a continuous 17-hour period. No auction activity was taking place during the survey.
- A1.1.3 Weather conditions: At equipment set-up, 0% cloud cover, 0°C, dry, no wind. At equipment take down, there was evidence of light snow fall overnight.
- A1.2 **Measurement Procedure:**
- A1.2.1 The meter was located in a weather-proof container and powered with heavy duty rechargeable batteries. The microphone was located on a tripod at a height of 1.5m in the middle of the lower yard at the rear of the neighbouring sensitive properties. The microphone was inside an approved weather-proof microphone housing in free-field conditions.
- A1.2.2 The meter was adjusted to log and store L_{Aeq} , L_{A90} and L_{AFmax} in 15-minute periods for the duration of the survey (see Table 4).
- A1.2.3 On completion of the survey, the data was downloaded to a computer for further analysis.
- A1.2.4 The analysis consisted of using B&K 7820 Evaluator software to extract the data relevant to the assessment time period, which in this case is 18:30 – 22:30 to represent the period when activities within the lower yard are proposed.
- A1.2.5 The data is further analysed to determine a representative value for the baseline noise level during this period. The data is analysed into 1-hour periods and a representative value is obtained from the median value of the 1-hour samples.
- A1.2.6 **Subjective Impressions**
- A1.2.7 The acoustic environment during the survey was characterised by road traffic using the neighbouring roads including the A465.

A1.3

Equipment Used:**Table 3 – Equipment Used**

ITEM	Serial No	UKAS Calibration Certificate Date (if applicable)
(ANL-M3) B&K 2250 Handheld Analyser	2559188	Certificate: 15913 Date: 25/03/21
(ANPC3) B&K 4231 Calibrator	2162602	Certificate: 15911 Date: 25/03/21

Table 4 – Meter Details

Instrument:		2250
Application:		BZ7224 Version 4.7.6
Start Time:		01/18/2023 18:11:32
End Time:		01/19/2023 11:12:03
Elapsed Time:		17:00:31
Bandwidth:		Broadband
Max Input Level:		140.89
	Time	Frequency
Broadband (excl. Peak):	FSI	AZ
Broadband Peak:		A
Instrument Serial Number:		2559188
Microphone Serial Number:		2556132
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field
Calibration Time:		01/18/2023 18:09:24
Calibration Type:		External reference
Sensitivity:		50.31 mV/Pa

Appendix 2 View of Noise Survey Location

A2.0 VIEW OF NOISE SURVEY LOCATION

Figure 1 – Noise Survey Location

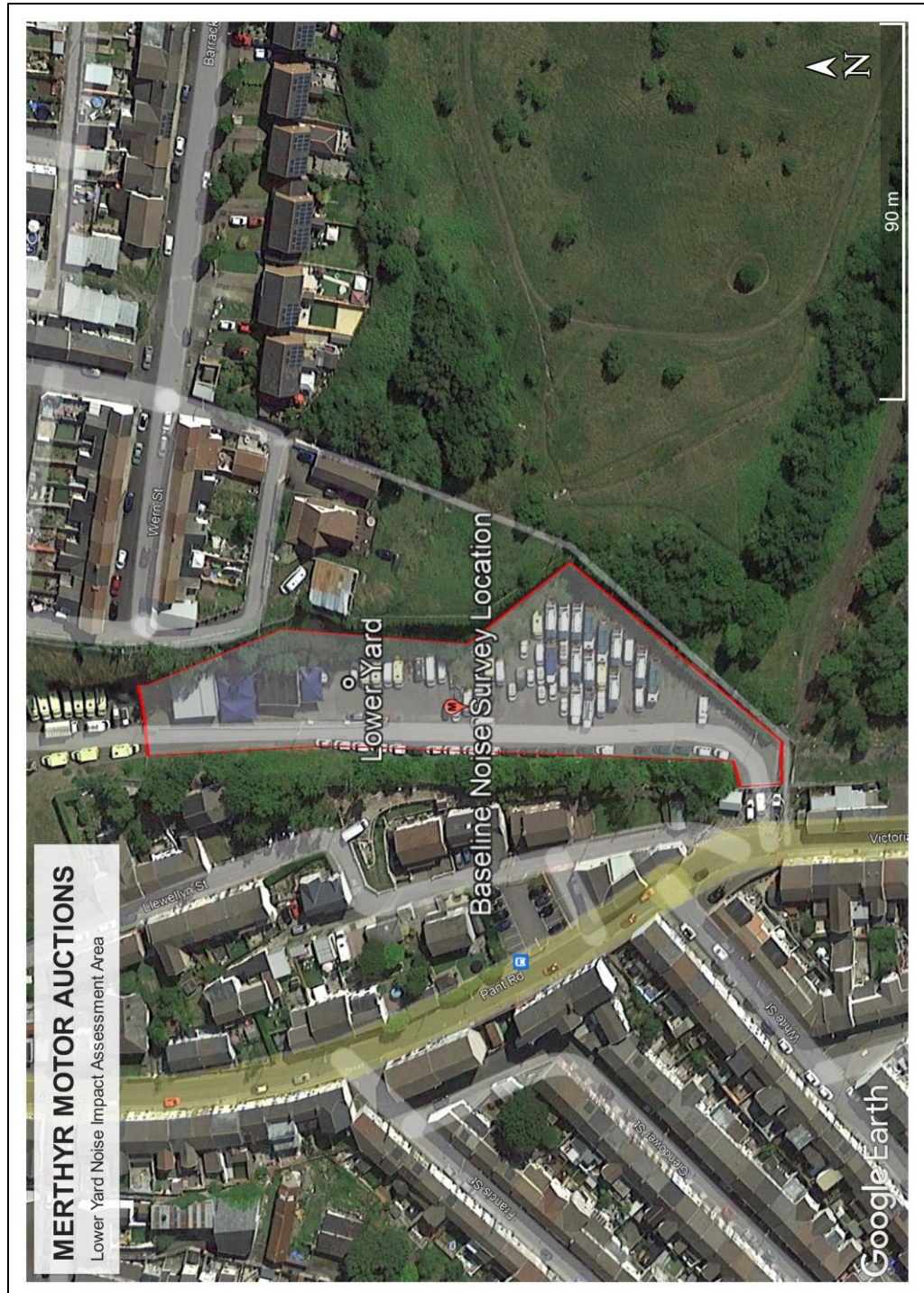


Figure 2 – View of Equipment Location



Appendix 3 Survey Results

A3.0 SURVEY RESULTS

Table 5 – Summary of Survey Results (Free-Field Noise Levels)

Description	Period	Duration, t	L _{Aeq,t} (dB)	L _{AF90,t} (dB)	L _{AFmax} (dB)
Evening	18:30 – 22:30	4:00	42.4	35.3	62.2

Table 6 – Evening Free-Field Noise Levels, 15 Minute Samples (18:30 – 22:30)

Start date	Start time	L _{Aeq,15mins} (dB)	L _{AF90,15mins} (dB)	L _{AFmax} (dB)
18/01/2023	18:30:00	42.5	39.1	58.3
18/01/2023	18:45:00	42.0	37.4	52.0
18/01/2023	19:00:00	42.4	36.3	57.1
18/01/2023	19:15:00	40.7	34.8	55.3
18/01/2023	19:30:00	43.6	37.3	58.8
18/01/2023	19:45:00	44.6	40.2	56.1
18/01/2023	20:00:00	44.9	39.5	62.2
18/01/2023	20:15:00	44.7	37.6	58.5
18/01/2023	20:30:00	43.5	36.9	56.8
18/01/2023	20:45:00	41.3	35.4	50.7
18/01/2023	21:00:00	40.5	34.9	53.4
18/01/2023	21:15:00	40.6	33.7	51.7
18/01/2023	21:30:00	38.9	31.6	53.8
18/01/2023	21:45:00	41.2	34.1	55.9
18/01/2023	22:00:00	41.4	34.7	50.1
18/01/2023	22:15:00	40.5	32.2	51.7
	median	41.7	35.9	55.6

Table 7 – Evening Free-Field Noise Levels, 1-Hour Samples (18:30 – 22:30)

Start date	Start time	L _{Aeq,1hr} (dB)	L _{AF90,1hr} (dB)	L _{AFmax} (dB)
18/01/2023	18:30:00	41.9	36.5	58.3
18/01/2023	19:30:00	44.5	38.6	62.2
18/01/2023	20:30:00	41.6	35.1	56.8
18/01/2023	21:30:00	40.6	32.7	55.9
	median	41.8	35.8	57.6

Table 8 – Measured Ambient Noise Level During the Movement of Four Medium Vans

Start Date	Start Time	Duration, t	L _{Aeq,t} [dB]
19/01/2023	11:00:00	0:12:03	45.7

Table 9 – Calculated Sound Power Level for Vehicle Movements

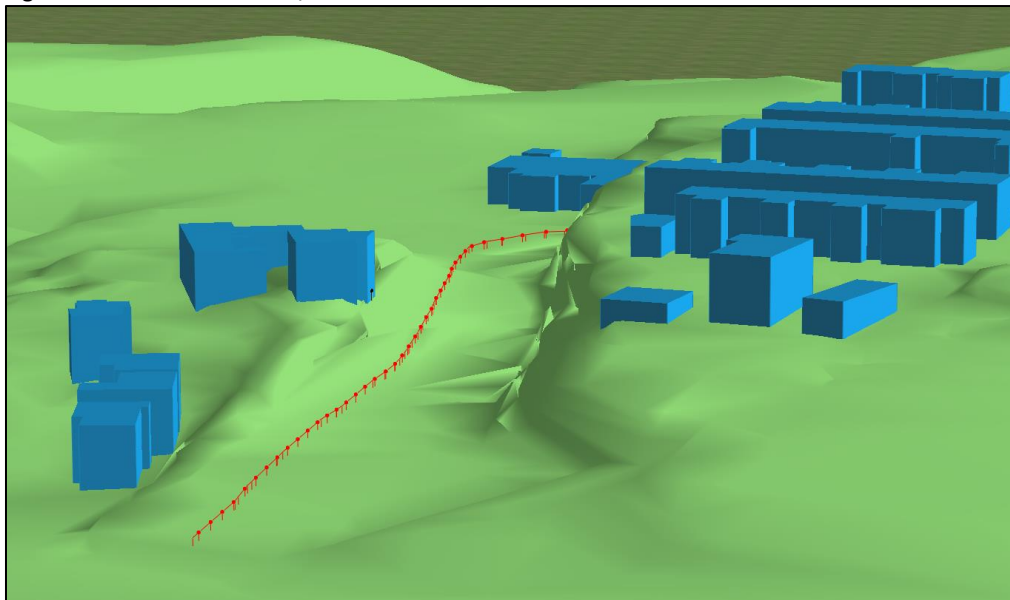
	Representative Value (dB)
Ambient Noise Level @ 20m (4 Medium Sized Vans), L _{Aeq,12mins}	46
Residual Noise Level, L _{Aeq,15mins}	41
Activity Noise Level @ 20m	44
Sound Power Level, L _{WA} = L _{PA} + 20Log(r) + 8	78

* Measurement distance, r = 20m

Appendix 4 3D Acoustic Model Details

A4.0 3D ACOUSTIC MODEL DETAILS

Figure 3 – Acoustic Model, 3D View



A4.1 ASSUMPTIONS MADE IN MODEL

A4.1.1 The ground attenuation was modelled as hard with a ground factor value of 0.0.

A4.1.2 Atmospheric conditions were modelled as

- *Temperature: 293.15 K*
- *Pressure: 101.33*
- *Air Humidity: 60%*

A4.2 PREDICTION OF NOISE LEVELS ACROSS PROPOSED DEVELOPMENT SITE

A4.2.1 As the site is relatively complex and comprises multiple dwellings and/or sources, a 3D acoustic CAD model of the proposed development is constructed to aid in the identification of potential areas or plots that may be exposed to an adverse noise impact. This process minimises unnecessary schemes of mitigation.

A4.2.2 EMS B&K Predictor V2019 Software was utilised to model the road traffic noise levels across the whole of site. This noise prediction software allows for the investigation of noise emissions in complex or large outdoor environments. The

software can be used to analyse industrial noise sources and traffic measurements to the latest European and U.K. Standards.

- A4.2.3 A major advantage of using this method is the ability to remodel changes and alterations to the site and/or sources.

A4.3 CAD MODEL CONSTRUCTION

- A4.3.1 Topographical information for the site was obtained from the online site '*Lle Geoportal for Wales*' in the form of Digital Terrain Model data (1m resolution). The '*Lle Geo-Portal*' has been developed as a partnership between Welsh Government and Natural Resources Wales. Lle serves as a hub for data and information covering a wide spectrum of topics, but primarily around the environment.

- A4.3.2 The topographical data was imported into the CAD software and used to construct the 3D terrain for the site.

- A4.3.3 A site centred OS map of the area was provided by Herbert R Thomas to be used as a background for the model to locate the lower yard noise sources, and existing buildings accurately.

- A4.3.4 A '*moving point source*' was positioned along the designated route through the lower yard using the site centred OS drawing as a guide.

- A4.3.5 The modelling software defines a '*moving point source*' as '*a moving point source is used to model the path of mobile sources (e.g. truck routes)*'.

A4.4 CAD MODEL NOISE SOURCE EMISSIONS

- A4.4.1 At the time of the baseline survey, four medium sized vans were moved from the lower yard to the upper yard at approximately 11:00 hours. The noise emissions from this activity were measured and corrected to account for measurement distance and the influence of the background noise (see Appendix 3).

- A4.4.2 The calculated emission level was used to define the moving point source representing the movement of vehicles throughout the lower yard along the designated route.

- A4.4.3 The average speed of the vehicles was set to 16 km/hr (10mph) and for the purposes of the modelling it is assumed that a total of 30 vehicles are moved during any 1-hour assessment period.
- A4.5 **CAD MODEL PREDICTION**
- A4.5.1 Once the moving point source is defined, the surrounding noise sensitive buildings are placed into the model using the site centred OS drawing as a guide.
- A4.5.2 All buildings are modelled with a height of 8m.
- A4.5.3 The free-field noise propagation from the proposed vehicle movements to the surrounding sensitive receptors is presented in the form of easily understood noise contours. A noise contour grid covering the whole assessment area is constructed to display the external free field noise levels. This grid is a collection of receivers set 1m apart at a height of 1.5m.
- A4.5.4 The modelling is carried out using EMS B&K Predictor V2019 software and calculations are completed using the procedures detailed in ISO 9613.
- A4.5.5 The results of the assessment are presented in Appendix 5.
- A4.5.6 The contour map is colour coded to visualise any external areas that are exposed to noise emissions that exceed the impact assessment criteria. These areas are displayed as red and indicate a potential noise impact at any sensitive receptor located within these areas.
- A4.5.7 All areas that are exposed to noise emissions below the impact criteria are displayed as green and indicate a negligible impact at any sensitive receptor located within these areas.

Appendix 5 Modelling Results

A5.0 MODELLING RESULTS

Figure 4 – Lower Yard Activity Noise Propagation, $L_{Aeq,1hr}$ (dB)



Table 10 – Calculated Noise Level at Most Exposed Sensitive Receptor

Name	Description	Height	L _{Aeq,1hr} (dB)
NSP1_A	Noise Sensitive Receptor 1	1.50	38.0

Appendix 6 Relevant Guidance

A6.0 RELEVANT GUIDANCE

A6.1 Planning Policy Wales [4]

- A6.1.1 The foreword to the Planning Policy Wales (PPW) document states that *'PPW will help to ensure that the planning decisions taken in Wales, no matter how big, or how small, are going to improve the lives of both our current and future generations. It will support changing the way we live and work, and the buildings and environment of Wales, today, building a better environment to accommodate current and future needs'*.
- A6.1.2 PPW sets out the land use planning policies of the Welsh Government. The primary objective is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. A well functioning planning system is fundamental for sustainable development and achieving sustainable places.
- A6.1.3 The planning system should create sustainable places (Placemaking) which are attractive, sociable, accessible, active, secure, welcoming, healthy and friendly. Development proposals should create the conditions to bring people together, making them want to live, work and play in areas with a sense of place and well-being, creating prosperity for all.
- A6.1.4 Placemaking in development decisions happens at all levels and involves considerations at a global scale, including climate change, down to the very local level, such as considering the amenity impact on neighbouring properties and people. Negative environmental impacts should be avoided in the wider public interest.
- A6.1.5 The environmental impact relevant to this assessment, will be from noise. PPW refers to the term *'soundscape'* which it describes as *'the acoustic environment as perceived or experienced and/or understood by a person or people, in context (ISO definition)'*.
- A6.1.6 An appropriate soundscape contributes to a positive experience of place as well as being necessary for public health, amenity and well-being. Conversely, noise pollution can have negative effects and should be reduced as far as possible.

- A6.1.7 Certain sounds, such as those created by trees, birds or water features, can contribute to a sense of tranquillity whilst others can be reassuring as a consequence of their association with the normality of everyday activities. Problematic forms of sound are generally experienced as noise pollution and can affect amenity and be prejudicial to health or a nuisance. Noise action plans drawn up by public bodies aim to prevent and reduce noise levels where necessary and preserve soundscape quality where it is good. Both high and low levels of noise, depending on context, can be annoying or disruptive and impact on amenity, health and well-being and as such should be protected through the planning process wherever necessary.
- A6.1.8 A key planning policy principle is to consider the effects which proposed developments may have on soundscape quality and the effects which existing soundscape quality may have on proposed developments. Soundscape influences the choice of location and distribution of development and it will be important to consider the relationship of proposed development to existing development and its surrounding area and its potential to exacerbate or create poor or inappropriate soundscapes.
- A6.1.9 The agent of change principle says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.
- A6.1.10 Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur.
- A6.2 **Noise and Soundscape Action Plan [5]**
- A6.2.1 This document sets out action plans for each of the three agglomerations in Wales. These are identified as the Cardiff and Penarth agglomeration, the Newport agglomeration and the Swansea and Neath agglomeration.
- A6.3 **Guidelines for Community Noise, W.H.O. [6]**

- A6.3.1 Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood.
- A6.3.2 The objective of the World Health Organization (WHO) is '*the attainment by all peoples of the highest possible level of health*'.
- A6.3.3 WHO defines 'health' as '*A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*'. This broad definition of health makes reference to the concept of well-being and thereby includes noise impacts such as annoyance, speech interference, and impaired task performance as 'health' issues.
- A6.3.4 The WHO guidelines deal with all aspects of environmental noise impact and provide guideline values for community noise in specific environments. Most of the noise guidelines are given as period L_{Aeq} values. The relevant values for Dwellings are summarized in Table 11 below.

Table 11 – WHO Guideline Noise Levels for Dwellings

Residential Environment	Critical Health Effect(s)	$L_{Aeq,T}$ (dB)	Time Base, T
Outdoor Living Area	Serious Annoyance, daytime and evening	55	07:00 – 23:00 (16 hours)
	Moderate Annoyance, daytime and evening	50	07:00 – 23:00 (16 hours)
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	07:00 – 23:00 (16 hours)
Inside Bedrooms	Sleep disturbance, night-time	30	23:00 – 07:00 (8 hours)
Outside Bedrooms	Sleep disturbance, window open (outdoor values)	45	23:00 – 07:00 (8 hours)

- A6.3.5 These guideline values consider specific environments and identified health effects. Each value is set at the lowest levels that affect health such as annoyance and were derived from annoyance studies.
- A6.3.6 The guidelines, whilst not having any legal force in the UK, are commonly used by local authorities when setting environmental noise criteria for proposed developments.
- A6.4 **ISO 9613 [7]**
- A6.4.1 Part 1 of this standard specifies an analytical method of calculating the attenuation of sound as a result of atmospheric absorption for a variety of meteorological conditions
- A6.4.2 Part 2 describes a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level (as described in ISO 1996) under meteorological conditions.
- A6.5 **Guidelines for Environmental Noise Impact Assessment, I.E.M.A. [8]**
- A6.5.1 These guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur.
- A6.5.2 The principles in the guidelines are relevant to all types of project regardless of size.
- A6.5.3 The guidelines do not seek to be prescriptive but provide sufficient guidance to enable decision makers to understand the processes utilised in the noise impact assessment.
- A6.5.4 In this respect any noise impact assessment will include elements of scoping, baseline studies, noise prediction, assessment, mitigation and reporting.
- A6.5.5 Care must be taken in the terminology used in a noise assessment. The '*Guidelines for Environmental Noise Impact Assessment*' uses the following definitions:

Noise Impact

The difference in the acoustic environment before and after the implementation of the proposals (also known as the magnitude of change). This includes any change in noise level and in other characteristics/features and the relationship of the resulting noise level to any standard benchmarks. Note, the change could be an increase or decrease.

Noise Effect

The consequences of the noise impact. This may be in the form of a change in the annoyance caused, a change in the degree of intrusion or disturbance caused by the acoustic environment, or the potential for the change to alter the character of the area such that there is a perceived change in quality of life. This will be dependent on the receptor and its sensitivity.

Significance of Effect

The evaluation of the noise effect and, particularly if the noise impact assessment is part of a formal EIA, deciding whether or not that impact is significant. Note, noise impacts may be both increases and decreases, hence the effect may be negative or positive.

- A6.5.6 The noise impact is described by considering the baseline sound levels, the predicted sound levels and the method of assessment and criteria including any mitigation that has been included in the proposals.
- A6.5.7 A comparison of the pre and post development sound levels is used to quantify the noise effect. The 'Guidelines for Environmental Noise Impact Assessment' [8] describes the effect in terms of the degree of change in sound level due to the development as detailed in Table 12 below.

Table 12 – Noise Impact Descriptors

Effect	Change in Noise Level
Very Substantial	Greater than 10 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Substantial	5 – 9.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise

Effect	Change in Noise Level
Moderate	3 – 4.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise or greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	3 – 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
None/Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposal.

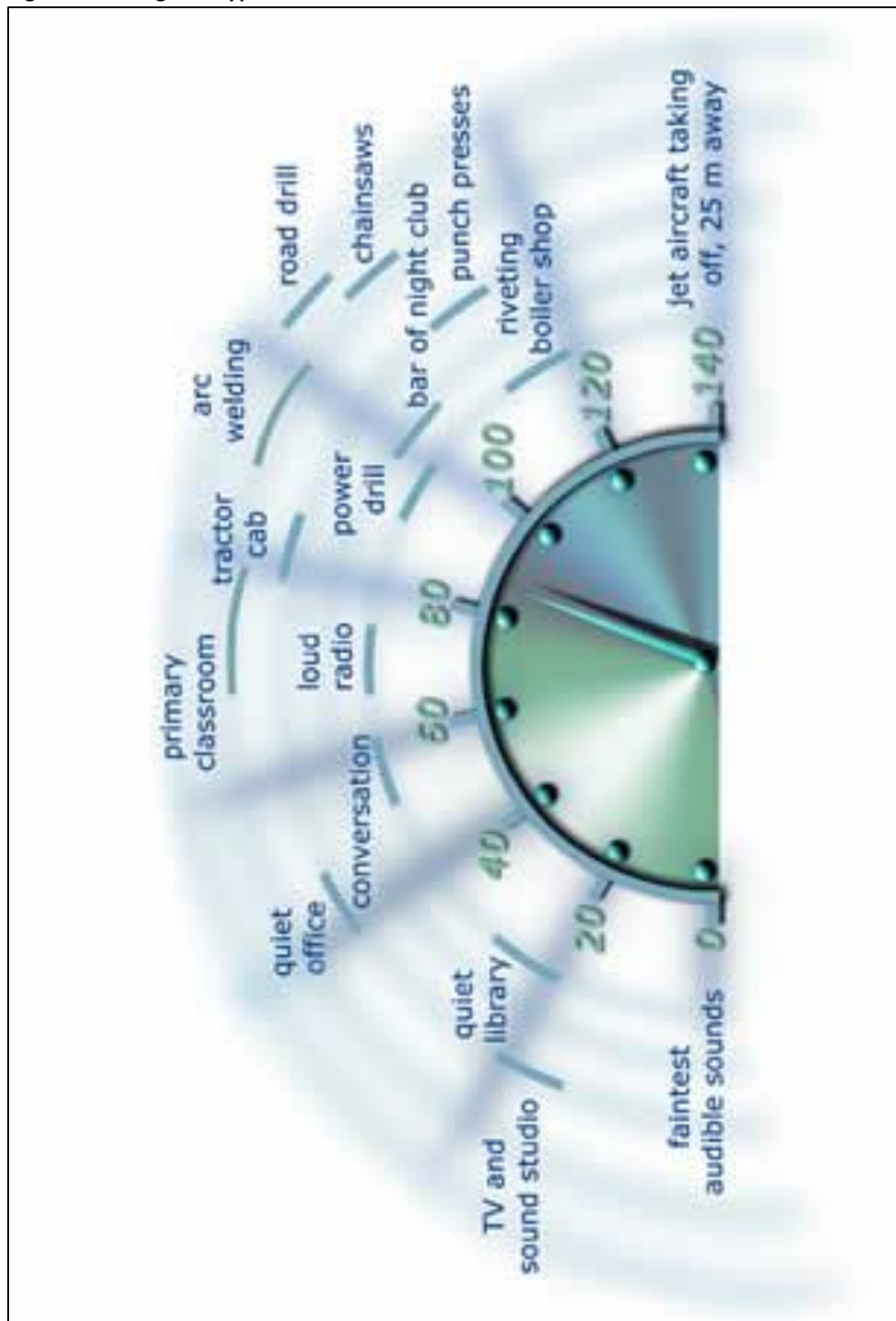
- A6.5.8 The presentation of changes in sound level to one decimal place in the table is not a reflection of the accuracy of any assessment undertaken but rather serves to provide a clear threshold between adjacent impact descriptions.
- A6.5.9 Once the change in sound level at a receptor has been determined, consideration of other factors should be taken into account that may or may not have an effect on the impact classification determined from the change in sound level alone.
- A6.5.10 Relying solely on the change in noise level is not appropriate because it risks ignoring the context of the noise change. It also gives scope for what is often called ‘noise creep’. This is the gradual increase in the noise level in an area as a result of a succession of small increases in noise level which, if taken individually, might not be regarded as having a noticeable effect, but cumulatively lead to a noticeable effect which could be considered to be significant.
- A6.5.11 To address this issue the guidelines [8] recommend that consideration must also be given to the absolute levels being encountered and how they compare with any relevant standards and guidance.
- A6.5.12 The guidelines [8] state that ‘A development proposal which would cause an increase in an existing level that is already well above an existing guideline should probably be regarded as worse than if the existing level were below the guideline. If the existing noise environment is already at a level where there might be significant risk of adverse quality of life and health effects, then any increase in

noise level, regardless of how small, is an impact which should be taken into account'.

Appendix 7 Range of Typical Sound Levels

A7.0 RANGE OF TYPICAL SOUND LEVELS

Figure 5 – Range of Typical Sound Levels



Appendix 8 Glossary of Acoustic Terms

A8.0 GLOSSARY OF ACOUSTIC TERMS

A8.1 Acoustic environment:

Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013]

A8.2 Ambient sound:

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

NOTE The ambient sound comprises the residual sound and the specific sound when present.

A8.3 Ambient sound level, $L_A = L_{Aeq,T}$:

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

NOTE the ambient sound level is a measure of the residual sound and the specific sound when present.

A8.4 Background sound 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

A8.5 Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$:

The value of the A-weighted sound pressure level in decibels of 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, and is given by the following equation:

$$L_{Aeq,T} = 10 \lg \left\{ \left(\frac{1}{T} \right) \int_{t_1}^{t_2} \left[\frac{p_A(t)^2}{p_0^2} \right] dt \right\}$$

where:

p_0 is the reference sound pressure (20 μ Pa); and

$p_A(t)$ is the instantaneous A-weighted sound pressure (P_A) at time t

NOTE The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.

A8.6 Measurement time interval, T_m :

Total time over which measurements are taken

NOTE This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.

A8.7 Rating level, L_{A,r,T_r} :

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

A8.8 Reference time interval, T_r :

Specified interval over which the specific sound level is determined

NOTE this is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.

A8.9 Residual sound:

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

A8.10 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

A8.11 Specific sound level, $L_s = L_{Aeq,T_r}$:

Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r

A8.12 Specific sound source:

Sound source being assessed

- A8.13 A-weighting:**
Normal hearing covers the frequency (pitch) range from about 20 Hz to 20,000 Hz but sensitivity is greatest between about 500 Hz and 5,000 Hz. The 'A-weighting' is an electrical circuit built into noise meters to approximate this characteristic of human hearing.
- A8.14 Decibel (dB):**
The logarithmic measure of sound level. 0dB (A) is the threshold of normal hearing. 140 dB (A) is the level at which instantaneous damage to hearing is caused. A change of 1 dB is detectable only under laboratory conditions.
- A8.15 dB(A):**
Decibels measured on a sound level meter incorporating a frequency weighting (A-weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with an individual's assessment of loudness. A change of 3 dB (A) is the minimum perceptible under normal conditions and a change of 10 dB(A) corresponds roughly to doubling or halving the loudness of a sound.
- A8.16 Free Field:**
A sound field in which no significant sound reflections occur.
- A8.17 L_{Amax} :**
The maximum 'A-weighted' level of sound recorded during a sound event. The time weighting used (fast or Slow) should be stated.
- A8.18 Tonality:**
The degree to which a sound contains audible pure tones. Broadband sound (across a wider range of frequencies) is generally less annoying than sound with identifiable tones.
- A8.19 Frequency:**
The number of cycles per second of a vibration usually expressed in units of Hertz, Hz

A8.20

Hertz:

Unit of frequency, equal to one cycle per second. Frequency determines the pitch of a sound.

Appendix 9 References

A9.0 REFERENCES:

- 1 Leeman v Montague [1936] 2 All E.R. 1677
- 2 Andrae v Selfridge [1937] 3 All E.R. 255
- 3 Gosnell v The Aerated Bread Co. Ltd. (1894) 10 T.L.R. 661
- 4 Planning Policy Wales, Edition 10, Welsh Government, December 2018
- 5 Noise and soundscape action plan 2018 – 2023, Welsh Government, 2018
- 6 “Guidelines for Community Noise”, Berglund, Lindvall, Schwela, World Health Organization, 1999
- 7 ISO 9613 Acoustics – Attenuation of sound propagation outdoors Parts 1 & 2
- 8 Guidelines for Environmental Noise Impact Assessment, i.e.m.a, Version 1.2, November 2014