Donald Ward Limited (WARD)

WARD Barnsley

Noise Impact Assessment

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R01

11 June 2026

TETRA TECH

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1.0 Introduction

1.1 Background

1.1.1 The Tetra Tech Consulting Limited's Acoustics Team (TT) has been appointed by Donald Ward Limited (WARD) to undertake a noise impact assessment to inform an application for a new environmental permit at the existing WARD waste processing facility located on Boulder Bridge Lane, Barnsley.

1.1.2 To inform the noise assessment, TT carried out a noise survey in May 2026 across the site and in the surrounding area.

1.1.3 The site is currently only partially operational, however all equipment was present on site and was activated to carry out specific sound measurements of plant and equipment. This source data has been used to inform a 3D model of the site and environment to predict operational sound levels at the closest Noise Sensitive Receptor (NSR).

1.1.4 An assessment of the predicted operational sound levels with respect to the measured baseline sound levels has been undertaken, based on the methodology detailed in British Standard 4142:2014+A1:2019 (BS 4142). This assessment has been based upon relevant operational details of the development provided by the WARD project team.

1.1.5 TT is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.

1.1.6 The technical content of this assessment has been provided by TT personnel, all of whom are members of the Institute of Acoustics (IOA), the UK's professional body for those working in acoustics, noise and vibration. This report has been peer reviewed within the TT team to ensure that it is technically robust and meets the requirements of our Integrated Management System.

1.1.7 Guidance and Legislation used to inform the noise assessment is summarised in Appendix A of this report.

2.0 Assessment Location

2.1 Site Location and Noise Sensitive Receptors

2.1.1 The site is located on Boulder Bridge Lane, Barnsley. The boundary of the site is shown in Figure 1 of this report.

2.1.2 The nearest residential noise sensitive receptors (NSRs) to the site are the residences on Shaw Lane (NSR1), and Fairfield Cottages (NSR2). Other sensitive receptors are located further away and have not been assessed as the potential impact will be equal to or less than the those identified at the NSRs. The noise sensitive receptors are shown in Figure 1. Their approximate distances to the site can be seen in Table 2.1 below.

Table 2.1: Noise Sensitive Receptor

Receptor	Approximate distance from site boundary (m)	Intervening ground description
NSR1 – 109 Shaw Lane, Monk Bretton, S71 3HH	340	Industrial buildings and vegetation
NSR2 – 1 Fairfield Cottages Shaw Lane, S71 3HL	215	Industrial buildings and vegetation

2.1.3 It is understood that the site will typically undertake waste activity between the hours of 07:00 and 17:00. Waste activity may occasionally be undertaken until 23:00 if dictated by operational need. Occasionally, maintenance works will be carried out during the night-time periods, however these are understood to be infrequent and internal, therefore have not been considered as typical operations at the site.

2.1.4 No sources of vibration that could be felt beyond the site boundary have been identified, so vibration is scoped out of this assessment.

3.0 Baseline Noise Monitoring

3.1 Methodology and Instrumentation

3.1.1 To establish baseline conditions, an unattended noise survey was undertaken between 15th May and 19th May 2026. This location is presented on Figure 1 and described below:

- ML1 – Free-field measurement at approximately 1.5 m above local ground level, to the west of NSR1, representative of sound levels at NSR1 and NSR2.

3.1.2 The existing acoustic environment at ML1 was dominated by road traffic on Shaw Lane, with noise from nearby industrial premises audible during breaks in traffic. As the WARD site was not operational at the time these observations were carried out, this is understood to be generated by other industrial sites in the area.

3.1.3 In addition to the unattended noise monitoring, attended specific sound levels from plant at the site were measured to inform the noise assessment.

3.1.4 Unattended measurements of the L_{Aeq}, L_{Amax}, and L_{A90} were undertaken at 100 ms intervals and temporally averaged over 15-minute periods for the duration of the survey. The equipment listed in Table 3.1 below was used to undertake the survey:

Table 3.1: Equipment Used During the Unattended Sound Survey

Measurement Location	Make/Model	Serial Number	Calibration Start (dB) (Ref: 94.0 dB)	Calibration End (dB) (Ref: 94.0 dB)	Last Manufacturer's Calibration Date
Calibrator	Rion NC-74	110090	-	-	11/06/2025
ML1	Rion NL-52	586905	94	93.8	11/11/2025

3.1.5 Measurements were undertaken in accordance with BS 4142:2014+A1:2019 and British Standard 7445-2:1991 – 'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data.

3.1.6 All sound level meters used meet the 'Class 1' criteria defined within BS EN 61672-2:2013+A1:2017 – 'Electroacoustics. Sound level meters – Pattern evaluation tests'. All calibrators used meet the 'Class 1' criteria defined within BS EN IEC 60942 – 'Electroacoustics. Sound calibrators'.

3.1.7 Meteorological conditions were monitored at the set up and collection of the noise survey, with intervening periods monitored online weather through a local weather station. The weather conditions during the noise survey were found to be dry and calm, with no precipitation and wind speeds below 5 m/s.

3.2 Results

3.2.1 The results of the unattended sound surveys are presented graphically in Appendix B.

3.2.2 The representative ambient sound levels $L_{Aeq,T}$ have been calculated by logarithmically averaging the survey data over the 16-hour period for the daytime.

3.2.3 The representative background sound levels $L_{A90,T}$ have been derived through statistical analysis of the measured background sound level data with reference to the guidance in BS 4142:2014+A1:2019, which states the following:

"A representative level should account for the range of background sound levels and should not automatically be assumed to be either the minimum or the modal value"

3.2.4 Histograms of the cumulative frequency of occurrence plotted against the range of $L_{A90,T}$ levels during the relevant periods have been generated from the baseline survey data at all positions.

3.2.5 The representative levels at each measurement position have been derived as shown in Table 3.2 below. These values have been reviewed against the time-history graphs in Appendix B, and are considered to be representative of those levels captured over the time period.

Table 3.2: Measured Baseline Sound Survey Results

Position	Measured Sound Levels (dB)		Representative NSR
	Day		
	Residual Sound Level, $L_{Aeq,16h}$	Background Sound Level, $L_{A90,1h}$	
ML1	57 - 60 dB	33 - 54 dB	NSR1/2

4.0 Noise Impact Assessment

4.1 Operational Plant

4.1.1 Following discussions with the site operator, it is understood that the following plant and equipment will be dominant when operational on site:

- Scrap Handlers
- Ferrous Shear
- Non Ferrous Shear
- Mobile Shear
- Trommel
- Super Chopper
- Cable Granulation Plant
- MRP

4.1.2 The measures specific sound levels were used to calculate the sound power levels of each plant. On-times for each equipment were modelled based on activities observed during the site walkover. Sound power levels and on-times are summarised in Table 4.1 below. The locations of the plant and equipment in the model are shown on Figure 2 of this report.

Table 4.1: Summary of Sound Power Levels

Activity	Broadband SWL (dB L_{WA})	On-time %
Scrap Handler Loading Shear	107	25%
Ferrous Shear	106	25%
Ferrous Shear Engine	107	25%
Non Ferrous Shear	106	25%
Non Ferrous Shear Engine	107	25%
Mobile Shear	106	25%
Trommel	105	25%
Super Chopper	106	25%
Super Chopper Fan	106	25%
MRP	96	50%
Cable Granulation Plant	89	100%
Cable Granulation Extract Plant	88 - 92	100%

*No commercial deliveries occurred during the time of the survey, therefore noise levels are in accordance with Table C2.30 of BS 5228-1:2009+A1:2014

4.1.3 The cable granulation plant is located within the cable granulation building in the south west of the site. This has been modelled as having walls and roof being constructed out of Kingspan KS1000RW or similar, with open loading bays in the south-east, and northern facades.

4.2 Assessment Methodology

4.2.1 The specific noise levels from plant, summarised in Table 4.1 above, have been used to inform a computational noise model to predict noise levels from the site at the NSRs. Acoustic modelling has been carried out in SoundPLAN v9.1 modelling software.

4.2.2 This model implements the propagation calculation method set out in ISO 9613-2:2024, allowing for the prediction of sound levels under light, down-wind conditions based upon hemispherical radiation. It includes corrections for atmospheric absorption, ground effects, screening, and directivity.

4.2.3 The topography of the site and the surrounding area has been obtained from DEFRA Lidar data.

4.2.4 The effect of screening from solid structures (buildings) has been incorporated into the modelling process by importing OS OpenMap Local data.

4.2.5 The surrounding area is predominantly industrial. Thus, the ground has been assumed to have a ground factor of predominantly G = 0.6 (Ground factors range from 0-1, with 0 being the acoustically hardest and 1 being the acoustically softest).

4.2.6 The specific sound levels output by the 3D model have informed an assessment in line with the guidance in BS 4142:2014+A1:2019 as detailed above. The sources listed in Table 4.1 have been modelled as presented in Table 4.2 below.

Table 4.2: Model Input Details

Plant Item	Quantity	Source Type	Modelled Height (m)
Scrap Handler Loading Shear	4	Point Source	1
Ferrous Shear	1	Point Source	2.5
Ferrous Shear Engine	1	Point Source	2.5
Non Ferrous Shear	1	Point Source	2.5
Non Ferrous Shear Engine	1	Point Source	2.5
Mobile Shear	1	Point Source	2.5
Trommel	1	Point Source	2.5
Super Chopper	1	Point Source	1.5
Super Chopper Fan	1	Point Source	1.2
MRP	1	Point Source	1.9

Cable Granulation Plant	1	3D Industrial Building	7
Cable Granulation Extract Plant	5	Point Source	1.2 - 5

4.3 Assumptions

4.3.1 The following assumptions have been incorporated into the noise model:

- When operational, all noise sources are assumed to operate concurrently.
- The ground surrounding the site is mixture of open agricultural grassland and woodland. As such, the ground type in the model has been set to a mixture of soft and hard ground (G = 0.6).
- The equipment measured at the site and operational times used to inform the assessment is representative of the equipment which will be used when the site is operational.
- All equipment will be maintained and kept in a good working order such that noise levels assessed will be representative of the equipment used onsite.

4.4 Uncertainty

4.4.1 In all assessments, it is good practice to consider uncertainty which can arise from a number of different aspects. There are degrees of uncertainty associated with:

- instrumentation used for surveying;
- measurement technique and the variables influencing the measurement results such as transmission path and weather conditions; source terms used for modelling;
- calculation uncertainty; assessment uncertainty; and
- the subjective response of residents to noise sources.

4.4.2 Uncertainty due to instrumentation has been significantly reduced with the introduction of modern instrumentation and is reduced further by undertaking field calibration checks on sound level meters before and after each measurement period and ensuring that all instrumentation is within accepted laboratory calibration intervals.

4.4.3 Every effort has been made to reduce the uncertainty of the baseline sound level measurements. The duration of the baseline survey is considered to significantly reduce the uncertainty associated with the baseline sound levels. Based on professional judgement including substantial experience of acquiring and analysing baseline data for numerous sites in various locations, and a desk-based review of the site and surrounding area, it is considered that the baseline data acquired during the survey is typical of the area.

4.4.4 Calculation uncertainty and assessment uncertainty have been reduced by peer review of all baseline data, model input data, model results and assessment calculations, and by using the appropriate level of precision at each stage of the assessment calculations.

4.4.5 A quantitative assessment has been undertaken based on source levels measured by TT personnel, provided by the project team for the proposed equipment or based on recognised and accepted empirical calculation methodologies. Where assumptions have been made, they have favoured a worst-case scenario.

4.4.6 Areas of potential uncertainty have been minimised where possible at each stage of the assessment process. On the basis of the above, it is considered that uncertainty associated with the assessment process is unlikely to significantly change the conclusions of this NIA.

5.0 BS 4142:2014 + A1:2019 Impact Assessment

5.1 Introduction

5.1.1 This section of the report details an assessment of the potential impacts of the plant on nearby NSRs with reference to the methodology contained with BS 4142:2014 + A1:2019.

5.2 Identification of Specific Sound

5.2.1 As described in Section 4.0 of this report, computational noise modelling in SoundPLAN v9.1 has been used to predict noise levels at the identified NSRs due to the operation of the site.

5.2.2 The predicted specific sound levels during the daytime periods at the noise sensitive receptors are presented in Table 5.1 below.

Table 5.1: Calculated Specific Sound Levels

NSR Name	Daytime (07:00 – 23:00) Specific Sound Level (dB L_S)	
	Ground Floor	First Floor
NSR 1	47	47
NSR 2	45	45

5.2.3 The specific sound levels shown in the table above were calculated as levels incident upon the facades of NSRs 1 and 2, located closest to and facing the proposed development, which are worst affected by the proposed noise sources.

5.3 Identification of the Background Sound Level

5.3.1 Section 8 of BS 4142:2014+A1:2019 provides guidance on the selection of the representative background sound level to be used in the assessment. BS 4142:2014+A1:2019 states that the background sound levels used for the assessment should be representative of the period being assessed (i.e., daytime and night-time periods), and that there is no “single” background sound level.

5.3.2 Therefore, analysis of the measured sound levels is required to select the most appropriate and representative background sound levels (L_{A90}) at the identified noise sensitive receptors. Statistical analysis of the background sound levels measured during the noise survey has therefore been carried out to establish the representative background sound levels during the daytime periods.

5.3.3 A summary of the representative background sound levels at NSRs is shown in Table 5.2 below.

Table 5.2: Representative Background Sound Levels

NSR Name	Representative Monitoring Location	Representative Background Sound Level (dB $L_{A90,T}$)
		Daytime (07:00 to 23:00 hours)
NSR1	ML1	40
NSR2	ML1	40

5.4 Application of Weighting for Characteristics of Specific Sound

5.4.1 BS 4142:2014 + A1:2019 includes guidance on the application of additional acoustic character corrections which include tonality, impulsivity or intermittency. Where such features are present or perceptible at the assessment location, characteristic corrections to the specific sound level should be added to obtain a rating level.

5.4.2 No tonal components were identified during the site walkovers and during the noise survey, therefore a correction for this has not been included in the assessment. While some plant and equipment will have on/off conditions, these are not expected to be clearly identifiable at receptors, therefore no corrections for intermittency have been included.

5.4.3 Activities on the site are known to have an impulsivity component. However, due to the distance to the NSR, and other activities in the area, any impulsivity generated at the site is unlikely to be readily distinguishable at the NSRs from the industrial nature of the existing acoustic environment. Therefore, no acoustic corrections for impulsivity have been included in the assessment.

5.5 Initial Noise Impact Assessment

5.5.1 The results of the computational noise modelling have been assessed in accordance with BS 4142:2014+A1:2019. The rating levels at the NSRs due to the operation of the proposed development have been compared with the representative background sound levels L_{A90}, with the difference presented below in Table 5.3.

Table 5.3: Initial Noise Impact Assessment

Receptor	Background Sound Level, dB $L_{A90,T}$	Specific Sound Level L_S (dB)	Character Correction, dB	Rating Level, dB $L_{Ar,Tr}$	Rating / Background Sound Level Difference, dB
NSR 1	40	47	0	47	+7
NSR 2	40	45	0	45	+5

5.5.2 The rating levels generated by the proposed development have been compared against the representative background sound level to establish the likelihood of an adverse impact occurring due to noise potentially experienced at the NSRs.

5.5.3 As shown in Table 5.3 above, the predicted rating levels at NSRs exceed the representative background sound levels by up to 7 dB at NSR1 and 5 dB at NSR2 during the daytime.

5.5.4 BS 4142:2014 + A1:2019 sets out that an exceedance of background sound levels of more than 5 dB is an indication of adverse noise impact, with an exceedance of more than 10 dB indicating a significant adverse noise impact.

5.5.5 With reference to the guidance in BS 4142:2014+A1:2019, the results of the initial impact assessment indicate the likelihood of an adverse noise impact at NSRs depending on context.

5.6 BS 4142:2014 + A1:2019 Context Assessment

5.6.1 BS4142:2014+A1:2019 states; “the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs”.

5.6.2 Context may be applied to the initial assessment of impacts, see above, by considering three pertinent factors:

- The absolute sound level;
- The character and level of the residual sound compared to the character and level of the specific sound; and,
- The sensitivity of the receptor.

Absolute Level of Sound

5.6.3 To determine the first context in BS 4142:2014+A1:2019 it is necessary to determine whether the rating and background sound levels are high or low. Section 11 of BS 4142:2014+A1:2019 states:

“Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.”

5.6.4 The rating levels are 47 dB(A) and 45 dB(A) at NSR1 and NSR2 respectively. The background sound level at the NSRs is 40 dB L_{A90} during the daytime periods. Neither the rating levels nor the background sound levels are considered as particularly high or low.

5.6.5 Therefore, the comparison of rating levels to the representative background sound levels shown in Table 5.3 is considered to be an appropriate indication of the noise impact at receptors.

Character and Level of Residual and Specific Sound

5.6.6 The residual sound at the NSRs comprises road traffic road traffic noise from the local road network, and well as significant influence from noise generated at the industrial estate. The industrial noise particularly audible at receptors is noise generated by moving large scrap metal and scrap cars, as well as operating large machinery.

5.6.7 The proposed sources of noise associated with the Ward Barnsley site are considered to comprise predominantly moving scrap metal, scrap cars, and operating large machinery. This is considered to be in keeping with the character to that of the residual sound which includes a number of scrap yards, car dismantlers and salvage dealers.

5.6.8 During the daytime, the residual sound level, as shown in Table 3.2, is between 57 and 60 dB(A) at the NSRs, and the specific sound level is 47 dB(A) and 45 dB(A) at NSR1 and NSR2 respectively, as shown in Table 5.1. Therefore, noise from the WARD site is likely to be significantly masked at receptors by the residual sound, and the likelihood of an adverse noise impact will be reduced.

5.6.9 Therefore, it is considered that noise from the site will not be readily distinguishable against the existing acoustic environment, which is considered to significantly reduce any noise impacts shown in Table 5.3.

Sensitivity of Receptor

5.6.10 With regard to pertinent factors to be taken into consideration, Section 11 of BS 4142:2014+A1:2019 states:

> *"The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal design and/or outdoor acoustic conditions, such as:*
>
> *i. Façade insulation treatment;*
>
> *ii. Ventilation and/or cooling that will reduce the need to have windows open as to provide rapid or purge ventilation; and*

iii. Acoustic screening."

5.6.11 As the glazing and ventilation strategy for existing NSRs is not known, it has been assumed that the NSRs will rely on open windows to maintain sufficient background ventilation. It is generally agreed that an open window provides 13 dB(A) of attenuation, therefore this allows for a robust assessment of noise levels at receptors.

5.6.12 As the rating levels at noise sensitive receptors are significantly below the measured residual sound levels, noise levels at sensitive receptors are not likely to experience a noticeable increase in noise levels. In addition, the receptors have the benefit of already being accustomed to noise of an industrial nature from facilities located closer than the WARD site.

5.6.13 Therefore, no additional specific mitigation measures are therefore considered to be necessary to protect receptors from industrial noise.

BS 4142:2014 + A1:2019 Assessment Summary

5.6.14 A BS 4142:2014+A1:2019 assessment has been undertaken to assess the potential noise impacts due to the proposed development at nearby existing noise sensitive receptors.

5.6.15 Following an initial assessment of the noise impacts, the rating levels predicted at the NSRs are shown to be between 5 and 7 dB(A) above the measured background sound levels. This indicates that the site is likely to generate an adverse noise impact at receptors, depending on context.

5.6.16 However, when the context assessment carried out for the proposed development is considered, it is shown that the actual impact at receptors is likely to be significantly reduced due to the character of the site being in keeping with the existing acoustic environment, and the level of noise experienced at receptors is less than the residual sound level. Therefore, the proposed development will generate a **low impact** at all noise sensitive receptors, when considered in context. This is the lowest category stated in BS 4142:2014+A1:2019.

5.6.17 Based on the above, it is unlikely that specific mitigation measures additional to those considered in the assessment will be required to reduce noise levels from the proposed development at nearby noise sensitive receptors.

5.6.18 It is therefore considered that the development is compliant with the requirements of the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and is below the Lowest Observable Adverse Effect Level (LOAEL) as set out in Planning Practice Guidance on Noise (PPG-N). Noise should therefore not be considered a material issue in terms of determining the Environmental Permit.

6.0 Conclusion

6.1.1 The Acoustics Team of Tetra Tech Consulting Limited (TT) has been commissioned by WARD to undertake a noise impact assessment to inform an application for an Environmental Permit for a waste management site in Barnsley.

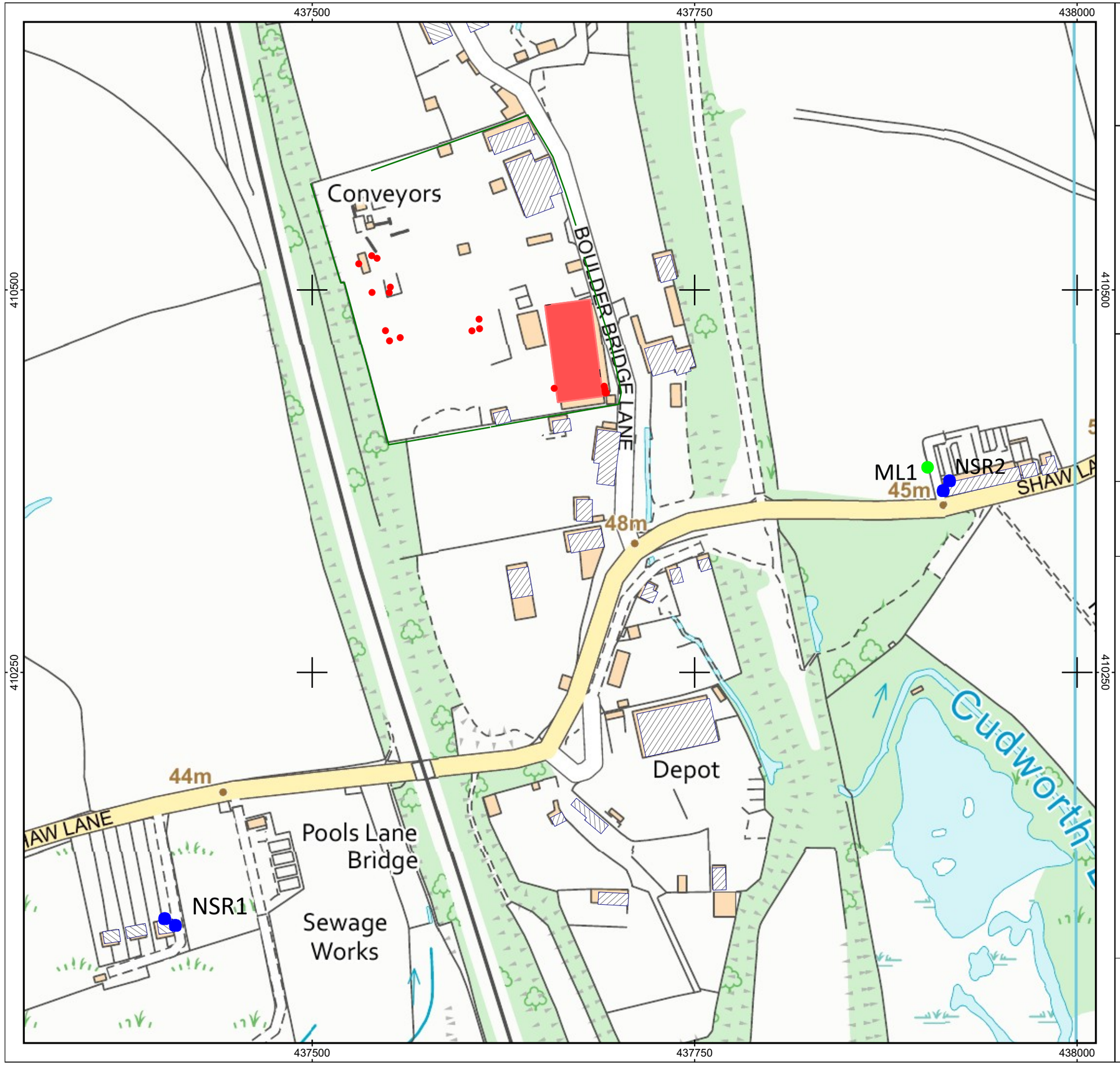
6.1.2 The NIA was based on comprehensive baseline monitoring conducted between 15th and 19th May 2026. The results of this monitoring were utilised to establish the representative baseline noise conditions at the nearest noise sensitive receptors (NSRs) during both the daytime period.

6.1.3 The assessment was carried out in accordance with British Standard (BS) 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound', which is the industry standard for evaluating commercial and industrial noise impacts at residential receptors.

6.1.4 The predicted noise levels associated with the site and associated operations were assessed at the identified NSRs. The results indicate that the rating levels generated by the proposed development are expected to result in a low impact at NSRs, when considered in context, which is the lowest impact category defined in BS 4142:2014+A1:2019.

6.1.5 Overall, the assessment concludes that the proposed development accords with the requirements of the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF), and is below the Lowest Observable Adverse Effect Level (LOAEL) as outlined in the Planning Practice Guidance on Noise (PPG-N). Accordingly, noise impacts are not anticipated to result in material harm to amenity, and thus should not weigh against the application.

Figures



Customer: Donald Ward Limited

Project: WARD Barnsley
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Figure
1

Figure 1
Noise Monitoring and Sensitive Location Figure

Project engineer:
Created: 11/06/2026
Processed with SoundPLAN 9.1, Update 19/12/2024

Signs and symbols

- Basemap
- Point Source
- Industrial Building
- Main building
- Wall
- Noise Sensitive Receptor
- Industrial building

N

Length scale 1:2500

0 20 40 80 120 160 m

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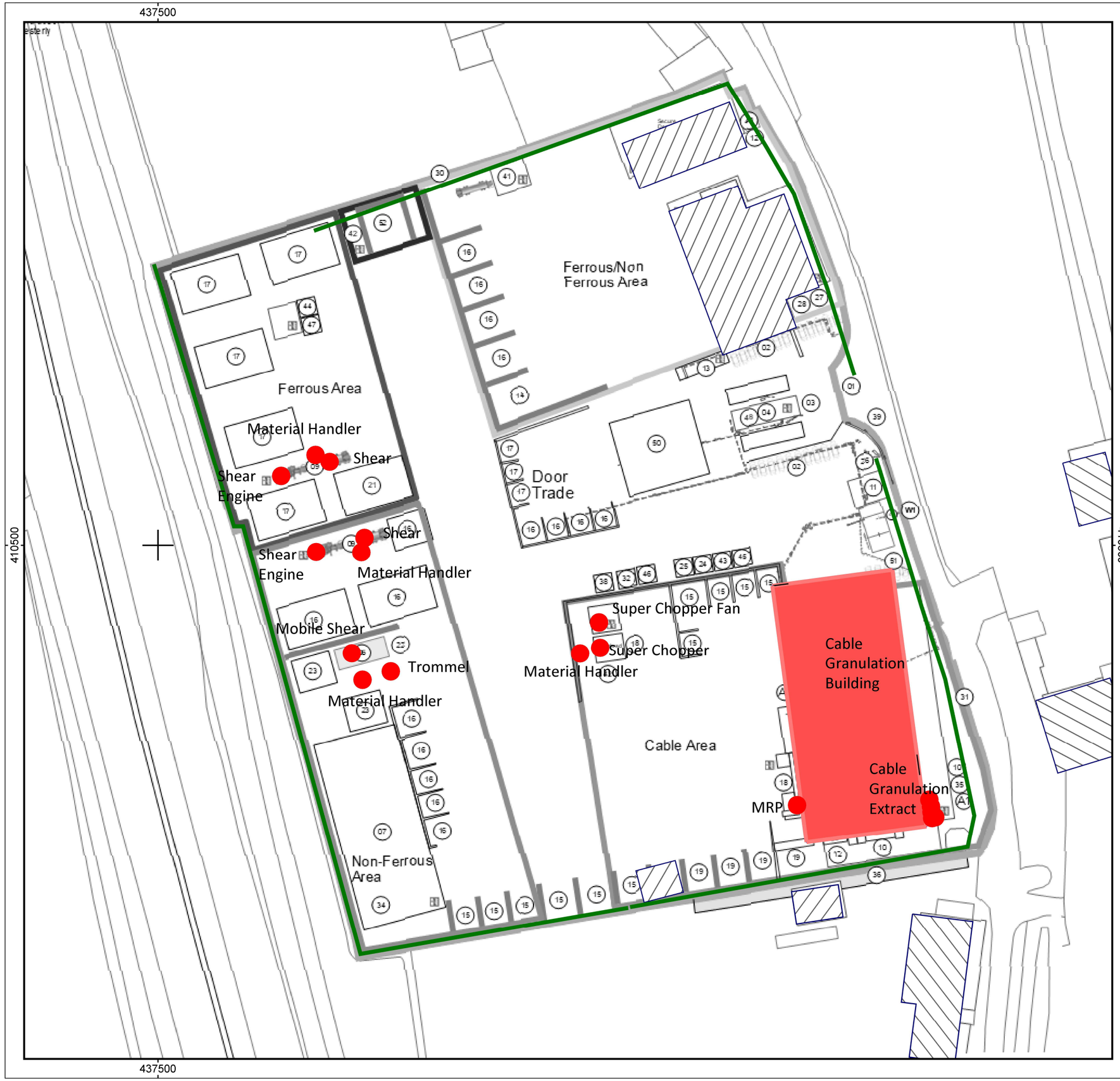
SoundPLANnoise 9.1 C:\Users\peter.kowalczuk1\OneDrive - Tetra Tech, Inc\Desktop\SP Models\Sims Barnsley\Data Incoming - Copy\Figure 1.sgs



Customer: Donald Ward Limited

Project: WARD Barnsley
Project-No. 794-ENV-EPC-23680

Figure
2

Figure 2
Modelled Noise Sources

Project engineer:
Created: 11/06/2026
Processed with SoundPLAN 9.1, Update 19/12/2024

Signs and symbols

- Basemap
- Point Source
- Industrial Building
- Main building
- Wall
- Noise Sensitive Receptor
- Industrial building

N

Length scale 1:961

0 5 10 20 30 40 m

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SoundPLANnoise 9.1 C:\Users\peter.kowalczuk1\OneDrive - Tetra Tech, Inc\Desktop\SP Models\Sims Barnsley\Data Incoming - Copy\Figure 2.sgs

Appendix A

National Planning Policy Framework

The National Planning Policy Framework (NPPF), December 2024, sets out the Government's planning policies for England and how these are expected to be applied. The emphasis of the Framework is to allow development to proceed where it can be demonstrated to be sustainable. In relation to noise, Paragraph 187, 198 and 200 of the Framework states:

- Paragraph 187:

  "Planning policies and decisions should contribute to and enhance the natural and local environment by:

  […] e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability…"

- Paragraph 198:

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

  a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life65 [See Explanatory Note to the Noise Policy Statement for England];

  b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason"

- Paragraph 200:

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

of change') should be required to provide suitable mitigation before the development has been completed. "

Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (NPSE) published in March 2010 by Defra, aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

Paragraph 1.6 of the NPSE sets out the long-term vision and aims of Government noise policy:

"Noise Policy Vision

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

"Noise Policy Aims

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

avoid significant adverse impacts on health and quality of life;

mitigate and minimise adverse impacts on health and quality of life; and

where possible, contribute to the improvement of health and quality of life."

The aims require that all reasonable steps should be taken to avoid, mitigate and minimise adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development, which include social, economic, environmental and health considerations.

With regard to the terms 'significant adverse' and 'adverse' included in the 'Noise Policy Aims', these are explained further in the 'Explanatory Note' as relating to established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation which are:

"NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on human health and quality of life due to noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected."

DEFRA has then extended these concepts for the purpose of the NPSE to introduce the concept of:

"SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

The accompanying explanation states:

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

Planning Practice Guidance on Noise

The National Planning Practice Guidance – Noise (NPPG) reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE, relevant guidance and British Standards, and contains examples of acoustic environments commensurate with various effect levels. A summary of the guidance from the NPSE and NPPG is set out in Table 6.1 below.

Table 6.1: Summary of Guidance from NPSE and NPPG

Perception	Example Of Outcomes	Increasing Effect Level	Action
Not present	No effect	No observed effect	
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			

Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level - SOAEL			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

British Standard 4142:2014+A1:2019

British Standard (BS) 4142:2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound' provides a method for rating and assessing the impacts of industrial and commercial sound upon nearby human receptors. The method is applicable to fixed plant installations, sound from industrial and manufacturing process, and other associated activities.

In summary, this standard provides guidance on determining rating levels by correcting the specific sound level from the site or operations under consideration for acoustic character corrections such as tonality, impulsivity, and intermittency. The standard provides the following corrections to be applied where each is appropriate:

> *"**Tonality***

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.

NOTE 2 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level should be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. … If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level of the specific sound. In the context of the standard, adverse impacts include, but are not limited to, annoyance and sleep disturbance. Typically, the greater this difference, the greater the magnitude of the impact:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a

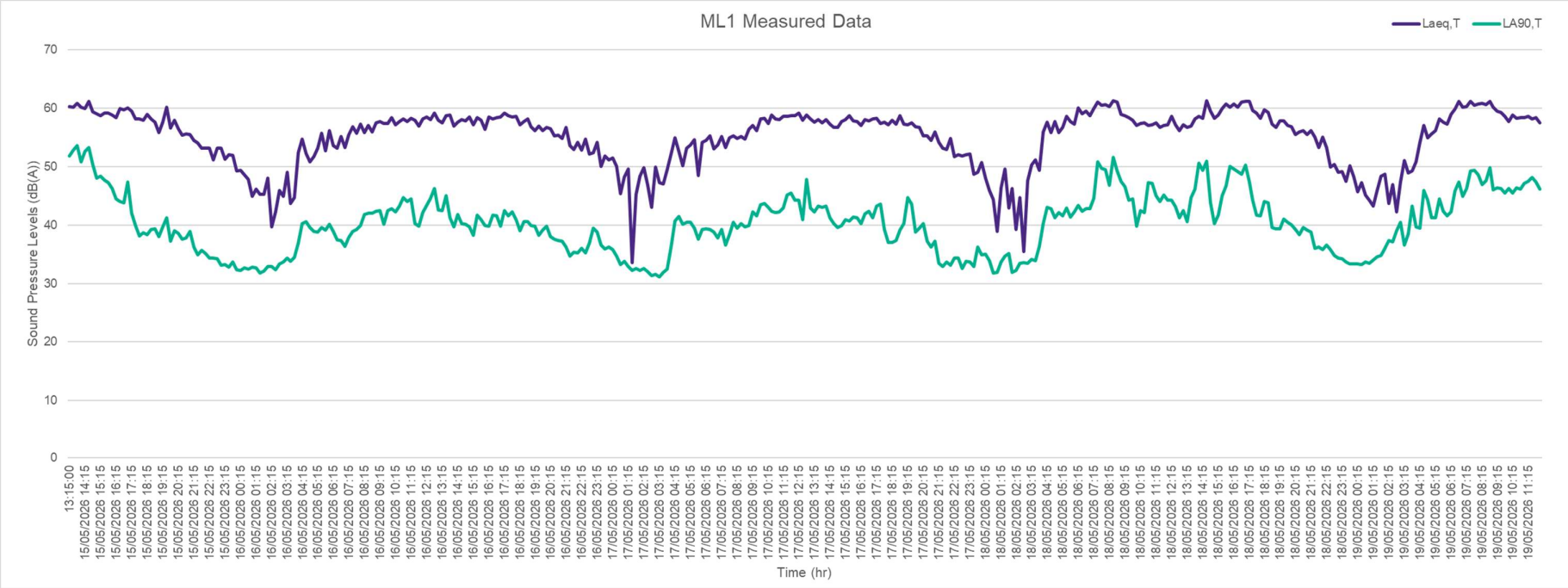
significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Table 6.2 below provides definitions for some of the key acoustic terminology adopted within this report.

Table 6.2: Definitions of Acoustic Terms

Terminology	Definition
Ambient Sound Level, $L_{Aeq,T}$	The steady sound level which, over a period of time *T*, contains the same amount of A-weighted sound energy as the time varying sound over the same period. Also known as the equivalent continuous sound pressure level. *NOTE The ambient sound level is a measure of the residual sound and the specific sound when present.*
Background Sound Level, $L_{A90,T}$	The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, *T,* measured using fast time-weighting, *F*, and quoted to the nearest whole number of decibels.
Rating Level, $L_{Ar,T}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Residual sound level, $L_r = L_{Aeq,T}$	The ambient sound level at a receptor in the absence of influence from the sound source under assessment.
Specific sound level, $L_{s,} = L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level produced by the specific noise source at the assessment location over a given reference time internal, *T*.

Appendix B


ML1 Measured Data
Laeq,T
LA90,T
Sound Pressure Levels (dB(A))
70
60
50
40
30
20
10
0
Time (hr)