ACOUSTIC CONSULTANTS LTD

Noise Impact Assessment

S L Recycling
Pontyfelin Industrial Estate, Pontypool

Reference: 11896/JA

Client
S L Recycling Ltd

Document Control					
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The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

The report limits itself to addressing solely on the noise, acoustic, and vibration aspects as included in this report. We provide advice only in relation to noise, vibration and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment. It should be noted that noise predictions are based on the current information as we understand it and, on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

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1. Introduction

S L Recycling Ltd appointed Acoustic Consultants Limited to provide a noise impact assessment in relation to Condition 8 of Planning Appeal Reference CAS-01626-P0X5N9. The planning appeal is in reference to the site located at Pont-y-Felin Industrial Estate, Pontypool, NP4 0DQ.

The full details of the condition are provided in the main body of the report below.

The presented report provides details and information on a site visit undertaken to obtain all relevant noise data to undertake a British Standard 4142:2014+A1:2019 assessment for the operations at the site.

The author of this report is a Member of the Institute of Acoustics (MIOA) with over seven years of experience in the field and a relevant qualification. The report has been reviewed an authorised by a full Member of the Institute of Acoustics (MIOA) with over five years of experience.

2. The Site

2.1. Site Description & Layout

SL Recycling is located at Pont-y-Felin Industrial Estate, New Inn, Pontypool, Torfaen, NP4 0DQ. The surrounding area is of mixed use, comprising other separate commercial and industrial premises/land, along with residential dwellings to the east and west of the site.

SL Recycling are a total waste management facility, with a large focus on metal recycling resource.

The site provides access to their own fleet of waste vehicles, along with private companies to access the waste yard.

The following figure provides the layout of the site. The figure is rotated to a northerly direction.

Figure 1: Site Layout

2.2. Site Operations & Plant

Plant on site comprises the following, as provided by our client:

- 1x Electric Bonfiglioli Metal Shredder
- 1x electric pre-shredder
- 3x diesel forklift trucks
- 3x diesel material handlers (grabbers)

Site operations comprise the following, as provided by our client:

- Vehicle depollution and dismantling
- Scrap metal tipping, sorting, processing and loading
- Waste tipping, sorting and loading
- Pre-shredding or over-sized metal
- Shredding of scrap metal

When the site is operating, the metal shredder and associated works/operations that feed into/out of the shredder, are typically active continuously across a 1-hour daytime assessment period.

2.3. Sensitive Receivers

To the nearest boundary edges, nearby sensitive receivers (NSRs) to the west are located approximately 65m to the nearest dwelling on Coed-y-Felin estate, 85m to Pont-y-Felin House on Pont-y-Felin Lane also to the west, and approximately 330m to the east on Churchwood. There is also an educational use site adjacent to the latter NSRs. These are summarised in the table below.

The following figure provides a satellite image of the site location (highlighted with the red boarder) at NSRs identified above.

Figure 2: Site Location & NSRs

Table 1: NSR Summary

NSR Reference	Location	Distance from Nearest Site Boundary-Edge
1	Coed-y-Felin Estate	~65m
2	Coed-y-Felin House	~85m
3	Churchwood	~333m

2.4. Subjective Assessments at NSRs

Subjective assessment of the noise climate at each noted NSR are as follows.

Table 2: NSR Subjective Assessments

NSR Reference	Without SL Recycling Operating	With SL Recycling Operating
1	Dictated by road traffic noise from the A4042 and Pont-y-Felin Road	Road traffic is still prominent. SL Recycling clearly audible during operations. Specific subjective tonal aspect perceptible.
2	Dictated by road traffic noise from the A4042 and Pont-y-Felin Road	Road traffic is still prominent. SL Recycling clearly audible during operations. Specific subjective tonal aspect perceptible.
3	Dictated by road traffic noise from the A4042	Road traffic is dominant. SL Recycling operations are audible at times, however masked to a significant degree by road and rail noise. NSRs 1 & 2 are worst-case due to distance and the A4042 and railway separating the NSRs and SL Recycling.

It should be noted that the subjective assessments at the NSRs identified the main shredding operations as the significant source of noise impacting the dwellings.

Movement of the diesel forklifts is negligible in comparison to the residual noise climate.

Movement of the diesel grabbers is negligible in comparison to the residual noise climate.

Movement of metal waste is audible via impulsive noise characteristics at the NSRs.

3. Planning Appeal Condition

The noise related conditions from the planning appeal notice are provided below.

3.1. Condition 7

Condition 7 states:

"7. The rating level of the noise emitted from the site shall have a 'low impact' when rated and assessed at the surrounding receptors in accordance with British Standard 4142:2014+A1:2019.

Reason: To protect the living conditions of local residents in compliance with the objectives of Policy BW1 of the Torfaen Local Development Plan."

3.2. Condition 8

Condition 8 of the appeal notice states the following:

"8. The use hereby permitted shall cease and all buildings, structures, plant, machinery, equipment, waste, and materials brought onto the land for the purposes of such use shall be removed within 2 months of the date of failure to meet any one of the requirements set out in i) to iii) below:

(i) Within 2 months of the date of this decision, a noise impact assessment shall have been submitted for the written approval of the local planning authority. The noise impact assessment shall include:

- *A detailed methodology of assessment conducted in line with BS4142:2014 + A1:2019;*
- *a list of all plant, machinery and site operations conducted on site;*
- *a site location plan depicting locations of all site operations/activities, plant, and machinery;*
- *a mitigation scheme and a timetable for its implementation, to include specific details of all mitigation measures to be adopted at the site, including (but not exclusive to), the use of broadband reverse alarms, the use of a one-way system for all vehicles delivering waste to the site (to limit noise generated from vehicles reversing), the use of acoustic barriers (size, location and orientation relative to noise generating activities on the site); and*
- *Evidence demonstrating compliance with the requirements of condition 7 by assessment, including associated calculations; and verification measurement (where practicable); at all local sensitive receptors including (but not exclusive to) those located at Coed-Y-Felin and Pont-Y-Felin House."*

4. Assessment Criteria

As required by the appeal conditions noted above the assessment will be undertaken in accordance with BS4142.

The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premise used for residential purposes.

4.1. BS4142, Initial Assessment

The initial estimate principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'. The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours). Clause 9 entitled 'Rating Level' states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location.

In Clause 11 of the Standard, entitled 'Assessment of the Impacts', it states:

"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following.

- *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."*

It should be noted that the numerical outcome only represents the initial estimate of impact, as stated in the first paragraph of Clause 11, and that contextual matters should be considered before determining what the potential impact is.

4.2. BS4142, Context

In all instances the context needs to be considered when determining the overall impact. In terms of context BS 4142:2014+A1:2019 states: *"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.*

1) *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.*

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.*

   NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

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

In terms of good internal acoustic conditions, the most relevant criteria and methodology is provided in BS8233:2014. This is in accordance with a March 2020 Technical published by the ANC Working Group, which provided comments and guidance to clear any ambiguity in BS4142:2014+A1:2019.

5. Noise Monitoring

Noise monitoring was undertaken at and around the site on Thursday 19th February 2026. The following sections detail the survey.

5.1. Monitoring Equipment

Sound Pressure Levels were measured using a Class 1 sound level meter with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2017 "General requirements for the competence of testing and calibration laboratories"; in accordance with British Standard EN 10012:2003 "Measurement management systems. Requirements for measurement processes and measuring equipment"; and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection.

Table 3: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial Number	Date of Calibration	Calibration Certification Number
SLM, NTI, XL3	A3A-00416-D1	04/12/2024	1510701-1
Pre-Amp, NTI, MA220	11239	04/12/2024	1510701-1
Microphone, NTI, MC230A	A23729	04/12/2024	1510701-1
Calibrator, Larson Davis, CAL200	16799	27/01/2026	1516348-1

The system was checked for drift, and calibrated before and after the survey. A drift of -0.1dB was measured once the survey was completed.

This drift is not significant and is not expected to affect the noise data obtained.

5.2. Weather Conditions

During the monitoring conditions were clear, dry, and calm. Wind speeds were measured with an anemometer.

The weather conditions are not expected to have adversely affected the measured data.

Table 4: Weather conditions during survey

Wind Speed (m/s)	Prevailing Wind Direction	Average Air Temperature (°C)	Precipitation (time/hrs)	Cloud Cover (%)
3 - 4	NW	~ 10	0	100

5.3. Noise Monitoring Procedure

Fully attended noise monitoring was carried out, first, at the NSRs with and without the site operating; then within the site to obtain specific noise data of operations and plant.

5.3.1. NSRs with Site Operating

On arrival to the survey, fully attended noise monitoring was carried out at all noted NSRs whilst typical operations were being carried out at SL Recycling.

At each location the microphone was mounted on a tripod at 1.5m above ground height, in a free-field position. The sound level meter was set to obtain 15-minute repeat periods, with a 0.1-second trace. At each location measurements were carried out for 30-minutes. The noise climate, including that of operations from SL Recycling, during this measurement period, were representative of a typical continuous 1-hour period.

Noise measurements were undertaken during this element between 10.00 and 11:30.

The following figure provides the monitoring locations at each NSR during this element of the noise survey.

Figure 3: NSR Measurement Locations with SL Recycling Operating

During this part of the survey, it could be subjectively determined that the impact of noise at ML3 was low in considering context of the residual noise from the A4042 and the railway traffic masking the specific sound levels from SL Recycling. This is discussed in the sections below.

5.3.2. NSRs without Site Operating

Noise measurements were taken at the locations marked ML 1, and ML 2, *without* SL Recycling operating. ML3 was not monitored during this element of the survey, as noted above and further discussed below.

The survey operative accessed the application site and spoke to site management prior to this element of the survey. This was to ensure all plant could be stopped and turned off for this period.

Noise measurements were carried out at NSRs 1 and 2 for 30-minutes each. This period is representative of the typical daytime background sound levels that are affecting the NSRs over a 1-hour period. The road traffic that dominates the noise climate is constant to a degree that reaffirms this.

The microphone was mounted on a tripod at 1.5m above ground height, in a free-field position. The sound level meter was set to obtain 15-minute repeat periods, with a 1-second trace.

These measurements were carried out between 12:00 and 13:00 hours.

This noise data provides the background noise climate data relevant to the BS4142 assessment required.

5.3.3. Specific Plant Measurements

Attended noise measurements were carried out within the site at set and measured distances from fixed and mobile plant used to carry out operations and processes at the site. A laser measure tool was used to ensure the distance measurements of the microphone form the noise source were accurate.

Each dominant noise generating process was either demonstrated for the specific sound measurement, or the measurements were obtained through typical use being carried out by staff and site visitors dropping off waste.

All plant measurements obtained are understood to be representative of typical daily operations at the site.

In all measurements, the microphone was mounted on tripod at 1.5m above ground height, in a free-field position. The sound level meter was set to obtain continuous measurements with a 1-second trace.

5.4. Measured Noise Data

5.4.1. NSRs with Site Operating: NSR 1

During this measurement site operations were typical to normal working conditions and clearly audible when occurring, at the NSR location. The overall noise levels are not significant, however, characteristics of operations taking place are clearly perceptible at the NSR.

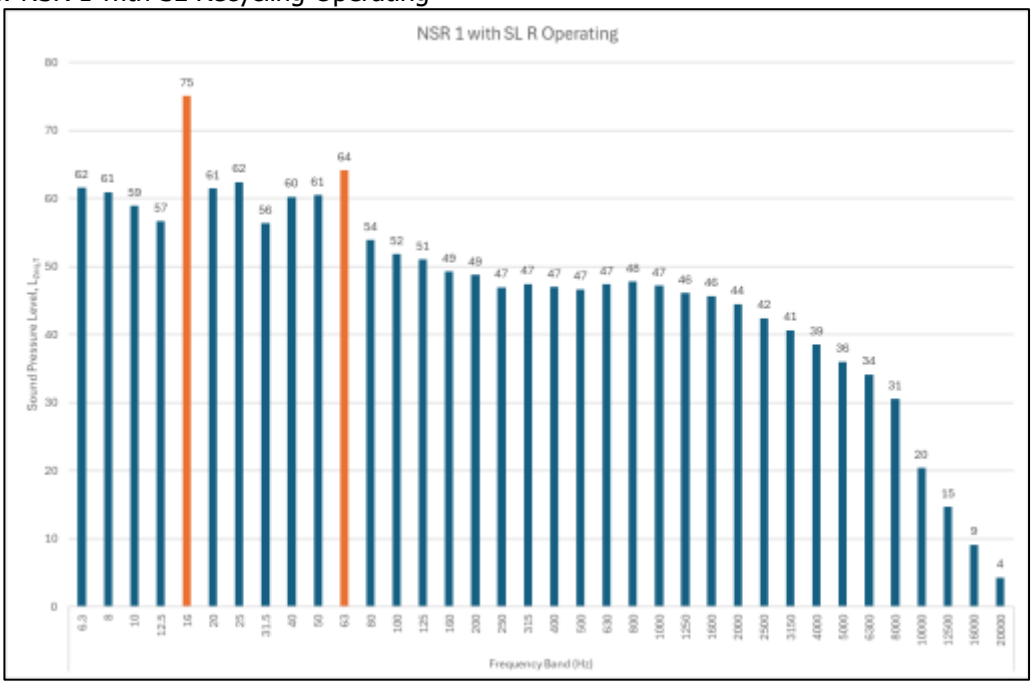
The following table provides the background and equivalent noise levels measured at this location.

Table 5: Summarised Noise Data at NSR 1 with SL Recycling Operating

Measured Background, dB $L_{A90,30minutes}$	**Measured Ambient, dB $L_{Aeq,30minutes}$**
53 dB	56 dB

The following chart provides measured $L_{eq,30minute}$ 1/3rd frequency noise data from the location.

Chart 1: NSR 1 with SL Recycling Operating



The two frequency bands highlighted in orange comprised subjective tonal noise characteristics that are clearly perceptible at the assessment location. The tonal noise within these bands were constant during the measurement exercise.

The audibility of this tonality is due to the noise level at 63 Hz only. However, the tonality at 16 Hz is clearly present via the measurement data.

The location of the source of this low frequency was identified to be coming from the direction of SL Recycling and is further investigated below.

5.4.2. NSRs with Site Operating: NSR 2

During this measurement site operations were typical to normal working conditions and clearly audible when occurring, at the NSR location. The overall noise levels were intermittent in comparison to the measurement exercise at NSR1, however, characteristics of operations taking place are clearly perceptible at the NSR.

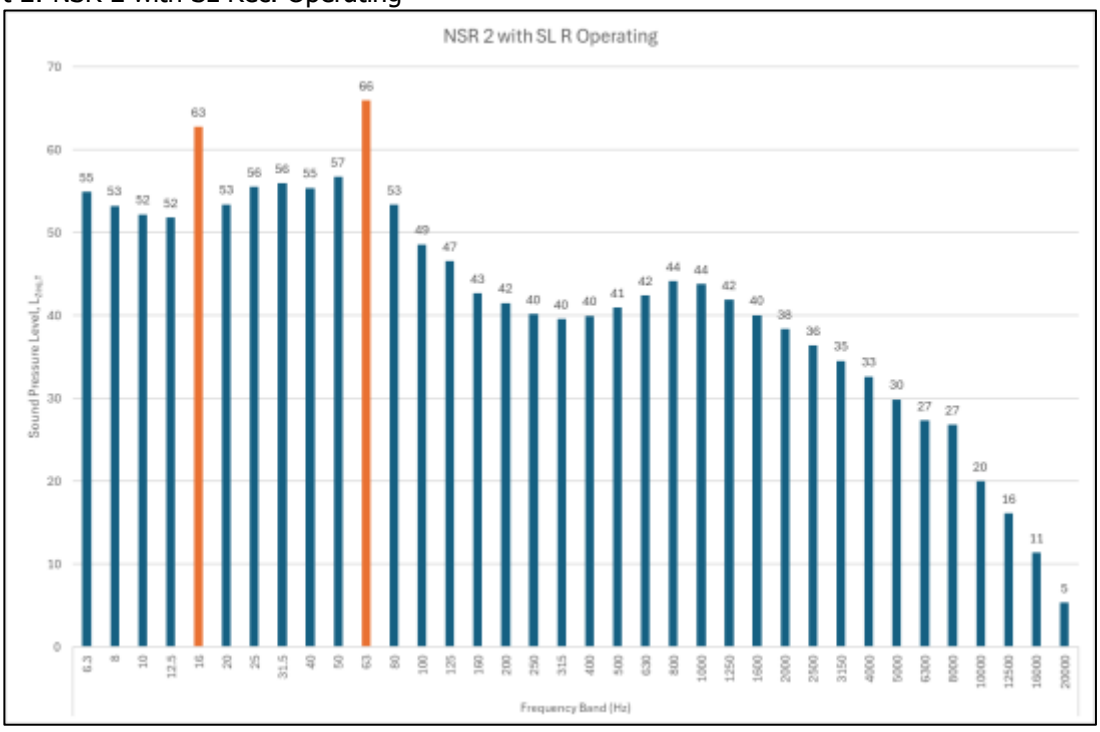
The following table provides the background and equivalent noise levels measured at this location.

Table 6: Summarised Noise Data at NSR 2 with SL Recycling Operating

Measured Background, dB $L_{A90,30minutes}$	**Measured Ambient, dB $L_{Aeq,30minutes}$**
48 dB	55 dB

The following chart provides measured $L_{eq,30minute}$ 1/3rd frequency noise data from the location.

Chart 2: NSR 2 with SL Rec. Operating



The two frequency bands highlighted in orange comprised tonal noise characteristics that are subjectively clearly perceptible at the assessment location. The tonal noise within these bands were constant during the measurement exercise.

The audibility of this tonality is due to the noise level at 63 Hz only. This is due to the hearing range of the human ear. However, the tonality at 16 Hz is clearly present via the measurement data.

The location of the source of this low frequency was identified to be coming from the direction of SL Recycling and is further investigated below.

5.4.3. NSRs with Site Operating: NSR 3

During this measurement site operations were not clearly audible at the NSRs.

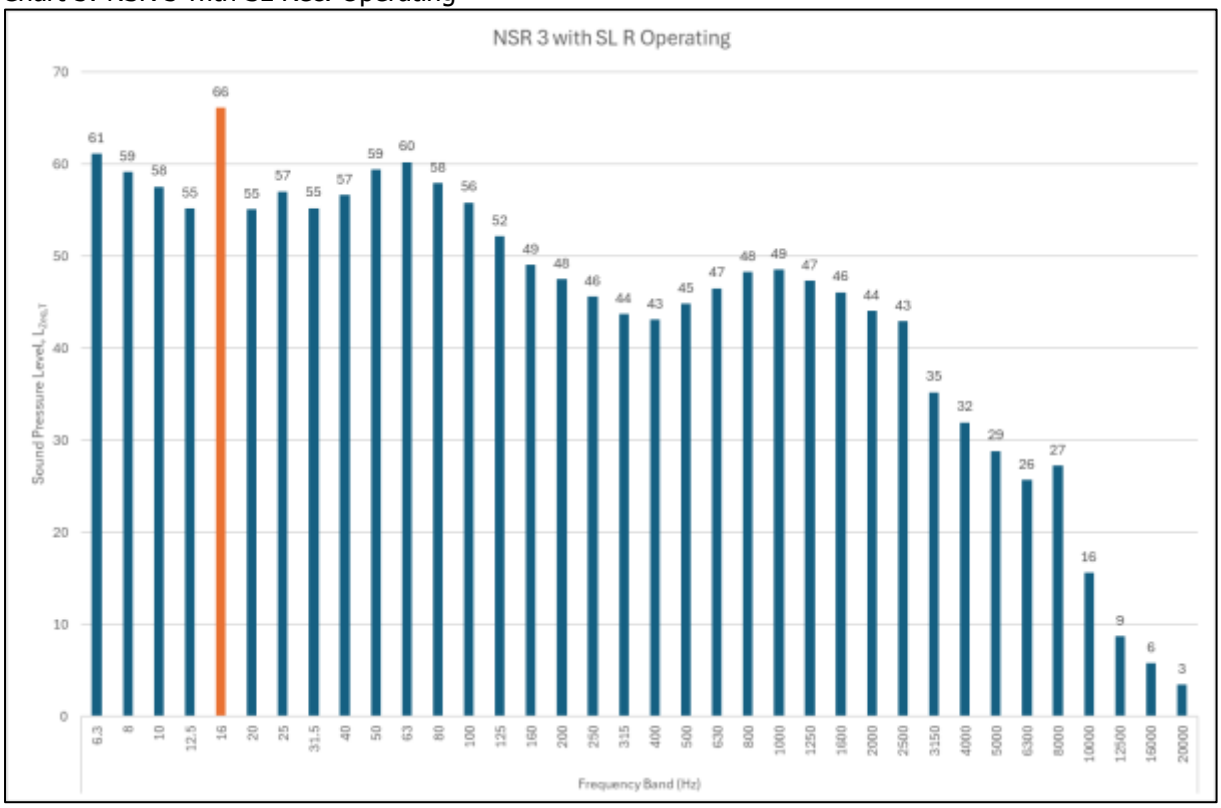
The following table provides the background and equivalent noise levels measured at this location.

Table 7: Summarised Noise Data at NSR 3 with SL Rec. Operating

Measured Background, dB $L_{A90,30minutes}$	Measured Ambient, dB $L_{Aeq,30minutes}$
53 dB	56 dB

The following chart provides measured $L_{eq,30minute}$ 1/3rd frequency noise data from the location.

Chart 3: NSR 3 with SL Rec. Operating



The overall noise level of SL Recycling operating under typical conditions is low at NSR 3.

The audibility of the low frequency noise source at 63Hz was not present at this location. However, the measurement data indicates that the low frequency noise source at 16Hz is still present at this location.

As NSRs 1 and 2 are the worst-case locations due to distance, if these low frequency sources can be controlled to NSRs 1 and 2, then NSR 3 would also be controlled. Therefore, the report will concentrate on data obtained at NSRs 1 and 2.

5.4.4. NSRs without Site Operating: NSR 1

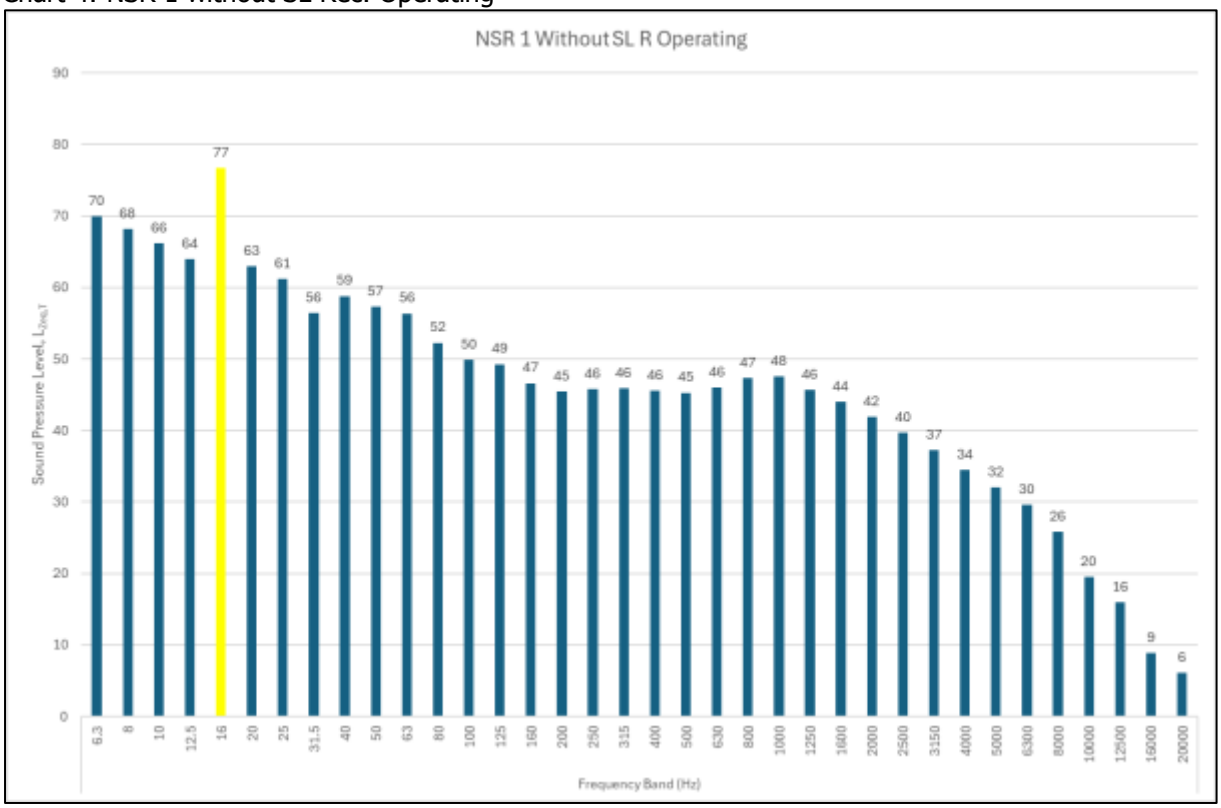
The following table provides the background and equivalent noise levels measured at this location. These are the levels without SL Recycling operating.

Table 8: Summarised Noise Data at NSR 1 without SL Rec. Operating

Measured Background, dB $L_{A90,30minutes}$	**Measured Residual, dB $L_{Aeq,30minutes}$**
52 dB	54 dB

The following chart provides measured $L_{eq,30minute}$ 1/3rd frequency noise data from the location whilst no operations were being undertaken.

Chart 4: NSR 1 without SL Rec. Operating



The prominent noise level at 16Hz is still present in the data set obtained at NSR 1 during the site shutdown. This might suggest that this low frequency source of noise is not emitted from SL Recycling.

The prominent noise level at 63Hz is no longer present in the dataset, and nor could it be heard subjectively by the survey operator. This indicates that the source of noise creating a tonal aspect at 63Hz when measured at the NSR is emitted from SL Recycling.

5.4.5. NSRs without Site Operating: NSR 2

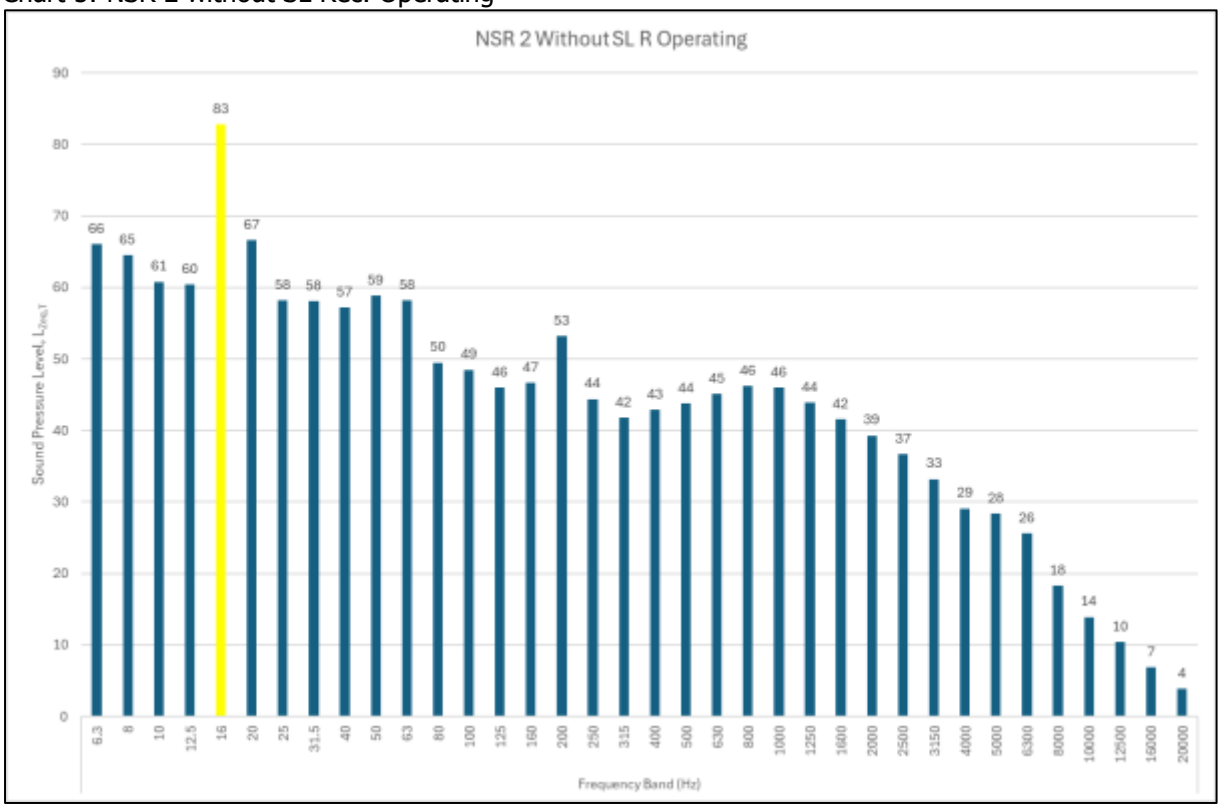
The following table provides the background and equivalent noise levels measured at this location. These are the levels without SL Recycling operating.

Table 9: Summarised Noise Data at NSR 1 without SL Rec. Operating

Measured Background, dB $L_{A90,30minutes}$	**Measured Residual, dB $L_{Aeq,30minutes}$**
52 dB	53 dB

The following chart provides measured $L_{eq,30minute}$ 1/3rd frequency noise data from the location whilst no operations were being undertaken.

Chart 5: NSR 2 without SL Rec. Operating



As at NSR 2, the higher noise levels measured at 16Hz are still present in the dataset. This might suggest that this low frequency source of noise is not emitted from SL Recycling.

The prominent noise level at 63Hz is no longer present in the dataset, and nor could it be heard subjectively by the survey operator. This indicates that the source of noise creating a tonal aspect at 63Hz when measured at the NSR is emitted from SL Recycling.

Other bands that display increased noise levels in the chart above are anonymous, extraneous sources of noise, i.e., those not emanating from SL Recycling.

5.4.6. Subjective Assessment Notes

From the attended surveys carried out at the NSRs, noted above, we provide the following summary of subjective assessment.

The notes are the same in nature, due to the similarity in distance and exposure of each NSR to the site.

Table 10: Subjective Assessment Summary

NSR 1	NSR 2
Impulsive noise sources clearly audible at NSR. These are due to metal material being unloaded / moved around site	*Impulsive noise sources clearly audible at NSR.* These are due to metal material being unloaded / moved around site
Impulsive noise sources clearly audible at NSR. When skip trucks are tipped to unload waste, the rear door of the tipper bed slams shut when the bed is straightened back out once it is emptied. This creates a boom-type noise across the immediate area and is clearly audible at the NSR intermittently.	*Impulsive noise sources clearly audible at NSR.* When skip trucks are tipped to unload waste, the rear door of the tipper bed slams shut when the bed is straightened back out once it is emptied. This creates a boom-type noise across the immediate area and is clearly audible at the NSR intermittently.
Low frequency tonality (subjective) clearly audible at NSR. The low frequency drone identified in the data above was identified from the direction of SL Recycling during the measurements and is constant during operations at the site. The comparison between operational / non-operational data indicates that this is sourced from within SL Recycling.	*Low frequency tonality (subjective) clearly audible at NSR.* The low frequency drone identified in the data above was identified from the direction of SL Recycling during the measurements and is constant during operations at the site. The comparison between operational / non-operational data indicates that this is sourced from within SL Recycling.
Subjective difference between operating & non-operating periods. The difference in noise climate between the two periods of working and non-working measurements is clearly distinguishable at the NSR. This is due to the constant drone of noise at 63Hz and the intermittent sources of metal material being dropped or moved around the site.	*Subjective difference between operating & non-operating periods.* The difference in noise climate between the two periods of working and non-working measurements is clearly distinguishable at the NSR. This is due to the constant drone of noise at 63Hz and the intermittent sources of metal material being dropped or moved around the site.

The noise of all types of vehicles entering the site is negligible to the impact of noise at the NSRs.

The dominant level of impact is present from characteristics of metal material being moved and dropped around site, from the shredder processing waste, from the rear door of large skip trucks slamming shut after being tipped, and from the low frequency drone which is constant when SL Recycling is operating.

5.4.7. On-Site Noise Sources

Fully attended noise monitoring was carried out on all plant and processes that are the primary sources of noise generated within the site.

The following table provides the single figure noise data from each source, including the distance at which it was measured.

Table 11: On-site Measurements of Specific Plant and Processes

Source	Measured Distance (m)	Measured Equivalent Level dB $L_{Aeq,T}$
Typical Whole Site Operation	From south-west corner of Office Block	72
Shredder & Grabber typical operation From east	28	82
Shredder being loaded by Grabber From south	26	82
Shredder typical operation and being loaded by Grabber From north	11	83
Shredder alone From north	11	83
Shredder motors and vibrating base plate	6	95
Diesel forklift driving forward and cleaning floor	6	76
Grabber drive-past	7.5 to 3	75
General unloading of a flat-bed van	7	74

*This includes the grabber moving around site, a skip truck entering site via weighbridge, and waste being broken down on the ground with a sledgehammer.

The dominant source of noise on the site is the operation of the shredder. The main sources of noise from this plant are as follows:

- Vibrating base conveyor fixed on springs, that is feeding the exit wheel
- Rotating motors
- The physical shredding of metal within the processing bin / hopper

From these sources, the vibrating conveyor base and the motors are the likely cause of the low frequency drone (at 63Hz) as measured at the NSRs.

The single figure data provided above does not provide this data, therefore we provide the following spectral noise data measured from the specific sources of the conveyor and motors as bar charts.

Sample 1 was obtained at 5.5m from the source.

Sample 2 was obtained at 6m from the source.

Chart 6: 1/3rd Sample of Low Frequency Source of Vibrating Base and Motors to Shredder (Sample 1) – 5.5m from source

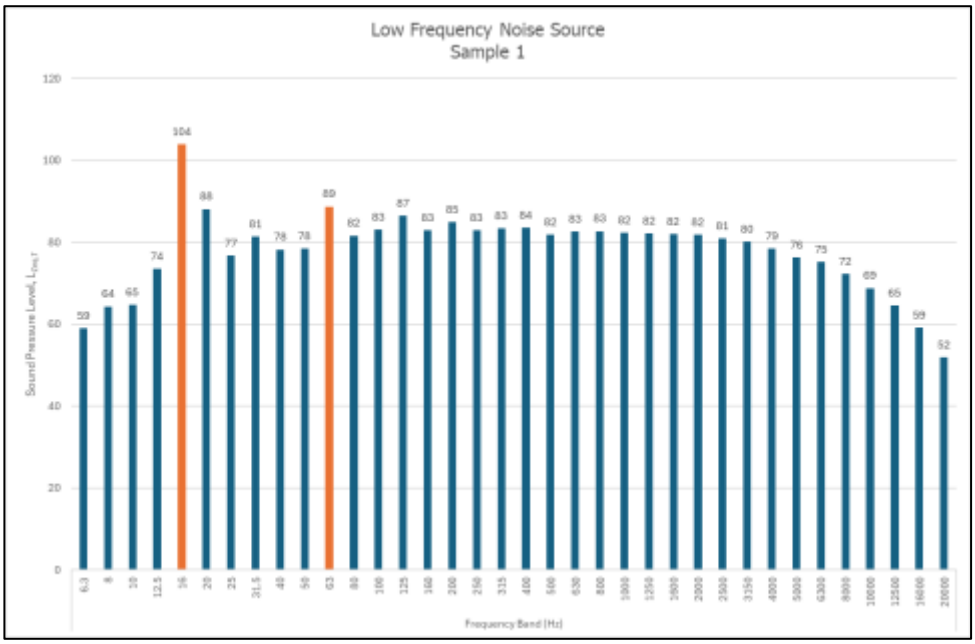
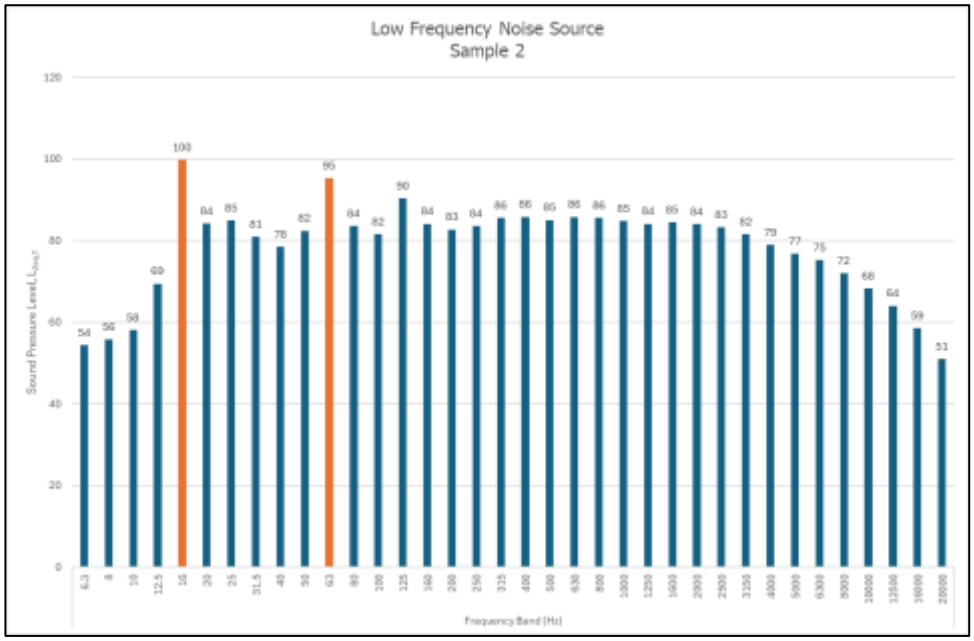


Chart 7: 1/3rd Sample of Low Frequency Source of Vibrating Base and Motors to Shredder (Sample 2) – 6m from source



From the attended on-site measurements, it could be concluded that the low frequency drone audible at NSRs 1 and 2 is emitted from the vibrating base and rotating motors of the metal shredder.

Out of these two sources, it could not be determined which one (if any in isolation) is causing the increased noise levels at either 16Hz or 63 Hz. This is due to the simultaneous operation of each element.

This data also indicates that the impact at 16Hz is sourced from within the site and is likely from the shredder given the measured levels.

6. BS4142 Assessment

A BS4142 assessment is provided below as required in the conditions noted above. The aim is to achieve a low impact level at the NSRs as required in Condition 7.

6.1. Background Sound Level

From the measured data obtained at the monitoring locations 1-3, we have determined the typical background sound levels as follows:

- NSR 1 = 52 dB $L_{A90(1hour)}$
- NSR 2 = 52 dB $L_{A90(1hour)}$

6.2. Specific Sound Level

From the measured data above the specific sound levels can be derived from the periods of site activity and no activity. The L_s at each NSR is as follows:

- NSR 1 = 52 dB $L_{Aeq(1hour)}$
- NSR 2 = 51 dB $L_{Aeq(1hour)}$

This is the level determined at the noise sensitive receivers without any character corrections applied.

6.3. Character Corrections

Character corrections should be added to the "specific sound level" if the "specific sound level" exhibits any *tonality, impulsivity, other specific characteristics and/or intermittency* at the assessment location. Based on our site visit the character corrections to be applied are as follows:

- ***Tonality*** – The subjective assessment of tonality at the NSRs is clearly perceptible at the NSRs. A +4dB correction is applied.

- ***Impulsivity*** – Impulsivity of operations is clearly perceptible at the NSRs. A +6dB correction is applied.

- ***Intermittency*** – A correction of intermittency is not required from the fully attended site survey. No correction applied.

- ***Other Sound Characteristics*** – With the above corrections applied, no further penalty is required.

6.4. Initial Estimate of Impact

Therefore, the British Standard 4142:2014 initial estimate of the noise impact at the most sensitive locations is as follows:

Table 12: British Standard 4142:2014 Initial Estimate

Parameter	NSR 1	NSR 2
Background Level, $L_{A90(T)}$	52 dB	52 dB
Specific Sound Level, $L_{Aeq(T)}$	52 dB	51 dB
Character Correction	+10 dB	+10 dB
Rating Level	62 dB	61 dB
Excess rating over background level	10 dB	9 dB

The initial estimate indicates that noise of typical operational over continuous 1-hour assessment periods do not achieve the required low impact level as noted in Condition 7.

6.5. Context

The initial estimate of assessment must also be considered alongside context of the site and local area.

However, given the noise characteristics of the operations at site, context would not alter the outcome of the initial assessment. Therefore, operations at SL Recycling fall into a significant level of impact as assessed at the NSRs, and noise control measures are required.

7. Noise Control

From the above information and the measured noise data both on and off-site, the following advice is provided for review. This is with the aim of achieving a low level of impact at the NSRs.

7.1. Vibration Isolation

A dominant source of low frequency noise emanates from the vibrating base plate of the shredder that feeds into the rotating conveyor system after material has been shredded.

This element of the shredder is highlighted in the photo below.

Site Photo 1: Vibrating Base of Shredder

Vibration specialists should be utilised by site management to investigate damping of the vibration process to this element.

This could be with a goal of shifting the natural frequency (Hz) of the vibration process to a frequency bandwidth lower than what the machine currently vibrates at. In turn reducing audibility of the tonal aspect at the NSRs.

From the measured noise data, the current natural frequency and/or a system resonance is within the 16 Hz or 63 Hz. Both these frequencies are present in the measured noise data at the NSRs and would need to be reduced to inaudibility at the same locations to assist in reducing the level of impact.

Examples of such specialists are TICO, AMC, and Mason.

7.2. Shredder Motors

There are several motors that are associated with the shredder. When operating, these create a significant level of noise and tonality.

Quieter motor systems could be sourced from the manufacturer.

Alternatively, each motor could be encased to reduce the noise emitted by at least 15 dB(A) when measured at 1m in front of the operating motor.

7.3. Noise Barrier

7.3.1. Barrier Requirements

In addition to the above, a noise barrier is advised to be installed to interrupt the path of propagation between the shredder and the noted NSRs.

Based on site observations, the following barrier location is provided to allow for site logistics of accessing the immediate area around the shredder.

If this location is not feasible, we should be made aware of a more appropriate location as this will need to be remodelled to assess for suitability.

From our visit to the site and understanding of how waste is unloaded, this barrier would require an alternative location and method of unloading waste implemented.

However, due to the height of the barrier required, this seems the most appropriate location from our site observations, as it would minimise impact on the grabber moving around the area and loading the shredder hopper.

The barrier location requirement is highlighted in yellow below.

The barrier would need to be:

- 6m high.
- Constructed with materials that comprise a minimum surface mass of 10 kg/m^2.
- Be of solid construction with no gaps or holes in its structure.
- Maintained to ensure that any breaks, gaps, or holes made are rectified to the same specifications.

Figure 4: Barrier Location Requirement (highlighted in yellow)

7.3.2. Barrier Noise Modelling Parameters

Noise modelling of such a barrier has been undertaken using computer software Cadna:A by Datakustik.

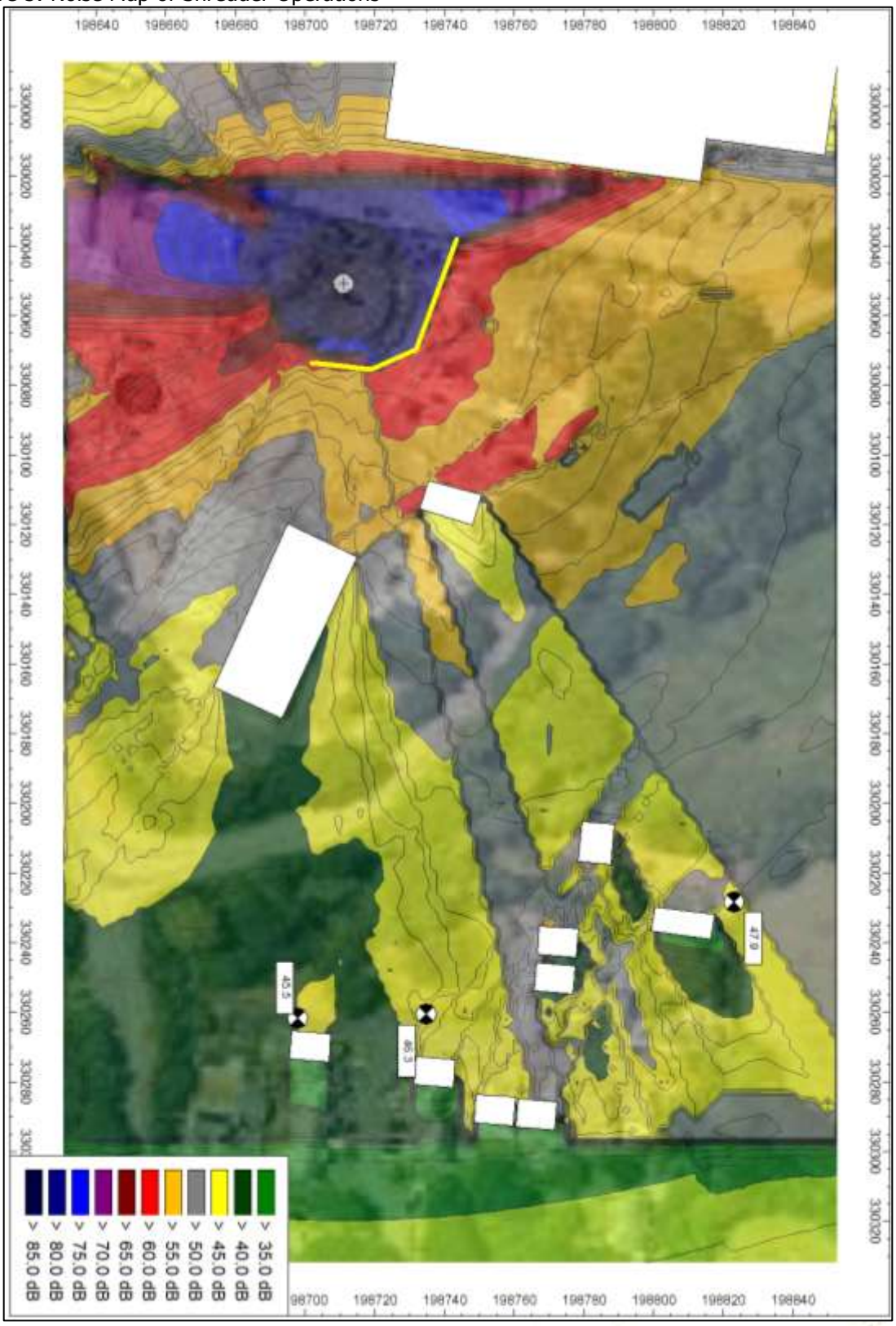
The modelling parameters used within the software are as follows:

- Building heights are based on site observations and online data from Open Street Maps.
- Topographical data has been included in the model to account for the difference in height between the NSRs and the site.
- The shredder is included in the model as a point source at a height of 2m.
- The shredder noise data has been calibrated to data provided above.
- A calibration model has been processed based on measured noise data at the NSRs.
- The ground across the site is considered as partially absorbent (G=0.5).
- A 3rd order of reflections is accounted for.

7.3.3. Barrier Noise Modelling Result

The following noise map provides the results of the noise modelling of the shredder and barrier.

Figure 5: Noise Map of Shredder Operations



7.3.4. Noise Modelling Results Summary

The noise map provided above indicates that with a barrier comprising the noted requirements above, the specific sound level at the NSRs could be significantly reduced.

The predicted specific sound levels due to the dominant noise source from the shredder are:

- NSR 1 = 46 dB $L_{Aeq,T}$
- NSR 2 = 48 dB $L_{Aeq,T}$

7.4. BS4142 Assessment with Noise Control

With the above implemented effectively and maintained, the level of impact at the NSRs can be significantly reduced.

The dominant source of noise causing a significant adverse impact as it stands is the shredder.

With the noise control measures noted above implemented effectively character corrections due to the shredder are not expected to be required.

Character corrections from impulsivity across site are still expected to be required when assessed at the NSRs. However, these are inherently difficult to mitigate due to the nature of waste materials being dropped and moved around site. Therefore, penalty for this still applies, and equates to a correction of +6dB.

In considering the above noise modelling, and character corrections, the predicted rating sound levels are:

- NSR 1 = 52 dB L_{Ar}
- NSR 2 = 54 dB L_{Ar}

This equates to a +2dB exceedance of site operations over the measured background sound levels at the NSRs.

This achieves the required low impact as required by Condition 7 of the planning appeal with the most feasible mitigation measures implemented based on site conditions.

8. Summary and Conclusions

S L Recycling Ltd appointed Acoustic Consultants Limited to provide a noise impact assessment in relation to Condition 8 of Planning Appeal Reference CAS-01626-P0X5N9. The planning appeal is in reference to the site located at Pont-y-Felin Industrial Estate, Pontypool, NP4 0DQ.

Noise monitoring has been carried out at the NSRs to the site, along with on-site noise measurements of specific plant and operations noted above.

As it stands, noise characteristics as noted in the main text of the report are such that the current level of impact does not achieve the requirement of planning appeal condition 7.

Noise control measures are provided in the report above in the form of:

- Vibration isolation to the vibrating shredder base.
- Attenuation applied to, or the use of quieter, motors that serve the shredder.
- A noise barrier around the area of the shredder and associated grabber.

With the above noise control measures implemented effectively, Condition 7 requirements to achieve a level of impact no greater than 'low' could be achieved, subject to installation and effective implementation.

9. Appendix 1 – Glossary of Acoustic Terminology

A-weighted sound pressure pA – value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network.

A-weighted sound pressure level, L_{pA} - quantity of A-weighted sound pressure given by the following formula in decibels (dBA)

$L_{pA} = 10 \log_{10} (p_A/p_0)^2$

where:

p_A is the A-weighted sound pressure in pascals (Pa);
p_0 is the reference sound pressure (20 μPa)

Background sound level, $L_{A90,T}$– A-weighted sound pressure level that is exceeded by the residual sound assessment location for 90% of a given time interval, T, measured using weighting F and quoted to the nearest whole number of decibels

Break-in - noise transmission into a structure from outside.

Decibel (dB) – The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, T = t2 – t1, has the same mean-squared sound pressure as a sound that varies with time, and is given by the following equation:

$$L_{AeqT} = 10\lg_{10}\left\{(1/T)\int_{t_1}^{t_2}[p_A(t)^2/p_0^2]dt\right\} \quad (1)$$

where:

p_0 is the reference sound pressure (20 μPa); and
$p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t

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

Facade level – sound pressure level 1 m in front of the façade. Facade level measurements of L_{pA} are typically 1 dB to 3 dB higher than corresponding free-field measurements because of the reflection from the facade.

Free-field level – sound pressure level away from reflecting surfaces. Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Octave and Third Octave Bands – The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

Sound pressure level – Sound pressure level is stated on many of the charts. It is the amplitude of the acoustic pressure fluctuations in a sound wave, fundamentally measured in Pascals (Pa), typically from 20 micro-Pascals to 100 Pascals, but commonly simplified onto the decibel scale.

Sound reduction index, R – laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,Tr}$ – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r.

Structure-borne noise – audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements.

Rating level, $L_{Ar,Tr}$ – Specific sound level plus any adjustment for the characteristic features of the sound.

Reverberation Time, T – The reverberation time is defined as the time taken for a noise level in an enclosed space to decay by 60 dB from a steady level once the noise source has stopped. It is measured in seconds. Often a 60 dB decay cannot be measured so the reverberation time is measured over a lesser range and corrected back to the time for a 60 dB drop assuming a constant decay rate. Common parameters are T20 (time taken for a 20 dB decay multiplied by three) and T30 (time taken for a 30 dB decay multiplied by two).

Vibration Dose Value, VDV – measure of the total vibration experienced over a specified period of time.

Estimated Vibration Dose Value, eVDV – estimation of the total vibration experienced over a specified period of time. This is usually based on the number of events and shortened measurement data.

Weighted sound reduction index, R_w – Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies. The weighted sound reduction index is used to characterize the insulation of a material or product that has been measured in a laboratory (see BS EN ISO 717-1).

Head Office: 194 West Street, Bedminster, Bristol, BS3 3NB
T: 0117 986 2956

www.acoustic-ltd.co.uk

Registered Office: 194 West St, Bristol, BS3 3NB Registered No: 8544901