

NOISE ASSESSMENT

**PROPOSED EXTENSION TO THE EXISTING WASTE TRANSFER AND
RECYCLING FACILITY INCLUDING AN INCREASE IN THROUGHPUT
AND CONSOLIDATING AND REGULARISING THE EXISTING WASTE
MANAGEMENT FACILITY, ELBRIDGE FARM RECYCLING CENTRE,
BOGNOR REGIS, PO21 5EF**

RECYCLE SOUTHERN LTD

MARCH 2023

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Revision	Prepared By	Date
2.1	L Jephson BEng (Hons) MIOA	30/3/23
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This report has been prepared using all reasonable skill and care within the resources and brief agreed with the client. LF Acoustics Ltd accept no responsibility for matters outside the terms of the brief or for use of this report, wholly or in part, by third parties.

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1. Introduction

LF Acoustics Limited have been appointed by Recycle Southern Ltd to prepare a noise assessment to accompany a planning application for a proposed extension to the existing waste transfer and recycling facility to include an increase in throughput and to consolidate and regularising the existing waste management facility at Elbridge Farm Recycling Centre, Bognor Regis, PO21 5EF.

Planning permission for the site was granted by West Sussex County Council on 4 September 2014 (Application Ref. WSCC/036/14). The planning application was accompanied by a planning application, which demonstrated that the proposed operations would not result in adverse impacts at the neighbouring properties.

There are three properties, which are close to the recycling centre, Elbridge Farmhouse to the west and Elbridge Farm Cottages, which are located to the south of the site access.

No specific noise conditions were attached to the planning permission, although Condition 2 requires the development to be carried out in accordance with the requirements / recommendations of the noise assessment.

Recycle Southern Ltd are now seeking to regularise the current site operations, increase their throughput from 30,000 tonnes per annum to 75,000 tonnes per annum and to incorporate an extension to the site.

There would be no requirement for any additional plant to operate on the site, as the existing plant operating has the capacity to handle the increased throughput. No changes to the existing operational hours are required, with the hours of operation remaining between 07:00 – 18:00 hours Mondays to Fridays and 08:00 – 14:00 hours on Saturdays.

The main changes on site would be associated with an increase in the number of vehicle movements, which are anticipated to increase from around 30 loads per day at present, to around 75 loads per day and an increase in the size of the inert tipping and processing area.

This report presents an assessment of the noise levels attributable to the existing and proposed operations at the neighbouring properties and provides recommendations to ensure that the increased throughput would not result in adverse impacts at the neighbouring properties.

The following section of this report presents an overview of the relevant standards and guidelines applicable when assessing noise from this type of facility. Section 3 provides a description of the site, its surroundings. The results of a noise monitoring exercise carried out to establish the existing noise levels attributable to site operations are provided within Section 4. An assessment of the noise levels attributable to the existing and proposed operations are presented within Section 5, together with details of additional noise mitigation measures, which would be provided to ensure any potential increase in noise levels are minimised. Finally, Section 6 provides a summary of the assessment.

2. Standards and Guidelines

A description of the noise units referred to in this report is provided in Appendix A.

2.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) revised in July 2021 [1], sets out the Government's planning policies for England and how these should be applied. It provides a framework upon which locally prepared plans for housing and other development can be produced.

The purpose of the planning system is to contribute to the achievement of sustainable development and at the heart of the Framework is a presumption in favour of sustainable development.

With regards noise, local planning policies and decisions should contribute to and enhance the natural and local environment by:

- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels noise pollution.
- mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development (including cumulative effects) – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Reference is made within the NPPF to the Noise Policy Statement for England (NPSE), which sets out the long-term vision of the Government noise policy. Further information has been provided on the assessment of noise within recent Planning Practice Guidance, updated in July 2019 and available on the Government planning web site. Whilst this guidance does not provide any objective criteria upon which to base noise assessments, the guidance provides a description of the relevant Effects Levels identified within the NPPF and NPSE and this is reproduced in Table 2.1.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect (NOEL)	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. 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)	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level (SOAEL)	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2.1 Significance Criteria

The NPPF advises that development should seek to ensure that noise from proposed developments does not give rise to significant impacts, i.e. a level identified as a Significant Observed Adverse Effect (SOAEL), which is at a level where the noise would cause a material change in behaviour.

2.2. British Standard BS 4142

BS 4142 [2] is the British Standard for rating and assessing noise of a commercial or industrial nature and is relevant to the noise associated with the operation of the proposed plant.

BS 4142 is a comparative standard in which the estimated noise levels from the proposed development are compared to the representative / typical background noise level from existing uses.

The initial assessment of impacts relates the likelihood of adverse impact to the difference between the Rating Level of the noise being assessed and the background noise level.

The background noise level is the L_{A90} noise level, usually measured in the absence of noise from the source being assessed, but may include other existing industrial or commercial sounds. The background noise levels should generally be obtained from a series of measurements each of not less than 15 minute duration.

The Rating Level of the noise being assessed is defined as its L_{Aeq} noise level (the 'specific noise level'), with the addition of appropriate corrections should the noise exhibit a marked impulsive and/or tonal component or should the noise be irregular enough in character to attract attention. The extent of the correction is dependent upon the degree of tonality or character in the noise and is determined either by professional judgement, where the plant is not operational at present, or by measurement.

Where the noise is tonal in nature, the standard imposes the following penalties when assessing the rating level:

- 2 dB for a tone which is just perceptible;
- 4 dB where the tone is clearly perceptible; and
- 6 dB where the tone is highly perceptible.

Where noise exhibits other sound characteristics, the Standard advises a penalty of 3 dB should be applied.

During the daytime, the specified noise levels are determined over a reference time interval of 1 hour, with a 15 minute reference period adopted when assessing night-time noise.

If the Rating Level of the noise being assessed exceeds the background level by 10 dB or more BS 4142 advises that there is likely to be an indication of a significant adverse impact, depending upon context. A difference between background level and Rating Level of around 5 dB is likely to be an indication of an adverse impact, depending upon context. The lower the Rating Level is, relative to the background noise level, the less likely the specific source will have an adverse or significant adverse impact. Where the Rating Level does not exceed the background noise level is an indication of a low impact, depending upon context.

The assessment method outlined above is intended for the assessment of external noise levels and is not intended to assess the extent of impact at internal locations.

Where the initial assessment of impact, based upon and assessment of the external noise levels, needs to be modified due to the context, all pertinent factors should be taken into account, including:

- The absolute level of sound;
- 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; and
- The sensitivity of the receptor and whether the premises will already incorporate measures to ensure good internal and/or external acoustic conditions.

3. Site Description and Identification of Potentially Affected Dwellings

The site location and its surroundings are indicated on Figure 1.

As indicated on Figure 1, there are three properties which are adjacent to the recycling centre, Elbridge Farmhouse to the west and Elbridge Farm Cottages to the south, adjacent to the main site access.

The proposed site layout is indicated on Figure 1. In addition to the increase in throughput of the site and extension area, minor amendments to the presently approved plans are being sought. These include the lego concrete block bays which have been constructed for the storage of waste and sited along the western boundary alongside the boundary with Elbridge Farmhouse. At present, the storage bays are approximately 3 metres in height and provide effective screening from the site operations and the property.

Changes have additionally been made to improve safety on the site. A one-way route has been implemented for the vehicle movements around the site. The vehicles now enter through the entrance gate and drive around the site to leave through the emergency exit gate. This not only improves safety but reduces the requirement for the vehicles to reverse on site.

The recycling centre is split into two main areas, the inert tipping and processing area, located within the northern part of the site and the waste reception and picking station, located centrally within the site.

The inert tipping area is primarily used by vehicles tipping soils and rubble. The material is processed through a crusher and screen, which operate in this area and serviced by a number of excavators. It is proposed to increase the size of this area to enable additional materials to be stocked. A concrete wall would be constructed along the northern and eastern boundaries to a height of 3 metres would be provided and landscaped on the outer face to provide visual screening.

Skip lorries deliver waste to the site and tip either in the main waste reception building or the secondary waste reception area, which is located between the buildings. A small number of loaders and an excavator work in this area, with the material sorted by hand, either on the reception floor to remove larger items or within the picking station.

There would be no changes to the existing plant operating on the site with the increased throughput, as the present plant has sufficient capacity. Thus, there would be no change in the noise levels attributable to the noise levels associated with the general site operations, other than associated with noise changes due to the relocation of the screening plant and inert picking line.

4. Noise Monitoring

4.1. Introduction

In order to evaluate the noise levels attributable to the current site operations, a noise monitoring exercise was carried out during the morning of Friday 11th February 2022.

Weather conditions for the exercise were good, with dry and calm conditions throughout.

The exercise comprised noise monitoring adjacent to the properties identified previously, with source term measurements made adjacent to the principal plant operating on site and associated with the vehicle movements at the site entrance.

The measurements were made using a number of Rion NL-52 Class 1 Sound Level Meters. The meters were all calibrated prior to and following the exercise using a Rion NC-74 Class 1 Acoustic Calibrator, with the instruments reading 94.0 dB on each occasion.

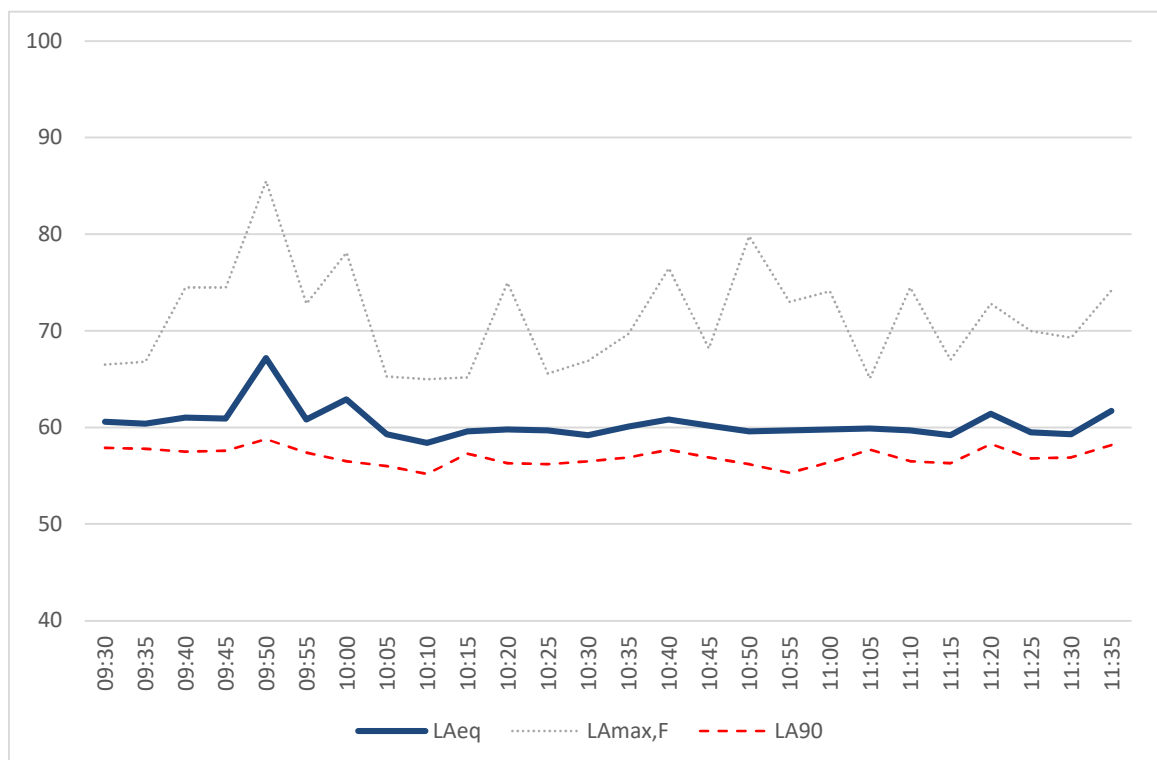
4.2. Noise Monitoring at Elbridge Farmhouse

A noise monitor was installed in the garden of the farmhouse, as indicated on Figure 1. The meter was set in freefield conditions, with the microphone at a height of 1.3 metres above the ground.

The meter was left to record unattended during the exercise, with periods of attendance made during the morning, alongside periodic audio recordings, which were used to identify the main sources of noise.

Measurements were obtained at this location between 09:30 – 11:30 hours. The measurements included a break period on site between 10:00 – 10:30, during which time no plant was operating on site.

The results of the noise monitoring at this location are indicated below.



Noise levels monitored at this location were observed to be principally attributable to traffic travelling along the A259 throughout the monitoring period. The results indicated from the break period, that the levels of road traffic noise were of the order of 60 dB L_{Aeq} , with background noise levels between 57 – 58 dB L_{A90} .

Between 09:45 – 10:00 there was a jet wash in use within a fenced area at the rear of the property, which was the main source of noise during this time.

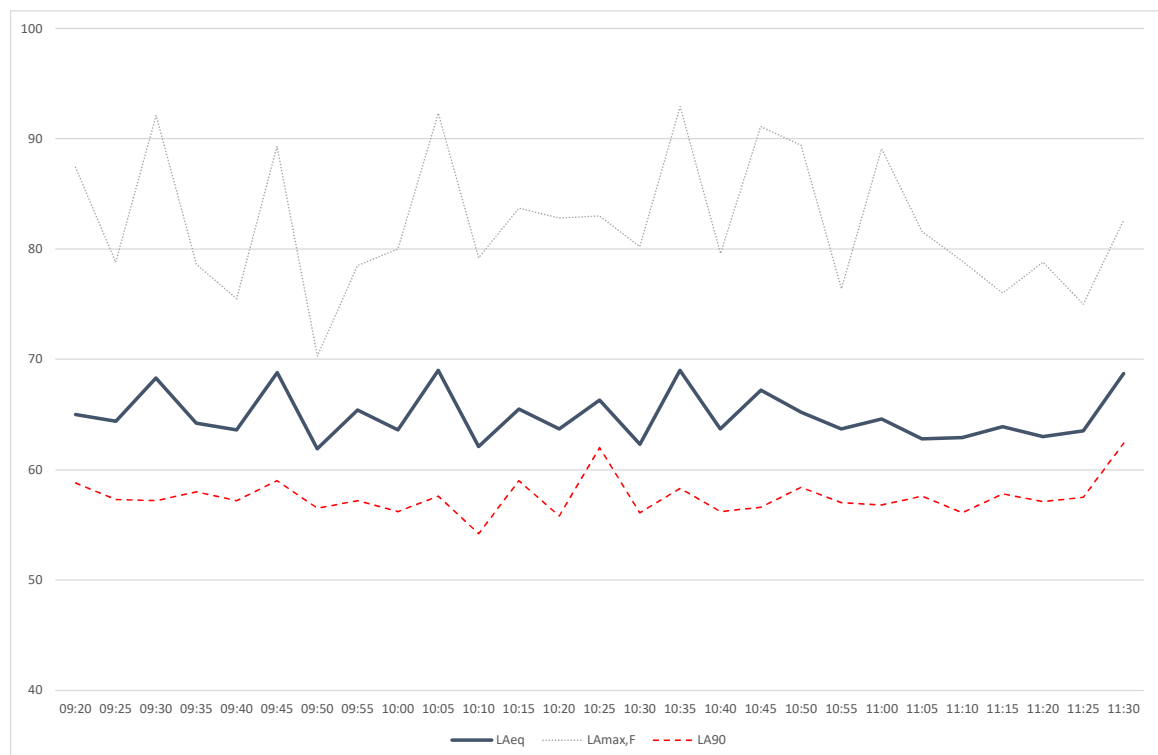
The observations and monitoring results indicated that the site operations had minimal influence on the noise levels at the property. It was possible to hear the plant operating on site at times, with the skip lorry movements and unloading clearly audible, principally attributable to the chains on the vehicles. The chains and tipping skip lorries were noted to give rise to the higher maximum noise levels monitored, although noted to be of very short duration on each occasion.

4.3. Noise Monitoring Adjacent to Elbridge Farm Cottages

The noise monitor at this location was located on the site boundary, adjacent to the site access and representative of the side façade of the closest property. The microphone was set in freefield conditions and at a height of 1.3 metres above the ground.

Noise levels at this location were recorded between 09:20 – 11:30 hours.

The results of the noise monitoring at this location are presented below.



Noise levels monitored at this location were observed to be generally attributable to the road traffic travelling along the A259. A detailed analysis of the measured noise levels indicated road traffic noise levels were typically of the order of 61 dB L_{Aeq} , with background noise levels obtained during the break period of 57 dB L_{A90} .

These properties are effectively screened from the main site operations, by boundary fences alongside the properties and around neighbouring business units. The general site operations were noted not to be clearly audible at the properties, with noise from the inert processing operations (screen and crusher) noted to be the main identifiable source of noise.

The main source of noise attributable to the operation of the recycling centre at this location was observed to be attributable to the vehicles entering and leaving the site, which pass within 10 – 15 metres of the closest property.

Whilst the noise from the tipper lorries was noted to be generally low, higher noise levels were noted associated with the skip lorries. The main source of noise attributable to the skip lorry passbys was associated with the chains on the vehicles, which rattled as they passed over the access. Noise from the chains of some vehicles was the main source of the peaks in the maximum noise levels monitored, with some vehicles clearly influencing the measured ambient L_{Aeq} noise levels.

4.4. On Site Noise Measurements

To supplement the noise measurements at the properties and to provide source data for the calculations and assessment of the noise levels attributable to the proposed operations, a series of measurements were taken around the site to evaluate the noise levels attributable to the main noise generating items of plant and associated with a number of vehicle passbys at the site entrance.

The results of the measurements are presented below.

Activity	Measurement Distance [m]	Noise Level [dB $L_{Aeq,T}$]
In Front of Open Door to Waste Transfer Building – General Operation with Loader and Excavator Working	10	76.1
In Front of Open Door to Waste Transfer Building – Skip Lorry Tipping	10	77.3
Picking Station Motor	3	78.2
Trommel	5	89.1
Crusher & Excavator	10	82.6
Screen & Excavator	10	77.2

Table 4.1 Source Term Noise Levels Attributable to On-Site Operations

Source term noise levels attributable to the vehicle passing along the access have been based upon measurements of the maximum passby noise levels, which have been used to derive the equivalent Sound Power Level used within the noise modelling exercise.

The results of the passby noise monitoring indicated typical maximum noise levels of 78 dB $L_{Amax,F}$ measured at a distance of 5 metres associated with the tipper truck passbys.

The noise levels attributable to the skip lorry passbys were more variable, as these were principally influenced by the noise from the chains banging against the sides of the skips. It was noted that none of the vehicles passing were fitted with chain sleeves, which significantly reduces noise. The results indicated noise levels attributable to the passing skip lorries of between 85 – 92 dB $L_{Amax,F}$, measured at a distance of 5 metres from the passing vehicles, significantly higher than the other vehicle movements.

5. Calculation and Assessment of Noise from the Operation of the Recycling Centre

5.1. Assessment of Noise from Existing Permitted Operations

The noise monitoring results indicated that, with the exception of the noise from vehicles using the access, the noise levels attributable to the operation of the site were relatively low and were below the noise levels attributable to traffic travelling along the A259.

To provide a clearer indication of the site noise levels at the property, a noise model has been prepared for the site and its surroundings, utilising the SoundPlan computer modelling package.

A base model taking account of the existing plant operating on the site was developed and taking account of the existing typical vehicle movements of 24 skip lorries / 6 HGVs per day. Calculations have been made for a typical hourly period, to enable an assessment against BS 4142 to be made and on this basis, it has been assumed that there are typically up to 3 skip lorries per hour and 1 other HGV per hour.

The results of the noise modelling, based upon the typical passby noise level from a skip lorry are presented on Figure 2. Modelling has also been prepared on the basis of skip lorries with noisy chains to provide worst case conditions. The results are summarised below:

- Elbridge Farmhouse – 52 – 53 dB $L_{Aeq, 1 hr}$; and
- Elbridge Farm Cottages – 55 – 58 dB $L_{Aeq, 1 hr}$.

An initial assessment of the potential impacts attributable to the present site operations has been made against the requirements of BS 4142. The noise from the operation of the site was not considered to be tonal or impulsive in nature. However, the chains rattling on the skip lorries does clearly generate other characteristic noise and a correction of 3 dB has been made within the assessment to account for this. The assessment is provided below.

Description	Location	
	Elbridge Farmhouse	Elbridge Farm Cottages
Calculated Noise Level at Dwelling [dB $L_{Aeq, T}$]	52 – 53	55 – 58
Character Correction	3	3
Rating Level [dB $L_{Aeq, 1 hour}$]	55 – 56	58 – 61
Background Level [dB L_{A90}]	57	57
Excess Over Background	-2 – -1	+1 – +4
Likelihood of Impact	Indication of Low Impact	Indication of Low Impact

Table 4.2 Initial BS 4142 Assessment – Existing Operations

The initial assessment above indicates that the presently permitted operations are likely to result in a potential for a low impact at the neighbouring dwellings and thus seek to minimise any potential adverse impacts.

Taken into context, as required within the BS4142 assessment methodology, the noise levels attributable to the operation of the site are below the noise levels attributable to the road traffic using the A259, thus further reducing any potential adverse impact.

It is clear, however, that the noise levels at the cottages are influenced by the vehicles using the access, in particular, the skip lorries. Noise from the skip lorries is dependent upon the quality of the road surface and the chains on the vehicles tend to rattle more when the vehicle passes over a bump or pothole. It is understood that Recycle Southern regularly maintain the access to ensure a good road surface is maintained and by doing so, seek to minimise any potential adverse impacts at the properties.

On this basis, the existing operations are generating acceptable levels of noise at the properties.

5.2. Assessment of Proposed Operations

As indicated previously, there would be no changes to the plant requirements on site, with the throughput increased from 30,000 tonnes per annum to 75,000 tonnes per annum. The main change in noise levels at the neighbouring properties would be attributable to the increase in vehicle movements and associated with the additional skip lorries tipping in the waste reception building and the repositioning of the screening and inert picking line.

The increase tonnage would result in vehicle movements increasing by a factor of 2.5, with 60 skip lorries and 15 tippers anticipated to use the site per day. On this basis, there would be typically up to 8 skip lorries and 2 tipper lorries visiting the site per hour.

The results of the noise modelling, based upon the typical passby noise level from a skip lorry are presented on Figure 3. Modelling has also been prepared on the basis of skip lorries with noisy chains to provide worst case conditions. The results are summarised below:

- Elbridge Farmhouse – 56 – 57 dB $L_{Aeq, 1 hr}$; and
- Elbridge Farm Cottages – 59 – 63 dB $L_{Aeq, 1 hr}$.

An initial assessment of the potential impacts attributable to the present site operations has been made against the requirements of BS 4142. The noise from the operation of the site was not considered to be tonal or impulsive in nature. However, the chains rattling on the skip lorries does clearly generate other characteristic noise and a correction of 3 dB has been made within the assessment to account for this. The assessment is provided below.

Description	Location	
	Elbridge Farmhouse	Elbridge Farm Cottages
Calculated Noise Level at Dwelling [dB $L_{Aeq, T}$]	53 – 57	59 – 63
Character Correction	3	3
Rating Level [dB $L_{Aeq, 1 hour}$]	56 – 60	62 – 66
Background Level [dB L_{A90}]	57	57
Excess Over Background	-1 – +3	+6 – +9
Likelihood of Impact	Indication of Low Impact	Indication of Low Impact / Indication of Adverse Impact

Table 4.3 Initial BS 4142 Assessment – Proposed Operations

The increase in vehicle movements would result in an increase in noise levels at the neighbouring properties by up to 3 dB(A).

In addition, noise levels attributable to the operation of the screen would result in an increase in noise levels at Elbridge Farm Cottages.

As indicated in the table above, the increased output and amendments to the site layout would result in a potential for an adverse noise impacts at the cottages, principally attributable to the noise from the increased number of skip lorries and operation of the screen, with the overall noise levels attributable to the site equivalent to that associated with the general road traffic.

5.3. Proposed Noise Mitigation and Control Measures

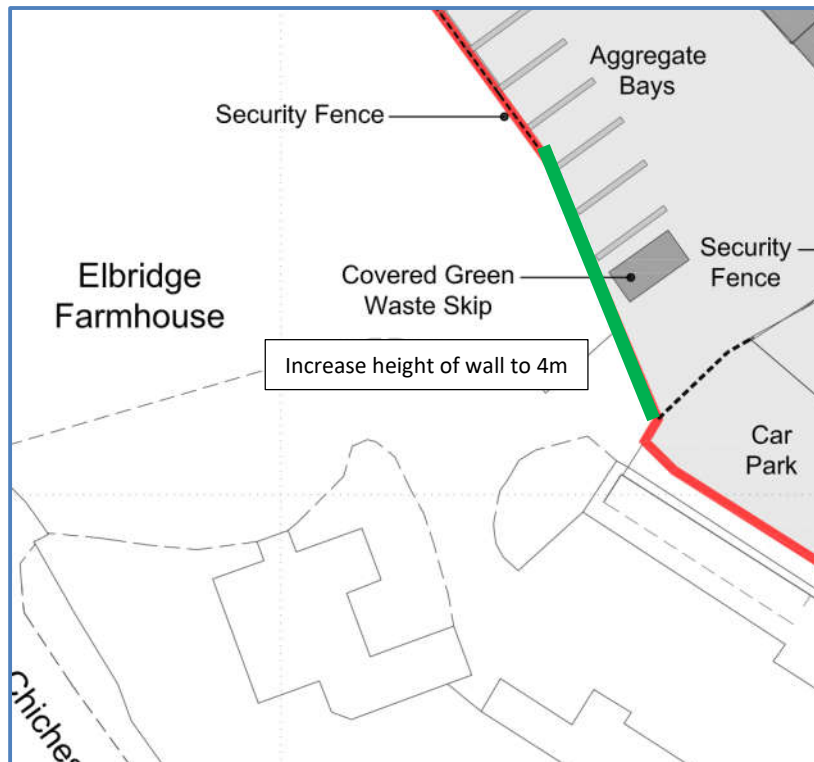
Additional noise mitigation and control measures would be implemented to ensure noise levels at the neighbouring properties remain acceptable.

Clearly, the main source of noise and potential adverse impact is attributable to the chains rattling on the skip lorries, as the vehicles enter and leave the site.

To reduce noise levels associated with vehicles entering the site, the road surface would be resurfaced with tarmacadam to provide a smooth surface, which would reduce the noise levels attributable to the vehicle presently bumping over the current rough surface considerably.

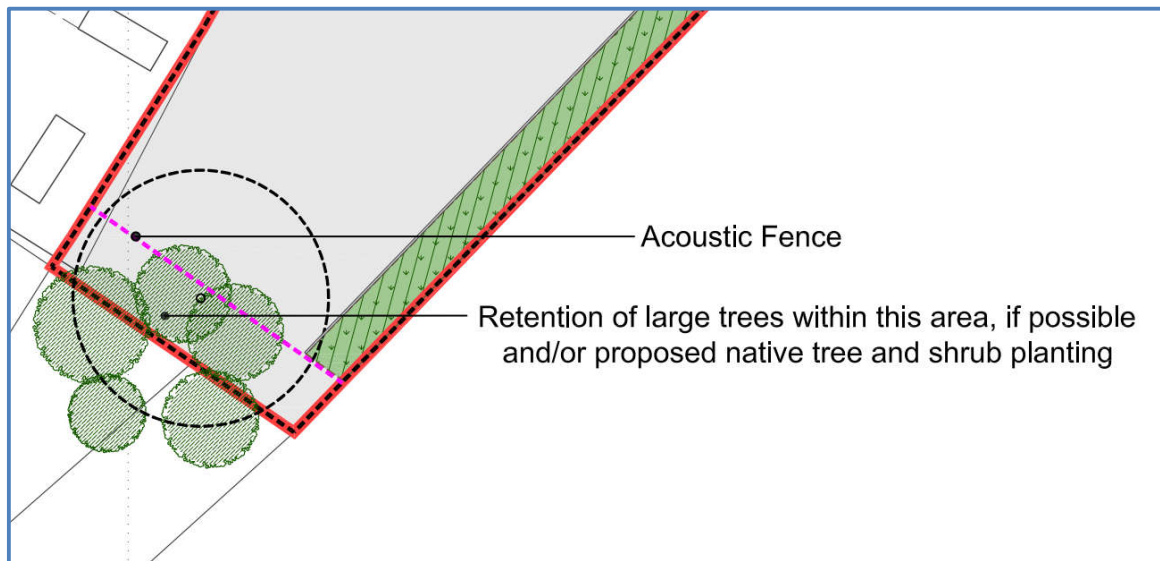
To further reduce noise from the skip lorries, it is recommended that the chains are fitted with sleeves. The use of chain sleeves provides a substantial reduction in noise levels from these vehicles, with typical reductions of up to 10 dB(A) associated with the vehicle passby.

The height of the concrete block wall to the rear of the stock bays would be increased to a height of 4 metres and extended along the boundary adjacent to the main waste reception building, to provide additional screening at the farmhouse, as indicated below:



The additional height of the mitigation on the boundary would be provided either by the provision of a timber close boarded acoustic fence or other sound attenuating barrier (e.g. Echo barrier) which could be attached to the existing lego blocks.

It is also proposed to construct an acoustic fence along the south western boundary adjacent to Elbridge Farm Cottages to mitigate noise from the proposed relocated screening operations, as indicated below.



The fence would be constructed to a height of 3.5 metres and would be a close boarded fence with a minimum surface density of 15 kg/m².

Calculations have been prepared on the basis of the mitigated scheme. The calculation results are presented on Figure 4, which indicates the following noise levels:

- Elbridge Farmhouse – 52 dB L_{Aeq, 1 hr}; and
- Elbridge Farm Cottages – 57 dB L_{Aeq, 1 hr}.

The initial BS 4142 assessment, based upon the mitigated scenario, is presented below.

Description	Location	
	Elbridge Farmhouse	Elbridge Farm Cottages
Calculated Noise Level at Dwelling [dB L _{Aeq, T}]	52	57
Character Correction	3	3
Rating Level [dB L _{Aeq, 1 hour}]	55	60
Background Level [dB L _{A90}]	57	57
Excess Over Background	-2	+3
Likelihood of Impact	Indication of Low Impact	Indication of Low Impact

Table 4.4 Initial BS 4142 Assessment – Proposed Operations with Additional Mitigation

The assessment based upon the mitigated scheme, indicates that the noise levels at the neighbouring properties would remain equivalent to those associated with the presently permitted operations, with the assessment indicating a low potential for adverse impact.

The reduction in the high levels of noise from the chains rattling as the skip lorries pass the cottages would further seek to reduce any potential disturbance which may be associated with this source.

On this basis, with additional mitigation and control measures implemented, the additional throughput would not result in any increase in the potential for an adverse impact at the neighbouring properties, compared to the presently permitted operations.

6. Summary

LF Acoustics Limited were appointed by Recycle Southern Ltd to prepare a noise assessment to accompany a planning application for a proposed extension to the existing waste transfer and recycling facility to include an increase in throughput and to consolidate and regularising the existing waste management facility at Elbridge Farm Recycling Centre, Bognor Regis, PO21 5EF.

Planning permission for the site was granted by West Sussex County Council on 4 September 2014 (Application Ref. WSCC/036/14). The planning application was accompanied by a planning application, which demonstrated that the proposed operations would not result in adverse impacts at the neighbouring properties.

There are three properties, which are close to the recycling centre, Elbridge Farmhouse to the west and Elbridge Farm Cottages, which are located to the south of the site access.

No specific noise conditions were attached to the planning permission, although Condition 2 requires the development to be carried out in accordance with the requirements / recommendations of the noise assessment.

Recycle Southern Ltd are now seeking to regularise the current site operations, increase their throughput from 30,000 tonnes per annum to 75,000 tonnes per annum and to incorporate an extension to the site.

An assessment of the noise levels associated with the proposed operations has been made, which would be principally attributable to an increase in noise from the vehicle movement. The following mitigation measures would be implemented to ensure any changes in noise levels are minimised:

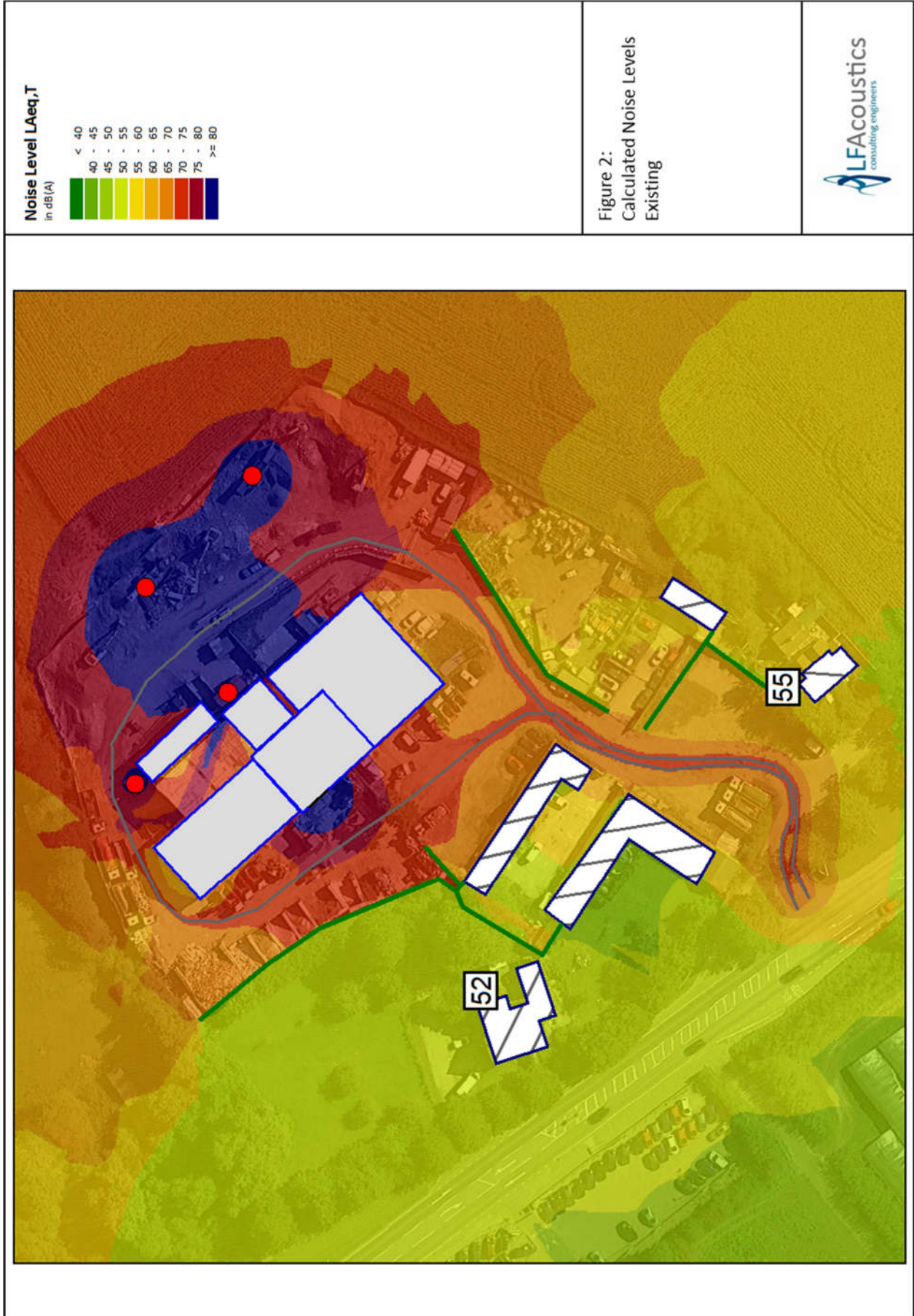
- Resurface the shared estate road at the entrance to the site;
- Ensure all skip lorries visiting the site are fitted with chain sleeves;
- Increase and extend the height of the existing concrete wall along the boundary with Elbridge Farmhouse to a height of 4 metres; and
- Provide an acoustic fence to a height of 3.5 metres along the south eastern boundary of the site, adjacent to Elbridge Farm Cottages.

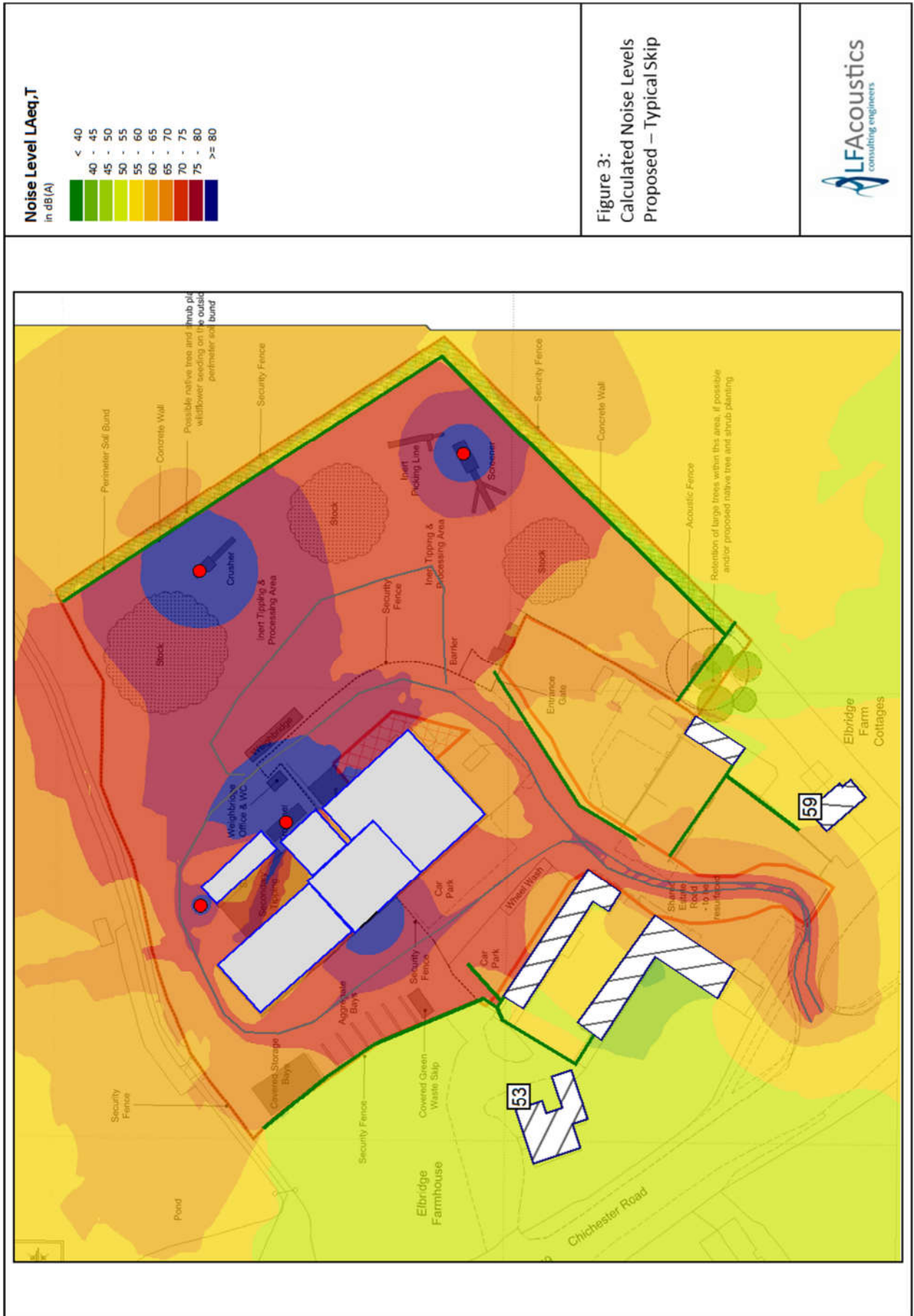
With the mitigation measures implemented, the assessment concluded that there would be no discernible change in noise levels with the additional throughput and other changes to the operation of the site, with the assessment concluding a low potential for adverse impacts.

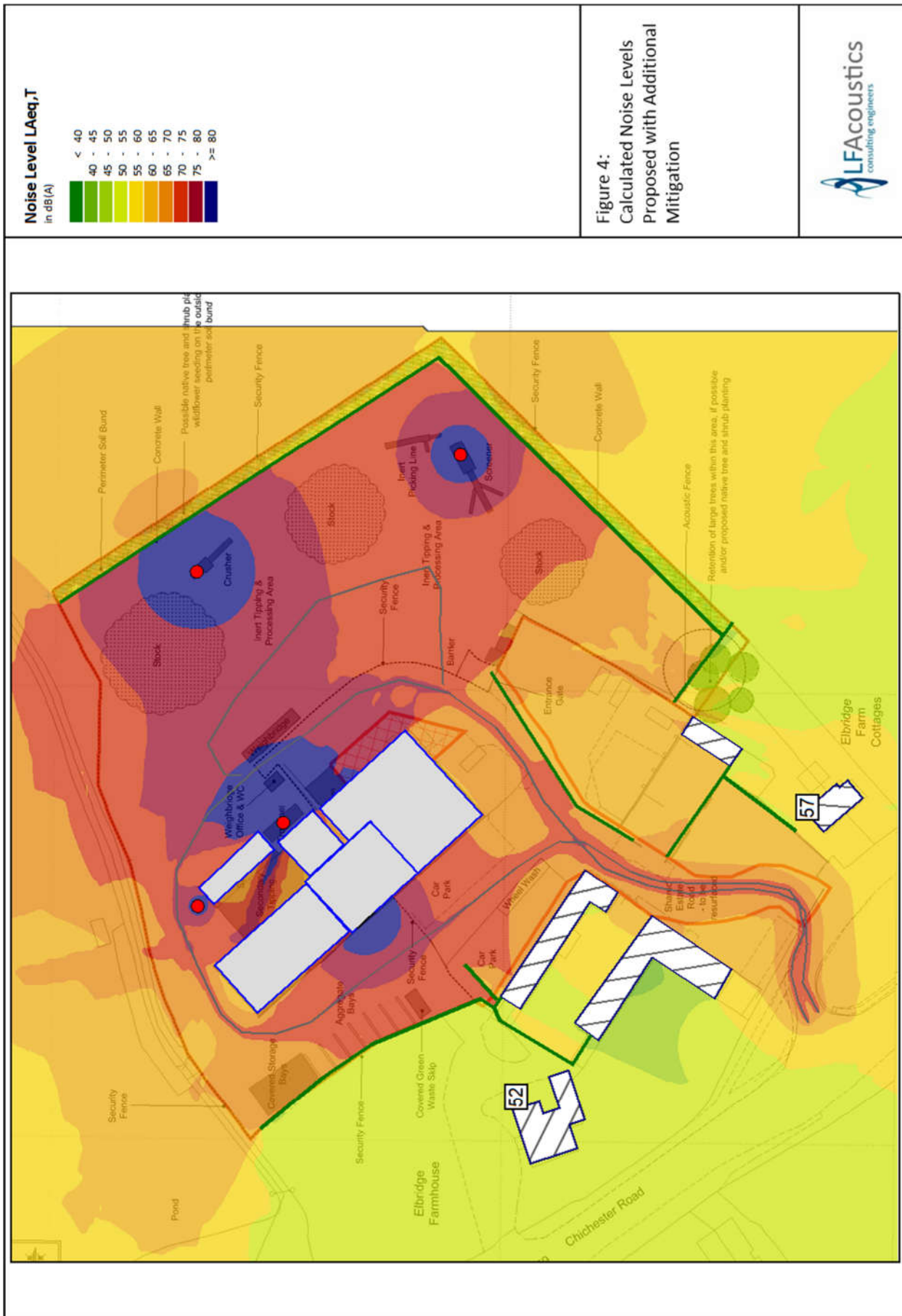
References

1. Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2021.
2. British Standards Institute. Methods for Rating and Assessing Industrial and Commercial Sound. BS 4142:2014 +A1:2019.

Figures







Appendix A Noise Units

Decibels (dB)

Noise can be defined as unwanted sound. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic.

The dynamic range of the auditory system is generally taken to be 0 dB to 140 dB. Generally, the addition of noise from two sources producing the same sound pressure level, will lead to an increase in sound pressure level of 3 dB. A 3 dB noise change is generally considered to be just noticeable and a 10 dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness. A 5 dB change is generally considered to be clearly discernible.

A-weighting

The bandwidth of the frequency response of the ear is usually taken to be from about 18 Hz to 18,000 Hz. The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit which has a frequency response similar to the human auditory system.

Units Used to Describe Noises Which Change Their Level with Time

The Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$) is the principal measurement index for environmental noise. The $L_{Aeq,T}$ is defined as the A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.

The L_{A90} is the noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise which is present even during the quieter parts of the measurement period.

The L_{Amax} is the single maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax,F}$, or Fast, is averaged over 0.125 of a second and $L_{Amax,S}$, or Slow, is averaged over 1 second. The measured L_{Amax} noise levels in this assessment are Fast.