



Noise Impact Assessment

Environmental Permit Application
Proposed Aggregate Processing,
Bersham Colliery Tip,
Rhostyllen, Wrexham, Clwyd



BERSHAM (GLENSIDE) LTD

R26.12541/2/IK
Date of Report: 18 February 2026

REPORT DETAILS

Client	Bersham (Glenside) Ltd
Report Title	Noise Assessment – Environmental Permit Application Proposed Aggregate Processing
Site Address	Bersham Colliery Tip, Rhostyllen, Wrexham, Clwyd
Report Ref.	R26.12541/2/IK
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QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
1	16/06/25		
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2	18/02/26		
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COMPETENCY AND EXPERTISE

The Company

Vibroch Limited is an established independent environmental consultancy who has been providing noise, dust and vibration consultancy services to industry since 1991. Vibroch Limited is a member of the Association of Noise Consultants (ANC) and its Consultants are Associate or Corporate Members of the Institute of Acoustics (IOA).

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NON-TECHNICAL SUMMARY

1. Bersham (Glenside) Ltd are seeking a new bespoke Environmental Permit for material delivery, processing temporary storage and removal from the site, on land off Colliery Road, Rhostyllen, Wrexham. Vibrock Limited are commissioned to undertake a noise impact assessment of the proposals.
2. As part of the assessment, background noise levels have been measured at locations that are considered to be representative of the nearest noise-sensitive premises to the application site. This information has been used to characterise the existing acoustic environment.
3. Predicted noise levels from the site have been calculated at nearby noise-sensitive premises and the proposals have been assessed with reference to BS 4142 '*Methods for rating and assessing industrial and commercial sound*' in line with Natural Resources Wales stipulations.
4. The outcome of the assessment demonstrates that with the implementation of the recommended mitigation, the proposed permit operations are unlikely to result in significant adverse impacts in accordance with BS 4142 at noise-sensitive premises in the vicinity of the site.

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1.0 INTRODUCTION

- 1.1 Vibrock Limited were commissioned to undertake a noise impact assessment in relation to an Environmental Permit application for aggregate processing and temporary storage on land off Colliery Road, Rhostyllen, Wrexham.
- 1.2 To support this application, an assessment of the potential noise impact of the proposals at identified noise-sensitive premises in the vicinity of the site has been made with reference to the guidance presented within BS 4142 as required by Natural Resources Wales (NRW).
- 1.3 This report is necessarily technical in nature, so to assist the reader a glossary of acoustic terminology is presented in Appendix 1.

2.0 SITE AND PROCESS DESCRIPTION

2.1 General Environs

2.1.1 The site is located on land off Colliery Road, Rhostyllen, approximately 3.2 km to the south-west of Wrexham, and to the east of the A483.

2.1.2 The site is bound to the north by an old colliery spoil heap that is largely wooded. To the east is Colliery Road and the Bersham Enterprise Centre. To the south is the Chester to Shrewsbury rail line with agricultural land beyond. To the west is open made ground, with the A483 situated beyond.

2.2 Site and Process Description

2.2.1 The proposed development site will occupy the land of former colliery workings which is currently vacant.

2.2.2 The proposed activities will include the delivery of shale material to site using dump trucks and a 360 excavator, and a loading shovel to deposit material into a crusher and screener. The material will be washed and then sorted ready for loading onto 40 tonne articulated trucks or 32 tonne tipper trucks. It is expected that the wash plant will process up to 400 tonnes of material per hour.

2.2.3 Two large water tanks and associated pumping equipment will be situated adjacent to the Parnaby screener and will supply the washing part of the process train. A wheel wash and weighbridge will be located towards the northern boundary of the yard, with a site cabin and generator set for site power.

2.2.4 It is anticipated that there will be approximately 50 tipper truck movements across a typical 10-hour working day. For the purposes of the assessment, it is assumed that the crusher/screener will operate continuously in any daytime working 1-hour reference period.

2.2.5 The proposed hours of operation for the delivery and processing of aggregate are as follows:

- 07:30 hours to 17:30 hours, Monday to Friday.
- 08:00 hours to 13:00 hours, Saturday.
- No working on Sundays and Bank Holidays.

2.2.6 No working, except for essential repair and maintenance, will be undertaken outside of the hours presented above. Where operations outside of these hours is required, the operator will seek prior approval in writing.

2.2.7 A drawing illustrating the wider site redline boundary and the proposed development layout plan are shown in Figures 1 and 2.

3.0 GUIDANCE

3.1 Noise and vibration management: environmental permits

3.1.1 Environmental permits have conditions that require operators to control pollution – this includes controlling noise and vibration.

3.1.2 The Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales and Northern Ireland Environment Agency have produced this guidance to help holders and potential holders of permits apply for, vary, and comply with their permits.

3.1.3 Operators (or permit applicants) must consider the potential noise impact of their site. They may need to carry out noise impact assessments:

- at the permit application stage
- when applying to vary a permit
- to comply with specific permit conditions

3.1.4 Where noise is possibly causing an impact, the operator must carry out an assessment to determine:

- the level of impact
- how much work needs to be done to prevent or minimise noise pollution

3.1.5 For assessment purposes, '*BS 4142: Methods for rating and assessing industrial and commercial sound*' must be used to quantify the level of environmental noise impact from industrial processes.

3.1.6 Noise impact assessments should be carried out to an appropriate standard and by competent personnel, for example, holders of either an Institute of Acoustics:

- Diploma in Acoustics and Noise Control
- Certificate of Competence in Environmental Noise Measurement, with relevant experience

3.1.7 Operators must prevent significant pollution and also comply with the requirements to use 'appropriate measures' (Waste Framework Directive 2018/851) or 'best available techniques' (BAT) to prevent or minimise noise pollution.

3.1.8 For any particular case, the environment agencies have to decide whether or not you are causing (or are likely to cause) unacceptable noise pollution, even if appropriate measures are used. It is the responsibility of the operator to avoid significant pollution and to demonstrate the use of BAT or appropriate measures to prevent, or where that is not practicable, to minimise noise impact.

3.2 Natural Resources Wales

3.2.1 Natural Resources Wales follow the guidance provided by the Environment Agency and state that:

“For most industrial noise impact assessments we expect you to follow the criteria and reporting requirements of BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS 4142).”

3.2.2 In relation to this application, Natural Resources Wales have made the following comments:

Noise impact assessment (NIA)

You have not submitted a NIA. Given the nature of the activity and the proximity of the site to noise sensitive receptor (within 190 metres of residential dwelling) a noise impact assessment is required to be submitted with the application.

Should you wish to reapply, we strongly recommend that you review:

- BS4142 and [Method Implementation Document for BS4142](#)
- [Noise and vibration management: environmental permits - GOV.UK \(www.gov.uk\)](#) and
- [noise impact assessments involving calculations or modelling](#) in producing the noise impact assessment.

If the noise impact assessment shows noise is an issue based upon the guidance a Noise Management Plan will be required.

3.3 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

3.3.1 This British Standard was amended in June 2019. BS 4142:2014+A1:2019 supersedes BS 4142:2014, which is withdrawn.

3.3.2 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- 1) sound from industrial and manufacturing processes;
- 2) sound from fixed installations which comprise mechanical and electrical plant and equipment;
- 3) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- 4) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

3.3.3 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

3.3.4 This standard is intended to be used for the purposes of:

- a) investigating complaints;
- b) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
- c) assessing sound at proposed new dwellings or premises used for residential purposes.

3.3.5 This standard is not intended to be applied for the following purposes:

- The determination of noise amounting to a nuisance;
- The assessment of indoor sound levels;
- The assessment of low-frequency noise;
- The assessment of sound from the passage of vehicles on public roads and railway systems;
- The assessment of sound from recreational activities, including all forms of motorsport;
- music and other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals;
- people;
- public address systems for speech;
- The assessment of sound from other sources falling within the scopes of other standards or guidance.

3.3.6 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 source exceeds the background sound level and the context in which the sound occurs. When making assessments and arriving at decisions it is essential to place the sound in context.

3.3.7 The sound level from a source when determined as a discrete entity, distinct and free of other influences contributing to the ambient sound, is referred to as the ‘specific sound level’. The specific sound level is evaluated, at an identified assessment location, over the appropriate reference time interval which is as follows:

- 1 hour during the daytime (07:00 – 23:00); and
- 15 minutes during the night-time (23:00 – 07:00).

NB. The shorter reference time interval at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

3.3.8 The specific noise may be subject to an acoustic character correction if the noise level at the assessment location is subjectively considered to exhibit certain acoustic features that could 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.

3.3.9 This standard requires the assessor to consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention. Such features are taken into account by applying the following corrections to the specific sound level to obtain the rating level as summarised in Table 1.

Table 1: Summary of BS 4142 Acoustic Feature Corrections

Subjective Prominence	Tonality	Impulsivity	Intermittency	Other Sound Characteristic (neither tonal, nor impulsive, nor intermittent)
Just Perceptible	+2 dB	+3 dB	-	-
Clearly Perceptible	+4 dB	+6 dB	-	-
Highly Perceptible	+6 dB	+9 dB	-	-
Readily Distinctive Against Residual Environment	-	-	3 dB	3 dB

3.3.10 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. The rating level is equal to the specific sound level if there are no such features present or expected to be present.

3.3.11 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and consider the following.

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB or more is likely to be an indication of an adverse impact, depending on the context.
- d) 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.

3.3.12 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) The absolute level of sound.
- 2) The character and level of the residual sound compared to the character and level of the specific sound.
- 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.
 - 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.

3.3.13 Response to sound can be subjective and is affected by many factors both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognises the importance of the context in which a sound occurs.

3.4 Other Relevant Standards and Guidance

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

3.4.1 This Standard provides guidance for the control of noise in and around buildings and is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

3.4.2 For dwellings, the main considerations are:

- a) for bedrooms, the acoustic effect on sleep; and
- b) for other rooms, the acoustic effect on resting, listening and communicating.

3.4.3 It is desirable that the internal ambient noise level does not exceed the guideline values detailed in Table 2 below.

Table 2: Indoor ambient noise levels for dwellings (From Table 4 of BS 8233)

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

3.4.4 For traditional external areas that are used for amenity space, such as gardens, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$.

World Health Organisation (WHO)

3.4.5 The World Health Organisation ‘Guidelines for Community Noise’ (1999) aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people.

3.4.6 This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep disturbance. It is the primary reference point for other guidance value based documents, such as BS 8233.

3.4.7 The following guideline values have been derived according to specific environments. The values relevant to residential development are shown in Table 3 below.

Table 3: Guideline values for community noise in specific environments. (From Table 4.1 of WHO Guidelines)

Specific Environment	Critical Health Effect(s)	L _{Aeq} (dB)	Time base (hrs)	L _{Amax,f} (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45

4.0 BACKGROUND NOISE SURVEY

4.1 Survey Methodology

4.1.1 Baseline noise level measurements were completed at the nearest noise sensitive receptors across two separate noise survey studies.

4.1.2 A long term unattended noise survey was completed at Plas Grono Farm (the closest sensitive receptor to the application site) over a 5 day period between the 9th – 14th May 2025. A second, fully attended, noise survey was completed at three additional receptor locations in the wider vicinity of the site during the daytime of 14th February 2026. A monitoring location plan is presented as Figure 3.

4.1.3 Measurements were undertaken with reference to the guidance presented within BS 7445 and BS 4142.

4.2 Instrumentation

4.2.1 Monitoring was undertaken using the equipment detailed in Table 4.

Table 4: Noise Monitoring Equipment

Manufacturer	Type	Serial No.	Date of last calibration
9 – 14th May 2025			
Cirrus	Class 1 Integrating Sound Level Meter CR:1710	G304465	01/06/23
Cirrus	Acoustic Calibrator CR:515	78059	20/08/24
14th February 2026			
Norsonic	Type 1 Precision Sound Analyser Nor:140	1403165	26/11/24
Norsonic	Acoustic Calibrator Nor:1251	34488	21/11/25

4.2.2 During all measurements the microphones were protected with a suitable outdoor windshield and mounted on a tripod. The monitoring positions were ‘free field’ (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

4.2.3 The following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 – 20 min
- Resolution: 1 second

4.2.4 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ± 0.5 dB) in the calibration value was observed between the initial and final checks. Further details are provided in Table 5.

Table 5: Field Calibration Check Details

Date	Serial No.	Calibration Level, dB	Offset, dB
09-14/05/25	G304465	93.7	-0.1
14/02/26	1403165	113.8	0.0

4.3 Ambient Noise Environment

4.3.1 The acoustic environment in the vicinity of the site during the daytime is comprised of contributions from road traffic on the local road network and the A483 to the west of the site. Other anthropogenic contributions include distant noise from industrial commercial activities at the Bersham Enterprise Centre and occasional passing trains on the Chester to Shrewsbury rail line. Occasional aircraft, birdsong and distant livestock were also noted.

4.4 Meteorological Conditions

9 – 14th May 2025

4.4.1 Weather observations were made when in attendance on site during equipment installation and again on equipment collection. During site attendance on the afternoon of Friday the 9th May 2025, conditions were dry and part cloudy (3 Oktas). Windspeeds were negligible and with average air temperatures ranging from 15.0°C to 17.0°C. Relative humidity was 55%. During the daytime of the 14th May 2025, conditions were dry and part cloudy (5 Oktas). Windspeeds were negligible and with average air temperatures ranging from 13.0°C to 17.0°C. Relative humidity was 58%.

4.4.2 Weather conditions during the unattended periods of the survey were measured using a portable Davis Vantage Vue Precision Weather Station located in the vicinity of the long term measurement location. A graphical summary of the key meteorological data obtained from the weather station across the entire survey period is shown as Figure 4. Conditions were generally dry and settled with average wind speeds less than 1.0 ms⁻¹. Relative humidity varied between 38 – 91% and temperatures ranged from 5 – 22°C.

14th February 2026

4.4.3 During the survey conditions were noted to be dry and settled with average wind speeds of approximately 0 – 1 ms⁻¹ and predominantly from the west. Cloud cover was around 0 – 2 oktas, relative humidity varied between 66 – 77% and temperatures ranged from 3 – 5°C.

4.4.4 The weather during the survey was considered suitable for environmental noise monitoring and it is not considered necessary to exclude any of the measured background noise level data due to potential interference from the prevailing meteorological conditions.

4.5 Results

9 – 14th May 2025

4.5.1 A summary of the daytime measurement data collected during the long-term survey at Plas Grono Farm and relevant to the proposed operational hours of the process is summarised in Tables 6. A table of the results for the entire measurement period are presented in Appendix 2.

Table 6: Summary of Measured Sound Levels at Plas Grono Farm (9-14/05/2025)

Measurement Location	Time Period (T)	Ambient Sound Level Average $L_{Aeq,T}$ dB	Background Sound Level Statistical Summary $L_{A90,T}$ dB		
			Mean	Median	Mode
1. Plas Grono Farm	Daytime	53.3	40.2	39.6	37.1

4.5.2 Statistical analysis in line with the example approach presented in Section 8 (Fig. 4) of BS 4142 was also performed on the long term dataset obtained from Plas Grono Farm to provide further information on the background sound level at the assessment location. This analysis is presented in Figure 5 with the lowest most frequently occurring value approximating closely with the median value presented in Table 6.

14th February 2026

4.5.3 This survey was comprised of a series of shorter-term disaggregated measurements at locations representative of the receptors or group of receptors to the west and northwest of the site. The measurement close to Pickering Court was deemed to be representative of the receptors at Croesfoel Court due to the similar setback distances from the A483 dual carriageway. The measurement location at Wrexham Road was deemed to be representative of the rear gardens of these dwellings.

4.5.4 A summary of the daytime noise levels obtained at Glan Yr Afon, Pickering Court and Wrexham Road during the daytime of 14th February 2026 are presented in Table 7.

Table 7: Summary of Measured Sound Levels at Glan Yr Afon, Pickering Court and Wrexham Road (14/02/2026)

Measurement Location	Time Period (T)	$L_{Aeq,T}$ dB	$L_{Amax,T}$ dB	$L_{A10,T}$ dB	$L_{A90,T}$ dB
2. Glan Yr Afon	08:37 – 08:57	49.7	64.8	51.7	47.1
	11:11 – 11:31	49.2	59.5	51.3	46.3
	12:41 – 13:01	51.5	65.9	53.8	48.0
	Average	50	66	52	47
3. Pickering Court / Croesfoel Court	09:15 – 09:35	56.9	69.1	58.7	54.9
	10:12 – 10:32	57.4	64.6	59.1	55.1
	11:44 – 12:04	57.2	68.1	58.0	55.7
	Average	57	69	59	55
4. Wrexham Road (B5605)	09:43 – 10:03	50.7	66.1	52.5	47.1
	10:39 – 10:59	53.2	72.4	54.2	48.5
	12:11 – 12:31	51.2	68.1	53.5	47.3
	Average	52	72	53	48

4.5.5 After reviewing the noise data collected during the surveys, the background sound levels, for the purposes of this assessment, are considered to be as follows:

NSR1	Plas Grono Farm:	39 dB $L_{A90,T}$
NSR2	Glan Yr Afon:	47 dB $L_{A90,T}$
NSR3	Pickering Court:	55 dB $L_{A90,T}$
NSR4	Croesfoel Court:	55 dB $L_{A90,T}$
NSR5	Wrexham Road:	48 dB $L_{A90,T}$

5.0 POTENTIAL NOISE EMISSIONS

5.1 Introduction

5.1.1 The level of noise in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

- (a) the sound level output of the plant or equipment used on site;
- (b) the periods of operation of the plant on site;
- (c) the distance between the source noise and the receiving position;
- (d) the presence of screening due to barriers;
- (e) the reflection of sound;
- (f) soft ground attenuation.

5.1.2 Noise levels from Site operations have been calculated at the identified assessment locations (See Figure 6) based on the following methodologies and assumptions.

5.2 Calculation Methodology

5.2.1 In order to assist in the calculation of predicted noise levels from the site, CadnaA noise modelling software has been used. The noise prediction software has been configured to undertake the noise calculations in accordance with ISO 9613 'Acoustics - Attenuation of sound during propagation outdoors'. Noise model configuration details are outlined in Table 8 below.

Table 8: Noise Model Configuration Details

Parameter	Input
Software	DataKustik GmbH CadnaA v.2025 (build: 209.5501)
Calculation Standards/Guidelines	ISO 9613-2:2024
Model of Terrain	Triangulation
Max. Order of Reflection	2
Ground Attenuation	Spectral
Frequency Band Calculation	Octave Bands (63Hz – 8kHz)
Temperature / Relative Humidity	10°C / 70%
Topographic data	3D contour data – 1.0m DTM LiDAR
Ground Absorption	Default 1.0, Site 0.0
Receiver Heights	1.5m above ground level

- 5.2.2 Within the model, HGVs and mobile plant movements have been modelled as line sources. Point sources have been used to represent stationary or quasi-stationary activities such as processing plant and activities undertaken in a defined area such as the unloading/loading of materials.
- 5.2.3 For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. ‘Soft’ ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to ‘hard’ ground surfaces which reflect sound such as paving, asphalt and surface water.
- 5.2.4 The modelling software predictions assume conditions favouring sound propagation from source to receiver. The ISO 9613 calculation methodology assumes wind direction with $\pm 45^\circ$ of the direction connecting the centre of the dominant sound sources and the centre of the specified receptor region, together with wind speeds of between 1 – 5 ms^{-1} . It should therefore be noted that in practice the eventual longer-term measured levels are invariably lower than predicted levels due to the temporal variation in meteorological conditions.
- 5.2.5 The predictions made by the modelling software are for ‘free-field’ sound levels to allow for an appropriate comparison with the free-field background sound levels measured during the survey.
- 5.2.6 The convention applied within BS 4142, and this report, is that all measured or calculated numbers are rounded to the nearest whole number with 0.5 being rounded up.

5.3 Noise Source Details

- 5.3.1 Information regarding potential operations at the site has been based on discussions with the applicant and the proposed permit application plans.
- 5.3.2 A list of noise generating plant and activities, from which the noise predictions have been made, is presented in Appendix 3 along with a number of assumptions regarding typical operating times and vehicle movements.
- 5.3.3 As the detail relating to the plant and machinery to be utilised on-site is outline at this stage, it has been deemed appropriate to adopt the sound power level data presented in BS 5228-1: 2009+A1:2014 *Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise* for equipment operating at similar sites. Noise levels for the crusher have been referenced from Vibrock’s noise source library dataset for similar equipment.

5.4 Operational Scenario

5.4.1 The colliery spoil heap will be worked over a number of years to remove the material for processing. This will effectively reduce the height of the existing colliery spoil heap and therefore the acoustic screening that this feature affords to receptors to the north, west and northwest of the processing area. Figure 7 illustrates the current and future year elevations across the site.

5.4.2 To present a worst-case scenario, the final year of operations have been predicted at the identified receptor locations. During this operational year, the colliery spoil heap will be at a height of 112 metres AOD along a transect from the southern corner to the north side of the redline boundary. We have been advised that an 8 metre high bund embankment will be retained to the north side of the site to protect the watercourse, Pentrebychan Brook. To protect receptors to the west through to north-west of the site, an embankment of 6-8 metres in height has been retained in the noise prediction model at the boundary with the A483.

5.4.3 Four scenarios have been modelled based on the information presented above and summarised in Appendix 3. The scenarios include:

1. HGVs and dump trucks arriving on-site, loading/unloading with 360 excavator, HGVs departing site, via wheel wash and weighbridge.
2. Shovel loading crusher/screener from stockpiles, 360 excavator, crusher/screener and water pumps operating.
3. Storage of material in stockpiles using shovel loader and 360 excavator.
4. Cumulative scenario – all plant, machinery and process running.

5.4.4 In the four scenarios above, the generator supplying site power is operating continuously.

5.5 Calculation Results

5.5.1 A summary of the noise prediction results for each operational scenario identified above at the assessment locations are presented in Table 9 below.

Table 9: Predicted Specific Sound Levels (L_s) at each NSR

Receptor ID	Calculated Specific Sound Level L_s (free-field) dB Daytime Operational Scenario			
	1	2	3	4
NSR 1 – Plas Grono Farm	41	52	41	52
NSR 2 - Glan Yr Afon	32	40	32	41
NSR 3 - Pickering Court	32	41	32	41
NSR 4 - Croesfoel Court	33	42	32	43
NSR5 - Wrexham Road (B5605)	33	43	33	43

6.0 ASSESSMENT

6.1 BS 4142 Assessment

6.1.1 This assessment has been undertaken with reference to the guidance provided within BS 4142.

6.1.2 This standard requires the following levels to be established:

- The Background Sound Level
- The Specific Sound Level
- The Rating Level

Background Sound Level

6.1.3 BS 4142 requires the quantification of typical background sound levels at locations representing the noise-sensitive receptors. The results of the survey are presented in Section 4 of this report.

Specific Sound Level

6.1.4 The specific sound level has been determined by calculation following the guidance within Section 7 of BS 4142. The method of calculation is explained in Section 5 of this report.

Rating Level

6.1.5 In determining the Rating Level it is recognised that certain acoustic features can increase the significance of noise impact over that expected from a basic comparison between the specific sound level and the background sound level.

6.1.6 The total daytime noise emissions associated with the operations at the site are likely to be lower than the ambient daytime noise level at the nearest noise sensitive receptor (NSR). Table 10 presents the range of predicted specific noise levels and the daytime residual noise level prevailing at each receptor in the baseline year, without development.

Table 10: Acoustic Character Corrections to be Applied to the Specific Noise Level

Receptor ID	Range of Specific noise levels, dB L_S	Residual noise level, dB $L_{Aeq,T}$	Acoustic Character Correction, dB
NSR 1 – Plas Grono Farm	41 – 52	53	+3 ¹
NSR 2 - Glan Yr Afon	32 – 41	50	0 ²
NSR 3 - Pickering Court	32 – 41	57	0 ²
NSR 4 - Croesfoel Court	33 – 43	57	0 ²
NSR5 - Wrexham Road (B5605)	33 – 43	52	0 ²
¹ +3 dB added for just perceptible impulsivity during the daytime. ² No acoustic character correction added where the prevailing ambient noise level is approximately 10 dB or more higher than the predicted specific noise level.			

6.1.7 The equipment and machinery in operation is unlikely to contain any significant tonal or intermittent features that would be readily distinguishable above the general ambient sound at each receptor. However, it is considered that noise from activities associated with the placement of materials in the hopper, into HGVs and on the ground could contain impulsive features that are just audible at times at Plas Grono Farm.

6.1.8 In accordance with BS 4142 it is considered appropriate to apply a correction of +3 dB for ‘just perceptible impulsivity’ during the daytime for the receptor Plas Grono Farm. Further corrections for characteristics such as tonality or intermittency are not required where one characteristic is subjectively prominent over the other.

Initial Estimate of Impact

6.1.9 The following Tables 11 – 14 present an ‘initial estimate’ of the potential impact of the proposals in accordance with BS 4142 for each operational scenario at the NSRs.

6.1.10 Table 11 below presents the assessment of impact for Scenario 1 (Material Delivery).

Table 11: Initial Estimate of Impact (BS 4142) – Scenario 1 (Material Delivery)

NSR	Background Sound Level $L_{A90,T}$ dB	Specific Sound Level L_S dB	Acoustic Feature Correction, dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
1 (Plas Grono Fm)	39	41	+3	44	+5
2 (Glan Yr Afon)	47	32	0	32	-15
3 (Pickering Court)	55	32	0	32	-23
4 (Croesfoel Court)	55	33	0	33	-23
5 (Wrexham Road)	48	33	0	33	-15

6.1.11 Table 12 below presents the assessment of impact for Scenario 2 (Material Processing).

Table 12: Initial Estimate of Impact (BS 4142) – Scenario 2 (Material Processing)

NSR	Background Sound Level $L_{A90,T}$ dB	Specific Sound Level L_S dB	Acoustic Feature Correction, dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
1 (Plas Grono Fm)	39	52	+3	55	+16
2 (Glan Yr Afon)	47	40	0	40	-7
3 (Pickering Court)	55	41	0	41	-14
4 (Croesfoel Court)	55	42	0	42	-13
5 (Wrexham Road)	48	43	0	43	-5

6.1.12 Table 13 below presents the assessment of impact for Scenario 3 (Storage Process).

Table 13: Initial Estimate of Impact (BS 4142) – Scenario 3 (Storage Process)

NSR	Background Sound Level $L_{A90,T}$ dB	Specific Sound Level L_s dB	Acoustic Feature Correction, dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
1 (Plas Grono Fm)	39	41	+3	44	+5
2 (Glan Yr Afon)	47	32	0	32	-15
3 (Pickering Court)	55	32	0	32	-23
4 (Croesfoel Court)	55	32	0	32	-23
5 (Wrexham Road)	48	33	0	33	-15

6.1.13 Table 14 below presents the assessment of impact for Scenario 4 (Cumulative).

Table 14: Initial Estimate of Impact (BS 4142) – Scenario 4 (Cumulative)

NSR	Background Sound Level $L_{A90,T}$ dB	Specific Sound Level L_s dB	Acoustic Feature Correction, dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
1 (Plas Grono Fm)	39	52	+3	55	+16
2 (Glan Yr Afon)	47	41	0	41	-6
3 (Pickering Court)	55	41	0	41	-14
4 (Croesfoel Court)	55	43	0	43	-12
5 (Wrexham Road)	48	43	0	43	-5

6.1.14 Typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact. BS 4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

- 6.1.15 The initial estimates presented above provides an indication that the worst-case cumulative development activities are likely to result in a significant adverse impact at Plas Grono Farm during material processing and a cumulative scenario in accordance with BS 4142, depending on the context.
- 6.1.16 When considering delivery/collection and movement of materials around the site, predicted impacts are likely to result in not greater than adverse impact at Plas Grono Farm, depending on the context.
- 6.1.17 At all other assessed NSRs, the rating level as a result of the process will not exceed the background sound level in the final year. A low impact is predicted.
- 6.1.18 It should be noted that the initial estimates are not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

Context

- 6.1.19 In addition to the initial estimate of noise impact which has determined the excess of rating level over background sound level, the following should also be considered as part of the impact assessment process:
- *Operational Period* – The noise sources under assessment, i.e. the operations associated with the process, would entirely take place during the daytime period when existing residents are likely to be at work, or at home undertaking activities where task interruption is the priority concern. The total noise from the process is likely to vary across a typical working day and will be highest when the crusher and screening plant is operational.
 - *Character of the Sound* – As part of the assessment the potential character of the sound has been assessed and an acoustic feature correction applied accordingly in accordance with BS 4142. The existing acoustic environment around the site is influenced predominantly by road and rail traffic but also comprises a range of other commercial sound sources. Overall, the character of the sound from the proposed operations at the receptors could at times be considered incongruous with the residual acoustic environment. This has been addressed through the application of an appropriate acoustic character correction.
 - *Absolute Level of Sound* – In some circumstances, absolute noise levels can be as, or more, relevant than the margin by which the rating level exceeds the background. With reference to the *guide* values recommended by BS 8233 and WHO, worst-case absolute external noise levels from the operations are such that the noise emissions are considered likely to have a low impact on residents using private external amenity areas during the daytime. When considering an open window provides approximately 15 dB(A) reduction from an external level to an internal level the internal daytime criterion of 35 dB $L_{Aeq,T}$ will be marginally exceeded at Plas Grono Farm.

- *Comparison to the Residual Sound* – Worst-case noise emissions from the site are expected to be lower than the residual sound levels at the nearest noise *sensitive* premises to the site during the daytime.

6.1.20 Considering the above points revision of the initial estimate of impact using context as described in BS 4142 is not proposed at this stage.

6.1.21 Having consideration to the outcome of the BS 4142:2014 assessment during the daytime at Plas Grono Farm, consideration to mitigation is warranted and is described in the following section.

Uncertainty

6.1.22 Uncertainty can occur throughout all aspects of the noise measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. During this process reference has been made to BS 4142 Annex B '*Consideration of uncertainty and good practice for reducing uncertainty*'.

6.1.23 The following list details the key steps taken to reduce uncertainty:

- Background sound level measurements were made in close proximity to the assessment locations and over a long duration to ensure that the acoustic environment was accurately characterised;
- Measurement procedures were in accordance with Section 6 of BS 4142 including precautions against interference such as unsuitable weather conditions;
- Monitoring carried out by experienced and qualified acousticians holding full membership of the Institute of Acoustics (MIOA);
- Site noise levels were determined by calculation with reference to Section 7 of BS 4142 and utilising the methodology outlined within ISO 9613 which is a widely accepted standard for the calculation of outdoor sound propagation;
- Source noise levels have been taken from the tabular data presented in BS 5228-1 and Vibrock's extensive noise source library for similar plant and machinery. The predicted noise levels in the model at 4 metres and 10 metres from the screener were consistent with measured operational noise levels from other washing and screening quarry plant albeit for coarse cobble sized material. These levels are considered to be worst case and the operational noise levels of the proposed plant are likely to be lower due to the finer material being processed on-site.
- The instrumentation used was in accordance with Section 5 of BS 4142. Use of digital transfer methods and equipment whose conformity and calibration have been checked periodically.

7.0 MITIGATION

7.1 BS 4142:2014+A1:2019 – Daytime Noise Impact

- 7.1.1 The assessment has identified that noise generated by a cumulative operation of the existing and future proposed plant during daytime operational periods could result in significant adverse impacts at the nearest NSR, Plas Grono Farm. Mitigation will be required to address these potential impacts.
- 7.1.2 As the predictions have been undertaken considering the comprehensive list of proposed plant, an analysis of the partial noise contribution at the receptor from each plant item has been completed.
- 7.1.3 When considering the nearest receptor at Plas Grono Farm, it is apparent that the loudest plant item is the ‘Crusher’ and ‘Screen Stockpiler’ i.e. the processing train. A summary of the partial specific noise levels of each plant item at the receptor is presented in Appendix 4 with the contribution from the ‘Crusher’ and ‘Screen Stockpiler’ indicated in red text. It should be noted that the predicted partial specific noise levels from the majority of the proposed mobile plant is significantly lower than the contributions from the screener.
- 7.1.4 The hierarchy of mitigation options have been explored with a focus towards the use of localised screening, acoustically treating hoppers and conveyors to reduce noise generation from the processing plant and general control measures.
- 7.1.5 An environmental noise barrier effectively screening the Parnaby screener from view of the NSR will achieve a reduction in operational noise of approximately 7 dB(A) (See Figure 8). The barrier will have to be installed with a minimum continuous height of 5 metres, have no gaps or breaks in its surface, be sealed at its base and have a surface density of at least 10 kg/m², as described in ISO 9613-2.
- 7.1.6 In addition, a number of noise control measures applicable to construction and demolition activities and which can be applied to the activities undertaken are recommended. These measures can be presented within a Noise Management Plan (NMP) and a few examples are presented below.
- Activities in the yard outside of the times permitted in Section 2 will not be undertaken.
 - Careful planning of activities and selection of plant to reduce noise emissions.
 - Locating static noisy plant in use as far away from sensitive receptors as is feasible for the particular activity.
 - Using suitable equipment and ensuring such equipment is properly maintained and operated by trained staff.
 - Using silenced equipment where possible.

- Vehicles and plant to be properly maintained and operated according to manufacturers' recommendations, in such a manner as to avoid causing excessive noise.
- Engine compartments and pumphouse doors to the wheel wash should be closed when equipment is in use and the resonance of body panels and cover plates reduced through the addition of suitable dampening materials.
- Where practicable, rubber linings would be used on chutes and dumper trucks, etc.
- Drop heights would be minimised when loading/unloading vehicles and hoppers.
- Ensuring plant machinery is turned off when not in use.
- Care to be taken regarding the need for reversing alarms, where possible, install non-tonal alarms.

7.1.7 The actual noise reductions that these measures could achieve is not known at this stage. However, experience would suggest that reductions of 5-10 dB can be achieved through implementation of some or all measures concurrently.

7.1.8 Table 15 presents the revised 'with mitigation' BS 4142 assessment process for the worst case cumulative scenario. Due to the predicted specific noise level being around 10 dB(A) lower than the prevailing residual sound level, no acoustic character correction has been applied for the receptor at Plas Grono Farm.

Table 15: Revised Estimate of Impact (BS 4142) – Proposed Operations

Scenario	Background Sound Level $L_{A90,T}$ dB	Specific Sound Level $L_{Aeq,Tr}$ dB	Acoustic Feature Correction dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
Cumulative	39	43	+0	43	+4

7.1.9 With the revised plant complement in place, the 'with mitigation' BS 4142 assessment of noise generated by a daytime cumulative scenario is predicted to be no greater than adverse impact at all NSRs.

7.1.10 The Environment Agency's guidance, Noise and vibration management: environmental permits, 2022 advises that it is the operator's responsibility *"to avoid significant pollution [our emphasis] and to demonstrate that you are using BAT or appropriate measures to prevent, or where that is not practicable, to minimise noise impact."*

7.1.11 Further mitigation measures including additional acoustic barriers at the boundary of the site and/or raising the height of the recommended barrier are unlikely to afford more than a 1-2 dB(A) reduction in noise from the processing plant. Such measures are likely to be very costly to implement with a negligible benefit to the receptor.

8.0 SUMMARY

- 8.1 An assessment of potential noise impact associated with the permit application has been made following the guidance presented within BS 4142 and the specific supplementary guidance set out by Natural Resources Wales and the Environment Agency.
- 8.2 Following an initial estimate of noise impact, along with consideration of the context and any potential effects of uncertainty, the proposed operations are likely to have a significant adverse impact at the nearest noise sensitive receptor.
- 8.3 Mitigation options have been presented and discussed together with a revised assessment of impact. Assuming a barrier with a minimum height of 5 metres is installed adjacent to the Parnaby screener and that physical and management controls are employed on site the residual impact is predicted to be no greater than 'adverse impact'. It is therefore considered that there will be no significant or unacceptable adverse impacts at existing noise-sensitive premises in the vicinity of the site.

9.0 REFERENCES

1. ANC Guidelines: *Environmental Sound Measurement Guide*. ANC. May 2021.
2. BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*, British Standards Institution 2019.
3. BS 7445-1:2003 *Description and measurement of environmental noise – Part 1 Guide to quantities and procedures*. British Standards Institution 2003.
4. *Guidance: Method implementation document (MID) for BS 4142*. Environment Agency Environment Agency, Natural Resources Wales and Department of the Environment (Northern Ireland). December 2023.
5. *Guidance: Noise impact assessments involving calculations or modelling*. Environment Agency. August 2022.
6. *Guidance: Noise and vibration management: environmental permits*. Environment Agency. January 2022.
7. *Guidance: Risk assessments for your environmental permit*. Environment Agency and Department for Environment, Food and Rural Affairs. January 2025.
8. *Guidelines for Environmental Noise Impact Assessment, v1.2*. Institute of Environmental Management & Assessment. November 2014.
9. ISO 9613-2:2024 *Acoustics - Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors*. Edition 2, 2024.
10. *Environmental Permits: Horizontal Guidance - Noise and vibration management*. Natural Resources Wales

FIGURE 1

Redline Boundary

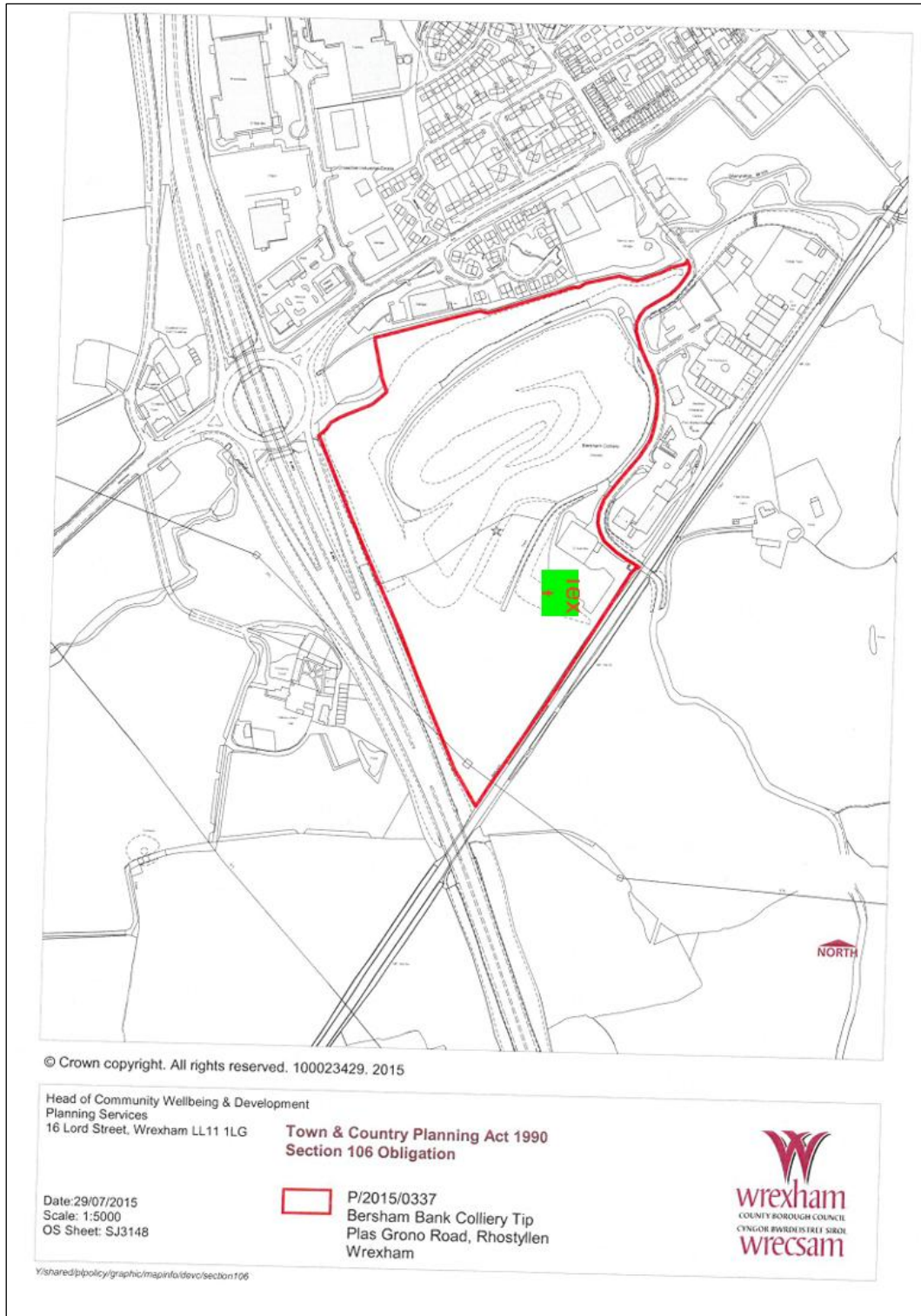


FIGURE 2

Proposed Site Layout

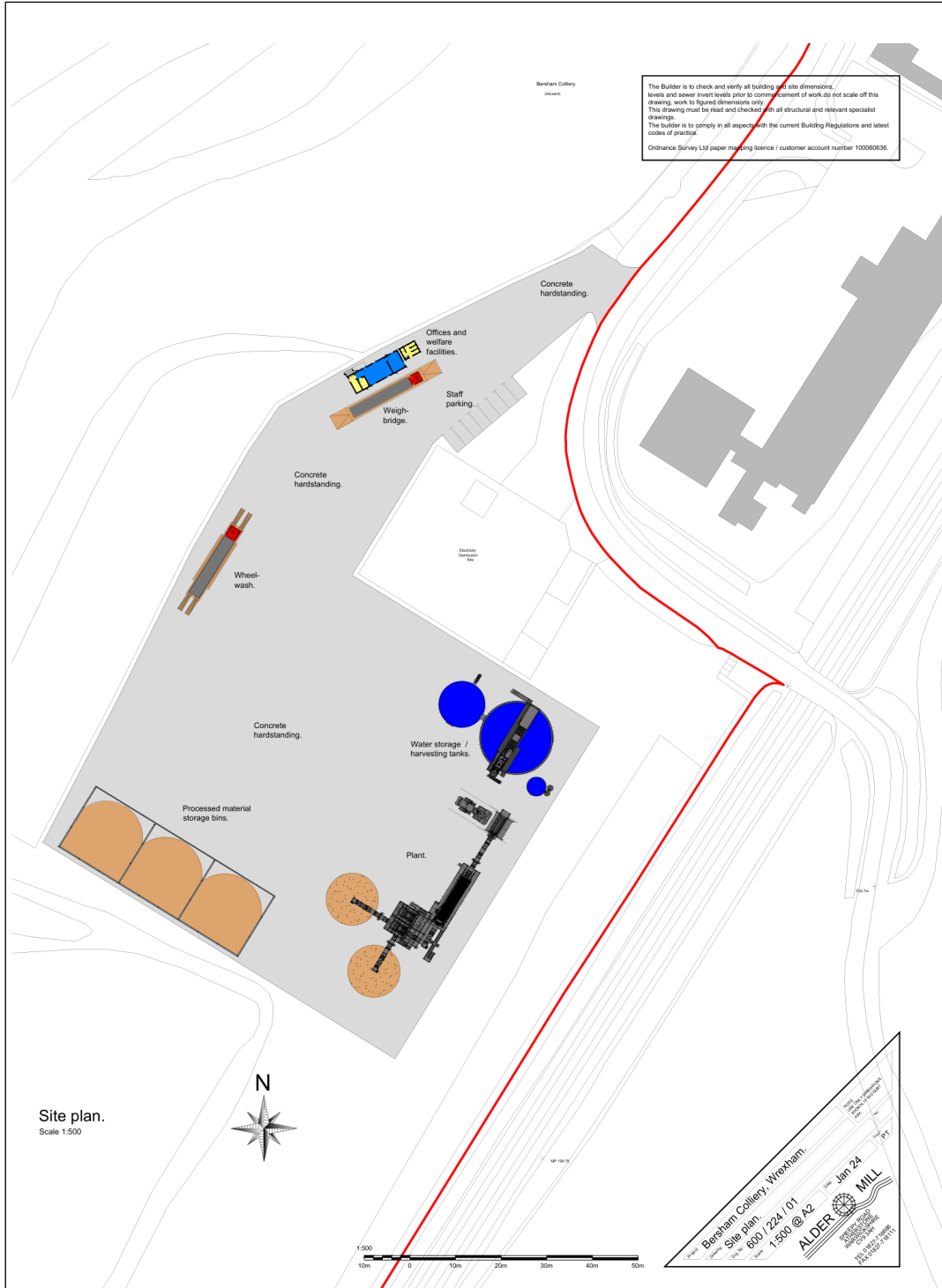


FIGURE 3

Measurement Location Plan

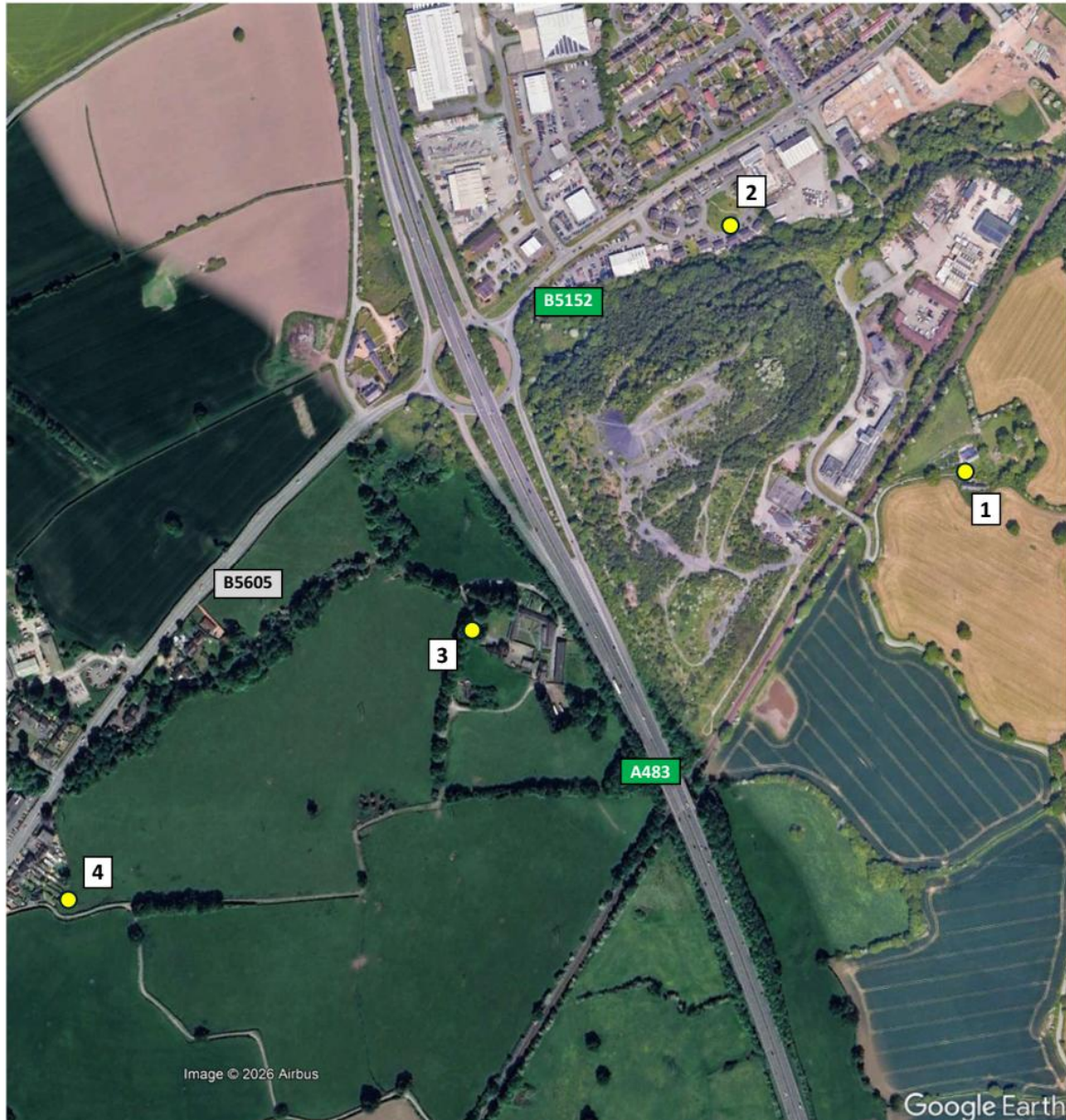


FIGURE 4

Meteorological Conditions 9-14 May 2025

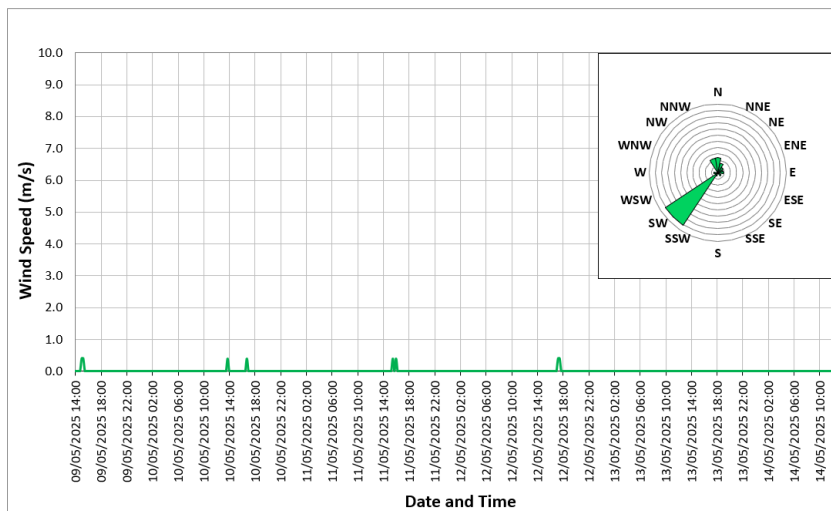
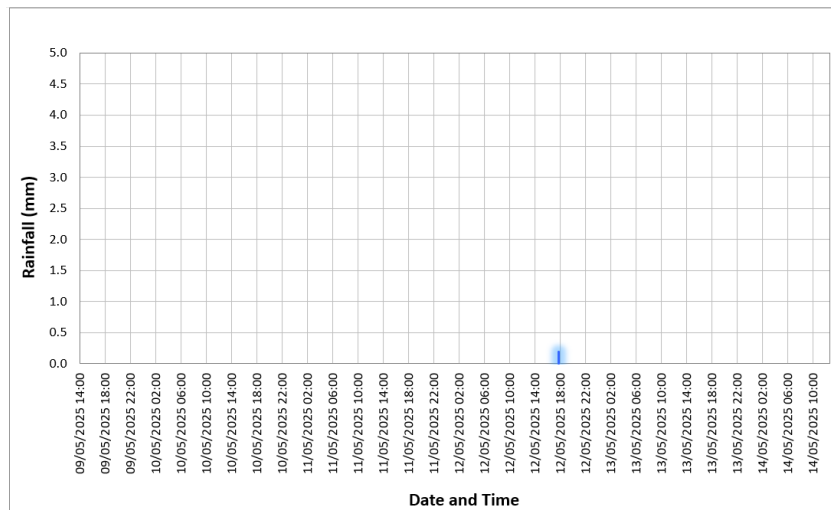
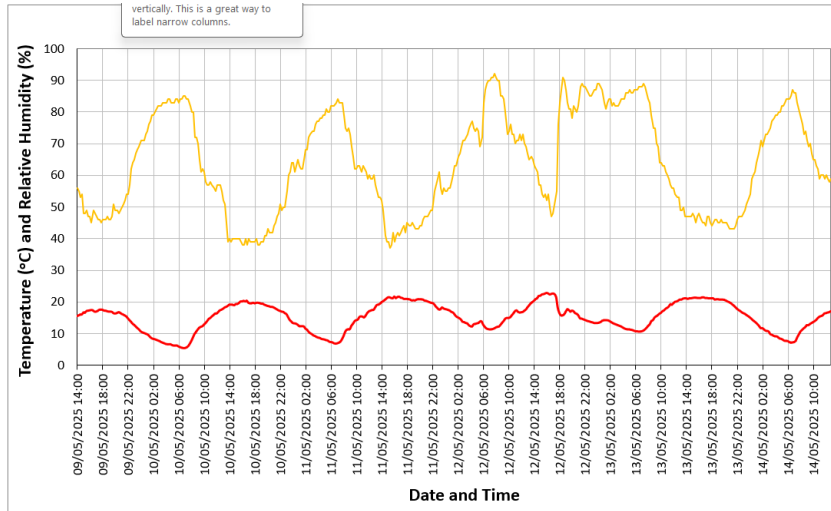


FIGURE 5

Statistical Analysis to Determine the Background Sound Level

Location 1 (Plas Grono Farm) 9-14 May 2025

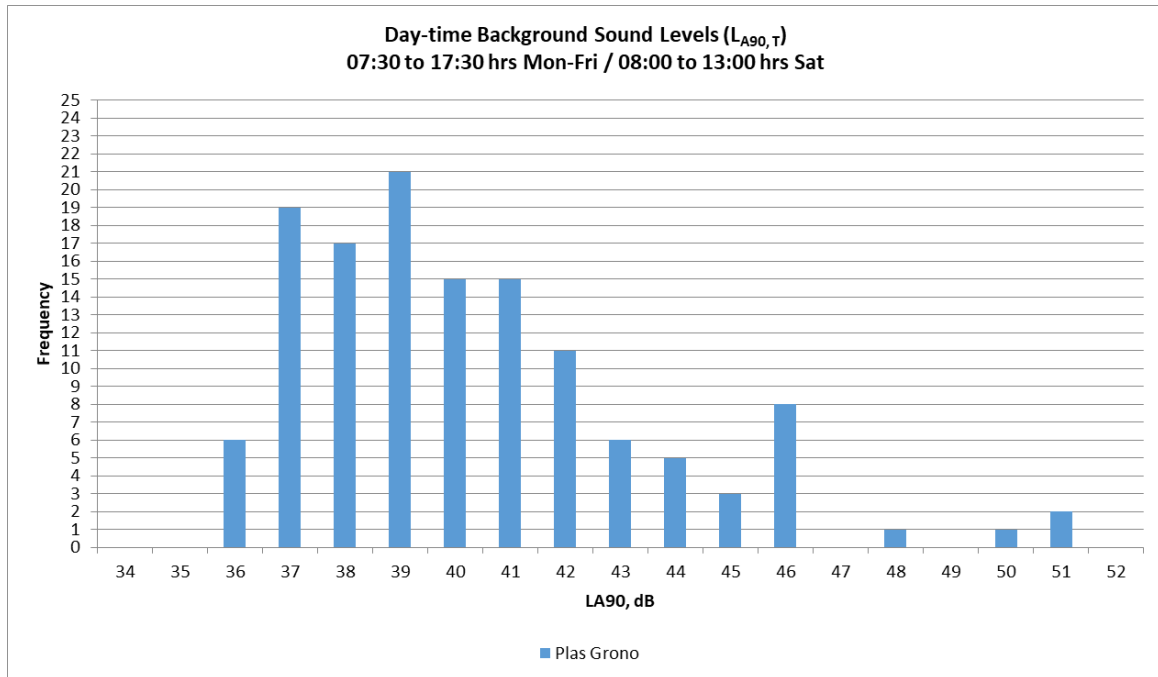


FIGURE 6

Noise Sensitive Receptor Locations



FIGURE 7

Site Elevations

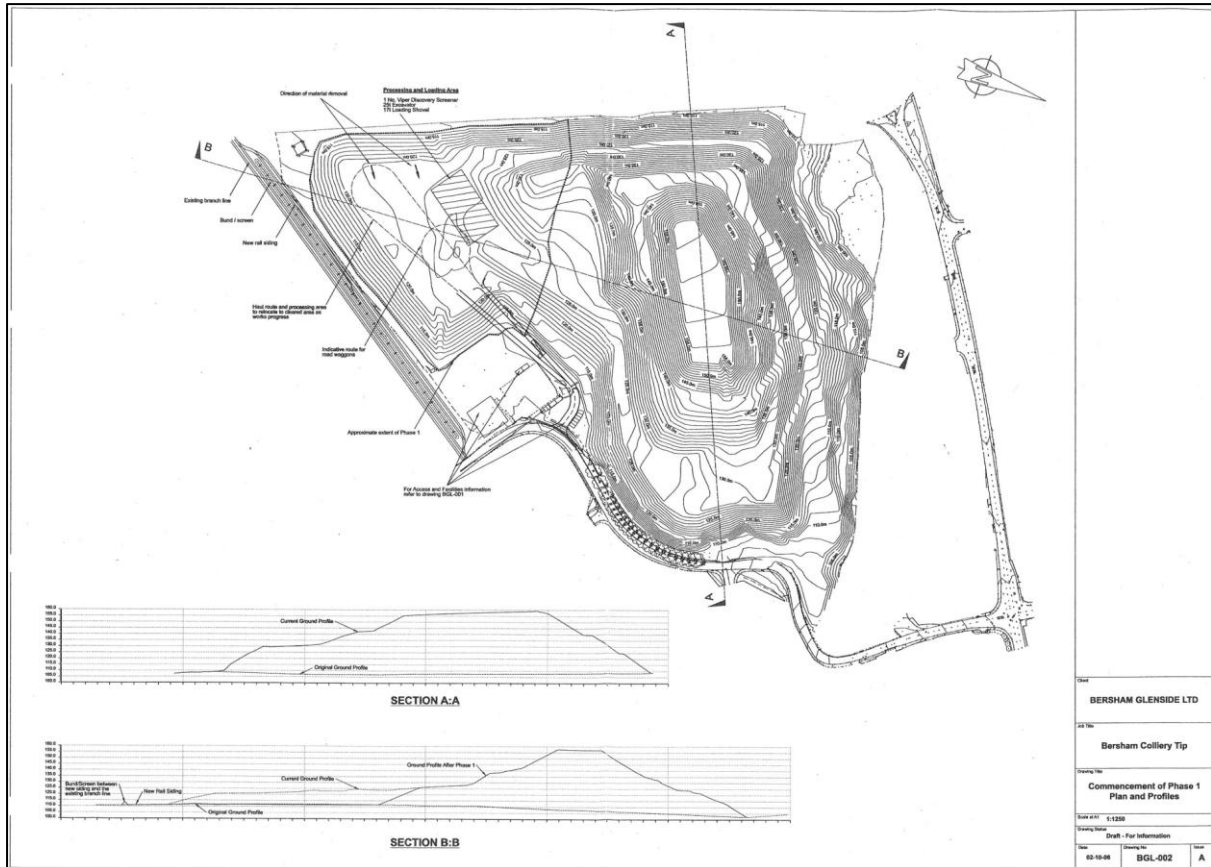
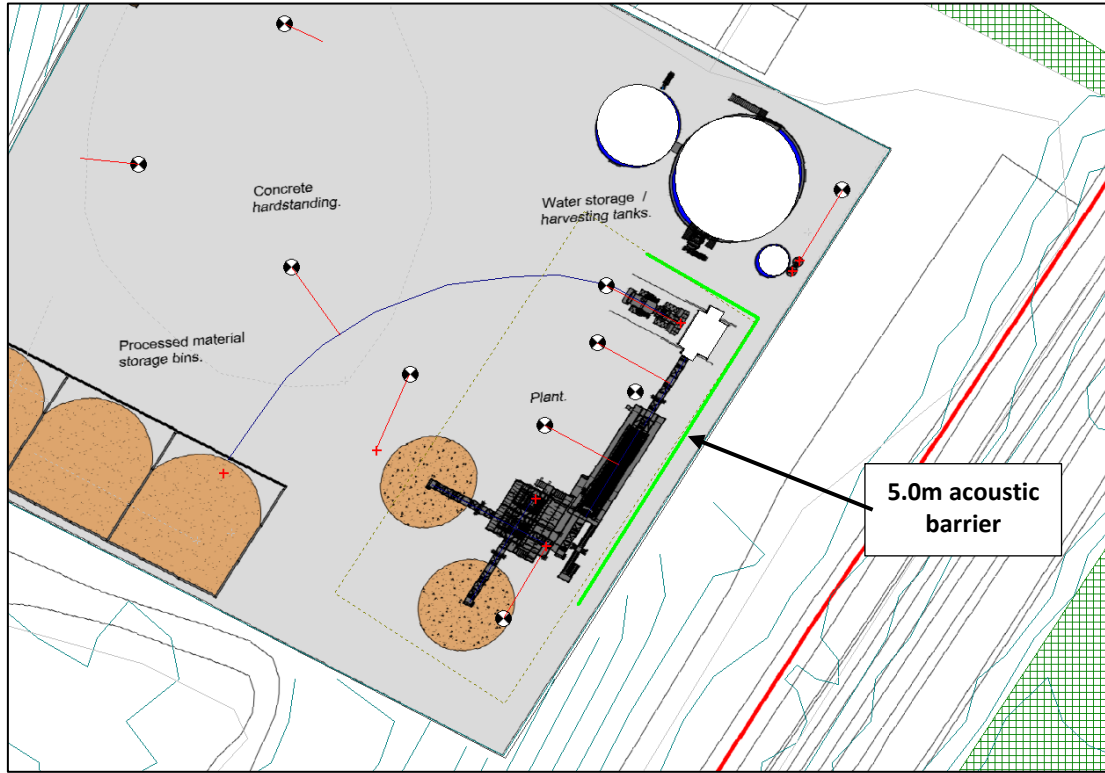


FIGURE 8

Recommended Mitigation Acoustic Barrier Location



APPENDIX 1

Terminology and Definitions

Acoustic Environment

Sound from all sound sources as modified by the environment.

Ambient Sound Level $L_{Aeq,T}$

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

A-weighting

The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Background Sound Level $L_{A90,T}$

The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, T , measured using time weighting F.

Break-out

Noise transmission from inside a structure to the outside.

Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$

Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T , has the same mean square sound pressure as a sound under consideration whose level varies with time.

Free-field Level

The sound pressure level away from reflecting surfaces.

NOTE Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.

Measurement time interval, T_m

Total time over which measurements are taken.

Octave band

Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Rating Level $L_{Ar,Tr}$

The specific sound level plus any adjustment for the characteristic features of the sound.

Reference Time Interval, T_r

The specified interval over which the specific sound level is determined.

NOTE This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).

Residual Sound Level $L_{Aeq,T}$

Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.

Sound Power Level, L_{WA}

The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.

Specific Sound Level (also referred to as 'site noise') $L_{Aeq,Tr}$

Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.

Specific sound source

Sound source being assessed.

APPENDIX 2

Noise Monitoring Data – Plas Grono Farm

Date and Time	L1	
	L _{Aeq,T} (dB)	L _{A90,T} (dB)
Friday 9th May 2025		
09/05/2025 12:45	49.2	39.3
09/05/2025 13:00	51.7	39.5
09/05/2025 13:15	54.8	42.4
09/05/2025 13:30	48.2	39.0
09/05/2025 13:45	52.1	45.5
09/05/2025 14:00	51.0	45.0
09/05/2025 14:15	53.3	45.7
09/05/2025 14:30	52.8	45.1
09/05/2025 14:45	51.9	45.8
09/05/2025 15:00	53.4	45.7
09/05/2025 15:15	51.4	45.6
09/05/2025 15:30	50.6	41.5
09/05/2025 15:45	51.7	45.8
09/05/2025 16:00	54.9	45.3
09/05/2025 16:15	53.3	46.2
09/05/2025 16:30	65.2	42.5
09/05/2025 16:45	52.9	43.9
09/05/2025 17:00	53.0	39.9
09/05/2025 17:15	49.6	37.8
Saturday 10th May 2025		
10/05/2025 08:00	47.3	37.1
10/05/2025 08:15	52.6	37.7
10/05/2025 08:30	55.3	37.8
10/05/2025 08:45	53.0	37.1
10/05/2025 09:00	50.1	35.9
10/05/2025 09:15	50.7	35.9
10/05/2025 09:30	54.0	36.9
10/05/2025 09:45	52.5	37.5
10/05/2025 10:00	52.3	38.5
10/05/2025 10:15	51.7	38.2
10/05/2025 10:30	51.5	37.1
10/05/2025 10:45	49.9	37.6
10/05/2025 11:00	50.6	40.3
10/05/2025 11:15	49.7	39.5
10/05/2025 11:30	51.8	37.8
10/05/2025 11:45	51.8	40.5
10/05/2025 12:00	52.6	39.7

Date and Time	L1	
	L _{Aeq,T} (dB)	L _{A90,T} (dB)
10/05/2025 12:15	52.3	43.8
10/05/2025 12:30	53.7	44.2
10/05/2025 12:45	53.9	44.4
Monday 12th May 2025		
12/05/2025 07:30	53.5	41.4
12/05/2025 07:45	52.9	39.6
12/05/2025 08:00	53.9	41.0
12/05/2025 08:15	50.5	39.4
12/05/2025 08:30	49.9	40.3
12/05/2025 08:45	53.8	42.3
12/05/2025 09:00	51.7	42.3
12/05/2025 09:15	49.2	38.9
12/05/2025 09:30	51.4	41.2
12/05/2025 09:45	52.3	41.2
12/05/2025 10:00	52.2	41.1
12/05/2025 10:15	53.4	41.7
12/05/2025 10:30	52.2	42.7
12/05/2025 10:45	53.5	44.0
12/05/2025 11:00	52.7	42.6
12/05/2025 11:15	54.1	42.4
12/05/2025 11:30	52.5	38.6
12/05/2025 11:45	58.7	39.2
12/05/2025 12:00	53.0	40.6
12/05/2025 12:15	51.2	40.2
12/05/2025 12:30	55.2	40.4
12/05/2025 12:45	53.6	40.6
12/05/2025 13:00	57.8	41.6
12/05/2025 13:15	51.9	40.5
12/05/2025 13:30	51.7	43.2
12/05/2025 13:45	50.8	41.0
12/05/2025 14:00	51.6	40.5
12/05/2025 14:15	50.8	42.7
12/05/2025 14:30	54.2	42.1
12/05/2025 14:45	46.0	39.1
12/05/2025 15:00	51.0	36.5
12/05/2025 15:15	51.0	36.6
12/05/2025 15:30	51.6	39.8
12/05/2025 15:45	52.5	41.8
12/05/2025 16:00	53.3	42.6
12/05/2025 16:15	54.7	50.1
12/05/2025 16:30	58.6	50.9
12/05/2025 16:45	56.8	47.9
12/05/2025 17:00	55.9	50.7

Date and Time	L1	
	L _{Aeq,T} (dB)	L _{A90,T} (dB)
12/05/2025 17:15	52.5	45.5
Tuesday 13th May 2025		
13/05/2025 07:30	53.4	41.1
13/05/2025 07:45	54.3	39.1
13/05/2025 08:00	54.8	38.6
13/05/2025 08:15	57.7	38.5
13/05/2025 08:30	50.0	37.0
13/05/2025 08:45	51.4	37.9
13/05/2025 09:00	53.3	38.5
13/05/2025 09:15	50.7	37.6
13/05/2025 09:30	50.5	37.0
13/05/2025 09:45	50.9	37.3
13/05/2025 10:00	50.6	36.7
13/05/2025 10:15	50.1	36.8
13/05/2025 10:30	52.5	36.3
13/05/2025 10:45	53.4	35.8
13/05/2025 11:00	53.4	37.3
13/05/2025 11:15	53.3	38.1
13/05/2025 11:30	50.6	37.0
13/05/2025 11:45	49.0	38.5
13/05/2025 12:00	52.2	39.3
13/05/2025 12:15	49.1	39.8
13/05/2025 12:30	49.5	40.1
13/05/2025 12:45	55.6	40.8
13/05/2025 13:00	50.1	38.8
13/05/2025 13:15	55.2	38.4
13/05/2025 13:30	52.0	37.0

Date and Time	L1	
	L _{Aeq,T} (dB)	L _{A90,T} (dB)
13/05/2025 13:45	51.2	38.1
13/05/2025 14:00	55.2	38.4
13/05/2025 14:15	55.2	41.9
13/05/2025 14:30	50.8	39.2
13/05/2025 14:45	53.1	38.0
13/05/2025 15:00	52.0	41.2
13/05/2025 15:15	54.1	41.0
13/05/2025 15:30	52.5	41.6
13/05/2025 15:45	54.6	40.1
13/05/2025 16:00	53.2	40.1
13/05/2025 16:15	54.8	38.2
13/05/2025 16:30	51.1	38.7
13/05/2025 16:45	47.5	37.1
13/05/2025 17:00	51.8	39.1
13/05/2025 17:15	50.4	37.1
Wednesday 14th May 2025		
14/05/2025 07:30	53.5	38.9
14/05/2025 07:45	55.3	38.6
14/05/2025 08:00	54.1	38.7
14/05/2025 08:15	53.7	38.4
14/05/2025 08:30	54.4	39.9
14/05/2025 08:45	52.0	35.9
14/05/2025 09:00	49.5	36.4
14/05/2025 09:15	49.8	36.7
14/05/2025 09:30	50.3	38.1
14/05/2025 09:45	49.4	36.8
14/05/2025 10:00	53.4	36.7

APPENDIX 3

Noise Source Model Inputs

Plant/ Activity	Octave band sound pressure levels, Hz (dB)								Sound Pressure Level dB(A)	Distance (m)	Source Height relative to ground (m)	Co-ordinates (m)			On-time Assumptions (relative to reference time interval)
	63	125	250	500	1k	2k	4k	8k				X	Y	Z	
Face Shovel Loading Hopper	84.0	88.0	81.0	74.0	74.0	71.0	66.0	65.0	80	10	3.0	331341	347988	107	7% ¹
Wheeled Loader picking up material from stockpile	89.0	80.0	82.0	73.0	70.0	69.0	64.0	57.0	78	10	1.5	331286	347970	106	14% ²
Trakpactor 480SR	84.0	83.5	85.5	84.2	82.9	82.9	79.5	72.4	84	4	3.0	331343	347986	107	100%
Screen Stockpiler	93.0	86.0	79.0	78.0	75.0	71.0	69.0	62.0	81	10	4.0 max. height	Line Source			100%
Conveyor Drive Unit	71.0	69.0	68.0	71.0	75.0	67.0	63.0	57.0	77	10	3.0	331342	347983	107	100%
Water Storage Tank pumps	67.0	65.0	65.0	64.0	63.0	63.0	60.0	54.0	69	10	0.5	331355	347994	105	10%
Generator (Diesel)	82.0	57.0	63.0	48.0	45.0	44.0	40.0	33.0	59	10	0.5	331313	348076	105	100%
Excavator 20 tonne, loading dump trucks	82.0	75.0	72.0	73.0	71.0	70.0	66.0	58.0	76	10	2.0	331305	347972	107	50%

Plant/ Activity	Octave band sound pressure levels, Hz (dB)								Sound Pressure Level dB(A)	Distance (m)	Source Height relative to ground (m)	Co-ordinates (m)			On-time Assumptions (relative to reference time interval)
	63	125	250	500	1k	2k	4k	8k				X	Y	Z	
HGV Drive-by	80.8	74.9	72.1	70.6	69.5	65.0	61.1	56.6	74	5	0.5	Line Source			7 movements per hr Speed 10 mph
HGV idling (Artic Tipper)	71.3	65.0	62.8	62.4	61.5	61.8	56.3	44.4	67	7	1.5	331327	348079	107	58% ³
Wheeled Loader moving between stockpiles and hopper	82.0	82.0	71.0	73.0	69.0	67.0	66.0	58.0	76	10	1.5	Line source			60 movements per hr
Articulated dump truck 40t	88.0	84.0	75.0	73.0	75.0	72.0	68.0	60.0	79	10	2.0	Line source			7 movements per hr Speed 10 mph
Wheel Wash	-	-	-	85.0	-	-	-	-	85	1	1.5	331281	348038	106	7 events of 40 seconds each event
¹ Based on 60 events per hour, of 4 seconds duration each event. ² Based on 60 events per hour, of 8 seconds duration each event. ³ Based on 7 HGV events of 5 minutes duration each event.															

APPENDIX 4

CadnaA® Partial Specific Noise Level of Cumulative Plant at Plas Grono Farm

Time Period: Daytime (07:30 – 17:30 hours)

Source	Partial Level dB(A)
Crusher	46.8
Screen stockpiler	43.7
Conveyor Drive Unit	43.2
Screen stockpiler	41.4
Screen stockpiler	41.0
Screen stockpiler	39.9
Conveyor Drive Unit	39.5
20 tonne excavator	38.9
Wheeled loader	34.9
Front loader (general yard movements)	34.0
Face shovel, loading hopper	33.2
40t maxi dump units arriving	30.8
40t maxi dump units departing	30.5
HGV Idling (Artic Tipper) In yard	28.9
Water Storage pump 2	27.2
Water Storage pump 1	27.0
HGVs departing	25.5
Generator (Diesel)	24.9
HGVs arriving	23.9
Wheel Wash	19.5
HGV Idling (Artic Tipper) On weighbridge	14.9
HGVs departing	13.0