

PROOF OF EVIDENCE

OF

SIMON STEPHENSON

ON BEHALF OF CORNWALL COUNCIL

APPEAL REFERENCE: APP/DO840/A/09/2113075
(PLANNING AUTHORITY REFERENCE 08/00761)

In respect of the Planning Appeal by SITA Cornwall Ltd

Relating to the decision by the former Cornwall County Council (now Cornwall Council) to refuse planning permission for the Cornwall Energy Recovery Centre (CERC) and associated development on land at Rostowrack Farm, Wheal Remfry, Goonvean and Parkandillick Dryers St Dennis St Austell Cornwall.



PREFACE

SIMON JOHN STEPHENSON will say:

I am a Principal Consultant in the Acoustics and Vibration group of Bureau Veritas (BV). I hold a Bachelor of Science (Honours) degree in Physics and I am a member of the Institute of Acoustics and a Chartered Engineer.

Bureau Veritas is a multi-national company providing independent certification, inspection and consultancy. The Acoustics and Vibration Group is a division within Bureau Veritas UK Limited. It undertakes many varied projects for major clients such as Shell, Associated British Ports (ABP), SITA, Veolia, Barratt Homes and many other companies. The group specialises in assessing the effects on the environment of noise sources associated with industry, construction, commerce, leisure, mineral extraction and the waste industry. The group also has an extensive local authority and central Government client base, and is the current technical noise advisor to the UK Government (Defra).

My experience in acoustics and vibration has included the assessment of noise and vibration within most of the above industries. I have also undertaken investigations of noise nuisance and complaints about noise in projects, which have involved modelling the noise emission from large industrial sites to the community. I have undertaken a research project for Defra to develop a new national method for the noise mapping of industrial sources, and have been actively involved in providing technical advice to Defra regarding noise mapping of transportation sources. I have represented both local authorities and developers at public inquiries and hearings and I am experienced in engineering noise control.

I have been particularly involved in the prediction and assessment of noise from waste and power generation developments. In the course of that work I have studied noise and vibration aspects of the construction and operation of a number of developments including energy from waste plants, waste transfer stations, materials recovery facilities and various types of power generation plant.

I was first instructed by Cornwall County Council to provide assistance in reviewing the Environmental Statement (ES) for the Cornwall Energy Recovery Centre in April 2008.

I have visited the appeal site and I am familiar with the area.

1 Introduction and Scope of Evidence

1.1 This Inquiry is being held into an appeal against Cornwall County Council's refusal of SITA Cornwall Limited's planning application to develop an energy from waste plant and ancillary development at Rostowrack Farm and Land at Whealremfry & Goonvean & Parkandillick Dryers, St. Dennis, near St. Austell, Cornwall.

1.2 The reasons for refusal relating to noise impacts are as set out below:

"4) *The proposal would have an unacceptable impact on the network and users of public rights of way. This is contrary to Policy 2 (Character Areas, Design and Environmental Protection), 6 (Waste Management) and 13 (Tourism and Recreation) of the Cornwall Structure Plan 2004, and Policy C1 (Operational Practice) of the Cornwall Waste Local Plan 2002.*

5) *The proposal would have an unacceptable impact on residential amenity due to noise both during the construction and operational stage, particularly in respect of those properties located at "La Mount Corner", Rostowrack and Bodella Farms; north-west Treviscoe and properties immediately adjacent to the proposed haul road. This is contrary to Policy 3 (Use of Resources) and 6 (Waste Management) of the Cornwall Structure Plan 2004; Policy C1 (Operational Practice) of the Cornwall Waste Local Plan 2002, and Policy 37 (Noise) of the Restormel Borough Council Local Plan 2001."*

1.3 The scope of my evidence is to:

- i. provide an analysis of the original application assessment provided by SITA and their consultants, Hoare Lea, regarding noise arising from the proposed development;
- ii. provide my own expert consideration of the impact due to the proposed development; and
- iii. provide a consideration of the noise reasons for refusal.

1.4 My evidence addresses the noise issues associated with the environmental and community impact of construction works and the operation of the proposed development.

2 Site and Scheme Description

2.1 The proposal is to be located at land in and around Rostowrack Farm at St. Dennis, near St. Austell, Cornwall. There are residential properties surrounding the site, as described below:

- Rostowrack Farm – on the north-east boundary of the proposal site;
- Bodella Farm – on the south-west boundary of the proposal site;
- Dwellings on Barton Court and Barton Road, some 70 m south of the proposed access road;
- Properties at La Mount Corner and other properties immediately adjacent to the proposed haul road;
- Various dwellings in Treviscoe, Trerice, Hendra and St Dennis;
- Various footpaths in the vicinity of the proposal site and access routes.

2.2 A map showing the locations of the relevant noise sensitive receiver points is included in Appendix 1 of this proof.

2.3 The current noise environment in the area is mainly influenced by noise from the clay processing plant and china clay workings as well as noise from traffic on the local roads. At night, the current noise environment is principally influenced by noise from the clay processing plant.

2.4 The development proposal is for a twin steam energy recovery facility with a single steam turbine generator designed to utilise the heat generated by combustion of waste.

2.5 The CERC is estimated to generate a total of 350 vehicle movements per day (paragraph 4.5 and note 1 of Chapter 4 in the ES). To reach the site, vehicles will travel along Stamps Hill (from the A30) and, where the road narrows, will join a private haul road which is approximately 2 km in length. Vehicles will then rejoin the highway for approximately 250 m before reaching a junction for the new access road to the site. The access road will be constructed across farmland and will be approximately 750 m in length.

2.6 A fuller description of the proposed development and surrounding area is given in the Environmental Statement prepared by Terence O'Rourke on behalf of SITA. The CERC will operate 24 hours a day, 7 days a week although refuse deliveries and collections will be made

07.00 – 18.00 Monday to Friday and 07.00 – 13.00 on Saturdays. Daily waste delivery will be completed by 17.00 hrs.

2.7 The total construction time for the development is estimated to be 42 months.

3 Introduction to Noise Indices

- 3.1 Noise is defined as unwanted sound and is measured on a logarithmic scale of ‘decibels’, abbreviated to dB. Because it is a logarithmic measure, normal arithmetic processes do not apply in a simple manner. For example, adding 90 dB and 90 dB would not elicit the answer of 180 dB, but would result in 93 dB, i.e. an increase by 3 dB.
- 3.2 The minimum pressure level that a person with ‘normal’ hearing can perceive is normally taken to be 20 μ Pa (which equates to a sound pressure level of 0 dB) and a level of 200 Pa (equivalent to 140 dB) is taken to be the ‘threshold of pain’. In this proof, all sound pressure levels are reported in dB re 20 μ Pa.
- 3.3 The frequency response of the ear is usually taken to be about 20 Hz (number of oscillations per second) to 20 kHz, although in reality humans can hear frequencies lower than 20 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than at the lower and higher frequencies and, because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. For normal environmental noise applications, this is known as ‘A’ weighting and is an internationally accepted standard for noise measurement.
- 3.4 Subjectively, and for steady noise levels, a change in noise level of 3 dBA is the minimum perceptible under normal conditions. Under laboratory conditions a smaller change may be perceptible. Where there is a more distinct time varying characteristic to the noise, such as that from road and rail traffic, a 3 dBA change represents a doubling of traffic flow, all other factors remaining equal.
- 3.5 External noise levels are rarely steady, but rise and fall in response to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise metrics have been developed. These include:

The L_{Amax} noise level:

- 3.6 This is the maximum noise level recorded over the measurement period.

The L_{Aeq} noise level:

- 3.7 The $L_{Aeq,T}$ is defined in BS 7445¹ as “*the value of the A-weighted sound pressure level of 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*”. Expressed more simply, it is the logarithmic average of the noise levels over a given time period. A logarithmic average tends to reflect the noisier levels more than an arithmetic average would. It is a unit commonly used to describe construction noise, noise from industrial premises, noise from railways and aircraft and other forms of environmental noise.

$L_{night,outside}$ noise level (night-time noise indicator)

- 3.8 The L_{night} noise level is defined in the European Noise Directive², article 3 (i) as “*the noise indicator for sleep disturbance*”. Specifically, it is the A-weighted long-term average sound level as defined in ISO 1996-2³, determined over all the night periods of a year (defined as an average year as regards the meteorological circumstances) and in which the incident sound is considered, which means that no account is taken of the sound that is reflected at the façade of the dwelling under consideration. In some documents, the “outside” suffix is used to denote that it is the level determined outside of a property in order to avoid confusion with the internal noise level limits.

The $L_{Ar,Tr}$ noise level:

- 3.9 The noise rating level, denoted $L_{Ar,Tr}$, is defined in BS 4142⁴ as equivalent continuous A-weighted sound pressure level at the assessment position produced by a specific noise source (i.e. just the noise from the source of concern) plus any adjustment for the characteristic features of the noise, such as the presence of whines, hums or bangs, or if it is irregular enough to attract attention.

The L_{A90} noise level:

- 3.10 This is the noise level exceeded for 90% of the time and gives an indication of the underlying noise level during periods which are occasionally punctuated by intermittent noise. This is

¹ British Standard 7445: 2003 “Description and measurement of environmental noise”, Part 1: Guide to quantities and procedures

² European Noise Directive 2002/49/EC

³ ISO 1996:1987 “Description and measurement of environmental noise -- Part 2: Acquisition of data pertinent to land use”

⁴ British Standard 4142: 1997 “Method for rating industrial noise affecting mixed residential and industrial areas”

often referred to as the “background” noise level and is used in the assessment of the disturbance from industrial noise.

Ambient Noise:

- 3.11 In addition, the term “ambient noise” is often referred to. Ambient noise is defined in BS 4142 as the ‘Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far’. It is commonly measured in terms of L_{Aeq} .

Façade / Free-field Noise Levels

- 3.12 When noise is measured in front of a hard surface (such as a building), the level is higher than it would have been if the building was not there (i.e. free-field) due to reflections from the façade. Paragraph 9 of Annex 1 to PPG 24⁵ states that, at 1 m from a façade, levels of noise from road and rail traffic “*should be assumed to be 3 dBA higher than levels measured away from any buildings unless a more accurate figure is available*”. For eligibility for noise insulation grants using CRTN⁶ and CRN⁷, a correction of 2.5 dB is used.
- 3.13 Section 5.3 of BS 4142 states that to minimize the influence of reflections, measurements should be made at least 3.5 m from any reflecting surface other than the ground. In reality, the influence of reflections from a façade of a building depends on the source, receiver and building geometry and the zone of influence can extend significantly beyond 3.5 m. This effect was investigated as part of a research project that I undertook on behalf of Defra in 2005, which concluded that a façade effect (of smaller magnitude) can occur at distances of up to 50 m from the facade, depending on the smallest dimension of the façade.

⁵ Planning Policy Guidance 24: Planning and Noise 1994

⁶ Calculation of Road Traffic Noise, 1998 ISBN 0 11 550847 3

⁷ Calculation of Railway Noise 1995 (CRN)

4 Review of Policy and Guidance

4.1 Planning Policy Guidance

- 4.1.1 Government guidance is provided primarily through Planning Policy Guidance (PPG) 24 (Planning and Noise)⁵. The document gives guidance to local authorities in England on the use of their planning powers to minimise the adverse impact of noise. The aim of the guidance is *“to provide advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business”*.
- 4.1.2 PPG24 provides clear guidance on how to assess noise from industrial and commercial developments in Annex 3, paragraph 19. The document suggests that BS 4142 can be used to assess industrial noise where appropriate and, in paragraph 11, states that *“the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration.”*
- 4.1.3 PPG24 also makes reference to British Standard (BS) 8233 for general guidance on acceptable noise levels within buildings.
- 4.1.4 In paragraph 10 it also states that *“local planning authorities must ensure that development does not cause an unacceptable degree of disturbance. They should bear in mind that a subsequent intensification or change of use may result in greater intrusion and they may wish to consider the use of appropriate conditions”*. Paragraph 12 adds *“noise sensitive development should not normally be permitted where high levels of noise will continue throughout the night, especially during the hours when people are normally sleeping (23:00 to 07:00).”*
- 4.1.5 With respect to designated areas and the countryside, paragraph 20 of PPG24 states that *“...The effect of noise on the enjoyment of other areas of landscape, wildlife and historic value should also be taken into account.”*

4.2 Development Plan Policies

- 4.2.1 Section 38(6) of the Planning and Compulsory Purchase Act⁸ states that development proposals should be determined in accordance with development plan policies unless material considerations indicate otherwise. This plan led approach is reaffirmed in paragraph 8 of PPS1⁹ and paragraph 10 of The Planning System: General Principles published together with PPS1.
- 4.2.2 Policy 3 of the Cornwall Structure Plan¹⁰ states that *“Development must be compatible with the prudent use of natural and built resources and energy conservation. Development should... avoid, directly or indirectly, risk of significant levels of pollution or contamination to air, land, soil or water, including noise and light pollution.”*
- 4.2.3 Policy 6 of the Structure Plan states that *“Overall capacity for wastes arising in Cornwall will be provided through the sustainable management of waste streams based on the principles of the waste hierarchy, the proximity principle and regional self-sufficiency. Development should be compatible with... the protection of the environment and local amenity from significant adverse effects of waste management facilities”.*
- 4.2.4 Policy C1 of the Cornwall Waste Local Plan¹¹ states that *“Proposals for waste management facilities will be carefully evaluated for potentially damaging effects and will not be permitted unless it can be satisfactorily demonstrated that :-*
- a) the development includes appropriate measures to prevent a significant risk of pollution;...*
 - c) proposed site management measures can be ensured to protect local amenity through minimising emissions of noise, dust and odour, fumes and control, litter and vermin and birds;...*
 - e) the traffic to and from the development would not prejudice amenity or highway safety and that there is adequate highway capacity;...*
 - h) the cumulative impact of individual effects will not cause unacceptable detriment to local amenity or the natural and historic environment...*

⁸ Planning and Compulsory Purchase Act 2004

⁹ Planning Policy Statement 1: Delivering Sustainable Development, 2005

¹⁰ Cornwall Structure Plan 2004

¹¹ Cornwall Waste Local Plan 2002

In the case of each potential impact close regard will be given to proposed measures to minimise the impacts and to provide for mitigation where appropriate.”

4.2.5 Further explanation is provided in paragraphs 7.15 – 7.18 of the document, as reproduced below:

“7.15 Noise from waste management facilities may give rise to public complaints. The determination of applications for new or extended waste management facilities creates an opportunity for effective preventative control of noise and this complements the provisions of Part III of the Environmental Protection Act 1990, which deals with statutory nuisance. Close liaison between all relevant units of the County Council and the environmental Health Departments of the District Councils will be particularly important.

7.16 For new waste management proposals, applicants will be required to submit surveys of existing and predicted noise levels at the boundary of the site and at “noise sensitive” locations and environments in the neighbourhood. An evaluation of the predictions will indicate where mitigating action is required to make the proposal acceptable. Noise-sensitive properties are normally defined as being dwellings but this definition can extend to include schools, hospitals, offices, some factories, livestock farms and places of recreation.”

7.17 When planning permission is granted for waste management facilities, conditions will be imposed to reduce noise at sensitive properties and environments by :-

- a) employment of all best practicable means to prevent or minimise the creation of noise during the approved use of the site;*
- b) defining the permitted hours of working;*
- c) setting maximum noise limits at the site boundary and/or neighbouring noise sensitive locations;*
- d) requiring mechanical and landscaping measures to mitigate noise emissions;*
- e) requiring the operator to monitor and keep records of noise.”*

4.2.6 Policy 37 of the Restormel Borough Council Local Plan¹² states that *“Development proposals will not be permitted that cause harm from noise.”*

4.2.7 Paragraph 5.201 of the document goes on to explain that *“Policy 37 is intended to ensure that among other factors, the effects of noise are taken into account when assessing development proposals. Where possible, noise generating development should be sited away from people to avoid disturbance. New developments that are noise sensitive should be sited away from sources of noise. In some cases noise disturbance can be reduced by the use of acoustic barriers and the installation of sound reduction and insulation measures. The Council will ensure that no serious dis-amenity will result from development both from existing noise or future noise (where the development involves a site where noise levels are likely to increase). In some cases the cumulative effect of a number of noise generating uses may need to be considered, and the Council will taken into account the potential dis-amenity of such "noise creep".”*

¹² Restormel Borough Council Local Plan 2001

5 Methodology for Assessing Noise Impact

5.1 British Standard 4142

- 5.1.1 As recommended in PPG 24, British Standard 4142: 1997, 'Method for rating industrial noise affecting mixed residential and industrial areas' is used, where appropriate, to assess noise from proposed industrial and commercial developments as it affects a dwelling. The scope of the standard is to assess noise from "*factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises*".
- 5.1.2 The method is based upon a comparison between the noise from the specific source being considered, measured as a time-average ($L_{Aeq,T}$) noise level, with the background noise level (measured as an L_{A90}) in the absence of the specific source. For rating purposes, the noise level measured with the source operating is increased by 5 dBA if the source has any distinctive characteristics (such as whines, hums or bangs), or if it is irregular enough to attract attention. For daytime operations (defined as between 07:00 and 23:00 hours) BS 4142 states that an assessment period of 1 hour should be used, whereas a period of 5 minutes should be used at night.
- 5.1.3 The standard specifies that, if the rating level of the noise exceeds the background noise by around 10 dBA or more, complaints about noise are 'likely'. A difference of +5 dBA is of 'marginal significance' with respect to the likelihood of complaints, whilst a difference of -10 dBA or less indicates that 'complaints are unlikely'.
- 5.1.4 The foreword to the standard notes that "*Response to noise is subjective and affected by many factors (acoustic and non-acoustic). In general the likelihood of complaint in response to a noise depends on factors including the margin by which it exceeds the background noise level, its absolute level, time of day, change in the noise environment etc., as well as local attitudes to the premises and the nature of the neighbourhood*".
- 5.1.5 The standard does not provide guidance relating to the absolute level of noise and, for this, reference can be made, as advised by PPG24, to BS 8233.

5.2 British Standard 8233

- 5.2.1 PPG24 cites the use of BS 8233¹³ for general guidance on acceptable noise levels within buildings when assessing the effects of noise from industrial development. In sleeping areas the recommended maximum indoor ambient noise levels range from 30 dB L_{Aeq} (good conditions) to 35 dB L_{Aeq} (reasonable conditions). These internal levels correspond to external façade noise levels of 40 - 50 dB L_{Aeq} with windows partially open to allow for ventilation (assuming a 10 – 15 dBA level difference, as recommended in Table 10 of the standard). If the noise of concern contains distinctive characteristics, then these levels may need to be lower.
- 5.2.2 As noted in Paragraphs 7.3 and 7.6.1.2 of the Standard, the criteria for good and reasonable resting conditions are for “anonymous” and steady noise, such as that from road traffic or continuously running plant. Consequently, I consider that the criteria may not always be directly applicable for unsteady noise or for noise which can be attributed to a particular source, such as an industrial development.
- 5.2.3 The standard also notes (in note a of Table 5) that, “*for a reasonable standard in bedrooms at night, individual noise events (measured with F time weighting) should not normally exceed 45 dB L_{Amax}* ”. This corresponds to an external façade noise level of 55 - 60 dB L_{Amax} with windows partially open.
- 5.2.4 For the daytime, the standard recommends maximum indoor ambient noise levels in living rooms range from 30 dB L_{Aeq} (good conditions) to 40 dB L_{Aeq} (reasonable conditions). These internal levels correspond to external façade noise levels of 40 - 55 dB L_{Aeq} with windows partially open.
- 5.2.5 As well as protection for inside the building, the standard makes recommendations for maximum external noise levels in gardens and balconies etc (7.6.1.2). The standard states that it is desirable that “*the steady noise level does not exceed 50 $L_{Aeq,T}$ dB and 55 $L_{Aeq,T}$ dB should be regarded as the upper limit*”.

¹³ British Standard 8233:1999: “Sound Insulation and Noise Reduction for Buildings - Code of Practice”

5.3 World Health Organisation Guidance

- 5.3.1 Guidance on desirable levels of environmental noise is also given by the World Health Organisation (WHO) in their 1999 document entitled Guidelines for Community Noise¹⁴. Section 4.3.1 of the document states that *“to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the sound pressure level should not exceed 50 dB L_{Aeq} . These values are based on annoyance studies but most countries in Europe have adopted 40 dB L_{Aeq} as the maximum allowable level for new developments.”*
- 5.3.2 The daytime value of 40 dB L_{Aeq} for new developments is very low and, in my experience, is not consistent with the criteria adopted for new developments (be it new noise sensitive development or new noise sources) in the UK. This level is much lower than the category A daytime noise criteria in the NEC procedure of PPG24. The values for moderate and serious annoyance are, however, consistent with UK planning policy.
- 5.3.3 Section 4.2.7 of the WHO document also states that *“the capacity of noise to induce annoyance depends upon many of its physical characteristics, including its sound pressure level and spectral characteristics, as well as variations of those properties over time.”* It goes on to state that *“it is emphasised that for intermittent noise it is necessary to take into account the maximum sound pressure level as well as the number of noise events.”*
- 5.3.4 For outdoors areas in parkland and conservation areas, the WHO guidance states (note #3, Table 4.1) that *“existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low”*.
- 5.3.5 For bedrooms, the guidance suggests a limit of 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for non-continuous or single sound events. This equates to an outside sound level (at 1 m from the façade of a window) of 45 dB L_{Aeq} or 60 dB L_{Amax} , assuming that the noise reduction from outside to inside with the window open is 15 dB. It also states that lower noise levels may be disturbing, depending on the noise source.

¹⁴ Guidelines for Community Noise, World Health Organisation, 1999

- 5.3.6 In 2003 the WHO received a grant from the European Commission for a project to provide expertise and scientific advice to the Commission and to its Member States for supporting them when developing future legislation in the area of night noise exposure control and surveillance. The new Night Noise Guidelines for Europe¹⁵ were published in 2009. This document can be seen as an extension of the 1999 guidelines and summarises the latest research relating to “health-based” effects from exposure to night-time noise.
- 5.3.7 One of the aims of the guidance is to present guidance in terms of the $L_{\text{night, outside}}$ metric. This is, in part, because the European Noise Directive requires member countries to report noise exposure in terms of this parameter. The guidance notes in Section 5.3, however, that short term sleep disturbance effects are mainly related to the L_{Amax} parameter. As a result, it is still relevant to consider the number of maximum sound events in addition to the equivalent continuous level.
- 5.3.8 The effects of different levels of night noise on the population’s health are summarised in Table 5.1.

Table 5.1: Summary of Observed Health Effects in the Population

Noise Level, L_{night} (Outside)	Observed Effect
up to 30 dBA	No substantial biological effects are observed.
30 to 40 dBA	A number of effects are observed to increase: body movements, awakening, self-reported sleep disturbance, arousals. The intensity of the effect depends on the nature of the source and on the number of events, even in the worst cases the effects seem modest.
40 to 55 dBA	Adverse health effects are observed along the exposed population. Many people have to adapt their lives to cope with the noise at night. Vulnerable groups are now severely affected.
Above 55 dBA	The situation is considered increasingly dangerous for public health. Adverse health effects occur frequently, a high percentage of the population is highly annoyed and there is limited evidence that the cardiovascular system is coming under stress.

- 5.3.9 The recommended night noise guidelines for Europe are presented in Table 5.2.

¹⁵ Night Noise Guidelines for Europe, World Health Organisation, 2009

Table 5.2: Night Noise Guidelines for Europe

Item	$L_{\text{night, outside}}$
Night noise guideline	40 dBA
Interim Target (IT)	55 dBA

5.3.10 Although, at first glance, it would appear as though the night noise guideline is lower than the 1999 recommended level, it should be borne in mind that it uses a different metric. Specifically, the $L_{\text{night, outside}}$ parameter is an incident level (i.e. it does not account for façade reflections) and it is a yearly averaged value under a range of meteorological conditions.

5.3.11 In summary, for night-time noise, it is relevant to assess long-term average incident noise levels under a range of meteorological conditions against the NNG 40 dB $L_{\text{night, outside}}$ value and shorter term façade noise levels under specific meteorological conditions against the 45 dB $L_{\text{Aeq, 8h}}$ guideline value for steady and continuous noise. For unsteady noise or individual events at night, it is still relevant to compare noise levels against the 60 dB L_{Amax} (façade) guideline value. For daytime noise, where the noise is steady and continuous, it is relevant to assess the ambient noise level against a level of 50 dB L_{Aeq} to avoid “moderate annoyance” and 55 dB L_{Aeq} to avoid “serious annoyance”. For outdoor public spaces, it is relevant to assess the ratio of “intruding” noise against the level of background sound.

5.4 Traffic Noise Criteria

5.4.1 Government guidance on assessing noise and vibration from roads is contained in the Highways Agency’s Design Manual for Roads and Bridges¹⁶ (DMRB)

5.4.2 The document contains a summary of the relevant research on the annoyance relationship for traffic in Annex 2. The document explains that although the steady state annoyance levels hold true where a development already exists, it does not hold true where a new development occurs. It states that (A2.6) *“the level of nuisance generated by the opening of a project has been shown to persist for seven years, at least. It seems clear that people living in a previously quiet area will continue to notice the excess noise caused by traffic, but people moving into the area will take account of it in making their choice of house. It is arguable that by the future*

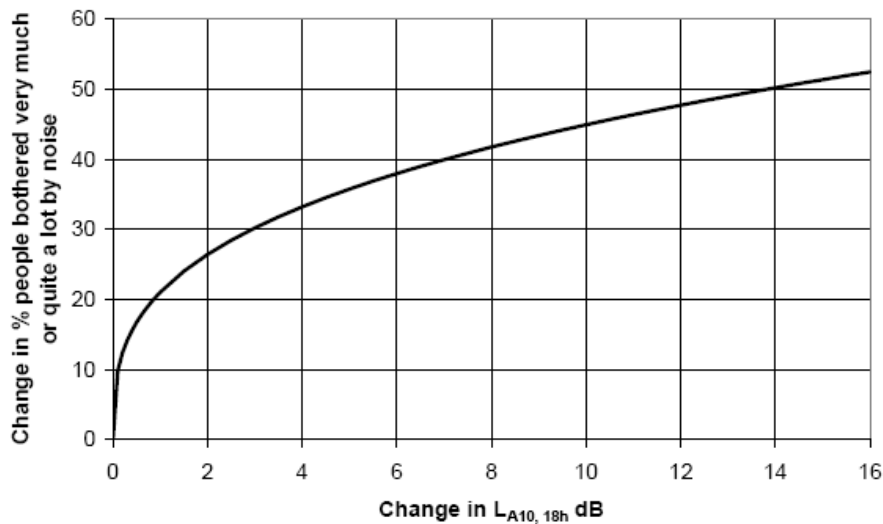
¹⁶Design Manual for Roads and Bridges, Volume 11: environmental assessment, Section 3, environmental assessment techniques, Part 7 HA 213/08 “Noise and Vibration”

assessment year changes in population may well cause overall nuisance levels to return to those predicted by the steady-state relationship.”

5.4.3 DMRB uses the results of several social studies to derive a response curve for new projects based on a noise change. Although DMRB is geared towards motorways and trunk roads, the document suggests that the nuisance criteria should be used even in cases where the traffic is not free flowing (A2.21 – A2.23). Indeed, Paragraph 1.1 states that the document provides guidance for assessing the noise and vibration impacts arising from “all road projects”. It does not place any limitations on the applicability of the guidance for low traffic flows.

5.4.4 The response curve for estimation of traffic noise nuisance (in terms of the change in the number of people bothered very much or quite a lot by noise) is presented in Figure 5.1.

Figure 5.1: Estimation of Traffic Noise Nuisance



5.4.5 On page 3/2 the document includes an example of the classification of magnitude of noise impacts, and is reproduced in Table 5.3, below:

Table 5.3: Classifications of Magnitude of Noise Impacts

Noise change, dB $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

5.5 IOA / IEMA Guidance

- 5.5.1 A draft guidance document¹⁷ was published jointly in 2002 by the Institute of Environmental Management and Assessment (IEMA) and the Institute of Acoustics (IOA). The document is intended to provide guidance on all aspects of noise impact assessment and was produced to ensure a consensus of the requirements of good practice across the acoustics, as well as EA, professions. Following a period of consultation, some amendments were proposed for the guidance, as detailed in a paper presented to the Institute of Acoustics in 2006 by Mr Turner of Bureau Veritas¹⁸. My current understanding is that it is intended to publish the final version of the document in the near future.
- 5.5.2 Paragraph 1.7 of the 2002 draft guidance document notes that there is currently no guidance on how to undertake a noise assessment for EIA and, although standards and guidance on noise are available, they have not been specifically developed for use in EIA and, as a result, many are used out of context.
- 5.5.3 Paragraph 7.12 of the 2002 draft guidance defines noise change as “*the difference in acoustic environment before and after the implementation of proposals*” and defines the noise impact as “*the consequence of a noise change. This may be in the form of annoyance caused or a change in the degree of intrusion or disturbance.*” The document does not, however, limit the definition of a noise change to a change in the ambient L_{Aeq} .
- 5.5.4 In paragraph 7.52, the 2002 draft guidance notes that “*it is necessary, therefore, to be sure that the indicators used to describe the noise environment, and the change in it, do so adequately. For most situations this can be achieved by examining the following indicators:*
- | | |
|------------|--|
| L_{Amax} | <i>An indication of the maximum sound level heard</i> |
| L_{Aeq} | <i>An indication of the average level of noise heard (L_{A10} can be used for road traffic in specified situations)</i> |
| L_{A90} | <i>An indication of the minimum noise level heard</i> |
| N | <i>The number of distinct events in a certain time period.”</i> |
- 5.5.5 With respect to the use of long term indicators (such as $L_{Aeq,16h}$ or $L_{Aeq,8h}$) the 2002 draft guidance notes (paragraphs 7.19 to 7.25 and 7.48 – 7.61) that relying on such metrics alone

¹⁷ IEMA / IOA Draft Guidelines for Noise Impact Assessment, 2002

¹⁸ Proceedings of the Institute of Acoustics, Vol. 28. Pt.7 2006

would be insufficient and could lead to misleading results. It notes that it is also necessary to take into account diurnal noise levels (e.g. $L_{Aeq,1h}$ at different times of the day).

5.5.6 The 2002 draft guidance also provides useful guidance regarding the use and interpretation of absolute noise limits. Of particular relevance, it discusses the situation where a proposal would cause an increase on an existing level which is already above an existing guideline for onset of effects (e.g. sleep disturbance) in paragraphs 7.39 – 7.47. The document states that such a situation should probably be regarded as worse than if the existing level was below the guideline. If the existing noise environment is regarded so unsatisfactory that ideally every effort should be made to reduce it, then almost any increase, regardless how small, is an impact which should be considered.

5.5.7 The draft guidance considers three categories, as described below:

1. The existing level and the future level are below the relevant guideline;
2. The existing level is below the guideline but the future level is above the guideline;
3. Both the existing and future levels are above the guideline.

5.5.8 The draft guidance states that, on balance, *“it is recommended that for the same noise change, situation (3) causes a relatively greater impact than (1). Situation (2) also has greater impact than situation (1), but is no worse than situation (3). Situation (3) is the worst because the final absolute level is the highest.”*

5.5.9 Mr Turner of Bureau Veritas presented a paper to the Institute of Acoustics in 2006 (Reference 18) providing a summary of the changes to the original draft document. The amendments presented in the 2006 paper are not material to my consideration of the impact of this development and I have therefore used the 2002 draft guidance for the assessment. However, the 2006 paper does include guidance on setting noise impact criteria for impacts on people which I find very informative, as reproduced in Table 5.4, below. This table presents the scale of effects of noise on humans correlated to suggested semantic descriptors and significance criteria.

Table 5.4: Generic Scale of Noise Impacts on People

Perception	Impact	Semantic descriptor	Significance
Not noticeable	None	No impact	Not significant
Noticeable	Non-intrusive Noise can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of TV, speaking more loudly, closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life	Slight	Not significant
Noticeable	Intrusive Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of TV, speaking more loudly, closing windows. Potential for non-awakening sleep disturbance. Affects the behaviour such that there is a material change in the quality of life	Moderate	Significant
Noticeable	Disruptive Causes a material change in behaviour or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	Substantial	Significant
Noticeable	Physically harmful Significant changes in behaviour and/or 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. noise induced hearing loss.	Severe	Significant

5.5.10 The 2006 paper notes in Section 2.2.2 that “*one of the key conclusions reached by the working party following consultation was that the guidelines should more strongly emphasise its recommendation of a shift away from the common practice of relying on simple decibel change semantic scales as the key indicator of impacts and their significance. The guidelines promote a more sophisticated approach of weighing up all the objective and subjective factors (including decibel change where appropriate) to reach a reasoned judgement of the impacts and their significance.*”

5.5.11 In my opinion, the 2002 draft guidance document (and the subsequent 2006 paper) presents a robust, balanced and sensible approach for undertaking environmental noise impact assessments. I have therefore followed the advice contained within these documents when assessing the impact due to this development.

5.6 British Standard 5228

5.6.1 British standard BS 5228-1¹⁹ deals with noise and vibration control on construction and open sites. The standard was revised in 2009. This standard (albeit the version which preceded this recent update) is also cited in PPG 24 for use in assessing noise from construction sites.

5.6.2 Section 6 of the standard deals with neighbourhood nuisance. The standard recommends using the $L_{Aeq,T}$ parameter to describe noise from construction activities (para. 6.2), giving example reference time intervals of 1 hour and 12 hours. The standard notes, however, that for more isolated events that might not always be apparent from using a longer period L_{Aeq} , it can be useful to use a short time period (e.g. 5 minutes).

5.6.3 The standard notes that for some large infrastructure projects that require an ES, construction noise is sometimes assessed by comparing the predicted construction noise (plus ambient noise) with the pre-construction ambient noise. However, it notes that a greater difference might be tolerated than for a permanent industrial source.

5.6.4 Paragraph 6.3 d of the standard notes that, for dwellings, times of site activity outside of normal working hours will need special consideration. It suggests that evening noise limits might have to be as much as 10 dBA below the daytime limit and that very strict noise control targets might need to be applied for night-time working.

5.6.5 Annex E (informative) of the standard provides examples of criteria that can be used for the assessment of the significance of effects due to construction noise. It notes three main reasons for undertaking such an assessment:

- For Environmental Impact Assessments (EIAs);
- Assessments for developments that do not require EIA; and
- Control of Pollution Act²⁰ (CoPA) Section 61 applications.

¹⁹ BS 5228-1:2009 "Code of practice for noise and vibration control on construction and open sites. Noise"

²⁰ Control of Pollution Act 1971, Section 61

- 5.6.6 Annex E describes two main approaches for assessing the significance of effects, as follows:
- Significance based upon fixed (absolute) limits and eligibility for noise insulation and temporary re-housing. This is primarily based on guidance given in Advisory Leaflet 72 and is described in Section 5.7, below.
 - Significance based upon noise change. The standard notes that this assessment method reflects more conventional EIA methodologies for noise.
- 5.6.7 With respect to noise change, the standard gives two examples of assessment techniques; the first being the “ABC” method and the latter being the 5 dB change method.
- 5.6.8 The ABC method criteria are based on a comparison of the predicted L_{Aeq} level due to construction works with the pre-existing L_{Aeq} before the construction works, rounded to the nearest 5 dB. If the rounded pre-existing L_{Aeq} level is less than the values listed in Category A, then the noise levels listed in the Category A column should be used as the threshold level for significance of construction noise. If the pre-existing L_{Aeq} level is equal to the values listed in Category A, then the noise levels listed in the Category B column should be used as the threshold level for significance. Finally, if the pre-existing L_{Aeq} level is greater than the values listed in Category A, then the noise levels listed in the Category C column should be used.
- 5.6.9 The more straightforward 5 dB change method is based upon a significant effect being deemed to occur where noise from construction activities exceeds pre-construction ambient levels by 5 dBA or more, subject to lower cut-off values of 65, 55 and 45 dB $L_{Aeq,period}$ for the daytime, evening and night-time periods respectively.
- 5.6.10 The standard states that *“for public open space, impact might be deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise ($L_{Aeq,period}$) by 5 dB or more for a period of one month or more. However, the extent of the area impacted relative to the total available area also needs to be taken into account.”*
- 5.6.11 Annex E also includes guidance on setting noise limits for construction activities which will involve long-term earth moving activities (as is the case for this development). It states that this type of activity is more akin to surface mineral extraction sites and that the guidance

contained within MPS2²¹ needs to be taken into account when setting criteria for acceptability. The standard suggests that a limit of 55 dB $L_{Aeq,1h}$ is adopted for these types of activities but only where the works are likely to occur for a period in excess of six months.

5.6.12 The standard also includes criteria for assessing the requirement for provision of sound insulation or temporary re-housing where, in spite of the mitigation measures applied and any Section 61 consents under the CoPA, noise levels at some properties exceed particular trigger levels.

5.7 Advisory Leaflet 72

5.7.1 Guidelines for noise from construction activities were given in the old Advisory Leaflet 72²², 'Noise Control on Building Sites'. The leaflet states that, for rural, suburban and urban areas away from main road traffic and industrial noise, noise levels between 07.00 and 19.00 measured outside the nearest window of the property should not exceed 70 dBA. This is equivalent to 67 dBA free-field. The recommended maximum level increases to 75 dBA in urban areas near main roads in heavy industrial areas.

5.7.2 The leaflet does not specify a measurement parameter but it does state that the limit is as "*measured using a simple sound level meter*". Given that the leaflet was published before integrating sound level meters were commonplace, this implies that the limit should be based on the instantaneous sound pressure level as opposed to a long term average such as $L_{Aeq,12h}$.

5.7.3 The leaflet also states that building work should not be allowed to disturb people sleeping nearby, although it does not quantify what levels of noise are likely to disturb sleep.

5.7.4 This leaflet is now over thirty years old (the last version was 1976), is out of print and has been superseded by guidance provided in other, more recent, guidance and standards, such as BS 5228 and MPS 2. I also believe there is some doubt regarding whether that Advisory Leaflet is still current (BS 5228 is silent on the matter). Consequently, I do not rely on Advisory Leaflet 72 when assessing construction noise. Nonetheless, I will have regard to it when assessing the impact due to the proposed development because Hoare Lea made reference to and used it in their original noise assessment.

²¹ Minerals Policy Statement 2: Controlling and mitigating the environmental effects of mineral extraction in England - Annex 2: Noise

²² Department of the Environment Advisory Leaflet 72, 'Noise Control on Building Sites', 1976

5.8 Mineral Policy Statement (MPS) 2

- 5.8.1 Landmark appeal decisions^{23,24} relating to noise from the construction of container terminals have utilised the guidance contained within Minerals Policy Statement (MPS) 2 (or its predecessor, MPG 11) where the works involve long-term earth-moving activities. This approach is also included in the new BS 5228, as described in Section 5.6 of this proof.
- 5.8.2 Guidance given in paragraphs 2.19 – 2.120 of MPS2 suggests that a noise limit of 70 dB $L_{Aeq,1h}$ (free-field) for up to 8 weeks per year is appropriate in mineral extraction sites for the essential construction of baffle mounds. For longer term noisier activities, a lower limit should be considered. The guidance suggests that noise should not exceed the background level by more than 10 dBA, subject to a maximum of 55 dB $L_{Aeq,1h}$. Evening limits should not exceed background by more than 10 dBA and night-time limits should not exceed 42 dB $L_{Aeq,1h}$.

5.9 Mineral Planning Guidance (MPG) 11

- 5.9.1 Although now withdrawn and superseded by MPS 2, the old MPG 11, entitled ‘The Control of Noise at Surface Mineral Works’, contained guideline noise limits for public spaces. This is of interest because it is the only guidance that I know of which contains absolute noise limit criteria for public spaces. The guidance stated that “*the noise limits would not be expected to be as low as at dwellings, and it is suggested that 65 dB $L_{Aeq,1h}$ during the working day and 55 dB $L_{Aeq,1h}$ at other times would be reasonable.*”

5.10 Comments Relating to HGV Noise

- 5.10.1 The assessment of HGV noise for this project presents a challenge because there is no single, clear cut objective assessment methodology for this source of noise. HGVs will form part of the all-encompassing ambient noise and, therefore, should be assessed as part of the absolute noise level and noise change assessment. However, it is less clear whether HGV noise should form part of the BS 4142 assessment.
- 5.10.2 It is generally acknowledged that people are more tolerant of noise from road traffic than they would be to noise from an industrial source. In the case of a road, people might make allowances for the fact that they, themselves, use the road and are therefore one of the polluters.

²³ *The Bathside Bay, Harwich, Container Terminal Inquiry Report, Report to the First Secretary of State and the Secretary of State for Transport, 23 March 2005 (para. 18.265).*

²⁴ *Dibden Bay Inquiry - Inspector's Report, Report to the First Secretary of State and the Secretary of State for Transport, 22 Sept 2003 (para. 36.603).*

It is therefore questionable whether residents living in the vicinity of the development would view noise from HGVs travelling on haul route and access road as they would “anonymous” and free-flowing traffic noise. Indeed, it is my experience that complaints about noise at other industrial and commercial sites, particularly in the refuse industry, are often in relation to noise from HGVs. By way of example, I appeared as a noise witness at a Public Inquiry into the extension to an existing Materials Recovery Facility at Beenham in 2008. Several of the letters of representation from third parties specifically mentioned lorry noise as a specific concern.

- 5.10.3 If residents do indeed associate noise from HGVs on the access road with the industrial site, then it follows that BS 4142 would be a suitable method for assessing the likelihood of complaints.
- 5.10.4 The scope of BS 4142 confirms that the standard can be applied to assess noise from industrial premises. It would therefore seem reasonable to include noise from HGVs on the premises in the BS 4142 assessment. By extension, if an HGV travelling around the perimeter of the site could be considered an industrial source, then it would also seem reasonable to include noise from HGVs on the access road as part of the specific noise, especially if people hearing the noise will not be able to distinguish the exact location of the source. This is the approach that I have taken when undertaking the noise impact assessment for other, similar, industrial developments, including the noise impact assessment for SITA’s proposed Granville Energy from Waste Centre near Telford. Therefore, on the basis that vehicles on the access routes will be predominantly HGV industrial traffic, it is my view that noise from HGVs on these access routes should form a part of the BS 4142 assessment
- 5.10.5 Whilst it is not clear cut whether HGV noise on the access routes should be included in the BS 4142 assessment, it is one of the objective methods available and, consequently, it is my view that the assessment should be done to inform the overall picture. It is not my intention to rely on a BS 4142 assessment alone. However, HGVs will contribute to the overall ambient noise and should, therefore, be included in the absolute level and noise change assessments described above.
- 5.10.6 A method for assessing community effects due to road traffic noise is presented in DMRB. The dose-response curves used in DMRB are based on social studies using the $L_{A10,18h}$ parameter, as opposed to the $L_{Aeq,10h}$ parameter used to describe noise from HGVs in the

Environmental Statement. It is therefore necessary to convert from one parameter to the other in order to compare against the DMRB dose-response curves.

- 5.10.7 CRTN presents a shortened measurement procedure (paragraph 43) for determining the $L_{A10,18h}$ from the arithmetic mean of three consecutive values of hourly L_{A10} minus 1 dBA. Paragraph 9 of PPG 24 presents a method for estimating the $L_{Aeq,16h}$ based on the $L_{A10,18h}$ minus 2 dBA. The PPG 24 conversion is, however, based on the assumption of free-flowing continuous traffic.
- 5.10.8 Inspection of noise data measured at La Mount (Reference 23) shows that the L_{Aeq} is typically some 2 – 4 dB lower than the L_{A10} value on this stretch of road. The ambient (L_{Aeq}) noise level on the existing public highway is currently dominated by HGVs coming and going. This provides some confidence that the 2 dB correction cited in PPG 24 to convert from L_{Aeq} to L_{A10} is a reasonable assumption in this case. Assuming that HGV noise will dominate the noise environment, then the correction from the $L_{Aeq,10h}$ to $L_{Aeq,16h}$ could be estimated by adding $10\log(10/16)$ to the $L_{Aeq,10h}$ value (i.e. subtracting 2 dBA). Using the formula from paragraph 9 of PPG 24, it would then be possible to convert this to a $L_{A10,18h}$ value by adding 2 dBA to this value. The net result of this conversion arithmetic is that the $L_{A10,18h}$ value is likely to be the same as the arithmetic value of the $L_{Aeq,10h}$ for this scenario.
- 5.10.9 Whilst it is acknowledged that the conversion method described above might not be appropriate or robust in all situations, it is considered that the method will provide an adequate basis to carry out an indicative impact assessment based on the dose response curves contained within DMRB.

5.11 Summary of Proposed Noise Impact Criteria

Operational Noise

- 5.11.1 In order to provide a holistic assessment, the impact of operational noise associated with the proposed development should be assessed by considering:
1. the noise level difference;
 2. the noise change; and
 3. the final absolute level.

5.11.2 In other words, it is appropriate to undertake:

1. a BS 4142 assessment;
2. to assess the noise change in terms of ambient noise and diurnal levels, as well as changes in other parameters such as the number and level of L_{Amax} events and the underlying background L_{A90} ; and
3. to compare absolute levels against the criteria set out in BS8233 and WHO guidance.

Construction Noise

5.11.3 For long-term construction activity, I believe that it is relevant to adopt the approach suggested in MPS2 by assessing the noise level due to construction activities at the exterior of any residential properties, relative to the existing background noise level during the daytime (subject to a maximum free-field level of 55 dB $L_{Aeq,1h}$). For night-time construction noise an external limit of 42 dB $L_{Aeq,1h}$ is appropriate. For short-duration activities, such as earth bund construction, I believe that a temporary higher daytime limit of 70 dB $L_{Aeq,1h}$ would be appropriate.

Summary of Operational and Construction Noise Criteria

5.11.4 My suggested criteria are summarised in Table 5.5.

Table 5.5: Criteria for Assessing Noise

Type of Receptor	Type of Noise	Type of Assessment	Relevant Guidance / Standards	Assessment
Residential (operational phase)	All-encompassing ambient noise	Absolute noise level assessment	BS 8233 / WHO	Comparison to guideline limits for annoyance and sleep disturbance
	All-encompassing noise	Noise change	IEMA Guidelines for noise impact assessments / DMRB	Assessment of noise change in terms of ambient noise and any other relevant parameters.
	Noise from industrial premises	Level difference	BS 4142	Assessment of specific noise rating level compared to background noise
Residential (construction phase)	All-encompassing construction noise	Absolute noise level assessment	BS 5228 / MPS 2 / AL72	Comparison to limits in MPS 2
	All-encompassing construction noise	Noise change	BS 5228	Assessment of noise change in terms of ambient noise and any other relevant parameters.
Rights of Way (operational and construction phase)	Specific (intruding) noise	Level difference	WHO	Assessment of intruding noise compared to background
	All-encompassing noise	Noise change	IEMA Guidelines for noise impact assessments BS5228 5dB method (for construction noise)	Assessment of noise change in terms of ambient noise and any other relevant parameters.
	All-encompassing ambient noise	Absolute noise level assessment	WHO / MPG 11	Comparison to guideline limits for community annoyance

6 Analysis of the ES and Noise Addendum Report

6.1 Analysis of Criteria Used to Assess Impact in the ES

- 6.1.1 Tables 8.6 and 8.7 in the ES summarise Hoare Lea's proposed operational noise significance criteria.
- 6.1.2 To understand the limitations of using the proffered criteria, it is important to bear in mind that that the response of people to noise depends, primarily, on three factors:
1. the absolute level of noise;
 2. the change in noise environment; and
 3. the difference between the specific noise and background noise.
- 6.1.3 The criteria described in Table 8.6 of the ES attempt to combine an assessment of the level difference and absolute level of the noise into one set of impact criteria. However, there are several problems in the way that this has been carried out.
- 6.1.4 Firstly, the table classifies noise from "fixed installations" which is equal to or less than background noise plus 10 dB as being a 'moderate' impact. It is not clear whether the table means to refer to the rating level of the noise, as defined in BS 4142 (i.e. the specific noise level with a character correction added if necessary). However, for the purposes of comparison, I have assumed that the criteria do refer to the rating level. BS4142 specifies that, if the rating level of the noise exceeds the background noise by around 10 dBA or more, complaints about noise are likely. The ES classifies a situation which, according to BS4142, is likely to result in complaints as being only a 'moderate' impact. I do not consider it helpful to translate BS 4142 into impact criteria in this way. However, if this exercise was to be undertaken then, in my opinion, this situation should be classified as a 'major' impact.

- 6.1.5 The table proposes that specific noise which is less than or equal to the background noise should be classified as a ‘negligible’ impact. For industrial noise, which can often be steady and continuous, this could lead to an increase in background noise by 3 dBA (i.e. if the background noise was equal to the specific noise) which, according to criteria commonly adopted in environmental assessments, would normally be classified as either a minor or moderate impact. For example, using the table in paragraph 7.66 of the draft IEMA guidance, a 3 dB noise change would be classified as a moderate impact.
- 6.1.6 There is also a problem with the way that the absolute noise levels are used in the significance criteria tables (Tables 8.6 and 8.7 in the ES). This is, in part, because the criteria for community annoyance and sleep disturbance presented in WHO guidelines, from which the significance criteria were derived, relate to the all encompassing ambient noise level (L_{Aeq}), not the specific noise from site excluding other sources. Ergo, it is erroneous to compare specific noise from fixed plant against absolute level criteria for all encompassing noise as is done in the ES.
- 6.1.7 A more appropriate way to proceed would be to compare the pre-existing ambient noise with the post development ambient noise level (i.e. including the contribution from fixed plant, operational traffic and pre-existing baseline noise) and both against the WHO criteria. In other words, it is appropriate to compare the L_{Aeq} before the development with the L_{Aeq} after the development. Instead, the ES attempts to “separate” the impact from HGV noise and, as a result, ignores the cumulative impact due to all noise sources combined. In addition, the criteria in the ES only define significance criteria for the impact due to HGV noise in terms of absolute noise levels.
- 6.1.8 Even if these absolute noise level criteria could be used in isolation to judge the impact due to HGV noise, there are problems with the significance attributed to each noise level band.
- 6.1.9 For example, looking at the impact criteria suggested in the ES for HGV noise (Table 8.7 of the ES), noise levels up to 11 dB in excess of the WHO criteria for onset of serious annoyance are classified as only of “moderate significance”. If the criteria suggested in the ES are used, it is only once noise levels exceed the WHO limit for onset of serious annoyance by more than 11 dBA that an effect of “major” significance has been judged to occur, irrespective of the change in noise level due to traffic.

- 6.1.10 I do not agree that it is necessarily helpful to attempt to categorise WHO guidelines to impact significance criteria. The absolute noise limits do not, on their own, determine the impact of noise from a development on the community. It is, more often than not, the noise change combined with an exceedance of an absolute noise limit that leads to a significant impact occurring.
- 6.1.11 This then leads to one of the most significant problems with the impact criteria contained in the ES. The noise change is one of the primary factors that influence the way people react to noise and the criteria adopted in the ES do not account for this. As discussed in Section 5.5 of this proof, noise impact is defined in IEMA guidance as the consequence of a difference in acoustic environment before and after the implementation of proposals. In my opinion, it is not, therefore, adequate to rely on absolute noise level criteria alone.
- 6.1.12 Consequently, it is concluded that the significance criteria used in the ES fail to properly identify the impact due to operational noise and, in particular, fail to properly assess the cumulative impact.
- 6.1.13 In the following sections I have summarised the noise monitoring and prediction results which I have subsequently used in Sections 7 to 10 of this proof.

6.2 Summary of Measured Baseline Noise

- 6.2.1 Baseline noise levels are presented in Section 2.1 of the noise addendum report and are reproduced in Table 6.1, below.

Table 6.1: Summary of Hoare Lea’s Baseline Noise Measurements

Location	Baseline Sound Pressure Level, dB	
	Ambient L_{Aeq}	Background L_{A90}
Rostowrack Farm	Typically 40 – 45 dBA Some noisier periods extend to 45 – 50 dBA	Typically 40 dBA Variations typically between 38 – 42 dBA
Bodella Farm	Typically 50 dBA Variations between 49 – 53 dBA	Typically 48 dBA Variations typically between 46 – 50 dBA
Carsella Farm	Typically 40 – 50 dBA	Typically 35 – 40 dBA Brief quieter periods noted to fall to 30 – 35 dBA
Western end of St Dennis	Not reported	36 – 37 dBA (early evening) 42 – 44 dBA (early morning)
Trerice (near Green Meadows)	Not reported	38 – 40 dBA
Western end of Treviscoe (Barton Court)	Not reported	40 – 41 dBA

6.2.2 Bureau Veritas undertook a noise measurement exercise to verify the baseline noise levels presented in the ES for the three locations likely to be most affected by traffic noise. Consecutive 15 minute sample period measurements were undertaken for 3 hours at each location and, in addition, an unattended noise monitor was positioned at Location 3, La Mount, to log sound levels over consecutive 15 minute sample periods, from 07:15 to 17:30. The results of this monitoring exercise are presented in a technical memo²⁵ and are summarised in Table 6.2, below.

²⁵ Bureau Veritas Report 1348924/1 Rev 0, “Environmental Noise Monitoring, Treviscoe, Cornwall”, 11th March 2009

Table 6.2: Summary of Bureau Veritas’s Baseline Noise Measurements

Location	Ambient L_{Aeq}		Background L_{A90}		Comments
	Range, dB	Log Average	Range, dB	Average	
Location 1: Track south of Stamp’s Hill Road (Hawthorns)	49 – 54	51	43 – 48	46	HGVs; cars; birds; percussive noise, probably from nearby quarry.
Location 2: Barton Court (north-west Treviscoe)	45 – 55	50	37 – 39	38	HGVs; cars; birds; wind in trees; aircraft.
Location 3: La Mount	54 – 58	56	41 – 44	42	Cars; wind in trees; birds.
Unattended Monitor (rear garden of La Mount)	48 – 57	52	42 – 49	45	High L_{Aeq} thought to be due to a single unrepresentative event near the sound level meter

6.2.3 In addition to these two surveys, Cornwall County Council commissioned Jacobs Babbie to undertake a baseline noise survey²⁶ in the St Dennis area in 2006.

6.2.4 I have discussed the results of the various noise surveys with Mr Dennis of Hoare Lea and we have agreed baseline noise levels which we believe are representative at various locations in the vicinity of the proposed development. These agreed baseline noise levels are presented in Table 6.3, below, and are used in my assessment.

Table 6.3: Baseline Noise Levels Used in Assessment

Location	Ambient, dB L_{Aeq}	Background, dB L_{A90}
Rostowrack Farm	46	39
Bodella	50	48
Location 1 - Hawthorns	49	46
Location 2 - Barton Court (frontage)	50	38 day 34 night
Location 3 - La Mount (frontage)	56	43*
Location 3 - La Mount (rear garden)	52	43*
Rear gardens of Barton Court and Barton Road	43#	38 day 34 night

* It was agreed that the value of 45 dBA for the rear garden looked high and was due to an unrepresentative noise event. It was agreed that the L_{A90} is 43dB(A) for front and rear/side garden

It was agreed that 46 dBA was too high and 43 dBA better represented the L_{Aeq} value during the daytime

²⁶ Jacobs Babbie report B110800/1, Cornwall County Council St Dennis Noise Survey, June 2006

6.3 Summary of Predictions for Construction Noise

6.3.1 Predicted noise levels during the construction period are presented in Section 3.2 of the noise addendum report. I have summarised Hoare Lea’s predicted construction ambient noise levels (i.e. including contribution from the construction traffic and pre-existing ambient noise) in Table 6.4 (for Bodella and Rostowrack Farm) and Table 6.5 (for the other locations). The data presented is free-field and 3 dBA should be added to these ambient values to determine the noise level at the building façades.

Table 6.4: Summary of Predicted Construction Ambient Noise Levels, dB L_{Aeq,1h} (free-field)

Construction Quarter	Bodella Farm			Rostowrack Farm		
	Specific Noise	Ambient Noise	Noise Change	Specific Noise	Ambient Noise	Noise Change
<i>Baseline</i>	-	50	-	-	46	-
Q1	60 – 65	60 – 65	+10 to +15	61 - 66	61 - 66	+15 to +20
Q2	65 – 71	65 – 71	+15 to +21	64 - 71	64 - 71	+18 to +25
Q3	64 – 71	64 – 71	+14 to +21	64 - 71	64 - 71	+18 to +25
Q4	57 – 66	58 – 66	+8 to +16	55 - 63	55 - 63	+9 to +17
Q5	57 – 66	58 – 66	+8 to +16	55 - 65	55 - 65	+9 to +19
Q6	58 – 68	59 – 68	+9 to +18	57 - 66	57 - 66	+11 to +20
Q7	58 – 67	59 - 67	+9 to +17	57 - 65	57 - 65	+11 to +19
Q8	59 – 67	60 – 67	+10 to +17	58 - 67	58 - 67	+12 to +21
Q9	59 – 69	60 – 69	+9 to +19	59 - 69	59 - 69	+13 to +23
Q10	56 – 65	57 – 65	+7 to +15	57 - 66	57 - 66	+11 to +20
Q11	40	50	0	39	47	+1

Table 6.5: Summary of Predicted Construction Ambient Noise Levels, dB L_{Aeq,1h} (free-field)

Construction Quarter	Location 1: Hawthorns			Location 2 Barton Court (rear garden)			Location 3 La Mount		
	Specific Noise	Ambient Noise	Noise Change	Specific Noise	Ambient Noise	Noise Change	Specific Noise	Ambient Noise	Noise Change
<i>Baseline</i>	-	49	-	-	43	-	-	56	-
Q1	52	53	+4	49	50	+7	58	60	+4
Q2	54	55	+6	52	52	+9	60	61	+5
Q3	53	54	+5	51	52	+9	59	60	+4
Q4	51	53	+4	47	48	+5	57	59	+3
Q5	51	53	+4	47	48	+5	57	59	+3
Q6	50	52	+3	45	47	+4	55	58	+2
Q7	50	52	+3	46	47	+4	56	59	+3
Q8	52	53	+4	49	50	+7	58	60	+4
Q9	50	52	+3	46	47	+4	56	59	+3
Q10	-	-	-	-	-	-	55	58	+2
Q11	49	52	+3	44	46	+3	55	58	+2

6.3.2 Hoare Lea’s predicted free-field specific noise levels due to construction of the haul and access routes is summarised in Table 6.6 below.

Table 6.6: Predicted Haul and Access Route Construction Noise Levels, dB L_{Aeq,1h} (free-field)

	Baseline	Construction specific noise	Construction ambient noise	Noise change
1. Hawthorns:				
Preparation Works	49	58 - 72	58 - 72	+9 to +23
Surfacing	49	67 - 71	67 - 71	+18 to +22
2. Barton Court:				
Preparation Works	43	53 - 66	53 - 66	+10 to +23
Surfacing	43	61 - 65	61 - 65	+18 to +22
3. La Mount:				
Preparation Works	56	64 - 77	65 - 77	+9 to +21
Surfacing	56	73 - 76	73 - 76	+17 to +20
Bodella Farm:				
Preparation Works	50	55 - 68	56 - 68	+6 to +18
Surfacing	50	63 - 67	63 - 67	+13 to +17
Rostowrack Farm:				
Preparation Works	46	36 - 49	46 - 51	0 to +5
Surfacing	46	44 - 48	48 - 50	+2 to +4

6.4 Summary of Predictions for Operational Noise

6.4.1 The specific noise level due to the development (i.e. including the contribution from fixed plant and operational traffic but excluding pre-existing ambient noise) is summarised in the following table (rounded to the nearest whole number). This is based on data contained in Section 6.5 of the noise addendum report in addition to the data contained in Section 5.2.2 of the ES.

Table 6.7: Predicted Specific Noise due to Operational Noise (Daytime)

Location	Specific Noise Level, dB L _{Aeq}				
	HGV Noise		Fixed Plant Noise	Total Specific Noise	
	Average hour	Peak hour		Average hour	Peak hour
Location 1 – Hawthorns	52	56	<i>not reported*</i>	52	56
Location 2 – Barton Court, Treviscoe	50	54	34	50	54
Location 3 – La Mount	56	60	<i>not reported*</i>	56	60
Bodella	52	56	43	53	56
Rostowrack	42	46	44	46	48

*Although not reported in the ES, fixed plant noise at these locations will not be significant compared to HGV noise.

6.4.2 The cumulative ambient noise level due to the development (i.e. including the contribution from the baseline ambient noise, fixed plant and operational traffic) is summarised in the following table (rounded to the nearest whole number).

Table 6.8: Predicted Ambient Noise and Noise Change due to Operational Noise

Location	Ambient Noise Level, dB L _{Aeq}				
	Baseline Level	Post-development Level		Change	
		Average hour	Peak hour	Average hour	Peak hour
Location 1 – Hawthorns	49	54	57	+5	+8
Location 2 – Barton Court, Treviscoe	43	51	54	+8	+11
Location 3 – La Mount	52	59	61	+7	+9
Bodella	50	56	57	+6	+7
Rostowrack	46	49	50	+3	+4

6.4.3 Section 6.6 of the noise addendum report states that the processing element of the plant is expected to result in noise levels between 45 and 55 dBA for the majority of the foot path around the site perimeter, with the exception of approximately half of the north-western boundary where noise levels extend into the 55 to 65 dBA range.

7 Assessment of Operational Impact on Residential Properties

7.1 Noise Level Difference (BS 4142 Assessment)

7.1.1 PPG24 provides guidance relating to noise from industrial and commercial sources within in Annex 3, paragraph 19, where it suggests that BS 4142 is the suitable method of assessment. I have undertaken my own BS 4142 assessment based on the total specific noise from the development, as summarised in Section 6.4 of this proof. The values in brackets relate to the development peak hour.

Table 7.1: BS 4142 Assessment (Daytime)

Location	Background Noise, dB L _{A90}	Estimated Specific Noise (peak hour), dB L _{Aeq}	Character correction	Rating Level, dB L _{Ar,Tr}	Difference, dB	Comments
Location 1 - Hawthorns	46	52 (56)	0	52 (56)	+6 (+10)	Marginal / Complaints likely
Location 2 – Barton Ct.	38	50 (54)	0	50 (54)	+12 (+16)	Complaints likely
Location 3 - La Mount	43	56 (60)	0	56 (60)	+13 (+17)	Complaints likely
Bodella	48	53 (56)	0	53 (56)	+5 (+9)	Marginal / Complaints likely
Rostowrack	39	46 (50)	0	46 (50)	+7 (+11)	Marginal / Complaints likely

7.1.2 I have not applied a character correction to the values in the table, even though the noise from HGVs will be irregular (i.e. coming and going) during some periods of the day. This is because, in my view, the character correction in BS 4142 is intended to apply to intermittently operating equipment or isolated events, whereas HGV traffic will be a constant source of noise during the daytime. If the character correction were to be added, then the BS4142 level differences would be 5 dB higher.

7.1.3 From this simple BS 4142 assessment, it is clear that the development, if permitted, would be likely to give rise to complaints during the daytime.

7.1.4 At night, there will be no vehicle deliveries or collections so it is only noise from the fixed plant that is of concern. The primary sources of noise will be the air-cooled condenser fans, noise breakout from the building and noise from the chimney stack. The noise within the

building will be generated by a combination of waste handling operations and equipment operating within the building. Exhaust stack noise is caused by induced draught (ID) fans which are used to extract exhaust gases into the chimney ducts. This has potential to cause high levels of tonal noise to be emitted via the exhaust stack unless adequate silencers are used.

- 7.1.5 It should be noted that, due to the directivity of chimney stacks, it is often not possible to hear noise from the stack when standing close to it, but below the lip of the stack exit. Refraction of sound ‘rays’ by the wind means that the apparent directivity of the stack at distances further away from the stack will vary depending upon wind speed and direction. This can result in higher levels of environmental noise being experienced in the community than predicted based on manufacturer’s data (which may be based on measurements at a particular angle). It is possible that discrete tones or other characteristic sounds which are not discernable closer to the stack or which would otherwise be masked by higher local ambient noise levels could become audible at distances further from the stack.
- 7.1.6 I have undertaken my own calculation of noise from the exhaust stack using data measured on another, similar, site and manufacturer data for the performance of typical industrial in-line silencers. My calculations were performed using the noise mapping software package CadnaA which implements the propagation methodology described in ISO 9613-2²⁷.
- 7.1.7 The sound power level for the stack was used to calculate the noise level at the receptor locations, taking into account, where applicable, the directivity of the stack, the attenuation due to geometric divergence, screening by bunds, air absorption, ground effects etc.
- 7.1.8 Stack directivity was calculated using the Müller-BBM²⁸ method, which takes into account the frequency of the sound, the characteristic dimensions of the stack exit, the ambient and exhaust gas temperature, the exhaust gas exit velocity and the wind speed. The results of the calculation predict that noise from the development would still be just within the proposed planning limit of 42 dBA, though higher than the levels presented by Hoare Lea in the ES.
- 7.1.9 On this basis, noise from fixed operational plant is unlikely to result in complaints according to the method described in BS 4142 during the night.

²⁷ ISO 9613-2:1996, “Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation”

²⁸ Müller-BBM research report No. 105 03 301, “Schallabstrahlung von Schornsteinen – Messung und technische Möglichkeiten zu ihrer Minderung”

7.2 Comments Relating to Noise Impact due to Operational Vehicles

7.2.1 In order to understand the impact of operational traffic, it is necessary to assess the entire noise environment before and after the scheme, rather than to split the noise into separate ‘partial’ contributions and assess each one individually against its own criteria. However, if one particular noise source dominates the noise environment, then it may be appropriate to assess that individual source noise against source specific criteria. In the case of this development, noise from traffic on the haul routes and public highway will dominate the noise environment during daytime operating hours. It is therefore relevant to appraise the impact of traffic noise separately as well as its cumulative impact with other sources of noise.

7.2.2 For the baseline case (the year 2012), there are around 116 individual HGV movements per day on the existing public highway. If the development is permitted, there will be 175 additional 2 way trips per day, or 350 individual movements, of which 113 trips (or 226 movements) will be HGVs. Approximately 26% of these movements (i.e. 59 movements) will be during the operational peak hours (13.00 – 14.00 and 14.00 – 15.00). During this period, there will be one HGV movement along the access road and haul road every minute. A summary of baseline and operational traffic flows is presented in Table 7.2, below.

Table 7.2: Summary of HGV Traffic Flows

Description	Baseline (2012)	Development Only	Cumulative (development + baseline)
AM peak hour	14	22*	36
Development peak hour	15	59	74
PM peak hour	2	22*	24
Daily	116	226	342

**rounded from 21.6 movements per hour for development average hour.*

7.2.3 To put this into perspective for residents living alongside the access routes, it is also necessary to consider the length of time it will take for each HGV to traverse the length of the road. Taking the example of the 750 m long access road, an HGV would take just under 1 minute to traverse the length of the road, assuming an average speed of 50 km/h. This means that, during the peak hour, there will be a continuous flow of HGVs on the access routes.

- 7.2.4 The development HGV traffic will be in addition to the baseline HGV traffic, meaning that there will be a total of 342 HGV movements per day on the public stretch of road between the haul road and access road. This represents a tripling in the daily number of HGV pass-bys for the properties at La Mount Corner in particular. I also understand that traffic movements will be higher during August, when it is likely that there will be an increase in HGVs by around 19% compared with the average month.
- 7.2.5 Comparing the baseline case to the development traffic, it is clear that there will be five times as many HGV movements during the operational peak hour (74 movements as opposed to 15).
- 7.2.6 It is also relevant to consider the character of noise from HGV movements. The proposed access route includes a significant gradient in addition to two junctions at Stamps Hill and La Mount Corner. This will result in high levels of engine revving noise as vehicles ascend the hill and accelerate from a standing start at the junctions. In addition, hissing noise from air brakes is likely to occur at the junctions and there is a possibility that “body slap” will occur on uneven sections of the road. It is, therefore, not enough to simply examine the noise change in terms of decibels. It is also important to understand how the noise character of the area will change.
- 7.2.7 The predicted average hour and peak hour specific noise level due to operational HGVs is presented in Table 6.7 of this proof. As discussed in paragraph 5.10.8 of this proof, the value of the $L_{Aeq,10h}$ presented in the table for HGV noise can be taken to be roughly numerically equal to the average hour $L_{A10,18h}$. On this basis, a simple DMRB type assessment has been carried out for the noise sensitive receiver locations, as presented in Table 7.3. The table contains a comparison to the dose-response curve contained within DMRB for estimating the change in the percentage of people bothered by noise as well as a comparison to the classification of magnitude of noise impacts contained within DMRB.

Table 7.3: DMRB Assessment for Operational Traffic Noise

Location	Baseline Noise, dB L_{A10,18h}*	HGV Noise, dB L_{A10,18h}*	Cumulative Noise, dB L_{A10,18h}*	Change in L_{A10,18h}	Change in % People Bothered very much or quite a lot by noise**	Magnitude of Impact[#]
Location 1 – Hawthorns	49	52	54	5	35%	Major
Location 2 – Barton Court	43	50	51	8	42%	Major
Location 3 – La Mount (frontage)	56	56	59	3	30%	Moderate
Bodella	50	52	54	4	34%	Moderate
Rostowrack	46	42	48	2	25%	Minor

* Estimated value based on typical relationship between L_{A10} and L_{Aeq} under 'baseline' flow conditions.

** Determined by comparison to Figure 5.1 of this proof.

Determined by reference to Table 5.3 of this proof.

7.2.8 From the table, it is clear that the increase in noise associated with operational road traffic is such that it will result in a major impact at Hawthorns and at the properties in western Treviscoe. In the case of the western extent of Treviscoe (i.e. the properties on Barton Court and Barton Road), as many as 42% of the population who are exposed to this noise change are likely to become highly bothered or bothered quite a lot by noise when they were not before. Furthermore, a 'moderate' impact will occur at La Mount and Bodella. It is therefore concluded that operational traffic noise will result in a significant loss of amenity.

7.2.9 With respect to the hourly L_{Aeq} level, the peak hour HGV traffic will lead to a 4 dB increase in HGV noise for those hours, compared to the average hour. It is also worth noting that the "peak hour" is likely to encompass a two hour period (during which approximately one third of the daily HGV movements will take place).

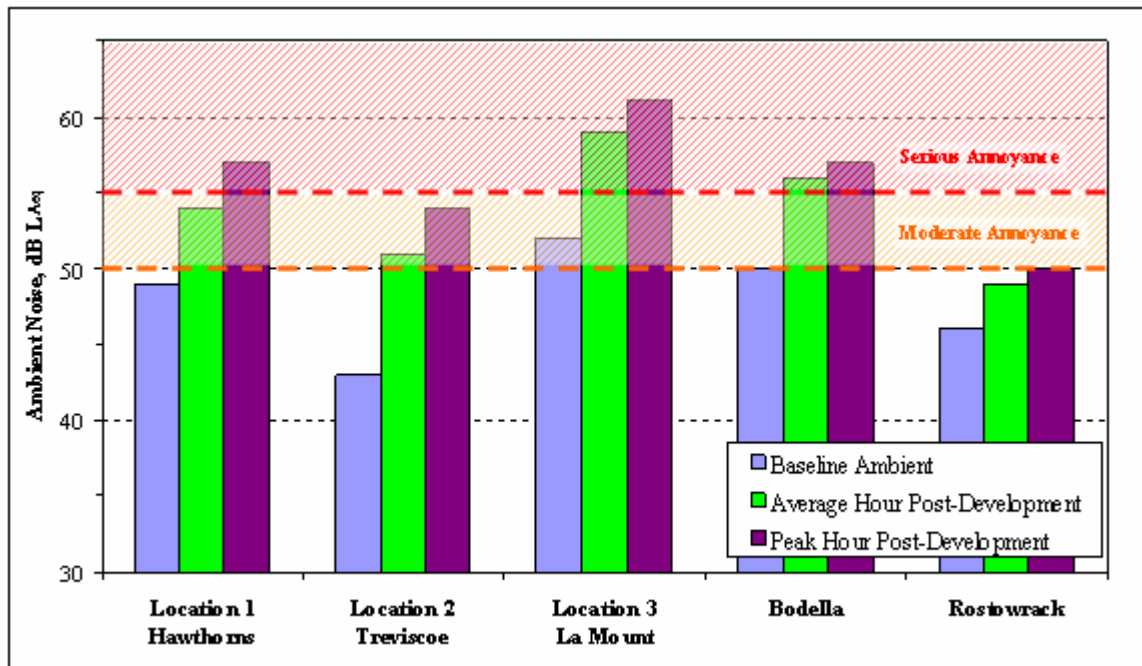
7.2.10 I have assessed the effect of increased HGVs in combination with other sources of noise in my ambient noise assessment and noise change assessment detailed in the following sections.

7.3 Absolute Noise Level Assessment (WHO / BS 8233)

7.3.1 The cumulative ambient noise level due to the development (i.e. including the contribution from the baseline ambient noise, fixed plant and operational traffic) is detailed in Table 6.8 of this proof (rounded to the nearest whole number). Figure 7.1, below, uses the ambient noise

levels presented in Table 6.8 and compares these to the thresholds presented in WHO guidance for onset of community annoyance effects (i.e. 50 dBA for moderate annoyance and 55 dBA for serious annoyance).

Figure 7.1: Absolute Noise Level Assessment (Day) against WHO Criteria



7.3.2 From the graph, it is clear that locations 1 and 2 will move from being below the level for onset of moderate annoyance to above that value. In the case of Location 1, peak hour traffic will exceed the level for onset of serious annoyance. Of particular concern, however, the rear garden to the properties at La Mount will move from a situation where the noise level already exceeds the level for onset of moderate annoyance to being well above the threshold for serious annoyance.

7.3.3 Although the ambient level at La Mount Corner already just exceeds the criterion for moderate annoyance, it does not necessarily follow that further increases in noise will have no effect or are any more acceptable. In this regard, the draft IEMA/IOA guidance provides useful guidance regarding the use and interpretation of absolute noise limits. Of particular relevance, the guidance discusses the situation where a proposal would cause an increase on an existing level which is already above an existing guideline for onset of effects in paragraphs 7.39 – 7.47. The document states that such a situation should probably be regarded as worse than if the existing level was below the guideline. If the existing guideline was already exceeded, then ideally every effort should be made to reduce it and almost any increase, regardless of how

small, is an impact which should be considered. Effects will get progressively more likely or more severe as the noise level increases.

7.4 Assessment of Noise Change

7.4.1 Cumulative ambient noise levels due to the development were presented in Table 6.8 of this proof and the noise change as a result of the development is summarised in Table 7.4, below. The table includes both the average hour noise change and the peak hour noise change, for which the contribution from site related HGVs is 4.2 dBA higher than the average hour.

Table 7.4: Predicted Noise Change due to Operational Noise

Location	Ambient Noise Level, dB L _{Aeq}	
	Noise Change (average hour)	Noise Change (peak hour)
Location 1 – Hawthorns	+5	+8
Location 2 – Barton Court, Treviscoe	+8	+11
Location 3 – La Mount	+7	+9
Bodella	+6	+7
Rostowrack	+3	+4

7.4.2 It is clear from the table that development will result in a significant increase in noise levels, both in terms of daily averaged noise and during the peak period. A change in noise level of +10 dBA is normally taken to represent a doubling in loudness for *steady* noise. Where noise is *unsteady* (i.e. as in this situation due to coming and going traffic), it is likely that there will be periods when the noise is perceived to have more than doubled in volume. In this context, it is concluded that the change in noise level due to the development would represent a significant negative impact, particularly in Treviscoe, La Mount and Hawthorns.

- 7.4.3 For the baseline case, HGVs travel along the existing public highway whereas HGVs associated with the development will also travel along the new haul road and access road. This means that the impact on properties will potentially affect different façades to those currently affected. For example, the rear garden of properties adjacent to the haul road (Hawthorns) which are currently screened from the Stamps Hill Road by the house will become exposed to noise from the new haul road without the benefit of screening from the house. In a similar manner, properties in Treviscoe will experience a new noise source due to the access road to the rear of their properties.
- 7.4.4 Noise change refers to the perceived change in the noise environment and can be assessed in many different ways. It can be used to understand whether the character of the area will change such that there is a perceived (adverse) change in the quality of life.
- 7.4.5 The statement that a change in noise level of 3 dB is the minimum perceptible change in noise does not hold true where the new noise is different in character (e.g. frequency, content or time variance) to the baseline noise.
- 7.4.6 There is currently a debate amongst acoustics professionals about whether the use of the L_{Aeq} parameter properly accounts for peoples' reactions to an increased number of discrete events, such as aircraft taking off and landing at airports or individual HGVs passing a property. The L_{Aeq} index places equal emphasis on doubling the number of individual events as it does to doubling the sound power of the source. Many acoustics professionals (myself included) contend that it is more appropriate to give greater weight to an increased number of events than to an increase in individual event sound energy and this is supported by various technical papers on the subject.

- 7.4.7 Research²⁹ presented in 1990 shows that there is not an equal energy relationship between the number of noisy events and peoples' response to noise. As another example, the Noise and Number Index (NNI) was derived during the 1960s as a method of correlating the average peak noise level of events and the number of events with annoyance. This research, as presented in Appendix XI of the Wilson Report³⁰ derived a relationship between the number events and annoyance using a value of 15 log of the number of events, rather than 10 log (N) which results from using L_{Aeq} .
- 7.4.8 This research provides further support to the argument that it is not enough to simply examine the noise change in terms of L_{Aeq} , but that appropriate account should also be taken of the number of events. This will be particularly important at properties adjacent to the access road, haul road and the stretch of public highway between the two (i.e. properties at Stamps Hill junction and at La Mount corner). Assessment of changes should not, therefore, be limited to a simple comparison of ambient noise levels before and after the development.

7.5 Conclusions on the Assessment of Operational Impact on Residential Properties

- 7.5.1 I have assessed the potential impact of the proposed development in several different ways using the various impact assessment methods that are available. The results of this assessment are as follows:
- i. The BS 4142 assessment shows that **complaints are likely** at some properties or of **marginal significance** at others. Complaints are likely at all locations during the peak hour.
 - ii. The absolute noise level assessment shows that locations 1 and 2 will move from being below the level for onset of moderate annoyance to above that value and the rear gardens to the properties at La Mount will move from a situation where the noise level slightly exceeds the level for onset of moderate annoyance to being **well above the threshold for serious annoyance**.

²⁹ "Trading Number of Operations Versus Loudness of Aircraft", Hugo Fastl, Internoise 90

³⁰ Wilson Report, 1963, 'Committee on the Problems of Noise': Final Report', Cmnd. 2056, HMSO, London

- iii. The noise change assessment shows that there will be a **significant negative impact** due to cumulative operational noise from the development, particularly in Treviscoe, La Mount and Hawthorns
- iv. The results of the DMRB style assessment shows that there will be a **major** impact at Hawthorns and Treviscoe, a **moderate** impact at La Mount and Bodella Farm and a **minor** impact at Rostowrack Farm due to operational traffic.

8 Impact due to Operational Noise on Public Rights of Way

8.1 General

8.1.1 There are numerous public footpaths in the vicinity of the proposal site. With respect to noise, the primary footpaths of concern are as follows:

- 416015 (adjacent to the haul road);
- 416017 (adjacent to the haul road and public highway);
- 416018 (leading from access road to Little Trecice);
- 416002 (adjacent to the access road);
- 416108 (leading from access road to Little Trecice);
- 416109 (leading from access road to Little Trecice);
- 416031 (leading from the access road to Treviscoe);
- 416005 (adjacent to the CERC's southern site boundary);
- 416014 (adjacent to the CERC's eastern site boundary).

8.1.2 In Section 6.6 of the noise addendum report, Hoare Lea states that *“during day time hours, the processing element of the plant is expected to result in noise levels between 45 and 55 dBA for the majority of the footpath around the site perimeter, with the exception of approximately half of the north-western boundary where noise levels extend into the 55 – 65 dBA range.”* The document does not, however, present the cumulative ambient level due to the fixed plant and HGVs on the access road. Consequently, the impact predicted by Hoare Lea for the public rights of way is likely to be significantly underestimated.

8.1.3 There are several footpaths in the vicinity of the scheme and the proposed haul route and access road. This includes the route of the two footpaths extending along the 250 m of public road

between the haul route and access road and a footpath running immediately adjacent to the entire length of the access road.

- 8.1.4 As discussed in the preceding section, assessment of changes should not be limited to a simple comparison of ambient noise levels before and after the development. It is therefore considered important to understand how the L_{Amax} levels will differ from the baseline case, particularly relating to HGV movements and tipping within the reception hall. I have carried out such an assessment for the impact of noise on public rights of way.
- 8.1.5 Typical noise levels for waste delivery vehicles are presented in BS 5228-1. The typical maximum sound pressure levels for a 44 tonne refuse lorry is 78 dBA at 10 m. This equates to a level of 84 dB L_{Amax} at 5 m and 92 dB L_{Amax} at 2 m from a passing HGV, i.e. at distances representative of walking alongside the access road.
- 8.1.6 I have calculated the resultant ambient noise level along the footpath as a result of HGV movements according to the methodology set out in BS 5228, assuming an average of 21.6 HGV movements per hour, travelling at 50 km/h. On this basis, the noise level due to HGVs on the access road will be in the range 60 - 65 dB $L_{Aeq,1h}$ alongside the track during the average hour. Noise levels during the peak hour will be about 4 dBA higher than this (i.e. in the range 64 – 69 dB $L_{Aeq,1h}$).

8.2 Noise Level Difference

- 8.2.1 According to WHO guidance, it is relevant to assess the difference between the level of intruding noise (i.e. noise arising from the development, or specific noise) to natural background sound. I have taken the background L_{A90} level to be the best indicator of background sound because it gives a robust indication of the underlying noise level.

8.2.2 Although I have not specifically undertaken background noise surveys for the footpaths in the vicinity of the site, background noise levels will be similar to those measured at the western end of Treviscoe and at Bodella Farm (i.e. in the range 40 – 48 dB L_{A90}). Noise levels along the proposed access road are further away from the clay workings and, as a result, noise levels will be similar to levels measured at the western end of Treviscoe (i.e. a background noise level of around 38 dB L_{A90}) or to the noise measurements on the public footpath to central Treviscoe as detailed in the 2006 Jacobs Babbie report (i.e. in the range 32 – 39 dB L_{A90}).

8.2.3 The difference between intruding noise to background noise is presented in Table 8.1, below.

Table 8.1: Assessment of Intruding Noise to Background Sound on Public Footpaths

Location	Background Noise, dB L_{A90}	Intruding Noise, dB L_{Aeq}	Difference, dB
Footpaths in vicinity of site	40 – 48	55 – 65	+7 to +25
Footpath alongside access road	38	60 – 65 (64 – 69 peak hour)	+22 to +27 (+26 to +31)

8.2.4 The WHO guidance suggests that the difference between intruding noise to natural background sound should be kept “low”, although it does not define what it means by low. However, it is clear that a level difference ranging from +7 to + 31 dB cannot realistically be described as “low”, particularly if the character and temporal variations in noise are taken into account. In other words, it is likely that noise from the development and, in particular, from HGVs on the access road will be intrusive in nature and out of character with the baseline “soundscape”.

8.3 Absolute Noise Level Assessment

8.3.1 It is also relevant to assess noise levels on public rights of way against absolute noise criteria. With average levels in the range 60 – 65 dB $L_{Aeq,1h}$, and between 64 – 69 dB $L_{Aeq,1h}$ during the peak hour, it is clear that the noise on public footpaths will exceed the WHO criterion for onset of serious community annoyance by noise (of 55 dB L_{Aeq}) by some 5 – 14 dBA. To put this into context, an increase of 10 dBA is usually taken to represent a subjective doubling in loudness. There will therefore be sections of footpath where the noise level, at times, will be subjectively twice as loud, or more, than the criterion for onset of serious community annoyance.

8.3.2 Comparing these limits to the old MPG 11 guidelines for public spaces (65 dB $L_{Aeq,1h}$), this guideline limit would be exceeded during the peak hours.

8.4 Assessment of Noise Change

8.4.1 The noise change on public footpaths is presented in Table 8.2, below.

Table 8.2: Assessment of Ambient Noise Change on Public Footpaths

Location	Baseline Ambient Noise, dB L_{Aeq}	Post Development Ambient Noise, dB L_{Aeq}	Noise Change, dB
Footpaths in vicinity of site	50*	56 – 65	+6 to +15
Footpath alongside access road	43 [#]	60 – 65 (64 – 69 peak hour)	+17 to +22 (+21 to +26)

* Based on ambient noise level at Bodella Farm.

Based on ambient noise level at rear gardens of Barton Court and Barton Road.

8.4.2 The minimum perceivable noise change discernable to the human ear is normally taken to be around 3 dBA, but this is for steady noise of similar characteristics. Likewise, a change in noise level of +10 dBA is normally taken to represent a doubling in loudness for steady noise. Where noise is unsteady, or of a different character, it is likely that there will be periods when the noise is perceived to have more than doubled in volume, or when a change of less than 3 dBA will be perceived.

8.4.3 Furthermore, although not necessarily directly relevant to operational vehicle noise (as opposed to construction noise), Annex E of BS 5228 includes the advice that, for public open space, impact might be deemed to be significant if the total noise exceeds the baseline ambient noise ($L_{Aeq,period}$) by 5 dB or more. If a noise is sufficiently high enough that it would be deemed to be a significant impact during temporary construction activities then it follows that a similar level of noise is unlikely to be less significant, and would be potentially more so, during permanent operations.

8.4.4 Assessing the noise change values presented in Table 8.2 in light of this, it is clear that a noise change in the range of +6 to +26 dB would represent a significant change in the noise character of the area. In this context, it is concluded that the change in ambient noise level due to the site and, in particular, HGVs on the access road would represent a significant negative impact to users of the public footpaths.

8.5 Conclusions on the Impact due to Operational Noise on Public Rights of Way

8.5.1 I have assessed the potential impact of operational noise from the proposed development on public rights of way in several different ways using the various impact assessment methods that are available. The results of this assessment are as follows:

- i. The **difference** between the noise due to the development and the background noise level will result in a change in the character of the soundscape.
- ii. According to the **absolute** noise level assessment, noise levels on public footpaths will exceed the WHO criterion for **onset of serious community annoyance** by some 5 – 14 dBA (and the old MPG11 noise limit for public spaces will be exceeded during the peak hours).
- iii. The change in ambient noise level will range between +6 to +26 dBA and would result in a **significant change** in the noise character of the area, particularly on the footpaths adjacent to the access routes.

9 Assessment of Impact due to Construction Noise on Residential Properties

9.1 Assessment of Noise Change

9.1.1 Construction noise levels are summarised in Section 6.3 of this proof.

9.1.2 Table 9.1 summarises the change in ambient noise level predicted for the construction phase of the development. The first column (“Site Construction”) shows the range in the expected noise change over the entire construction programme, whereas the second and third columns show the expected noise change during haul road preparation and surfacing.

Table 9.1: Predicted Noise Change due to Construction Noise

Location	Change in Ambient Noise Level, dB L _{Aeq}		
	Site Construction	Haul Road (Preparation)	Haul Road (Surfacing)
Location 1 – Hawthorns	+3 to +6	+9 to +23	+18 to +22
Location 2 – Barton Court, Treviscoe	+3 to +9	+10 to +23	+18 to +22
Location 3 – La Mount	+2 to +5	+9 to +21	+17 to +20
Bodella	0 to +21	+6 to +18	+13 to +17
Rostowrack	+1 to +25	+0 to +5	+2 to +4

9.1.3 From the table it is clear that there will be significant changes in the ambient noise environment at all of the locations assessed for some periods of the construction programme. Taking the example of Rostowrack farm (see Table 6.4 for more detail), noise levels will increase by up to 25 dBA for six months (quarters 2 and 3). The noise change for the remaining construction periods will range between +9 to +23 dBA, with the exception of the very last quarter (plant commissioning) which will result in a smaller change of +1 dBA.

9.1.4 Whilst it is recognised that construction will be a temporary activity, it should be borne in mind that the construction period is likely to last for 3½ years. Residential properties in the vicinity of the site will experience a significant change in the noise environment for some or all of this period.

9.2 Absolute Noise Level Assessment

9.2.1 Examining the predicted noise levels due to construction at Bodella Farm and Rostowrack (see Table 6.4), it is clear that noise from construction activities will potentially be very high for much of the construction period. Noise levels ranging between 64 – 71 dB L_{Aeq,1h} (free-field) will be experienced at these two properties for six months and slightly lower levels (but still up to 69 dBA) will be experienced through other periods of construction. Noise levels at the façades of the properties will be 3 dB higher due to reflections, i.e. in the range 67 – 74 dB L_{Aeq} (façade).

- 9.2.2 Table 6.4 shows that noise levels due to construction of the haul and access routes are likely to be very high at properties near to the routes. For example, noise levels at La Mount are predicted to be around 77 dB $L_{Aeq,1h}$ (free-field), equivalent to 80 dB $L_{Aeq,1h}$ (façade).
- 9.2.3 A summary of the specific noise levels due to construction activities is presented in Figure 9.1 to Figure 9.3, below, against the absolute limit specified in AL72 and the MPS 2 absolute limit of 55 dBA. In order to show a comparison to both the MPS 2 limit (which is a free-field value) and AL72 limit (which should be measured at a façade) on the same graph, the AL72 limit has had a -3 dB correction applied to it (making the limit 67 dBA) to convert it to a free-field noise level. The values in the graphs are taken from Table 6.4 to Table 6.6 of this proof.

Figure 9.1: Predicted Ambient Noise due to Site Construction (free-field)

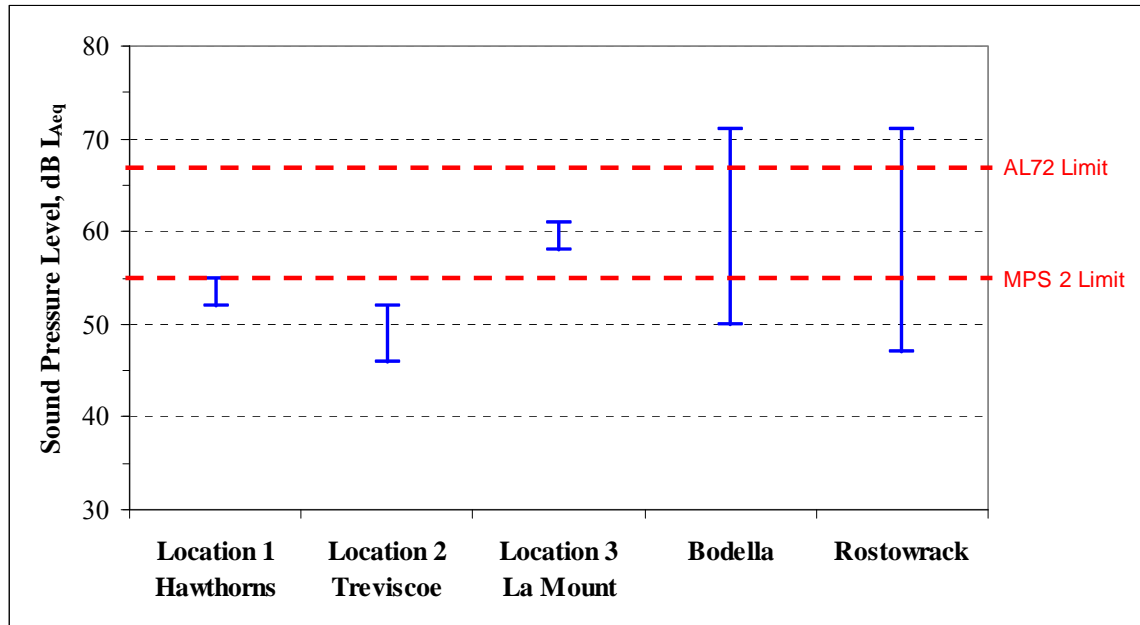


Figure 9.2: Predicted Ambient Noise due to Haul Road and Access Route Preparation Works (free-field)

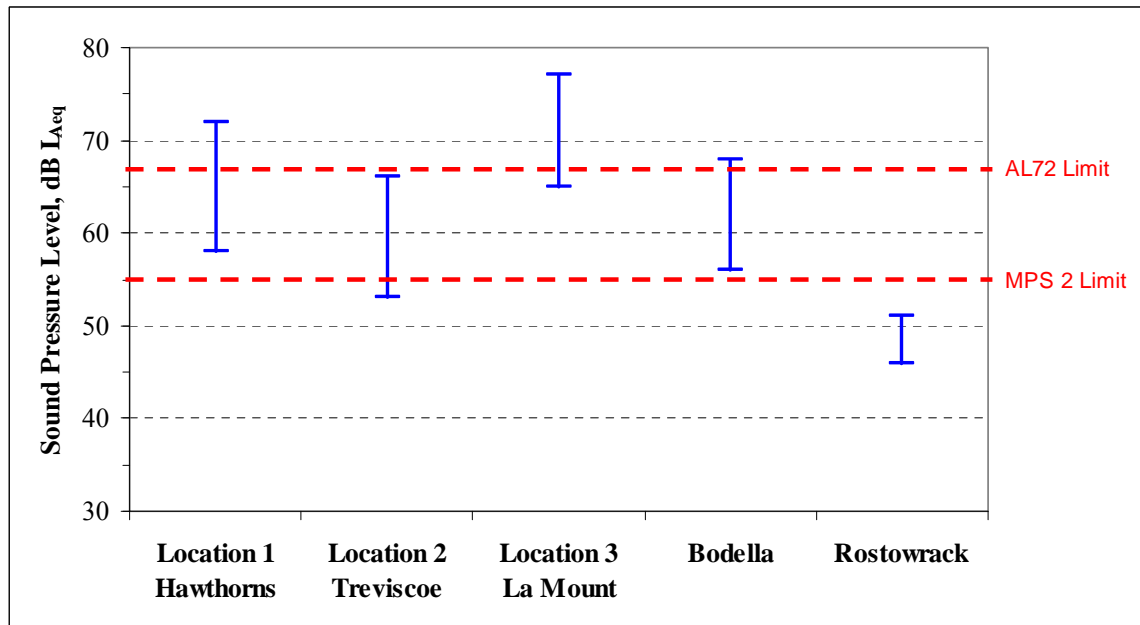
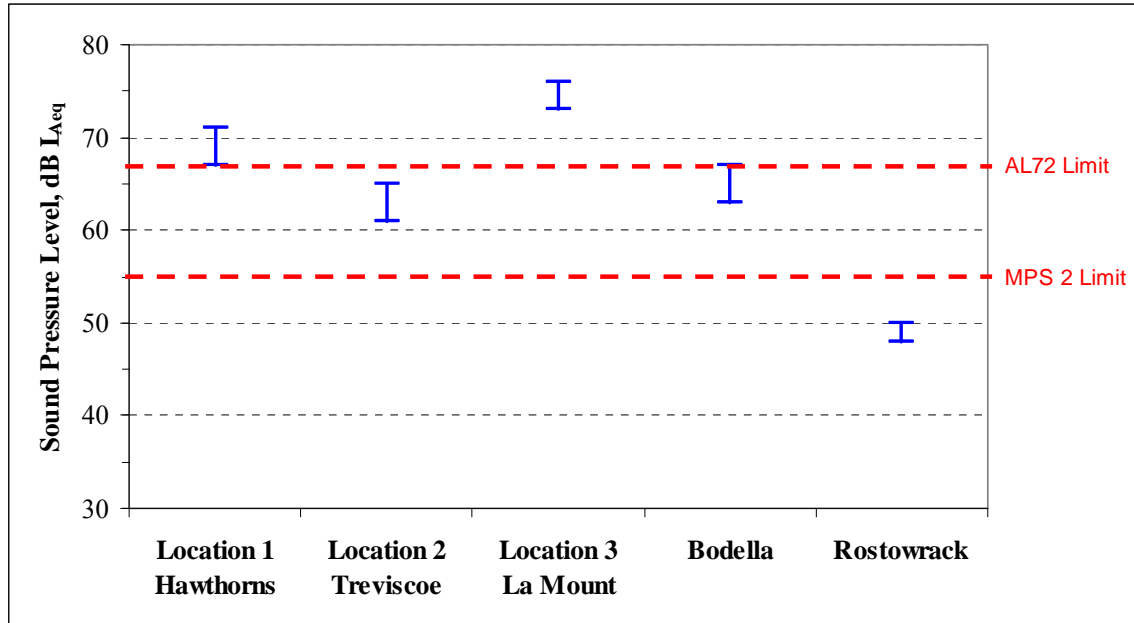


Figure 9.3: Predicted Ambient Noise due to Haul Road and Access Route Surfacing (free-field)



9.2.4 From the figures, it is clear that noise from construction activities will exceed the noise limit of 70 dBA at the façade of residential properties contained in Advisory Leaflet 72. It can be seen that the limit will be exceeded by as much as 10 dBA at La Mount during Haul Road preparation activities (i.e. the noise will be subjectively twice as loud as the limit). Likewise, this limit is likely to be exceeded (by a margin of up to 4 dBA) for a period of half a year at both Bodella and Rostowrack Farms.

9.2.5 Construction noise levels will exceed the WHO criterion for onset of serious community annoyance by noise (of 55 dB LAeq) for much of the time during the 3½ year construction programme. It is therefore likely that construction noise could potentially result in widespread community annoyance based on noise levels presented in the noise addendum report.

9.2.6 On the basis of the absolute ambient noise levels presented above, there is also the possibility that the properties at La Mount, Hawthorns, Bodella and Rostowrack could reach the noise insulation trigger levels presented in Table E.2 of BS 5228 for some of the construction period. There is, however, insufficient detail at this stage to fully assess the construction noise levels in line with these suggested criteria. Notwithstanding this, the possibility that noise levels will

exceed the suggested criteria for eligibility for noise insulation throughout much of the construction programme further illustrates the acuteness of the impact.

9.2.7 An alternative method for undertaking an absolute noise level assessment (which also takes into account the baseline ambient noise level) is the ABC method (E.3.2 from BS5228), as described in Section 5.6.8 of this proof. Because the ambient noise level at all locations is less than Category A values during the daytime, a significant impact will be judged to have occurred if the ambient noise level exceeds 65 dB L_{Aeq} . As this level is exceeded for some periods of the construction programme at all of the receiver locations assessed, it is concluded that a significant impact will occur according to this method.

9.3 MPS2 Construction Noise Assessment (Noise Level Difference Assessment)

9.3.1 The guidance contained in MPS2 suggests that noise should not exceed the background level by more than 10 dBA, subject to a maximum of 55 dB $L_{Aeq,1h}$. The predicted ambient noise levels due to construction are assessed against the MPS2 implied noise limit in Table 9.2, below.

Table 9.2: Construction Noise Assessment according to MPS2

Location	Noise Level, dBA		MPS2 Assessment		
	Background dB L_{A90}	Implied MPS2 Limit	Site Construction	Haul Road (Preparation)	Haul Road (Surfacing)
Location 1 – Hawthorns	46	55	Within limit	Exceeds limit	Exceeds limit
Location 2 – Barton Court, Treviscoe	38	48	Exceeds limit	Exceeds limit	Exceeds limit
Location 3 – La Mount	43	53	Exceeds limit	Exceeds limit	Exceeds limit
Bodella	48	55	Exceeds limit	Exceeds limit	Exceeds limit
Rostowrack	39	49	Exceeds limit	Within limit	Within limit

9.3.2 The table shows that the MPS2 guideline relative noise limits (i.e. taking the background noise into account) will be exceeded throughout the majority of the site and haul road construction programme.

9.4 Comments on Construction Noise

- 9.4.1 It is possible to control the effects of noise from construction activities through powers under the Control of Pollution Act or, if construction noise is a material planning consideration, as part of the planning process. In deciding whether it will be necessary to consider construction noise under the planning process, it is therefore necessary to form a view on whether the powers under COPA would be adequate and appropriate or whether a more appropriate standard can and should be applied through planning powers.
- 9.4.2 It should be noted that the use of planning and nuisance provisions do not duplicate each other because the objectives are different. A higher standard of environmental protection is possible through the planning regime since any requirement to protect amenity would be a more rigorous test than avoiding nuisance. In this regard, the duration of the works is also relevant. It may, therefore, be appropriate to apply planning conditions for long term construction projects where the development might not otherwise go ahead because the disruption would be so great.
- 9.4.3 It is often argued that residents near a development will tolerate a period of relatively noisy construction works in the knowledge that the noise will eventually subside when the plant becomes operational. In this case, however, the operational noise level will be very high, by virtue of HGVs. Taking this into account, and because the construction noise impact is so acute, it is considered that it may be appropriate to apply greater weight to construction noise in these circumstances.
- 9.4.4 The high levels of noise predicted for the construction phase for this development demonstrate that there is a possibility of significant disruption during construction of the CERC and haul road. Consequently, it is proposed that planning conditions should be imposed limiting construction noise, making allowances for temporary noisy activities where necessary, and requiring submission of a noise management scheme to reduce the impact from construction noise.
- 9.4.5 However, based on the construction noise levels predicted at Bodella Farm and Rostowrack Farm, it is unlikely that a planning condition which sufficiently protects amenity would be achievable at these locations. It may, therefore, be more appropriate to consider further mitigation, such as temporary re-housing during construction, for residents of these properties.

Likewise, it may be appropriate to consider temporarily re-housing residents in some of the properties near to the proposed haul road during particularly noisy periods of construction.

9.5 Conclusions on the Assessment of Impact due to Construction Noise on Residential Properties

9.5.1 I have assessed the potential impact of construction noise due to the proposed development in several different ways using the various impact assessment methods that are available. The results of this assessment are as follows:

- The results of the **noise change** assessment show that there will be **significant changes** in the ambient noise environment at all of the locations assessed for some periods of the construction programme.
- The **absolute** noise level assessment shows that noise from construction activities will **exceed the guideline noise limit** of 70 dBA at the façade of residential properties contained in Advisory Leaflet 72 for some of the construction period. The absolute noise limit contained in MPS2 will also be exceeded for much of the time.
- With respect to the **level difference** assessment, it is concluded that the MPS2 guideline relative noise limits (i.e. taking the background noise into account) will be **exceeded** throughout much of the site and access route construction programme.

10 Assessment of Impact due to Construction Noise on Rights of Way

10.1 Noise Level Difference

- 10.1.1 I have calculated the resultant ambient noise level along the footpath as a result of HGV movements according to the methodology set out in BS 5228, assuming an average of 30 HGV movements per hour, travelling at 30 km/h (based on 149 two-way trips, or 248 movements, per 10 hour day, as stated in paragraph 3.2.1 of the ES noise addendum report and taking the worst case quarter from Table 3.2). On this basis, the noise level due to HGVs on the access road will be in the range 58 - 63 dB $L_{Aeq,1h}$ alongside the track during the average hour, not including the contribution from other sources of construction noise.
- 10.1.2 I understand that there will be disruption to the route of the footpath alongside the access road. However, without detailed proposals, I have assumed that any alternative route will be adjacent to the existing route.
- 10.1.3 According to WHO guidance, it is relevant to assess the ratio of intruding noise to natural background sound. The ratio of intruding noise to background noise is presented in Table 10.1, below.

Table 10.1: Assessment of Intruding Noise to Background Sound on Public Footpaths

Location	Background Noise, dB L_{A90}	Intruding Noise, dB L_{Aeq}	Difference, dB
Footpaths in vicinity of site	40 – 48	55 – 71*	+7 to +31
Footpaths alongside access road during access route construction	38	Up to 77 dBA**	Up to +39
Footpaths alongside access road during remaining construction period	38	58 - 63	+20 to +25

* based on predicted construction noise levels at Bodella Farm

** based on predicted haul road construction noise levels at La Mount

- 10.1.4 The WHO guidance suggests that the ratio of intruding noise to natural background sound should be kept “low”. It is clear that a level difference ranging from +7 to + 39 dB is not “low” and, in my opinion, represents a significant difference, particularly if the character and temporal variations in noise are taken into account.

10.1.5 Of particular concern, noise levels on the footpath alongside the access road will experience extremely high noise levels during construction of the haul road. However, it should be recognised that this activity will occur for a short period during the construction period. Even so, noise levels during the remainder of the construction programme will still be high.

10.1.6 It is therefore concluded that noise from the development and, in particular, from construction of the access routes and HGVs on the access road will be intrusive in nature and out of character with the baseline “soundscape”.

10.2 Absolute Noise Level Assessment

10.2.1 It is also relevant to assess noise levels on public rights of way against absolute noise criteria. With average levels in the range 55 – 77 dB L_{Aeq} it is clear that the noise on public footpaths will exceed the WHO criterion for onset of serious community annoyance by noise (of 55 dB L_{Aeq}) by up to 22 dBA for some periods of the construction programme. The limit for public spaces suggested in the old MPG 11 of 65 dB L_{Aeq} will also be exceeded at many locations.

10.3 Assessment of Noise Change

10.3.1 The noise change on public footpaths is presented in Table 10.2, below.

Table 10.2: Assessment of Ambient Noise Change on Public Footpaths

Location	Baseline Ambient Noise, dB L_{Aeq}	Construction Ambient Noise, dB L_{Aeq}	Noise Change, dB
Footpaths in vicinity of site	50*	56 – 71	+6 to +21
Footpaths alongside access road during access route construction	43 [#]	Up to 77	Up to +34
Footpaths alongside access road during remaining construction period	43 [#]	58 – 63	+15 to +20

* Based on ambient noise level at Bodella Farm.

[#] Based on ambient noise level at rear gardens of Barton Court and Barton Road.

10.3.2 Appendix E of BS5228 suggests that, for public open space, impact might be deemed significant if the noise change is equal to 5 dB or more, but only if the change is for a period of one month or more. Noise levels on footpaths in the vicinity of the site and access routes will experience a change in noise level ranging from +6 to +34 dBA throughout the four year

construction period. This would be a clearly discernable change in noise environment and construction noise would become the dominant source of noise.

10.3.3 Appendix E of BS 5228 suggests that, for public open space, impact might be deemed significant if the noise change is equal to 5 dB or more, but only if the change is for a period of one month or more. In this context, it is concluded that the change in ambient noise level due to construction would represent a significant negative impact to users of the public footpaths.

10.4 Conclusions on the Assessment of Impact due to Construction Noise on Rights of Way

10.4.1 I have assessed the potential impact of noise from the construction of the proposed development on public rights of way in several different ways using the various impact assessment methods that are available. The results of this assessment are as follows:

- i. There will be a large **difference** between the construction related noise and the background noise level. Noise from construction activities will be intrusive in nature and out of character with the existing “soundscape”.
- ii. According to the **absolute** noise level assessment, noise levels on public footpaths will exceed the WHO criterion for onset of **serious community annoyance** (and the old MPG11 noise limit for public spaces will be exceeded at some locations).
- iii. The change in ambient noise level will range between +6 to +34 dBA and will result in a **significant change** in the noise character of the area, particularly on the footpaths adjacent to the access routes during construction of those routes.

11 Policy Compliance

- 11.1 I have summarised the results of my assessment of construction and operational noise due to the development in Tables A2.1 to A2.3 of Appendix 2. The table summarises the results of my assessment in line with national policy, guidance and standards.
- 11.2 It is also relevant to review the noise impact from the development in line with the Development Plan Policies detailed in Section 4.2 of this proof. This assessment is shown in Table A2.4 of Appendix 2, and summarised below.

Table 11.1: Development Plan Policy Compliance Table

Policy Plan	Policy No.	Policy Requirement	Comment	Compliance?
Cornwall Structure Plan	3	Development should <u>avoid</u> , directly or indirectly, risk of <u>significant levels</u> of pollution or contamination to air, land, soil or water, including <u>noise</u> and light pollution	The impact of both operational and construction noise will be significant.	No
	6	Development should be compatible with... the <u>protection</u> of the environment and <u>local amenity</u> from <u>significant adverse effects</u> of waste management facilities	Noise will result in a significant adverse effect during both construction and operational phases. Both construction and operational noise will result in a loss of amenity to local residents and users of public footpaths.	No
Cornwall Waste Local Plan	C1	Proposals for waste management facilities will be carefully evaluated for potentially damaging effects and will not be permitted unless it can be satisfactorily demonstrated that :		
	a)	the development includes appropriate <u>measures to prevent a significant risk of pollution</u> ;...	Measures to minimise the effect of noise from the development were dismissed by the appellant as not required during the application	No
	c)	proposed site management measures can be ensured to <u>protect local amenity</u> through minimising emissions of noise, dust and odour, fumes and control, litter and vermin and birds;...	Both construction and operational noise will result in a loss of amenity to local residents and users of public footpaths.	No
	e)	the <u>traffic</u> to and from the development would not <u>prejudice amenity</u> or highway safety and that there is adequate highway capacity;...	The traffic to and from the development will result in a loss of amenity to local residents and users of public footpaths, as demonstrated by	No

Policy Plan	Policy No.	Policy Requirement	Comment	Compliance?
			the DMRB assessment as well as the absolute level, noise change and level difference assessments	
	h)	the <u>cumulative impact</u> of individual effects will not cause <u>unacceptable detriment to local amenity</u> or the natural and historic environment...	The cumulative noise impact due to all of the sources associated with the development will result in a loss of amenity to local residents and users of public footpaths.	No
Restormel Borough Council Local Plan	Policy 37	Development proposals will not be permitted that cause harm from noise	The BS 4142 assessment shows that complaints are likely, primarily due to noise from HGVs. Absolute ambient noise level will in some cases move to above level for onset of serious annoyance.	No

12 Response to Appellant's Proposals for Mitigation

- 12.1.1 I have not had sight of full and detailed proposals for mitigation as yet, although I understand that they intend to offer further mitigation in the form of a raised Cornish hedge running the length of the access road and additional noise barriers in the vicinity of Hawthorns and La Mount. I am unable to provide my own detailed analysis of these measures until I have received the detailed proposals and details of the appellant's predicted residual noise impact taking into account the benefit of the proposed mitigation measures.
- 12.1.2 It is also understood that the appellant has offered to re-house residents of the properties at Bodella Farm and Rostowrack Farm within six months of the site becoming operational. This does not, however, protect the amenity of those affected residents during the construction phase of the development, even though the impact will be acute at these properties during this period.

13 Planning Conditions

13.1 Various conditions relating to noise have been proposed in the Statement of Common Ground (conditions 12, 13, 21, 24, 30, 33 and 34). However, no noise limits have been proposed, even though the appellant proposed a night-time noise limit of 42 dBA in the original application.

13.1.1 I have considered what additional planning conditions might be proposed in addition to those contained in the Statement of Common Ground in order to ensure that the impact due to both operational and construction noise is more acceptable. However, in my view, many of the impacts would currently be unacceptable and, in absence of detailed proposals of mitigation measures, this is a matter to which I intend to give further consideration, in discussion with the appellant, once proofs of evidence have been exchanged.

14 Conclusions

- 14.1 A person's response to a noise depends on factors including the margin by which it exceeds the background noise level, its absolute level, the time of day, the change in the noise environment etc., as well as local attitudes to the premises and the nature of the neighbourhood. In other words, it is not sufficient to rely on only one method of assessing a noise source but, if a holistic approach is to be taken, it is necessary to consider all of these factors
- 14.2 With this in mind, I consider that the criteria adopted in the ES for assessing the impact due to noise from the proposed development are inadequate. I have therefore assessed the impact of the proposed scheme according to the national and local plans and guidance referred to in Section 4 of this proof of evidence.
- 14.3 When assessing the level difference (i.e. undertaking a BS 4142 assessment), I have concluded that the development will result in a BS 4142 rating ranging from +5 dB at Bodella Farm to +17 dB at La Mount Corner. Consequently, I have concluded that the likelihood of complaints ranges from being marginal to well above the complaints likely threshold.
- 14.4 Many locations will move from being below the level for onset of moderate annoyance to above that value. Of particular concern, however, the properties at La Mount will move from a situation where the noise level already exceeds the level for onset of moderate annoyance to being well above the threshold for serious annoyance.
- 14.5 With respect to changes in ambient noise, I have concluded that the development will result in a significant increase in noise levels, both in terms of daily averaged noise and during the peak period, resulting in a significant negative impact, particularly at the properties in the western extent of Treviscoe. The impact on properties, at La Mount and Hawthorns in particular, will potentially affect different façades to those currently affected.

- 14.5.1 It is HGV noise that is likely to have the greatest impact. During the operational peak hours, the number of noisy HGV pass-by events will increase by a factor of 5 at properties alongside the public road (between the haul road and access road). The number of HGV pass-by events over the entire day will increase by a factor of three. In a similar vein, users of the public footpaths adjacent to the haul road and access road will be subjected to L_{Amax} levels of up to 92 dBA at frequent intervals.
- 14.6 Accordingly, I have concluded, having taken into account the relevant guidance documents, that the development will result in an unacceptable noise impact, contrary to the provisions of the development plan policies.

15 References

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