

CONTENTS

INTRODUCTION	1
Government Advice, Standards and Good Practice	1
Methodology	3
RECEIVING ENVIRONMENT	5
IMPACT OF THE PROPOSED WASTE FACILITY	8
Direct Short Term Impacts	8
Long -Term Impact	9
Indirect Impact	9
Interaction with Other Environmental Receptors	10
MITIGATION MEASURES AND MONITORING	10
Mitigation Measures	10
Good Practice in Noise Reduction	10
Monitoring	11
CONCLUSION	11

TABLES

Table 8-1	Impact Scale for Comparison of Future Noise against Existing Noise
Table 8-2	Summary of Measured Noise Levels, free-field, dB
Table 8-3	Predicted Noise Levels for Pit Extension Operations, free-field, dB

FIGURES

Figure 8-1	Noise Monitoring Locations
Figure 8-2	Assessments of Impacts

APPENDICES

Appendix 8-1	Glossary of Terminology
Appendix 8-2	Noise Assessment
Appendix 8-3	Limitation to this Report



INTRODUCTION

- 8.1 This Chapter of the Environmental Impact Statement (EIS) considers the potential impacts of noise arising from the proposed backfilling and restoration of the worked out void at Brownswood Quarry. An assessment of the potential noise impact has been undertaken with reference to EIA good practice, the EIA Regulations, British Standards and other guidance documents.
- 8.2 This Chapter, prepared by SLR Consulting Ireland, assesses the potential impacts of additional noise and vibration emissions associated with the site restoration activities. BHP Laboratories undertook the baseline noise monitoring presented in this chapter on behalf of Roadstone Wood Ltd.
- 8.3 Noise aspects of the proposal have been considered at the nearest noise-sensitive locations around the application site. This assessment identifies and assesses the noise impacts from quarry backfilling and restoration activities and examines the cumulative impacts against the stated criteria.
- 8.4 The application site comprises a worked out quarry which is to be restored. It is located approximately 2.5 km south of Enniscorthy, County Wexford. The site is accessed from N11 National Primary Road. Traffic turning off the N11 runs for short distance over the local road network before entering the site. Land use at and in the immediate vicinity of the application site is primarily industrial and commercial. Surrounding land use comprises isolated rural housing and agriculture land.
- 8.5 Technical terms or references are occasionally used in this section. To assist the reader, a glossary of terminology, including a table of typical everyday noise levels is included in Appendix 8-1.
- 8.6 In essence, the quarry backfilling and restoration activities will comprise:
- importation of inert soils from external sources
 - stockpiling, placement and compaction of inert soil
 - occasional separation of any non-inert construction and demolition waste (principally metal, timber, PCV pipes and plastic)

Government Advice, Standards and Good Practice

British Standard 5228:2009

- 8.7 British Standard 5228:2009 *Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 Noise and Part 2: Vibration* set out a methodology for predicting noise and vibration levels arising from a wide variety of construction and related activities. As such, it can be used to predict noise levels arising from the operations of proposed minerals extraction sites. BS5228-1:2009 also sets out tables of sound power levels generated by a wide variety of mobile equipment.
- 8.8 Noise levels generated by the site operations and experienced at local receptors will depend upon a number of variables, the most significant of which are:

- the amount of noise generated by plant and equipment being used for inert soil recovery at the worked out quarry void, generally expressed as a sound power level;
- the periods of operation of the plant at the worked out quarry void, known as the “on-time”;
- the distance between the noise source and the receptor, known as the “stand-off”;
- the attenuation due to ground absorption or barrier screening effects; and
- the reflection of noise due to the presence of hard vertical faces such as walls, berms, quarry faces, banks.

Environmental Management Guidelines (EPA, 2006)

8.9 The *Environmental Management Guidelines for the Extractive Industry (Non-Scheduled Minerals)* present a summary of current environmental management practices for surface workings within the extractive industry. They are based on a review of current environmental management practice in Ireland, the UK and Europe.

8.10 The published guidelines are intended to provide general advice and guidance in relation to environmental issues to practitioners involved in the planning, design, development, operation and restoration of surface extractive industry developments and ancillary facilities in Ireland.

8.11 In relation to surface extractive industry and ancillary activities, it is recommended that noise from activities on site shall not exceed the following noise emission limit values (ELVs) at the nearest noise sensitive receptor:

Daytime: 08:00 hrs – 20:00 hrs LAeq (1hr) = 55 dB(A)
 Nighttime: 20:00 hrs – 08:00 hrs LAeq (1hr) = 45 dB(A)

(Note: 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dB(A)).

Guidelines for Planning Authorities- Quarries and Ancillary Activities (DoEHLG, 2004)

8.12 The DoEHLG Planning Guidelines on Quarries and Ancillary Activities are primarily addressed to statutory planning bodies. They provide an overview of environmental issues and best practice / possible mitigation measures associated with surface working of aggregates and associated ancillary activities. The guidelines are routinely referred to by practitioners involved in the planning, design, development, operation and restoration of surface workings and ancillary facilities in Ireland.

Draft Guidelines for Noise Impact Assessment

8.13 The draft *Guidelines for Noise Impact Assessment* produced by the Institute of Acoustics / Institute of Environmental Management and Assessment Working Party have been referenced in relation to the potential changes in noise levels as a result of the proposed activities.

- 8.14 The findings of the Working Party are draft at present although they are of some assistance in this assessment. The draft guidelines state that for any assessment, the noise level threshold and significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise.
- 8.15 The impact scale adopted in this assessment is shown in Table 8-1 below.

Table 8- 1
Impact Scale for Comparison of Future Noise against Existing Noise

Noise Level Change dB(A)	Subjective Response	Significance
0	No change	No impact
0.1 – 2.9	Barely perceptible	Minor impact
3.0 – 4.9	Noticeable	Moderate impact
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial impact
10.0 or more	More than a doubling or halving of loudness	Major impact

- 8.16 The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.
- 8.17 It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels in this case and have been used to assess the impact of the operational noise.

Methodology

Approach to this Assessment

- 8.18 This assessment considers the likely noise levels that would be generated by the proposed quarry backfilling and restoration activities at the nearby noise-sensitive receptors.
- 8.19 For the purposes of this assessment the term 'sensitive receptors' includes any persons, locations or ecosystems that may be susceptible to changes as a consequence of the proposed activities.
- 8.20 Ecological receptors of concern are those areas designated under EU Habitats Directive (92/43/EEC) or the Birds Directive (79/409/ EEC).
- 8.21 Three isolated residential properties surrounding the application site have been selected for impact assessment. These are identified as R1, R11 and R20 on Figure 8-1. In addition, the Special Conservation Area – Slaney River Valley (Site Code: SAC 000781) designated under EU Habitats

Directive (92/43/EEC), adjoins Roadstone Wood Ltd.'s property boundary and is also selected for impact assessment.

- 8.22 The principal noise impact associated with restoration through deposition is increased noise nuisance. An increase in noise levels is likely to arise on account of:
- Increased traffic along the existing access road to the facility and internally across Roadstone Wood Ltd.'s landholding
 - End-tipping of inert soil
 - Operation of additional plant and equipment within the application site (i.e. bulldozers).
 - Rare or occasional separation of any non-inert construction and demolition wastes (principally metal, timber, PVC pipes and plastic) intermixed within the imported inert soil.
- 8.23 With respect to the potential for noise impacts, the key objective at the application site is to manage activities in order to ensure that any discernable increase in noise levels is prevented and the effect of any increase in noise emissions is minimised.
- 8.24 An assessment has been made of the baseline noise environment and the potential impact of the soil recovery activities. Environmental advantages and disadvantages have been identified and where appropriate, mitigation measures and/or scheme changes to offset potentially adverse environmental impacts have also been identified.
- 8.25 The following issues are addressed separately for the potential impacts:
- methodology used to assess the potential impacts of activities at the facility on noise and vibration levels at local properties;
 - baseline conditions pertaining to measured (or estimated) existing noise and vibration levels around the facility;
 - evaluation criteria;
 - prediction of the potential impacts;
 - evaluation of these impacts;
 - description of mitigation measures which will be incorporated into the design and operation of the facility to eliminate or reduce the potential for noise (or vibration) impacts;
 - summary of any residual impacts and reinstatement;
 - monitoring proposals.
- 8.26 At the measurement positions, the following noise level indices were recorded:
- $L_{Aeq,T}$ – the A-weighted equivalent continuous noise level over the measurement period, effectively represents an “average” value
 - $L_{A90,T}$ – the A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe the background noise
 - $L_{A10,T}$ – the A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe road traffic noise

- 8.27 'A-weighting' is the process by which noise levels are corrected to account for the non-linear frequency response of the human ear. All noise levels are quoted in dB (A) relative to a sound pressure of 20µPa.

Sources of Information

- 8.28 Information regarding the proposed backfilling and restoration activities including plant utilisation and working hours is provided in Chapter 2 of this Environmental Impact Statement.
- 8.29 Information on the noise baseline studies for the purpose of this impact assessment was provided by BHP Laboratories.
- 8.30 Expected noise emission data, in the form of sound power levels have been obtained from Tables provided in BS5228-1:2009.

RECEIVING ENVIRONMENT

- 8.31 The noise impact arising from the operation of the proposed quarry backfilling scheme is assessed by comparing predicted noise levels from proposed activities with existing levels of noise in the environment. The existing background noise environment is characterised by undertaking a baseline noise measurement survey at a number of locations around the application site. The objectives of the baseline study are to:
- determine existing noise levels on site
 - identify sources of noise
 - determine the current impact on the nearest noise sensitive receptors / residents
 - use the data collected to predict noise levels associated with future activity at the site
 - identify suitable and effective mitigation measures
- 8.32 Environmental noise surveys were carried out between 2007 and 2009 at several locations within the Brownswood landholding in compliance with Section 261 Condition No. 18 - QY3. Additional monitoring was also undertaken having regard to Condition No. 21 of the planning permission in respect of the proposed eastward extension of the Old Quarry (Ref. No. PL.26.202259, the "Harris Extension"). The methodology of the surveys and the results are set out below. The weather conditions during the survey periods were acceptable for noise monitoring, being generally dry with little or no wind.
- 8.33 The measurements were carried out using Cirrus 813A Type 1 sound level meter by BHP Laboratories.
- 8.34 The noise monitoring locations considered to be representative of the nearest noise-sensitive locations to the proposed development site are:
- Location 1 (N01)
 - Location 2 (N02)
 - Location 3 (N03)

- Location 4 (N04)
- Location 5 (N05)
- Location 6 (N06)
- Location 7 (NSL 1)
- Location 8 (NSL 2)

8.35 The microphone was placed 1.5m above the ground in free-field conditions, *i.e.* at least 3.5m from the nearest vertical, reflecting surface.

8.36 The results of the noise surveys are summarised in Table 8-2 below. Noise monitoring locations are shown on Figure 8-1.

Table 8-2
Summary of Measured Noise Levels, free-field, dB

Location	Date	Time	Measured Noise Levels – dB(A)		
			L _{Aeq,T}	L _{A10,T}	L _{A90,T}
N01	5/10/2007	12:12-12:42	46.2	46.2	41.8
N02	5/10/2007	12:49-13:19	46.4	48.8	41.8
N03	5/10/2007	13:36-14:06	46.3	47.5	42.5
N06	4-5/10/2007	23:47-00:17	43.4	47.2	27.9
N01	9/06/2008	14:16 -14:46	59.5	74.1	46.7
N02	9/06/2008	14:49 -15:19	56.2	58.1	54.4
N03	9/06/2008	13:33 -14:13	46.9	48.3	42.4
N04	9/06/2008	12:08-12:38	46.0	48.7	41.1
N05	9/06/2008	12:48-13:18	40.7	42.3	35.3
N06	9/06/2008	23:06-23:36	56.7	45.1	31.0
NSL1	15/12/2008	14:48 -15:48	50.1	52.0	45.0
NSL2	15/12/2008	15:57 -16:57	51.9	48.1	43.7
NSL1	30/06/2009	15:57-16:57	49.9	51.2	38.7
NSL2	30/06/2009	14:4 -15:46	43.8	46.0	38.1

8.37 The noise climate at each location was characterised as follows:

5th October 2007

- N01 The noise monitoring location is positioned towards the back of the quarry. Reversing sirens were audible up to 53 dB at 12:37. General Plant activity was audible up to 50 dB. 1 aeroplane passed overhead at 50 dB at 12:25.
- N02 The noise monitoring location is positioned towards the back of the quarry – not currently in use. Off site traffic was audible up to 50 dB throughout the monitoring period. The quarry related activity was not audible during the monitoring period.
- N03 The noise monitoring location is positioned at the northern side of the quarry with several houses nearby. Off site traffic audible in background up to 45-50 dB throughout monitoring period. 2 cars passed during monitoring period reaching 64 dB. Dog started barking at 1:48 pm reaching 52 dB. Reverse sirens heard at 1:56pm

reaching 56dB. Quarry related activity between 45 and 50 dB generally.

N06 The noise monitoring location is positioned at the quarry entrance. Roadside traffic is the main source of noise between 55 and 57 dB at times. A security jeep arrived at 23:54 reaching 60 dB. No activity from the adjoining quarry as it was closed.

9th June 2008

N01 The noise monitoring location is positioned towards the back of the quarry. A dumper passed near the NSL at 14:18 reaching up to 69 dB and again at 14:28 reaching up to 80 dB. General plant activity is audible up to 50 dB.

N02 The noise monitoring location is positioned towards the back of the quarry. The quarry related activity was audible during the monitoring period between 54-58 dB.

N03 The noise monitoring location is positioned at the northern side of the quarry with several houses nearby. Quarry related activity between 40 and 50 dB generally.

N04 The noise monitoring location is positioned at the northern side of the quarry near the proposed new site. Quarry related activity was audible during the monitoring period between 40-50 dB.

N05 The location is near the proposed recovery facility. Quarry activity can be heard between 40 and 50 dB generally.

N06 The noise monitoring location is positioned at the quarry entrance. The quarry was not operating at the time of the survey. 12 cars passed on the road reaching up to 75 dB.

15th December 2008

NSL1 No noticeable noise coming from quarry related activity. Traffic is the most significant noise source with approximately 50 cars (~58 dB) and 8 lorries (~75 dB) passing during the monitoring period. Noise was also evident from nearby farm activity (50-52 dB).

NSL2 No noticeable noise from quarry related activity. 1 tractor passed during monitoring (~70 dB).

30th June 2009

NSL1 No noticeable noise coming from quarry activity. Traffic is the most significant noise source with approximately 30 cars (~52 dB) and 4 lorries (~60 dB) passing during monitoring.

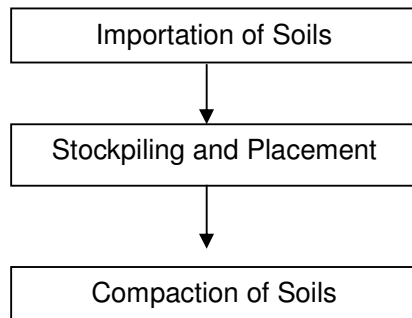
NSL2 No noticeable noise from quarry related activity. 1 van passed during monitoring (~65 dB).

8.38 The recorded averaged ambient noise levels typically range between 40.7 dBA L_{Aeq} and 59.5 dBA L_{Aeq} . Noise levels recorded at location N01, N02 & N06 exceeded the threshold limit of 55 dB (A) during the noise survey undertaken on the 9/6/2008.

8.39 Allowing for external factors, the noise monitoring results show that existing site activity at the Old Quarry generally complies with Condition No. 18 imposed under Section 261 of the Planning and Development Act, 2000 (Quarry Ref. No. QR 3) and Condition No.11 of planning permission PL. 26.202259, the "Harris Extension".

IMPACT OF THE PROPOSED WASTE FACILITY

- 8.40 A noise prediction assessment has been undertaken, whereby the levels of noise associated with inert soil recovery activity were calculated at the nearest noise sensitive receptors (residences) shown on Figure 8-2.
- 8.41 The following flow chart shows the main site activities within the proposed restoration area:



Direct Short Term Impacts

- 8.42 The operational noise levels associated with the proposed inert soil recovery activity are anticipated to include the following:
- HGV movements associated with importation soils, stockpiling and placement
 - Bulldozer activity associated with compaction of soils
- 8.43 The worst case scenario in relation to the above noise sources occurs when the activity takes place closest to the sensitive receptor. This arises when soil placement and compaction takes place at the nearest distance to the receptor; refer to Figure 8-2.
- 8.44 The noise assessment methodology used was based on BS5228: Part 1 (2009) "Code of Practice for Noise and Vibration Control on Construction and Open Sites".
- 8.45 For the purposes of this assessment, a reduction of -10 to -15dB(A) for full noise screening by quarry faces / berms / walls / banks has been adopted. A reduction of -5 dB(A) has been adopted for partial noise screening.
- 8.46 Monitoring of the effects of actual full noise screening by quarry faces / berms / walls / banks indicates that a reduction of -15 to -20 dB(A) is often more realistic. In addition, for the purposes of this noise assessment it is assumed that all of the noise sources are active for a 100% of the time, at the distances stated during working hours. On this basis it is considered that the noise assessment is very conservative and represents a worst case scenario.
- 8.47 For the purposes of the noise assessment, it is assumed that a bulldozer will be used to spread the imported inert natural materials when backfilling and

restoring the void. HGV trucks will be used to transport the material onto and around the site. The following noise sources associated noise levels have been considered:

Bulldozer L_{Aeq} at 10m 80 dB(A)
 HGV truck L_{Aeq} at 10m 79 dB(A)

- 8.48 A noise prediction assessment has been undertaken, whereby the levels of noise arising from the development were calculated at the nearest sensitive receptors, designated R1, R11, R20 and R21 - Special Conservation Area shown on Figure 8-2. Detailed noise assessment calculations are provided in Appendix 8-2.
- 8.49 Table 8-3 details the worst-case predicted noise levels for the proposed soil recovery activities, calculated in accordance with BS5228:2009 and compares them with the criteria as set out in the Environmental Management Guidelines.

Table 8- 3
 Predicted Noise Levels for Pit Extension Operations, free-field, dB

Location	Predicted Noise Level $L_{Aeq,T}$	Recommended ELVs $L_{Aeq,T}$
R1	46	55
R11	49	
R20	45	
R21	50	

- 8.50 In relation to noise thresholds, projections show that even in a worst case scenario, the proposed restoration works can progress *without* exceeding the recognised threshold average ambient noise level of 55dBA L_{Aeq} recommended in the EPA (2006) Environmental Management Guidelines for the Extractive Sector at all Receptors.

Long -Term Impact

- 8.51 The nature of the proposed backfilling and restoration scheme is such that there will be no long-term impacts in relation to noise. Once quarry backfilling works are complete, there is likely to be significantly less operational and/or traffic noise generated across the application site. The reduction in traffic levels along the internal haul roads and over public roads should result in average ambient noise levels falling back to existing levels, with negligible long-term impact on the local environment.

Indirect Impact

- 8.52 There are no indirect impacts with noise and /or vibration at this site.

Interaction with Other Environmental Receptors

- 8.53 As there will be no identifiable increase in noise levels above existing baseline levels, the noise generated by the proposed inert waste recovery activities will not adversely impact on the ecological environment in the vicinity of the site.

MITIGATION MEASURES AND MONITORING

Mitigation Measures

- 8.54 The assessment has shown that, with implementation of the mitigation measures proposed below, the development can comply with the noise emission limit values of 55 dB(A) recommended by the EPA (2006) Environmental Management Guidelines for the Extractive Industry, therefore specific mitigation measures are considered un-necessary.
- 8.55 The following mitigation measures, which are in accordance with the 'best practice/mitigation' measures described in the DoEHLG (2004) Guidelines, have been suggested to reduce any unforeseen impacts, should they arise at the nearby noise-sensitive receptors:
- retention of existing external hedgerows to provide acoustic as well as visual screening
 - provision of screening berms / banks along the appropriate property boundary where feasible to provide acoustic as well as visual screening
 - use of plant and equipment below the crest within the existing quarry void so as to ensure that quarry faces will provide additional acoustic screening.

Good Practice in Noise Reduction

- 8.56 In addition to the noise mitigation measures incorporated into the site design, good site management and good working practices would also provide additional noise mitigation. Through implementation of the proposed mitigation measures it is considered the development will have no significant effects with regard to noise levels on the local residences, their property, livestock and amenity. These measures would include:
- activities within the site would be undertaken in locations where noise attenuation from existing natural landforms would maximise the benefit to the nearby noise-sensitive properties;
 - internal haul routes would, wherever possible, be routed such that separation distances to the noise-sensitive properties are maximised;
 - all haul roads would be kept clean and maintained in a good state of repair, *i.e.* any potholes would be filled and large bumps removed, to avoid unwanted rattle and "body-slap" from heavy goods vehicles;
 - heavy goods vehicles entering and leaving the site should have tailgates securely fastened;

- all mobile plant used at the proposed development would have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments;
- plant would be operated in a proper manner with respect to minimising noise emissions, *e.g.* minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling;
- plant would be subject to regular maintenance, *i.e.* all moving parts to be kept well lubricated, all cutting edges to be kept sharpened, the integrity of silencers and acoustic hoods to be maintained;
- All plant at the proposed development would be fitted with effective exhaust silencers which would be maintained in good working order to meet manufacturers' noise rating levels. Defective silencers would be replaced immediately.

Monitoring

- 8.57 Mitigation measures for noise control are already in place at the site and included in the site Environmental Management Plan. The effective application of these mitigation measures will continue to be monitored.

CONCLUSION

- 8.58 This assessment has considered the potential for the proposed restoration plans at Brownswood Quarry to give rise to noise impacts at the nearest noise-sensitive properties around the proposed development site.
- 8.59 The assessment has found that the proposed quarry backfilling can comply with the noise emission limit values of 55 dB(A) recommended EPA (2006) Environmental Management Guidelines for the Extractive Industry.
- 8.60 Mitigation measures, above and beyond those already designed into the proposed development scheme, are considered un-necessary.

FIGURES

For inspection purposes only.
Consent of copyright owner required for any other use.

APPENDICES

*For inspection purposes only.
Consent of copyright owner required for any other use.*

APPENDIX 8-1 – GLOSSARY OF TERMINOLOGY

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale, is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 8A- 1
Noise Levels Commonly Found In the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at one metre away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2×10^{-5} Pa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{AeqT} L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L₁₀ & L₉₀ If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L₁₀ is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L₉₀ is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L₁₀ index to describe traffic noise.

APPENDIX 8-2 – NOISE ASSESSMENT

Table A8-2

Operational Phase: Importation and Compaction of soils / (refer to Figure 8.4): Worst Case

Plant Type	Average L_{Aeq} at 10m (dB(A))	Screening (dB(A))				Reflection (dB(A))	Activity Distance (m)				Attenuation with Distance (dB(A))				Activity L_{Aeq} (dB(A))			
		R1	R11	R20	R21		R1	R11	R20	R21	R1	R11	R20	R21	R1	R11	R20	R21
Bulldozer	80	-10	-10	-10	-10	+3	353	237	379	210	30	27	31	26	43	46	42	47
HGV Truck	79	-10	-10	-10	-10	+3	353	237	379	210	30	27	31	26	42	45	41	46

Combined Noise Level at R1 = **46 dB L_{Aeq}**
 Combined Noise Level at R11 = **49 dB L_{Aeq}**
 Combined Noise Level at R20 = **45 dB L_{Aeq}**
 Combined Noise Level at R21 = **50 dB L_{Aeq}**

APPENDIX 8/3 – LIMITATIONS TO THIS REPORT

This entails a physical investigation of the site with a sufficient number of sample measurements to provide quantitative information concerning the type and degree of noise and vibration affecting the site. The objectives of the investigation have been limited to establishing sources of noise and vibration material to carrying out an appropriate assessment.

The number and duration of noise and vibration measurements have been chosen to give reasonably representative information on the environment within the agreed time, and the locations of measurements have been restricted to the areas unoccupied by building(s) that are easily accessible without undue risk to our staff.

As with any sampling, the number of sampling points and the methods of sampling and testing cannot preclude the existence of “hotspots” where noise or vibration levels may be significantly higher than those actually measured due to previously unknown or unrecognised noise or vibration emitters. Furthermore, noise or vibration sources may be intermittent or fluctuate in intensity and consequently may not be present or may not be present in full intensity for some or all of the survey duration.

*For inspection purposes only.
Consent of copyright owner required for any other use.*