

Castlepollard Quarry, Deerpark, Castlepollard, Co. Westmeath

Castlepollard Quarry

Environmental Impact Assessment Report

Section 10

Noise & Vibration

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Part of the Breedon Group

Prepared by:

J Sheils Planning & Environmental Ltd

31 Athlumney Castle, Navan, Co. Meath

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TABLE OF CONTENTS

10 NOISE & VIBRATION 1

10.1 Introduction 1

10.2 Regulatory Background 1

 10.2.1 Policy & Legislation..... 1

 10.2.2 Westmeath County Development Plan 2021-2027 2

 10.2.3 Emission Limit Values..... 3

 10.2.3.1 Noise Emission Limit Values 3

 10.2.3.2 Blast Vibration Criteria 4

 10.2.4 Extractive Industry Guidelines 4

10.3 METHODOLOGY 5

 10.3.1 Study..... 5

 10.3.2 Sources of information..... 5

10.4 BASELINE DESCRIPTION OF RECEIVING ENVIRONMENT..... 6

 10.4.1 Sensitive Receptors..... 6

 10.4.2 Environmental Monitoring 6

 10.4.2.1 Routine Noise Monitoring 6

 10.4.2.2 Noise Monitoring 30/05/21 9

 10.4.2.3 Blast Monitoring 11

10.5 ASSESSMENT OF IMPACTS 12

 10.5.1 'Do Nothing' Impacts..... 12

 10.5.2 Direct Impacts..... 13

 10.5.2.1 Blast Vibration..... 17

 10.5.3 Indirect Impacts 18

 10.5.4 Cumulative Impacts 18

 10.5.5 Transboundary Impacts..... 18

 10.5.6 Residual Impacts 18

 10.5.7 'Worst Case' Impact 18

10.6 MITIGATION & MONITORING..... 19

 10.6.1 Mitigation 19

 10.6.1.1 Noise..... 19

 10.6.1.2 Blasting & Vibration 21

Westmeath County Council Planning Authority - Inspection Purposes Only



10.6.1.3 Monitoring 22
 10.7 REFERENCES 24

LIST OF TABLES AND FIGURES

Table 10.1 Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4, 2016)..... 3
 Table 10.2 Recommended Tonal/Impulsive Noise Ratings 3
 Table 10.3 Recent Compliance Monitoring Results 8
 Table 10.4 Results of Noise Monitoring Survey 31/05/21 10
 Table 10.5 Blast Monitoring Results 11
 Table 10.6 Noise - Impact Matrix..... 12

 Figure 10.1 Operational Activities..... 15
 Figure 10.2 Flow Chart for Source of Noise Emissions..... 16

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10 NOISE & VIBRATION

10.1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) pertains to the continued operation of an existing limestone quarry at Deerpark, Castlepollard, Co. Westmeath, known as the Castlepollard Quarry. The proposed development will consist of the continued use and operation of the existing quarry (permitted under P.A. Ref. 01/525), including deepening of the quarry, along with minor amendments to the permitted quarry layout comprising an extraction area of c. 4 ha within an overall application area of c. 11.4 ha. The development will include provision of new site infrastructure including water management system, wheelwash and other ancillaries.

This section of the EIAR deals with the issue of noise and blast vibration associated with the proposed development. The section will determine the existing environment with respect to noise and blast vibration by assessing the level of noise and vibration in the vicinity of the site, the potential impacts on the environment, and propose appropriate mitigation measures, if required, by the applicant to avoid, reduce or remedy any significant adverse impacts on the environment.

10.2 REGULATORY BACKGROUND

10.2.1 POLICY & LEGISLATION

The strategic control of environmental noise is directed by the Environmental Noise Regulations, which transposed EU Directive 2002/49/EC. This Directive was developed to provide a common framework to avoid, prevent, or reduce the harmful effects of environmental noise. The regulations focus on the process for addressing environmental noise from major infrastructure such as airports, major roads, and large agglomerations.

Sections 106 to 108 of the *Environmental Protection Agency Act* deal with noise on a smaller (i.e., more local) scale:

- Section 106 deals with control of environmental noise by the Minister and the Agency;
- Section 107 sets out the powers prescribed by the Act to a local authority or the Agency to prevent or limit noise. It typically relates to noise from sites regulated by the Agency or a local authority. This allows local authorities or the Agency to serve notices on premises/sites where prevention or limitation of noise is required. The Environmental Protection Agency Act 1992 (Noise) Regulations 1994 provide for a prosecution where there is a failure to comply with the requirements of the issued notice; and
- Section 108 describes the provisions for complaints regarding noise nuisance to be taken to the District Court by any person or agency. It allows for any person,

local authority or the Agency to make a complaint to the District Court where noise levels are considered to be generating a reasonable cause for annoyance. Where the court finds in favour of a noise nuisance complaint, the person or body responsible for the noise must reduce it to a specific level, to limit it or cease it altogether.

10.2.2 WESTMEATH COUNTY DEVELOPMENT PLAN 2021-2027

Noise control is governed by the Environmental Protection Agency Act 1992 and the Environmental Protection Agency Act (Noise) Regulations 1994 (S.I. No. 179 of 1994). The definition of environmental noise includes “noise which causes a nuisance, or would endanger human health or damage property or harm the environment”. Noise that is continuous, repeated or loud can have significant impacts on the quality of life of individuals, communities and the environment, in particular, wildlife. The protection of noise sensitive land usage, such as residential uses, is important in order to foster a good quality of life. The Council will seek to minimise noise through the planning process by ensuring that the design of future developments incorporate measures to prevent or mitigate the transmission of noise and vibration, where appropriate.

Westmeath County Council adopted the 2018-2023 Noise Action Plan, which is in accordance with Environmental Noise Regulations (S.I. No. 140 of 2006). These Regulations give effect to the EU Directive 2002/49/EC relating to the assessment and management of environmental noise. This Noise Action Plan is aimed at the strategic long term management of environmental noise from transport systems i.e. traffic noise.

It is the policy objective of the Council to:

- CPO 10.132** Support the implementation of the Noise Directive 2002/49/EC and associated Environmental Noise Regulations 2006.
- CPO 10.133** Support the Implementation of the Westmeath Noise Action Plan 2013-2018 (and any revision made thereto).
- CPO 10.134** Require all developments to be designed and operated in a manner that will minimise and contain noise levels, having regard to relevant national guidelines and in the absence of national guidelines, to relevant international standards, where appropriate.

A detailed assessment of potential noise and blast vibration impacts of the proposed development is provided within this report. Traffic on the adjacent R395 Regional Road is the dominant noise source at this location. The Proposed Development will not give rise to significant adverse noise related effects on nearby noise sensitive locations provided the limits and conditions are complied with and mitigation measures are in place.

10.2.3 EMISSION LIMIT VALUES

10.2.3.1 Noise Emission Limit Values

The following environmental noise limits are based on Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4, January 2016) as produced by the Environmental Protection Agency (EPA 2016). It should be noted *“that the guidance within this document relates to the assessment and measurement of noise in relation to Agency scheduled activities only”*.

Table 10.1 Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4, 2016))

Daytime Noise Criterion, dB L _{Ar,T} (07:00 to 19:00hrs)	Evening Noise Criterion, dB L _{Ar,T} (19:00 to 23:00hrs)	Night-time Noise Criterion, dB L _{Ar,T} (23:00 to 07:00hrs)
55dB	50dB	45dB

Where tonal and/or Impulsive noise is identified a rating level based on the penalty as outlined in Table 10.2 is to be applied to the measured L_{Aeq}.

Table 10.2 Recommended Tonal/Impulsive Noise Ratings

Period	Sound Characteristic	Correction to L _{Aeq} to Arrive at Rating Level L _{Ar,T} (dB)
Daytime & Evening	Tonal/Impulsive	5
Night-time	Tonal/Impulsive noise from the facility should not be audible at any NSL	

If more than one adjustment is potentially applicable for the type or character of a given single sound source (i.e., a source that is both tonal and impulsive), only a single adjustment shall be applied.

The proposed quarry working hours are:

- Monday to Friday: 07:00 to 18:00 hours.
- Saturdays: 07:00 to 14:00 hours.
- Sundays/Public Holidays: No working except in the case of maintenance or emergency.

This is also in line with the planning and development Guidelines for Quarrying and Ancillary Activities issued by the DoEHLG in 2004. An early start-up is required particularly when servicing large construction projects.

It is considered that the proposed development can operate for the proposed working hours and comply with the EPA Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4 2016) Daytime Noise Criterion, 55 dB LAr,T (07:00 to 19:00 hrs)).

Adoption of the above ELV's will ensure that there is no significant impact on noise sensitive receptors in the vicinity of the site.

10.2.3.2 Blast Vibration Criteria

Blasting in quarries gives rise to ground transmitted vibrations as well as air overpressure, which also maybe perceptible at nearby residences.

It is proposed that blasting will continue to be carried out in accordance with Conditions No. 9 and 10 of Planning Permission P.A. Ref. 01/525 (PL 25.128072):

9. *The vibration levels from the blasting shall not exceed a peak particle velocity of 12 millimetres per second (when measured in any one of three mutually orthogonal planes) for any blast when measured at the site boundaries.*
10. *Blasting shall not give rise to air overpressure values at noise sensitive locations exceeding 125 dB (Lin) max peak.*

10.2.4 EXTRACTIVE INDUSTRY GUIDELINES

The EPA's Draft Advice Notes for Preparing an Environmental Impact Statement (EPA 2015) provides guidance on Air Quality in respect of preparation of EIARs. Some of the guidance available that have a bearing on Air Quality is given below.

DoEHLG (2004). *National Guidelines on Quarries and Ancillary Activities for Planning Authorities*. Department of Environment, Heritage and Local Government (DoEHLG), Dublin, Ireland.

EPA (2006). *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*. Environmental Protection Agency (EPA), Johnstown Castle, Wexford, Ireland.

EPA (2015). *Advice Notes on Current Practice for preparing Environmental Impact Statements*, Draft. Environmental Protection Agency (EPA), Johnstown Castle, Co. Wexford, Ireland.

ICF (2005). *Environmental Code*, 2nd Edition. Irish Concrete Federation (ICF), Dublin, Ireland.



10.3 METHODOLOGY

10.3.1 STUDY

The purpose of the baseline study was to assess existing levels of noise associated with the site, i.e., determine the baseline noise environment. The baseline study included a desktop review of relevant policy, legislation, planning guidelines and technical guidance with respect to noise emissions. The review of the guidance enabled identification of appropriate noise criteria for the proposed development, and prediction of the levels of noise & vibration emissions at the noise sensitive locations in the vicinity of the site.

Noise measurements surveys were undertaken at a number of noise sensitive locations and the results analysed to determine noise conditions. From these results, an assessment can be made of the impact of the development on the existing noise levels of the area.

10.3.2 SOURCES OF INFORMATION

Refer to Section 10.7 below for details on sources of information.

The following has been taken into consideration with respect to noise monitoring surveys and noise modelling:

- Measurement of noise levels was undertaken using a Type 1 Sound Level Meter;
- Cognisance was taken of the EPA's 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities (NG4);
- The surveys were carried out in accordance with '*ISO 1996 Acoustics - Description and Measurement of Environmental Noise: Parts 1/2/3*'.
 - This standard defines the basic quantities to be used for the description of noise in community environments and describes basic assessment procedures. It also specifies methods to assess environmental noise and gives guidance on predicting the potential annoyance response of a community to long-term exposure from various types of environmental noises;
 - For example, it stipulates that noise measurements taken when it's raining are invalid. It also advises on microphone positioning and other relevant procedures such as recording weather conditions.



10.4 BASELINE DESCRIPTION OF RECEIVING ENVIRONMENT

10.4.1 SENSITIVE RECEPTORS

The principal concern in respect of emissions from the proposed development is the effect on residential amenity.

The surrounding lands are largely agricultural and held in pasture, although there is significant afforestation nearby to the west and a copse of trees partly covers the flanks of the hill into which the quarry has been excavated. The minor access road (i.e., c. 130 m in length) to the quarry has a c. 10 m frontage onto R395 Regional Road.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads and to a minor extent, along and at the end of lanes off the public roads.

Residential development in the area consists of dispersed farmsteads and diffuse or sporadic ribbon development along roadsides and around towns and villages. The closest large residential settlement to the site is Castlepollard, which is located c. 2 km to the northwest. There are 10 residences within 250 m, 16 within 500 m and 42 within 1 km of the site planning application boundary (Refer Figure 4.1). There are several clusters of residential dwellings located near the site. A cluster of 6 residences are located within 250 m on the east side of the R395 across from the site entrance and north along the L5743 (i.e., nos. 5-10), while another cluster of 4 residences are located within 250 m west of the site adjacent to the drainage ditch into which it is proposed to discharge surface waters (i.e., nos. 1-4).

There are no occupied residences within the application site or landholding, and the closest is located c. 270 m northeast of the quarry extraction area. There has been a long historical association with quarrying at this location and consideration has been given to screening of the development, phasing and direction of working with respect to receptors, in order to reduce environmental impacts.

There are no community facilities within 1 km of the site, the nearest being the Maple Court Nursing Home and Little Friends Montessori on the outskirts of Castlepollard c. 1.1 km from the site. There are no industrial or commercial developments within 1 km of the site, the nearest being a petrol station on the outskirts of Castlepollard c. 1.1 km from the site. Thus, the number of sensitive receptors primarily relates to residences 5-10 (Refer to Figure 4.1), which lie within 250 m of the site and some have partial views of the quarry workings.

10.4.2 ENVIRONMENTAL MONITORING

10.4.2.1 Routine Noise Monitoring

Routine noise monitoring is carried out by TMS Environment Ltd. at Castlepollard on a bi-annual basis at four noise monitoring locations (N1 to N4). The location of the noise monitoring stations are shown on the Existing Site Plan Figure 1.3. Most of these locations are at the site boundaries as opposed to nearest Noise Sensitive residences which are further removed. A copy of the more recent noise monitoring reports are

provided in Appendix 13. Octave band analysis was also carried out at the monitoring locations and observations were made by TMS Environment personnel to identify the presence of any tonal or impulsive noise. There were no tonal components recorded in the spectra and no tonal or impulsive noise was noted.

Results of monitoring are submitted to Westmeath County Council on a routine basis. A copy of the most recent noise monitoring results are shown below.

The following parameters were recorded during the noise monitoring survey:

- $L_{Aeq,T}$** is the equivalent continuous A-weighted sound pressure level, in decibels, determined over a time interval T (the sampling interval).
- $L_{A10,T}$** the A weighted level of noise exceeded for 10% of the specified measurement period (T). It gives an indication of the upper limit of fluctuating noise such as that from road traffic.
- $L_{A90,T}$** the A weighted noise level exceeded for 90% of the specified measurement period (T). It is typically used as a descriptor for background noise, giving an indication of the underlying noise level or the level that is almost always there between intermittent noise events.

L_{eq} is recommended by the International Organisation for Standardisation (ISO) for measuring and rating noises for traffic areas and for the description of environmental noise.

A summary of the recent noise monitoring results are provided in Table 10.3 below. The $L_{Aeq,T}$ values as shown range from 35dB to 61dB $L_{Aeq,30mins}$. All measurement results comply with the current planning permission limits (P.A. Ref. 01/525, PL 25.128072) with the exception of the measurement result at N1 on 08/02/21 & 24/08/21. The measured noise level at N1 was due to passing traffic on the adjacent R395 road and was not due to site activities. It was noted that the dominant noise source at all monitoring locations was passing traffic on the nearby R395 Road.

The results of the monitoring survey confirm that the existing quarry at Castlepollard is operating within the accepted noise limits for a scheduled activity such as this (Refer to Section 10.2.3.1 above).

It is considered that the proposed development can continue to operate for the proposed working hours and comply with the EPA Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4 2016) Daytime Noise Criterion, 55 dB $L_{Ar,T}$ (07:00 to 19:00 hrs).



Table 10.3 Recent Compliance Monitoring Results

Location	Date	Start Time	L _{Aeq,30 mins}	L _{A90,30 mins}	L _{A10,30mins}	Weather Conditions	Notes
N1	20/08/2020	16:03	47	33	51	Bright & Humid with SW breeze <8Kt/hr	Main source of noise intermittent passing of traffic on R395 road and birdsong. Noise emissions from site activity were intermittent and low level.
N2	20/08/2020	15:26	36	27	38	As above	Main source of noise was traffic noise from R395 road and birdsong. Site activity noise was observed to be very faint and intermittent.
N3	20/08/2020	14:49	38	27	39	As above	Main source of noise was birdsong, and agricultural activities in the distance. Site activity noise was observed to be very faint and intermittent.
N4	20/08/2020	14:10	35	29	36	As above	Main sources of noise were from distant traffic on R395 and birdsong. Site activity noise was observed to be very faint and intermittent.
N1	23/11/2020	13:25	55	40	58	Overcast with a slight NW breeze of <8kt/hr	Main source of noise intermittent passing of traffic on R395 road & birdsong. Low-level noise from farm animals throughout. Site activity noise observed to be faint and intermittent.
N2	23/11/2020	14:00	40	31	42	As above	Main source of noise from the nearby farm. Birdsong and passing traffic on R395 road noted throughout the interval. Site activity noise observed to be faint and intermittent.
N3	23/11/2020	14:32	44	37	46	As above	Main source of noise was birdsong, wind rustling in the trees and passing traffic on the R395. Site activity noise was observed to be faint and intermittent.
N4	23/11/2020	15:07	47	41	49	As above	Main sources of noise was from passing traffic on the R395 and birdsong. Site activity noise was observed to be faint and intermittent.
N1	08/02/2021	14:53	57	32	58	Overcast, light snow & hail showers. Strong Westeryl breeze	Main source passing traffic on Regional R395. Other sources dog barking, strong gusts and chainsaw. Site noise faint & intermittent.
N2	08/02/2021	15:28	44	35	47	As above	Main source passing traffic on Regional R395. Site noise faint & intermittent.
N3	08/02/2021	16:02	41	33	44	As above	Main source passing traffic on Regional R395. Site noise faint & intermittent.
N4	08/02/2021	16:38	42	32	45	As above	Main source bird song, distant traffic, rustling of leaves & wind gusts. Site noise faint & intermittent.
N1	24/08/2021	13:58	61	39	65	Dry & Sunny with a slight NW breeze	Main source passing traffic on Regional R395. Other sources dogs barking & strong wind gusts. Site noise faint.
N2	24/08/2021	14:30	41	37	42	As above	Main source of noise intermittent passing traffic on the R395 road. Site activity noise observed throughout monitoring interval.
N3	24/08/2021	15:02	54	38	60	As above	Main source of noise was quarry activity including operation of a nearby drilling rig. Passing traffic on the R395 road was also noted.
N4	24/08/2021	15:37	42	33	42	As above	Main source of noise was intermittent passing traffic on R395. Site activity noise was observed throughout the monitoring interval.

10.4.2.2 Noise Monitoring 30/05/21

An additional Noise monitoring survey was conducted by JSPE on 31/05/21 to determine noise monitoring levels at Noise Sensitive receptors both on and off site. The locations (NSL1 to NSL3) are shown on EIAR Figure 1.3.

A summary of the monitoring results from the additional noise monitoring survey are provided in Table 10.4 below. The $L_{Aeq,T}$ values as shown range from 41dB to 58dB $L_{Aeq,30mins}$. All measurement results comply with the planning permission limits ((P.A. Ref. 01/525 (PL 25.128072)) with the exception of the measurement result at N1. The measured noise level at N1 was due to passing traffic on the adjacent R395 road and was not due to site activities. It was noted that the dominant noise source at all monitoring locations was passing traffic on the nearby R395 Road.

The results of the monitoring survey confirm that the existing quarry is operating within the accepted noise limits for this type of development (Refer to Section 10.2.3.1 above).

It is considered that the proposed development can continue to operate for the proposed working hours and comply with the EPA Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4 2016) Daytime Noise Criterion, 55 dB $L_{Ar,T}$ (07:00 to 19:00 hrs).



Table 10.4 Results of Noise Monitoring Survey 31/05/21

Location	Date	Start Time	Elapsed Time	L _{Aeq}	L _{AF90}	L _{AF10}	Traffic Count				Weather Conditions	Notes
							Cars	HGV Lagan	HGV other	Pedestrian /Cyclist		
NSL1	31/05/2021	07:20	00:30:00	56.9	37.1	61.4	37	5	3	2	Bright hazy sunshine, some Cirrostratus, Light Easterly Breeze	Bird song, passing traffic on adjoining Regional R395, loading out of trucks
NSL2	31/05/2021	07:58	00:30:00	46.5	36.3	50.1	2	1			As above	Bird song, distant traffic on R394
NSL3	31/05/2021	09:00	00:30:00	47.3	33.7	46.9					As above	Bird song, distant traffic on R395, No quarry activity audible
NSL1	31/05/2021	10:21	00:30:00	54.8	33.4	58	73	2	4		As above	Bird song, passing traffic on adjoining Regional R395, loading out of trucks
NSL2	31/05/2021	11:09	00:30:00	49.2	35.7	52.3	3				As above	Bird song, distant traffic on R394
NSL3	31/05/2021	11:54	00:30:00	41.3	33.9	43.1					As above	Bird song, distant traffic on R395, No quarry activity audible
NSL1	31/05/2021	12:38	00:30:00	57.7	45.9	61.3	114		4	2	As above	Bird song, passing traffic on adjoining Regional R395
NSL2	31/05/2021	13:21	00:30:00	45.4	37.1	49.5	3	4			Bright hazy sunshine, some stratocumulus, Light northerly Breeze	Bird song, distant traffic on R394, some quarry activity audible
NSL3	31/05/2021	14:04	00:30:00	41.4	37	44.2		1			As above	Bird song, distant traffic on R395, No quarry activity audible

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10.4.2.3 Blast Monitoring

Blast monitoring is carried out at Castlepollard for all blasts and is undertaken by Irish Industrial Explosives. The results of blast monitoring undertaken in 2020 and 2021 are summarised in Table 10.5 below.

Table 10.5 Blast Monitoring Results

Location	Residence	Date	Blast Time	Plan Distance	MIC Kg	H mm/s	T mm/s	V mm/s	AOP dB
B1	C. McCormack	07/05/2020	13:00	406	130	1.6	2.56	1.45	119
B2	D. McCormack			422		1.54	1.85	0.94	121.3
B3	J. McCormack			444		1	1.4	0.8	122
B4	Smiths			315		2.1	1.97	1.97	122
B5	McCabe			520		1.59	1.46	1.14	114
B6	Quarry Boundary			310		3.94	3.18	3.68	88
B1	C. McCormack	03/12/2020	13:07	384	150	2.16	1.59	2.29	123
B2	D. McCormack			411		0.04	0.05	0.04	125
B3	J. McCormack			426		1.6	1.6	0.8	121
B4	Smiths			323		2.67	1.84	1.72	99
B5	McCabe			500		2.03	1.27	0.89	100
B1	C. McCormack	12/07/2021	12:41	417	117	1.27	0.95	0.95	121.7
B2	D. McCormack			448		1.21	0.95	0.57	123.7
B3	J. McCormack			473		1.02	0.73	0.39	123.6
B4	Smiths			405		1.02	1.14	0.57	119.7
B5	McCabe			390		1.65	2.03	0.95	115

Notes:

1. (H) Horizontal
2. (V) Vertical
3. (T) Transverse
4. (MIC) Maximum Instantaneous Charge

Recent blast monitoring results confirm that the quarry at Castlepollard is operating with accepted limits for this type of development (Refer to Section 10.2.3.2 above) i.e. in accordance with Conditions No. 9 and 10 of Planning Permission P.A. Ref. 01/525 (PL 25.128072):

9. The vibration levels from the blasting shall not exceed a peak particle velocity of 12 millimetres per second (when measured in any one of three mutually orthogonal planes) for any blast when measured at the site boundaries.
10. Blasting shall not give rise to air overpressure values at noise sensitive locations exceeding 125 dB (Lin) max peak.

10.5 ASSESSMENT OF IMPACTS

The principal concern in respect potential noise emissions from the proposed development is the effect on residential amenity.

The following Impact Assessment matrix (Refer to Table 10.6) provides an indication of the significance of potential effects arising during the life cycle of the development not accounting for any mitigation measures.

Table 10.6 Noise - Impact Matrix			
'Do Nothing' Impacts	X		
Factors	Construction	Operation	Decommissioning
Direct Impacts	X	●	X
Indirect Impacts	X	X	X
Cumulative Impacts	X	X	X
Residual Impacts	X	X	X
'Worst Case' Impacts	X	●	X

None/imperceptible: X; Slight: ●; Moderate: ●; Significant/Very significant: ●.

Refer to Appendix 3 for definition of Significance

10.5.1 'DO NOTHING' IMPACTS

It is evident from analysis of the above results (Refer to Section 10.4.2 above) that the noise environment in the immediate vicinity of the existing quarry site is determined primarily by noise from the Regional R395 road.

Residences along this road are typically experiencing noise levels of >55 dBL_{Aeq} during daytime hours due to passing traffic on the Regional R395 road. Locally, rural sounds such as birds, dogs and farmyard animals, as well as farm machinery are intermittently audible. It is expected that the volume of road traffic in the area will increase over time, and thus may lead to an increase in noise levels.

Under the 'Do Nothing' scenario, the proposed development would not occur and the site would be restored as per the requirements of the existing planning permission (P.A. Ref. 01/525, PL 25.128072).

10.5.2 DIRECT IMPACTS

The proposed development will consist of the continued use and operation of the existing quarry (permitted under P.A. Ref. 01/525), including deepening of the quarry, along with minor amendments to the permitted quarry layout comprising an extraction area of c. 4 ha within an overall application area of c. 11.4 ha. The development will include provision of new site infrastructure including water management system, wheelwash and other ancillaries.

The scale of the operation permitted under planning permission P.A. Ref. 01/525 was approximately 100,000 tonnes per annum. An average extraction capacity of 100,000 tonnes is anticipated as part of the proposed development.

The proposed development will not require the stripping, transport and placement of soils and overburden, as part of the quarry extraction, which has already been completed.

As part of the restoration scheme, an excavator and dump trucks will be mobilised to site as and when required to carry out these operations. These activities will be of short term duration and occur during the decommissioning and restoration stages.

The overburden stripped to access the underlying bedrock has been used to construct peripheral screening berms or embankments, temporary berms to aid noise attenuation and visual impact of the upper quarry face and/or for restoration of the completed sections of the excavation. The presence of the existing quarry means that there is little development works required.

The current vegetated site boundaries will be retained in-situ and the existing vegetation and intervening natural topography, coupled with the distance to neighbouring residences will ensure that the development does not impinge on the locality.

As an existing quarry with much of its infrastructure in-situ, only a brief construction phase is envisaged with respect to construction of the settlement tanks. The proposed development will continue to use the established quarry infrastructure located at the site, including site entrance, internal roads, aggregate storage area and other ancillaries (Refer to Figure 1.3). The development will include provision of new site infrastructure, including water settlement tanks and hydrocarbon interceptor and other ancillaries.

It is considered that any direct impact with respect to noise emissions will be slight, temporary, negative due to both construction, decommissioning and restoration stages.

This is an established well developed quarry and as such the working face has already been developed/exposed within the central portion of the site. The mobile crushing and screening plant will be located centrally within the existing excavation, relocating periodically as the working face is developed to the south.

The attached Site Layout Figure 3.1 shows the proposed site layout. Cross sections illustrating the quarry development are shown in Figure 3.3.

There will be no changes to the method of extraction and processing (crushing, screening, rinsing, etc) as a result of this planning application. Drilling and blasting will continue to be utilised with processing of extracted rock using mobile crushing and screening plant located within the quarry void. This will reduce handling of material and will also have the benefit of screening these activities from outside views and also mitigate impacts associated with noise and dust. The broken rock will be excavated by a combination of either a wheeled loading shovel and / or excavator. Once loaded, the excavated rock will be taken directly to the crushing plant.

The proximity to residences and the requirement to protect their amenity value has been given due consideration through scale, siting and layout of plant and machinery, phasing and direction of working and site restoration. A working scheme has been designed for the quarry that provides for the sequence and direction of working. The objective of this scheme is to reduce as far as possible the overall visual impact of the workings (Refer to Figures 3.1 to 3.3). Furthermore, mitigation measures to alleviate any adverse impacts from the development on the environment have been incorporated into the design to ensure that the development can be operated above / within accepted thresholds / standards for this type of development.

The quarry will continue to be worked top-down and phased with development in a southeasterly direction. The main site activity including mobile processing plant will be sited on the quarry floor and as such benefit from screening afforded by the existing quarry faces, topography, perimeter berms and hedgerows.

The following figure is a generalised flow chart (Refer Figure 10.1) showing the main site activities likely to give rise to noise emissions.



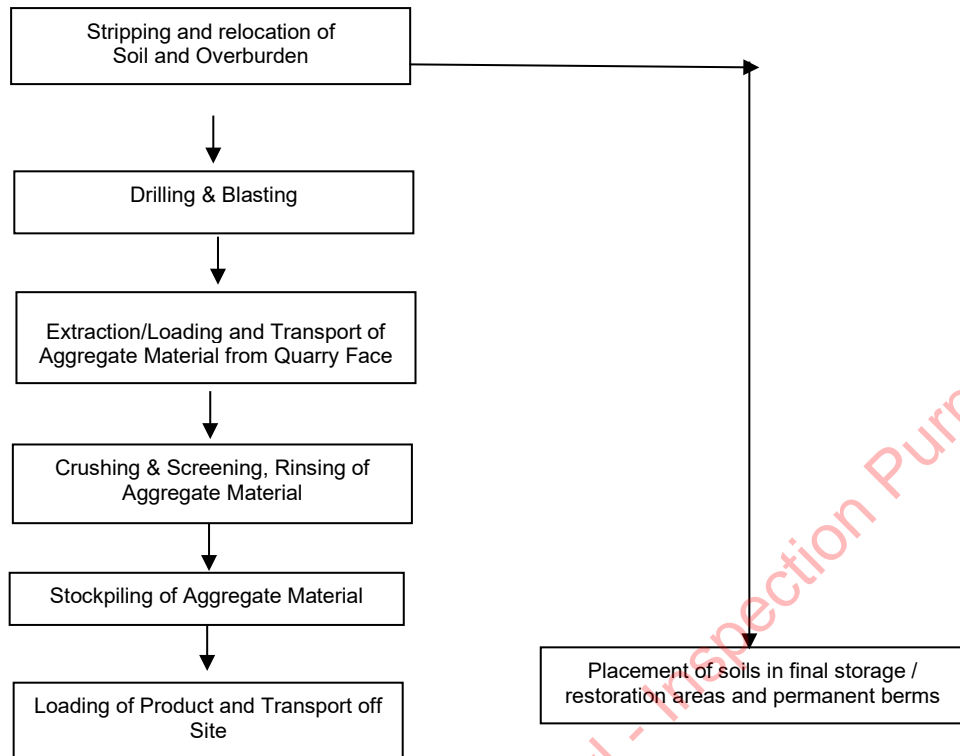


Figure 10.1 Operational Activities

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The following flow diagram shows the main sources of noise emissions arising on site and the methods of treatment/abatement to be employed. Note the “Stripping and relocation of Soil and Overburden” step has already been completed.

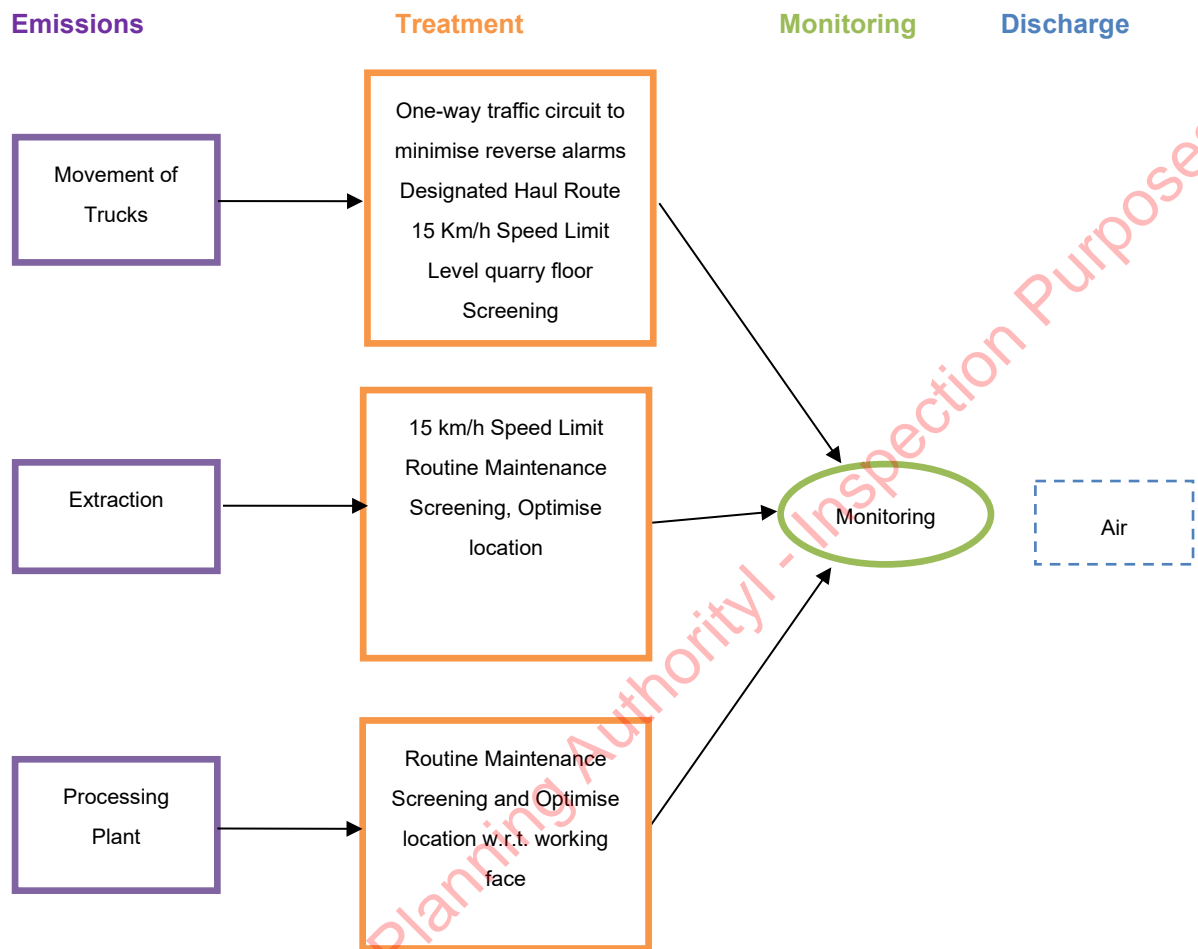


Figure 10.2 Flow Chart for Source of Noise Emissions

The results of the monitoring surveys (Refer to 10.4.2 above) show that the existing quarry at Castlepollard is operating within the specified noise limits for this type of scheduled activity (Refer to Section 10.2.3.1 above).

It is considered that the proposed development can continue to operate for the proposed working hours and comply with the EPA Recommended General Noise Limit Criteria (For EPA Scheduled Activities (NG4 2016) Daytime Noise Criterion, 55 dB LAr,T (07:00 to 19:00 hrs).

The impact assessment and its context are such that the development is unlikely to result in an adverse effect.

It is considered that any direct impact with respect to noise emissions will be long-term, slight, negative due to continued operation of the quarry.

Noise resulting from the quarry operations can continue to be kept to below the specified limits by the implementation of good design, effective operation and management and by the implementation of measures which are deemed to be best

practice. As such, there is no reason from a noise impact perspective for this development not to proceed.

10.5.2.1 Blast Vibration

The duration of a blast in terms of noise is over in a split second similar to a clap of thunder. The nearest proposed limit of the quarry extraction area will be c. 270 m removed from the nearest residential property.

A blast must be carried out on site on the specified day as concerns over security does not allow for explosives to be stored on site. In exceptional circumstances, due to unforeseen circumstances (e.g. late delivery or security) a blast may be delayed or brought forward. Where possible the Company would endeavour to inform the public of the revised blasting timetable.

Blasting will be carried out using industry standard bench blasting techniques. A consequence of blasting is ground vibration measured as peak particle velocity (i.e., PPV) and air overpressure measured as the noise level of "air blast" (i.e., dB (Lin)). Blast monitoring will be carried out at agreed residences within the area. Ground vibration and air overpressure will continue to be measured for each blast.

The Environmental Protection Agency publication "Integrated Pollution Control Licensing – Guidance Notes for Noise in Relation to Scheduled Activities" states that *"in the case of quarrying and mining operations, the vibration levels from blasting should not exceed a peak particle velocity of 12 mm/sec, measured in any three mutually orthogonal directions at a receiving location when blasting occurs at a frequency of once per week, or less. For more frequent blasting the peak particle velocity should not exceed 8 mm/sec. These levels are for low frequency vibration, i.e., less than 40 Hertz. Blasting should not give rise to air overpressure values at sensitive locations which are in excess of 125 dB (Lin) max peak"*.

This is consistent with with Conditions No. 9 and 10 of Planning Permission P.A. Ref. 01/525 (PL 25.128072):

9. *The vibration levels from the blasting shall not exceed a peak particle velocity of 12 millimetres per second (when measured in any one of three mutually orthogonal planes) for any blast when measured at the site boundaries.*
10. *Blasting shall not give rise to air overpressure values at noise sensitive locations exceeding 125 dB (Lin) max peak.*

Ground vibration and air overpressure measurements will continue to be undertaken at agreed residences within the area.

Lagan have in place a "Blast Notification Procedure & Blast Monitoring Programme". A copy of the procedure is provided in Appendix 11. This procedure will be amended as necessary to take account of specific conditions attached to any grant of planning permission for the quarry development.

It is considered that any likely direct impact with respect to blast emissions will be momentary, not significant, negative due to continued operation of the quarry.

10.5.3 INDIRECT IMPACTS

There are no indirect impacts with respect to noise.

10.5.4 CUMULATIVE IMPACTS

There are no other projects, quarries, commercial or industrial facilities in close proximity to the site. As such it is considered there is no significant cumulative impact with respect to the operation of the quarry.

10.5.5 TRANSBOUNDARY IMPACTS

The EIA Directive 2014-52-EU invokes the Espoo Convention on Environmental Impact Assessment in a Transboundary Context, 1991, and applies its definition of transboundary impacts. Given the location (c. 50 km from the border with N. Ireland), nature, size and scale of the proposed development, it is expected that the impacts of the development would have imperceptible transboundary effects on air quality.

10.5.6 RESIDUAL IMPACTS

As a result of the proposed mitigation and enhancement measures incorporated in the design, no significant, negative residual impacts are predicted in terms of noise and vibration levels on the local residences, their property, livestock or amenity during the operational phase.

Following full restoration and closure of the site that there will also be no significant negative impacts in terms of the noise levels. The restored quarry will provide a more quiescent environment than is currently the case, but with a change in land-use from the original agricultural use to mineral extraction to ultimately a future beneficial use as a wildlife amenity.

10.5.7 'WORST CASE' IMPACT

The existing quarry development is the worse-case scenario given that the processing plant will be relocated further to the southeast within the shelter of the quarry void as quarrying progresses and suggests any impact with respect to noise emissions will be long-term, slight, negative due to the continued operation of the quarry. The closest noise sensitive locations are also close to the R395 road and the some of the existing measured ambient noise levels here already exceed the noise levels from the development.

Various mitigation measures will be implemented to minimise all noise emissions as much as possible, and to ensure noise emissions at the operation continue to remain below specified limits. As a result of these measures, there will not be any significant impact on residences or local amenities (Refer to Section 10.6.1 below).

10.6 MITIGATION & MONITORING

10.6.1 MITIGATION

10.6.1.1 Noise

Sources of noise from the development will originate mainly from the operation of the extraction equipment, processing plant, mobile plant and from the movement of trucks. Noise resulting from the operations can be kept below specified limits by the implementation of good design, effective operation and management and by the adoption of 'best practices'.

In accordance with the principles of Best Available Techniques (BAT) the applicant is committed to employing the most effective and advanced methods of operation to reduce noise emissions and their impacts on the environment.

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). They have established an integrated management system (IMS) designed to comply with the Environmental requirements of the ISO 14001:2015 standard and the Quality Management requirements of ISO 9001:2015. The IMS is a two-tier system with this top-level Environmental Manual based on ISO EN 14001:2015 being applicable to all activities. The top-level Quality manual then feeds down to the Factory Production Control (FPC) Quality Plans and the depot specific Environmental Management Plans.

The FPC Quality Plans incorporate the procedures and controls in place to reflect the quality system for asphalt and aggregate production. The Environmental Management Plans (EMP's) are depot specific and have been designed to comply with the requirements of ISO EN 14001:2015. The EMP's record the procedures and controls in place to reflect the Quality System and the specific environmental aspects and impacts and the legislative requirements applicable at each depot.

The Company has implemented a quality assurance system and an environmental management system and has certification to the ISO 9001 and ISO 14001 standards. The Company's experience and implementation of the systems has identified the advantages of a structured and systematic approach in achieving managerial objectives.

A copy of the existing EMP for Castlepollard Quarry is included as Appendix 10.

A number of mitigation measures are/will be put in place with respect to the continued operation of the quarry in order to minimise noise emissions and blast vibration as much as possible, and to ensure they remain below specified limits. These mitigation measures will ensure that the operation remains within all specified thresholds, and compliant with good industry practice. These are:



EMP (Refer to Appendix 10 - DP 010 Noise & Vibration Management)

- Working hours shall be strictly confined to the hours stated in the sites permissions;
- There shall be no works on Sundays or Bank Holidays;
- The lowest possible noise level reverse warning alarms consistent with site safety shall be utilised;
- Compressors and pumps shall be enclosed and insulated where possible when in use;
- Muffling devices shall be fitted to ensure that effective noise control is achieved;
- Unnecessary revving of engines shall be avoided;
- Equipment shall be switched off when not in use;
- Plant and vehicles shall be properly maintained and, in particular, the effectiveness of silencers and lubrication of bearings and moving parts shall be carefully monitored; cutting edges of relevant equipment shall be kept sharp;
- For directional noise sources e.g. reversing trucks, the noise source shall be pointed away from the nearest noise sensitive receptors wherever possible;
- Internal haul roads shall be effectively maintained and constructed in such a way as to minimise gradients;
- Acoustic enclosures for pumps and generators and similar plant shall be used to minimise noise levels associated with their operation where possible;
- Drop heights for materials shall be minimised;
- Plant and vehicles shall be started sequentially rather than all at once; and
- When working in close proximity to noise sensitive receptors the works programme shall be carefully controlled so that noisy activities are planned in such a way that they do not all occur simultaneously.

Other Site Measures

- The provision of temporary screen banks to screen site activities from outside views as necessary;
- The preservation of hedgerows and boundary features aids noise attenuation;
- Consideration has been given to phasing and direction of working through preparation of the working scheme;
- The quarry will be worked top-down and phased with development in a southeasterly direction. As such the plant and machinery will be screened from outside views by the intervening quarry face and topography which will also act as a noise attenuation barrier;
- Extracted rock will be processed on the floor of the quarry using mobile crushing and screening equipment to produce saleable aggregates. As such the plant and



machinery will be screened from outside views by the intervening quarry face and topography which will also act as a noise attenuation barrier;

- Noise sources will be located to take advantage from screening provided by quarry faces and stockpiles. Mobile processing plant will be located at a screened location within the quarry. Haul routes will be designed and maintained, with strict speed limits, to limit vehicle noise;
- The existing designated internal haul roads will be utilised to manage traffic entering and leaving the site to ensure that site traffic is removed from nearest noise sensitive receptors;
- Internal haul road gradients will be kept as low as possible to reduce engine / brake noise from heavy vehicles;
- All plant and machinery is switched off when not in use;
- A noise management programme will be defined as part of the EMS.

10.6.1.2 Blasting & Vibration

Blasting in quarries gives rise to ground transmitted vibrations as well as air overpressure, which also may be perceptible at nearby residences. In order to minimise these effects, the blast management practice at this quarry will include several mitigation measures, such as: (1) best professional practice in the design and execution of blasting; (2) only certified Shotfirers are used to conduct blasting; (3) millisecond time delays are used in sequential detonation of the explosives to limit the maximum instantaneous charge; and (4) explosive charges are properly confined by a sufficient quantity of quality stemming material.

Efficient blasts ensure as much of the explosive energy as possible is utilised for rock fragmentation, and by implication ground vibration and air overpressure is inefficient use of this energy. Air overpressure values arising from blasting operations fluctuate depending on the weather conditions, a factor outside the control of operators. The emission limit value should be specified with a 95% confidence limit to address this issue.

The following measures should be considered to reduce the effects of blasting:-

- Optimise blast design;
- Monitor blasts and revise blast design, as required;
- Limit ground borne vibration and minimise air over pressure by:
 - taking care in unusual situations e.g., corners;
 - including geological considerations in blast design;
 - Air overpressure is minimised through proper blast design, avoiding detonation of large unconfined charges, and by consideration of atmospheric conditions before blasting;
 - A blast must be carried out on a specified day as concerns over security does not allow for explosives to be stored on site. In exceptional circumstances or

unforeseen circumstances (e.g. late delivery, security, meteorological conditions, etc.) a blast may be delayed or brought forward. Where possible the operator should endeavour to inform the public of the revised blasting timetable;

- Adequate stemming of holes;
- Ensure the correct blasting ratio is obtained. The blasting ratio is a measure of the amount of work expected per unit volume of explosives i.e., tonnes/kg; and
- Notify nearest residences prior to the blast.

It is proposed that blasting continues to be carried out in accordance with Conditions No. 9 and 10 of Planning Permission P.A. Ref. 01/525 (PL 25.128072):

- 9. The vibration levels from the blasting shall not exceed a peak particle velocity of 12 millimetres per second (when measured in any one of three mutually orthogonal planes) for any blast when measured at the site boundaries.*
- 10. Blasting shall not give rise to air overpressure values at noise sensitive locations exceeding 125 dB (Lin) max peak.*

The local community will be informed by the Company of the blasting schedule i.e.,

- Residences within 500 m of the quarry will be provided with a minimum of 24 hours' written notice of intention to blast;
- On the day of the blast, all of these identified residents will be contacted by phone approximately 1 hour before the blast is due to take place. A clearly audible warning siren is sounded before each blast. When blasting operations are completed an ALL CLEAR siren is sounded.

A copy of the proposed Blast Notification Procedure & Blast Monitoring Programme to be adopted at Castlepollard Quarry is provided (Refer to Appendix 11).

Consequently, it is considered that the proposed development can continue to operate within the accepted noise and vibration thresholds.

Blast monitoring will be carried out at agreed residences within the area. The results obtained will be used to ensure compliance with any planning condition requirements.

10.6.1.3 Monitoring

Noise monitoring will ensure that the operations comply with recognised thresholds for this type of development.

The results of noise monitoring surveys confirm that the quarry at Castlepollard is operating within specified noise limits for a scheduled activity of this type (Refer to Section 10.2.3.1 above).

Lagan Materials Ltd have in place a group wide Environmental Management System (EMS). A copy of the existing EMP for Castlepollard Quarry is included as Appendix 10. The EMP for the quarry includes for regular noise monitoring to demonstrate that

the development is not having an adverse impact on the surrounding environment. The locations of the proposed noise monitoring stations are shown in Figure 3.1.

Lagan have in place Blast Notification Procedures & a Blast Monitoring Programme (Refer to Appendix 11). Blast monitoring (ground-borne vibration and air overpressure) is carried out for each blast. The monitoring locations are shown in Figures 1.3 & 3.1. The following information is recorded for each blast: date; time; location in the quarry; amount of explosive used; maximum instantaneous charge; vibration and air overpressure monitoring results. The results of the monitoring shall be submitted to the Planning Authority four weeks after the end of the quarter being reported on.

This programme will allow on-going monitoring of noise and blast vibration emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

Through implementation of the proposed mitigation measures it is considered the development will continue to have no significant effects with regard to noise and blast vibration levels on the local residences, their property, livestock and amenity.



10.7 REFERENCES

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