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INTRODUCTION

Background

- 10.1 This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland, addresses the potential effects of the proposed development at Rossmore Quarry on noise and vibration. The existing quarry is located at Rossmore, Carrigtwohill, Co. Cork.
- 10.2 The proposed development being applied for under this current planning application is shown on EIAR Figure 2-2 and will consist of:
- extension of the existing quarry over an extraction area of c. 12.5 hectares to a level of minus 35mOD;
 - extraction and processing of limestone using the industry standard blasting and processing techniques in place at the existing quarry;
 - provision of overburden storage area;
 - provision of a vehicular tunnel underneath the local private road to link the extension area to the existing quarry;
 - operational landscaping including perimeter screening berms around the proposed extension area;
 - restoration of the quarry to natural habitat after-uses; and
 - all related ancillary site works within an overall application area of c. 22.3 hectares, and all for a period of 35 years and a further 2 years to complete final restoration of the site.

The proposed development, in conjunction with the existing quarry permitted under planning ref. 21/6983 (ACP Ref. ABP-313-903-22), will result in a combined extraction capacity of 500,000 tonnes per annum. The permitted extraction capacity of the existing quarry area will remain unchanged.

- 10.3 Further information on the proposed development, site activities, environmental management systems and controls at the application sites are provided in the Chapter 2 of this EIAR.
- 10.4 The proposed development combined with the existing quarry will have a maximum annual extraction rate of c. 500,000 tonnes per year. Based on this output level all of the existing quarry and the proposed development operations (including the existing concrete plant and asphalt plant) will generate a maximum of c. 110 HGV trips per day, refer to EIAR chapter 14 Traffic. The development will also continue to generate some light vehicular traffic, principally by employees and visitors travelling to and from the quarry.
- 10.5 The noise impact assessment presented herein describes and assesses the existing noise baseline characteristics of the local area. The anticipated effects of the proposed quarry extension activities are then applied to these baseline conditions and the resulting noise impacts assessed. Mitigation measures are identified where necessary to eliminate or minimise adverse impacts, insofar as practical.
- 10.6 An operational vibration assessment has also been undertaken and is largely informed by experience gained in undertaking blasts at the quarry previously and by ground-borne vibrations, measured / recorded at properties near the quarry.

- 10.7 To assist the understanding of acoustic terminology and the relative change in noise, a glossary of terms and phrases, which specifically relate to this Chapter of the EIAR, is provided in Appendix 10-A: Glossary of Terms.

Scope of Work

- 10.8 The following sections of this EIAR Chapter describe the potential noise impacts associated with the proposed development. The following issues are addressed separately:
- regulatory control framework for noise and vibration;
 - methodology used to assess potential impacts from activities at properties (dwellings and farms) and sensitive ecological receptors;
 - baseline conditions pertaining to existing background and ambient noise levels around the project site;
 - existing vibration levels;
 - noise and vibrations impact evaluation criteria;
 - prediction of the noise and vibrations levels and identification of potential impacts;
 - assessment of severity of impacts, with reference to the evaluation criteria;
 - description of mitigation measures that will be incorporated into the design and operation of the scheme to eliminate or minimise the potential for noise and vibrations impact;
 - a summary of any residual impacts; and
 - monitoring proposals.

Consultations / Consultees

- 10.9 Following a review of published development plans and site surveys, it was considered that there was no requirement for any formal external consultations to be carried out in respect of noise for the purposes of this assessment.

Contributors / Author(s)

- 10.10 The noise impact assessment presented in this Chapter was prepared by SLR Consulting Ireland. The lead consultant for the study was Tim Paul MSc CEng MIEI MRICS MIQ.

Limitations / Difficulties Encountered

- 10.11 This assessment is compiled based on published guidance documents, and site-specific field surveys. No difficulties were encountered in compiling the required information.

REGULATORY CONTROL FRAMEWORK: NOISE

- 10.12 The following sections address the statutory planning / policy requirements and regulatory control of noise generated by development activity. Currently, there is no national or regional legislation which specifically addresses noise and vibration generated by mineral extraction and production of aggregates and construction materials. However, there are several guidance documents that are relevant in the context of both noise and vibration action planning.

Planning Policy and Development Control

- 10.13 The National Planning Framework (NPF) 2040 (published in February 2018) is a national planning framework for Ireland. The framework provides the policies for all regional and local plans. In the framework, the extractive industries are recognised as important for the supply of aggregates and construction materials to a variety of sectors.
- 10.14 National Planning Framework Objective 65 addresses noise related impact of development and identifies a requirement for Planning Authorities to:
- 10.15 *"Promote the pro-active management of noise where it is likely to have significant adverse impacts on health and quality of life and support the aims of the Environmental Noise Regulations through national planning guidance and Noise Action Plans."*
- 10.16 There are no specific policies in relation to noise emissions in NPF for mineral extraction or production of construction aggregates and materials. The stated general development objective is to facilitate the development while at the same time protect the environment.

Quarries and Ancillary Activities

- 10.17 The EPA (2006) publication *Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*¹ recommends the following in respect of noise:

In relation to sand and gravel pit developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

- Daytime: 08:00–20:00 h $L_{Aeq}(1h) = 55$ dBA
- Night-time: 20:00–08:00 h $L_{Aeq}(1h) = 45$ dBA

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 dBA.)

The DoEHLG (2004) Guidelines for Planning Authorities (*Quarries and Ancillary Activities: Guidelines for Planning Authorities*)² recommends similar limit values.

¹ https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

² https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

Planning Practice Guidance 2014

- 10.18 The web-based Planning Practice Guidance (PPG) sets out the Government's planning policies for England and has a specific category for mineral developments.
- 10.19 The guidelines provide advice on noise from temporary activities at mineral extraction sites, the recommended derivation of free-field criteria for normal daytime operations, and the absolute criterion of 70dB LAeq,1hr for temporary operations.

Guidelines for Noise Impact Assessment (IEMA)

- 10.20 The *Guidelines for Noise Impact Assessment* produced by the Institute of Environmental Management and Assessment (IEMA) are generally recognised as established good practice standards for scope, content, and methodology of noise impact assessment.

These guidelines address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. These 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. An example impact scale offered by the IEMA guidelines is shown in Table 10-1.

Table 10-1 Example Impact Scale from the Change in Sound Levels (IEMA)

Long-Term Classification	Impact	Short-Term Classification	Impact	Sound Level Change dB L _{pAeqT} (+ive or -ive) T = either 16hr day or 8hr night
Negligible		Negligible		≥ 0 dB and < 1 dB
		Minor		≥ 1 dB and < 3 dB
Minor		Moderate		≥ 3.0 dB and < 5 dB
Moderate		Major		≥ 5.0 dB and < 10 dB
Major				≥ 10.0

- 10.21 The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3dB is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under most normal conditions. A 10dB 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.
- 10.22 To determine the overall noise impact, the magnitude and sensitivity Noise Effects Descriptors are presented in Table 10-2.

Table 10-2 Noise Effects Descriptors (IEMA)

Noise Effect Levels	Description
Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a highly sensitive noise receptor
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise-sensitive receptor, or a 5 to 9.9 dB L_{Aeq} change in sound level at a highly sensitive noise receptor
Moderate	A 3 to 4.9 dB L_{Aeq} change in a sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in a sound level at a receptor of some sensitivity
None / Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors of negligible sensitivity to noise or marginal to the zone of the influence of the proposed development

10.23 As recognised in the IEMA guidance, there are however many factors which affect people's perception and their responses to noise. Guidance on assessment of the magnitude of noise impact and the significance of the effects are presented in Table 10-3.

Table 10-3 Relationship between Noise Impact, Effect and Significance (IEMA)

Magnitude (Nature of Impact)	Description of Effect (On a Specific Sensitive Receptor)		Significance
Substantial	Beneficial	Receptor Perception = Marked Change Causes a material change in behaviour and/ or attitude, e.g., individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect)
Moderate		Receptor Perception = Noticeable Improvement Improved noise climate resulting in small change in behaviour and/or attitude, e.g., turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Slight		Receptor Perception = Just Noticeable Improvement Noise impact can be heard but does not result in any change in behaviour or attitude. Can slightly affect character of the area but not such that there is a perceived change in quality of life.	(Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect) Less Likely to be Significant

Magnitude (Nature of Impact)	Description of Effect (On a Specific Sensitive Receptor)		Significance
Negligible	N/A = no discernible effect on receptor		Not Significant
Slight	Adverse	Receptor perception = non-intrusive Noise impact can be heard, but does not cause change in behaviour or attitude, e.g., turning up volume of television, 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.	Less Likely to be Significant Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a significant effect)
Moderate		Receptor Perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g., turning up volume of television; speaking more loudly; closing windows. Potential for non-waking sleep disturbance. Affects the character of area such that there is a perceived change in the quality of life.	↑ ↓ Greater justification needed- based on impact magnitude and receptor sensitivities- to justify a non-significant effect)
Substantial		Receptor perception = Disruptive Causes material change in behaviour and /or attitude, e.g., avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in character of area.	More Likely to be Significant
Severe		Receptor Perception = Physically Harmful Significant Changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or psychological effects, e.g., regular sleep deprivation / awakening; loss of appetite, significant, medically definable harm, e.g., auditory and non-auditory.	Significant

British Standard 5228: 2009+A1:2014

- 10.24 British Standard 5228-1:2009+A:2014 *Noise and Vibration Control on Construction and Open Sites, Part 1: Noise* (BS5228) sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities. It can be used to predict noise levels arising from construction and operational stage activities at extraction sites, including associated earthmoving / restoration operations. BS5228 also sets out tables of sound power levels generated by a wide variety of mobile equipment.
- 10.25 Noise levels generated by site operations and experienced at local receptors will depend upon several variables, the most significant of which are:
- the amount of noise generated by plant and equipment being used at the development site, generally expressed as a sound power level;
 - the periods of operation of the plant at the development site, 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

- any reflections of noise due to the presence of hard vertical faces (i.e., walls).

Design Manual for Roads and Bridges

- 10.26 The Design Manual for Roads and Bridges DMRB (LA 111) considers the following criterion to understand the need for further assessment:
- is the project likely cause change in the baseline noise levels of 1dB $L_{A10,18hr}$ in the do - minimum year compared to do- something opening year;
 - is the project likely cause change in the baseline noise levels of 3 dB $L_{A10,18hr}$ in the do – something future year compared to do- minimum opening year;
 - does the project involve construction of new road links within 600m of noise sensitive receptors; and
 - would there be a reasonable stakeholder's expectation that an assessment is undertaken.

AQTAG09 - Guidance on Effects of Industrial Noise on Wildlife

- 10.27 AQTAG09 (Air Quality Technical Advisory Group 09) guidance provides guidance to assist planning and/or licensing officials handling pollution prevention and control applications for industrial installations on relevant noise emissions and relates these to the requirements of the Habitats Regulations.
- 10.28 The guidance specifies that, where specific noise from industry, measured at the habitat / nest site is below the levels in Table 10-4, it is considered unlikely that it will have an adverse impact on designated species. Where noise levels are exceeded, a more detailed noise assessment will be required.

Table 10-4 Specific Noise Levels at Habitat / Nest Site

Parameter	Noise Level, dB
$L_{Amax,F}$	80
$L_{Aeq,1hr}$	55

Noise and Human Health

- 10.29 Environmental noise exposure response relationships and thresholds for health endpoints for industry are not available at European or Irish level in legislation or guidelines.

WHO Environmental Noise Guidelines

- 10.30 World Health Organisation (WHO) Europe have produced the WHO Environmental Noise Guidelines 2018 for the European Region as a regional update to the WHO Community Noise Guidelines. The Guidelines include a review of evidence on the health effects of environmental noise to incorporate significant research carried out in recent years. The guidelines provide recommendation for protecting human health from exposure to environmental noise from various sources. The guidelines assess several environmental noise sources such as aircraft, rail, road, wind turbines and leisure noise.
- 10.31 EU Directive 2002/49/EC on the assessment and management of environmental noise introduced annual average indicators of noise exposure (L_{den} and L_{night}) as long-term exposure indicators, which differ from those used in the earlier WHO Guidelines for Community Noise (1999).

Site Specific Limit Values for Noise

- 10.32 Condition 12 attached to the existing quarry planning permission ABP Ref. 313903 (Plan. Ref. 21/6083) states:

The noise level from within the boundaries of the quarry extension area, measured at noise sensitive locations in the vicinity shall not exceed:

- a) *An L_{ArT} value of 55dB(A) during 0700 hours to 1800 hours Monday to Friday and 0700 hours to 1400 hours on Saturday. The T value shall be 1 hour.*
- b) *An L_{AeqT} value of 45dB(A) at any other time. The T value shall be 15 minutes.*

REGULATORY CONTROL FRAMEWORK: VIBRATION

- 10.33 There is currently no legislation regulating or controlling ground-borne vibration from rock blasting and extractive activity more generally. Several guidance documents which are relevant in the context of vibration action planning for the proposed development are referenced below.

Quarries and Ancillary Activities

- 10.34 The EPA (2006) publication *Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*³ recommends the following limit values for ground-borne vibrations and air overpressure:

Ground-borne vibration

Peak particle velocity = 12 mm per second, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40 hertz).

Air overpressure

125 dB (Linear maximum peak value), with a 95 % confidence limit. Any blasting will be restricted to normal hours (e.g., 11:00 -17:00 hrs Monday to Friday). Advance notification of blasting will be provided to nearby residents within 600m through use of written notes, signage at site entrance, telephone, or warning sirens or a combination of these methods.

The DoEHLG (2004) Guidelines for Planning Authorities (*Quarries and Ancillary Activities: Guidelines for Planning Authorities*)⁴ recommends similar limit values.

British Standard 7385-2:1993

- 10.35 British Standard 7385-2:1993 *Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Ground-borne Vibration* gives guidance on vibration limits to prevent building damage. It is applicable to blasting associated with rock extraction.
- 10.36 The damage threshold criteria provided in BS7385 are based on systematic studies using a carefully controlled vibration source in the vicinity of buildings. Vibration limits for transient

³ https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

⁴ https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

vibrations (such as those associated with blasting operations), above which cosmetic damage could occur, are indicated in Table 10-5 below.

Table 10-5 Transient Vibration Guide Values for Cosmetic Damage

Type of Building	PPV 4 TO 15 Hz (mm/sec)	PPV 15 Hz AND ABOVE (mm/sec)
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/sec	50 mm/sec
Unreinforced or light framed structures Residential or light commercial buildings.	15 mm/sec at 4Hz increasing to 20 mm/sec at 15 Hz	20 mm/sec at 15Hz increasing to 50 mm/sec at 40 Hz and above.

- 10.37 The definition of “cosmetic damage” is the formation of hairline cracks or the growth of existing cracks in plaster, dry wall surfaces, or mortar joints. BS7385-2 notes that the probability of damage tends towards zero at a peak component particle velocity of 12.5mm/sec.

Site Specific Emission Limits for Vibration

- 10.38 Condition 13 (d) and (e) attached to the existing quarry planning permission ACP Ref. 313903 (Plan. Ref. 21/6083) states:
- d) *Ground vibration shall not exceed a peak particle velocity of eight millimetres per second when measured in any three mutually orthogonal direction at any sensitive location.*
 - e) *Blasting shall not give rise to air overpressure values at sensitive locations which are in excess of 125 dB (linear) maximum peak with a 95% confidence limit. No individual air overpressure value shall exceed the limit value by more than 5dB(Lin).*

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RECEIVING ENVIRONMENT

Study Area

- 10.39 The application site is located in a coastal setting and on a local county road approximately 2km south of Carrigtwohill and 6km southwest of Middleton, Co. Cork. It is located approximately 2km south of N25 National Primary Road (E-30 European Route) which links Cork city to Rosslare Europort.
- 10.40 The site is located in the townland of Rossmore, Carrigtwohill, Co. Cork. Access to the lands is via an existing access to the public road to the north which connects to the N25 National Primary Road to the north. This local county road forms the northern boundary of the landholding and links the R624 Regional Road to the west at Fota and the N25 National Primary Road at Middleton. Beyond the southern boundary of the landholding is an access right of way to the adjacent Kilsaran quarry and Rossmore Bay, part of the Cork Harbour channel.
- 10.41 The application site covers an area of c. 22.3 hectares. It is bounded to the west by the existing quarry operated by Breedon, to the north by a greenfield buffer zone and residential dwellings located along the east-west local public road, to the east by agricultural lands, and to the south by a local access road / natural habitat land. The East Cork Civic Amenity site is located c. 0.25km south of the site. Residential development in the vicinity of the subject site is confined to single houses located along the local LP3619-0 road and other minor public roads. The lands within the application site are currently predominantly in agricultural use. The application site is not subject to any statutory or non-statutory nature conservation designations.
- 10.42 The nearest dwellings to the application site and extraction boundary are shown in Figure 10-1.

Baseline Study Methodology: Noise Assessment

- 10.43 Noise monitoring is carried out by TMS Environment Ltd. on a quarterly basis at the boundaries of the existing quarry. This monitoring programme measures the typical noise levels arising from the existing quarry operations and other noise sources / activities in the vicinity of the quarry.
- 10.44 Noise measurements were made using a Bruel & Kjaer 2250 Light integrating sound level meter. The instrument was calibrated prior to and after use. The noise meter was mounted on a tripod 1.5 metres above ground level.
- 10.45 At the measurement positions, the following noise level indices were recorded:
- $LA_{eq,T}$ is the A-weighted equivalent continuous noise level over the measurement period and effectively represents an “average” value.
 - $LA_{90,T}$ is the A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe the background noise.
 - $LA_{10,T}$ is the A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe traffic noise.

- 10.46 All noise levels are recorded in 'A-weighted' decibels, dB(A). 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 20 Pa.

Baseline Study: Vibrations

- 10.47 At the existing quarry, vibration monitoring is carried out at each blasting event. All monitoring results are routine recorded and filed as part of the Environmental Management System (EMS) which is in operation at the quarry.
- 10.48 During each blasting event at the existing quarry both Ground Vibration and Air Blast (Air Overpressure) are monitored at a minimum at one sensitive location (i.e., the location nearest to the blast).

Baseline Noise Monitoring

- 10.49 The noise monitoring locations are shown in Figure 10-1 and comprise the following:
- N1 at northwestern landholding boundary, near residences closest to the northwestern boundary, along the public road;
 - N2 at northern landholding boundary, near residences closest to northern boundary, along the public road;
 - N3 at northeastern boundary of the quarry, adjacent to the private access road;
 - N4 at western boundary of the quarry, adjacent to the private access road;
 - N5 at southern boundary of the landholding, adjacent to Rossmore Bay; and
 - N6 at northwestern boundary of the quarry.
- 10.50 Noise monitoring results for the baseline survey on are provided in Table 10-6.
- 10.51 These measured baseline noise levels include all the operations within the existing Rossmore Quarry combined with all other activities / noise sources in the vicinity of the site.

Table 10-6 Summary of Measured Noise Levels, Free Field dB

Date	Time	Location	L _{AEQ,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
6/02/2025	14:06–14:36	N1 (Day)	48	51	39
6/02/2025	13:31–14:01	N2 (Day)	50	52	41
6/02/2025	11:29–11:59	N3 (Day)	54	54	53
6/02/2025	12:06–12:36	N4(Day)	53	58	50
6/02/2025	12:49–13:19	N5 (Day)	48	53	39
6/02/2025	10:54–11:24	N6 (Day)	52	53	49
12/06/2025	14:22–14:52	N1 (Day)	47	52	45

Date	Time	Location	L _{Aeq,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
12/06/2025	13:46-14:16	N2 (Day)	51	53	49
12/06/2025	11:43-12:13	N3 (Day)	51	54	48
12/06/2025	12:16-12:46	N4 (Day)	50	53	48
12/06/2025	13:10-13:40	N5 (Day)	53	58	50
12/06/2025	11:09-11:39	N6 (Day)	52	55	49
12/06/2025	23:34-00:04	N1 (Night)	40	42	39
13/06/2025	00:08-00:38	N2 (Night)	42	43	37
13/06/2025	00:44:01:14	N3 (Night)	41	44	38
13/06/2025	01:18-01:48	N4 (Night)	42	45	39
13/06/2025	01:57-02:27	N5 (Night)	41	44	37
12/06/2025	23:00-23:30	N6 (Night)	40	43	38

10.52 These measured baseline noise levels are representative of the baseline noise environment at residential receptors, refer to Table 10-7.

Table 10-7 Baseline Noise Levels Representative of Residential Receptors

Location	Residential Receptors	Period	Baseline Noise Level (L _{Aeq})
N1	R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22	Daytime	47 - 48
N2	R1, R2, R23, R24	Daytime	50 - 51

Blast Monitoring: Ground Vibration & Air Overpressure

10.53 Historical blasting operations at the Rossmore Quarry have been monitored the nearest inhabited dwellings and at East Cork Civic Amenity Centre by the blasting and shot firing team. The blast monitoring location is shown on Figure 10-1.

10.54 Blast monitoring results for Rossmore Quarry are provided in Table 10-8 below.

Table 10-8 Blast Monitoring Results 2025

Date		Monitoring Locations – (refer to Figure 10-1)			
		Ground Vibration (Peak particle velocity (mm/sec))			Air overpressure dBL(l)
		Horizontal	Transverse	Vertical	
04/02/2025	B1	2.29	2.03	1.91	117.2
	B2	2.41	1.65	1.78	117.2
	B3	0.76	0.38	0.51	117.5
03/03/2025	B1	2.67	2.54	2.16	119.0
	B2	2.54	1.52	1.65	117.1
	B3	<0.5	<0.5	<0.5	<120
22/04/2025	B1	0.89	1.02	0.89	120
	B2	0.64	0.38	0.38	120
	B3	0.76	0.76	0.89	110.9
12/05/2025	B1	2.54	3.05	2.79	112.6
	B2	1.40	1.52	0.89	104.2
	B3	<0.5	<0.5	<0.5	<120
09/06/2025	B1	1.91	0.89	1.02	109.9
	B2	0.89	0.64	0.76	108.8
	B3	1.02	0.64	0.89	108.0
09/07/2025	B1	0.89	1.27	0.89	111.2
	B2	0.76	0.76	0.89	111.5
	B3	0.89	1.02	1.65	108.0
08/08/2025	B1	5.97	4.06	3.68	116.4
	B2	1.02	1.02	0.68	113.8
	B3	<0.5	<0.5	<0.5	<120

10.55 The 2025 ground vibration and air overpressure monitoring results comply with the emission limit values for ground vibration (8 mm/sec peak particle velocity) and air overpressure

(125dB(Lin).) set out in the existing quarry planning permission ABP Ref. 313903 (Plan. Ref. 21/6983) Condition 13 (d) and (e). Furthermore, SLR Consulting have also reviewed the 2024 blast monitoring results and confirm that all of these blast monitoring results also comply with the emission limit values.

Sensitive Receptors

Human Receptors

- 10.56 Sensitive locations are those where people may be exposed to noise from the existing or planned activities. The closest receptors to the application site have been identified and assessed based on their closest distance from the extension extraction boundary. This is a cautious approach, as noise generating activities are often located at greater distances within the site. The relevant receptors are listed in Table 10-9 and their locations are shown in Figure 10-1.
- 10.57 There are 24 receptors identified within 500 metres of the extension extraction area, refer to Figure 10-1 and these have been included in the detailed noise assessment.

Table 10-9 Sensitive Receptors

Receptor reference	Receptor	Sensitivity	Distance (m) / from extraction boundary
R01	Residential	Medium	215
R02	Residential	Medium	180
R03	Residential	Medium	275
R04	Residential	Medium	345
R05	Residential	Medium	375
R06	Residential	Medium	410
R07	Residential	Medium	445
R08	Residential	Medium	530
R09	Residential	Medium	230
R10	Residential	Medium	245
R11	Residential	Medium	275
R12	Residential	Medium	335
R13	Residential	Medium	355
R14	Residential	Medium	350
R15	Residential	Medium	365
R16	Residential	Medium	380

R17	Residential	Medium	405
R18	Residential	Medium	400
R19	Residential	Medium	425
R20	Residential	Medium	445
R21	Residential	Medium	460
R22	Residential	Medium	475
R23	Residential	Medium	410
R24	Residential	Medium	450

Ecological Receptors

- 10.58 The application site is not subject to any statutory nature conservation designation.
- 10.59 A number of nature conservation sites are located within the study area, i.e. one Special Area of Conservation (SAC), one Special Protection Area (SPA) and one proposed Natural Heritage Area (pNHA), as detailed below and see also EIAR Figures 5-2 and 5-3.

Natura 2000 Site	Site Code	Location at Closest Point to Extraction Area Site (m)
Great Island Channel SAC	001058	c. 140m southwest
Cork Harbour SPA	004300	c. 140 m southwest
Great Island Channel pNHA	001058	c. 140m southwest

NOISE IMPACT ASSESSMENT

- 10.60 To determine the noise impact generated by the proposed quarry extension, SLR carried out a noise prediction assessment, whereby the levels of noise were calculated at the nearest noise sensitive receptors (residences), as identified in Figure 10-1.
- 10.61 Operational noise rating ($L_{Ar, 1hr}$) predictions at each receptor location are based on the methodology set out in BS5228: Part 1 (2009)+ A1:2014 “Code of Practice for Noise and Vibration Control on Construction and Open Sites”.
- 10.62 For the purposes of this impact assessment, no reduction has been applied for noise screening around the application site during the site preparatory works including soil stripping, perimeter berm construction, concrete plant construction and some quarry restoration activities.

- 10.63 A reduction of -10dB(A) has been adopted for full noise screening by screening berms / existing boundary vegetation and topography in assessing noise impacts for the operational stage.
- 10.64 For the purposes of the assessment, it is assumed that all potential operational noise sources are active and arise continuously and simultaneously during assessment hours and that the attenuation distance to the selected receptors is calculated: from the extraction boundary (as indicated in Figure 10-1)
- 10.65 Based on the methodology outlined above, it is considered that the noise impact assessment presented herein is sufficiently robust and conservative and represents a worst-case scenario. Detailed noise assessment calculations are provided in Appendix 10-B.
- 10.66 The EPA (2006) Environmental Management Guidelines for Quarries and Ancillary Activities and the DoEHLG (2004) Guidelines for Planning Authorities both recommend a noise emission limit, applied to the nearest noise-sensitive receptors, of 55 dB $L_{Aeq, 1hr}$ during daytime working hours (defined as 07:00 to 18:00 hours), as per Condition 12 attached to the existing planning permission. A limit of 70 dB $L_{Aeq, 1hr}$ is permitted for periods of up to eight weeks in any working year at nearby noise sensitive receptors to facilitate ant necessary construction or temporary site works.
- 10.67 The noise characteristics of the plant and equipment which will be deployed in the extension area at Rossmore and considered by this noise assessment are shown in table 10-11 below.

Table 10-1011 Noise Sources

Plant	Octave Band Sound Pressure Levels @ 10m, Hz dB								Noise Level L_{Aeq} @ 10m (dB(A))
	63	125	250	500	1k	2k	4k	8k	
Excavator	72	71	74	73	69	66	63	58	75
Mobile Processing Plant (crushing)	93	86	79	78	75	71	69	62	82
Dump Truck	80	76	73	70	69	66	63	58	74

Note: Excavator & dump truck combination: noise source level @ 10m, L_{Aeq} 78 dB(A)

- 10.68 The plant and equipment used at the quarry will not generate impulsive or tonal noise. No penalty was therefore applied to the predicted operational $L_{Ar, 1hr}$ noise level for presence of tonal or impulsive elements or for prediction of resultant noise level at each receptor.

Noise Prediction

10.69 The noise prediction / assessment was undertaken to calculate the level of noise generated by proposed site activities at the nearest sensitive receptors, shown on Figure 10-1. Detailed noise assessment calculations are provided in Appendix 10-B: Noise Assessment Calculations.

Construction & Restoration Stages

10.70 The following noise sources have been considered in the noise assessment for the initial site operations, during the preparatory / construction and restoration stage works which will include activities such as soil stripping, perimeter berm construction, and quarry restoration activities:

- Excavator
- Dump Truck

10.71 For the purposes of the noise assessment, it is assumed that an excavator will be used continuously to carry out the soil stripping / earthworks, with one HGV in attendance on-site always. Calculated noise levels at nearest receptors are shown in Table 10-12 below, refer to noise calculations in Appendix 10-B

Table 10-1112 Soil Stripping, Berms Construction, and Restoration Noise Levels

Receptor reference	Period	Noise Limit LAeq 1hr (dB(A))	Operational LAeq 1hr (dB(A))	Difference
R01	Daytime	70.0	54	-16
R02	Daytime	70.0	55	-15
R03	Daytime	70.0	52	-18
R04	Daytime	70.0	50	-20
R05	Daytime	70.0	49	-21
R06	Daytime	70.0	48	-22
R07	Daytime	70.0	48	-22
R08	Daytime	70.0	46	-22
R09	Daytime	70.0	53	-17
R10	Daytime	70.0	53	-17
R11	Daytime	70.0	52	-18
R12	Daytime	70.0	50	-20
R13	Daytime	70.0	50	-20
R14	Daytime	70.0	50	-20
R15	Daytime	70.0	49	-21

R16	Daytime	70.0	49	-21
R17	Daytime	70.0	48	-22
R18	Daytime	70.0	48	-22
R19	Daytime	70.0	48	-22
R20	Daytime	70.0	48	-22
R21	Daytime	70.0	47	-23
R22	Daytime	70.0	47	-23
R23	Daytime	70.0	48	-22
R24	Daytime	70.0	47	-23
SAC / SPA	Daytime	70	55	-15

10.72 It can be seen from the results in Table 10-12 above that the noise criterion limits for the short-term preparatory / construction works (70dB(A)) are complied with at all sensitive locations assessed.

Operational Stage

10.73 The following noise sources have been considered in undertaking the noise assessment for the operational stage of the proposed development:

- Excavator & dump truck combination, conservatively assumed to be located at the extraction boundary closest to the receptors ;
- Mobile processing plant (MPP), located within the extraction area, minimum of 100 metres from the quarry boundary closest to the receptors. (Distance of MPP to receptor = distance from extraction boundary to receptor + 100 metres).

10.74 The operational $L_{Aeq, 1hr}$ noise level calculated at each receptor location is presented in Table 10-13 below, refer to Appendix 10-B for noise calculations. Table 10-13 also shows the comparison between the predicted operational $L_{Aeq, 1hr}$ noise level and the noise emission limit value of 55 dB(A) at each receptor.

Table 10-1213 Operational Noise Levels: Rossmore Quarry

Receptor reference	Period	Noise Limit L_{Aeq} 1hr (dB(A))	Operational L_{Aeq} 1hr (dB(A))	Difference
R01	Daytime	55.0	48	-7
R02	Daytime	55.0	49	-7
R03	Daytime	55.0	46	-9

Receptor reference	Period	Noise Limit LAeq 1hr (dB(A))	Operational LAeq 1hr (dB(A))	Difference
R04	Daytime	55.0	44	-11
R05	Daytime	55.0	44	-11
R06	Daytime	55.0	44	-11
R07	Daytime	55.0	42	-13
R08	Daytime	55.0	41	-14
R09	Daytime	55.0	47	-8
R10	Daytime	55.0	47	-8
R11	Daytime	55.0	46	-9
R12	Daytime	55.0	44	-11
R13	Daytime	55.0	44	-11
R14	Daytime	55.0	44	-11
R15	Daytime	55.0	44	-11
R16	Daytime	55.0	44	-11
R17	Daytime	55.0	43	-12
R18	Daytime	55.0	43	-12
R19	Daytime	55.0	43	-12
R20	Daytime	55.0	42	-13
R21	Daytime	55.0	42	-13
R22	Daytime	55.0	42	-13
R23	Daytime	55.0	43	-12
R24	Daytime	55.0	42	-13
SAC / SPA	Daytime	55.0	48	-7

- 10.75 It can be seen from the results in Table 10-13 above that the noise levels generated solely by proposed activities, even in a worst-case scenario, are comfortably below the EPA (2006) and DoEHLG (2004) recommended noise emission limit value of 55 dB(A).at all nearby residential noise sensitive locations.
- 10.76 To identify the potential cumulative impact of the existing quarry and the proposed development activities, calculated specific $L_{Aeq, 1hr}$ dB(A) noise levels have been

logarithmically added to existing baseline noise levels. The cumulative operational noise levels have been compared to the existing baseline noise levels at each of the residential receptor locations. The cumulative noise assessment is presented in Table 10-14.

Table 10-1314 Cumulative Operational Noise Levels

Receptor	Period	Existing baseline L _{Aeq,T} dB(A)	Operational L _{Aeq,1HR} dB(A)*	Cumulative L _{Aeq,T} dB(A)*	Difference	Noise Impact (refer to Table 10-2)
R01	Daytime	50	48	52	+2	None / Not significant
R02	Daytime	50	49	53	+3	Slight
R03	Daytime	47	46	50	+3	Slight
R04	Daytime	47	44	49	+2	None / Not Significant
R05	Daytime	47	44	49	+3	None / Not significant
R06	Daytime	47	43	48	+1	None / Not significant
R07	Daytime	47	42	48	+1	None / Not significant
R08	Daytime	47	41	48	+1	None / Not significant
R09	Daytime	47	47	50	+3	Slight
R10	Daytime	47	47	50	+3	Slight
R11	Daytime	47	46	50	+3	Slight
R12	Daytime	47	44	49	+2	None / Not significant
R13	Daytime	47	44	49	+2	None / Not significant
R14	Daytime	47	44	49	+2	None / Not significant
R15	Daytime	47	44	49	+2	None / Not significant
R16	Daytime	47	44	49	+2	None / Not significant
R17	Daytime	47	43	48	+1	None / Not significant
R18	Daytime	47	43	48	+1	None / Not significant
R19	Daytime	47	43	48	+1	None / Not significant

Receptor	Period	Existing baseline $L_{Aeq,T}$ dB(A)	Operational $L_{Aeq, 1HR}$ dB(A)*	Cumulative $L_{Aeq, T}$ dB(A)*	Difference	Noise Impact (refer to Table 10-2)
R20	Daytime	47	42	48	+1	None / Not significant
R21	Daytime	47	42	48	+1	None / Not significant
R22	Daytime	47	42	48	+1	None / Not significant
R23	Daytime	49	43	50	+1	None / Not significant
R24	Daytime	49	42	50	+1	None / Not significant

- 10.77 The cumulative long-term noise impact from the proposed development is assessed to be None / Not Significant to Slight at the nearest residential receptors.
- 10.78 In view of the above findings, it is considered that mitigation measures to reduce the noise impacts of plant associated with the planned development are not strictly required to mitigate long term noise impacts arising at the application site. Notwithstanding this, and in line with accepted best practice, several measures will be implemented at the quarry to minimise the noise levels generated by site operations.

Ecological Receptors

- 10.79 As previously noted, the application site is not subject to any statutory nature conservation designation. The nearest designated European sites (Great Island Channel SAC / Cork Harbour SPA) is located at approximately c.140m south of the extension extraction area, at its closest point.
- 10.80 The operational $L_{Aeq, 1hr}$ noise prediction for ecological receptor location is presented in Table 10-15 below. It also presents a comparison between the predicted operational $L_{Ar, 1hr}$ noise level and the prescribed noise limit for protection of wildlife.

Table 10-1415 Operational Noise Levels at Ecological Receptors

Receptors	Period	Noise limit $L_{Aeq, 1HR}$ dB(A)	Operational $L_{Aeq, 1HR}$ dB(A)	Difference (dB(A))
Great Island Channel SAC / Cork Harbour SPA	Daytime	55.0	48	-7

- 10.81 As can be seen, the noise criterion limits for protection of wildlife arising from the proposed development at Rossmore are comfortably met at the nearest Great Island channel SAC / Cork Harbour SPA boundary.

Traffic

- 10.82 For the purposes of assessment, the total volume of traffic generated in the future by the existing quarry and the proposed development will not exceed a maximum of c. 110 HGV trips per day.
- 10.83 In view of the existing development and associated HGV traffic movements across the local road network it is considered that the extent of any change and the likely impact of the quarry extension and ancillary quarry activities can be deemed 'negligible' in terms of traffic and that no further assessment is necessary.

VIBRATION IMPACT ASSESSMENT

- 10.84 Rock extraction at Rossmore Quarry and the proposed extension area will continue to be carried out using conventional blasting techniques with the blasted rock materials removed for further processing (crushing & screening using mobile equipment) by mechanical excavators.
- 10.85 The duration of a blast in terms of noise is of short duration, like a clap of thunder. Blasting-induced vibration is also of short duration and transient in nature. A typical blast comprises several drilled holes into which explosive charges are placed. The charged holes are detonated individually by use of detonators, each with a different micro-second delay.
- 10.86 The number of blasts carried out at the quarry over a defined period is ultimately dependent on demand for aggregates and other quarry products (including concrete). Drilling of holes for blasting will involve the use of a mobile rig to drill holes through the upper rock surface, parallel to the active / exposed quarry face. The extent and duration of drilling prior to each rock blast will vary with the number and depth of charge holes required. Drilling of holes will only be carried out during permitted operational hours.
- 10.87 The closest vibration sensitive receptors (within 500 m of the extraction area) to the blasting activities within the extension extraction area are shown on Figure 10-1. Attenuation of ground-borne vibration increases with distance such that vibration impacts reduce with increased distance from the blast site.

Residences

- 10.88 The principal cause of complaints from blast-induced vibration is usually attributed to the fear of damage and/or nuisance rather than actual physical damage or nuisance itself. The human body is very sensitive to vibration, and this can result in concerns being raised at vibration levels well below the threshold of cosmetic damage to buildings, or levels identified in planning conditions.
- 10.89 In general terms a person will become aware of blast-induced vibration at levels of around 0.3 mm/second peak particle velocity (ppv). However, people are very poor at determining relative magnitudes of vibration, for example, the difference between 4.0 mm/sec ppv and 6.0 mm/sec ppv is unlikely to be distinguishable by an individual person. Even though vibration levels between 0.6 mm/sec ppv and 50.0 mm/sec ppv are routinely experienced in everyday life within a property and are considered wholly safe, when similar levels are experienced through blasting operations, it is not unusual for such levels to give rise to subjective concern.
- 10.90 Table 10-16 gives examples of vibration levels routinely generated with a conventional residential property.

Table 10-1516 Vibration Levels Generated by Everyday Activities

Activity	Vibration level (Peak particle velocity, mm/sec)
Walking, measured on a wooden floor	1.0 to 2.5
Door slam, measured on a wooden floor	2.0 to 5.0
Door slam, measured over the doorway	12.0 to 35.0
Foot stamps, measured on a wooden floor	5.0 to 50.0

- 10.91 Regarding physical damage to properties, extensive research has been carried out around the world, the most prominent being undertaken by the United States Bureau of Mines (USBM). Damage to a structure could occur if the dynamic stresses induced in a structure exceeds the allowable design stress for the specific building material. Classifications of building damage range from very fine plaster cracking up to major cracking of structural elements.
- 10.92 When defining damage to buildings, the following classification is applied:
- Cosmetic – the formation of hairline cracks or the growth of existing cracks in plaster, dry wall surfaces, or mortar joints;
 - Minor – the formation of large cracks or loosening or falling of plaster on dry wall surfaces, or cracks through bricks / concrete blocks; and
 - Major or Structural – damage to structural elements of the building.
- 10.93 Studies by USBM concluded that vibration levels more than 50 mm/sec ppv are required to cause structural damage. It should be noted that this limit is set for worst-case structural conditions and that it is independent of the number of blasting events and their durations.
- 10.94 British Standard 7385-2:1993 *Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Ground-borne Vibration* gives guidance on vibration limits to prevent building damage. It is applicable to blasting associated with mineral extraction. The damage threshold criteria provided in the standard are based on systematic studies using carefully controlled vibration sources in the vicinity of buildings. Vibration limits for transient vibrations (such as those associated with blasting operations), above which cosmetic damage could occur, are identified in Table 10-5 of this EIA Chapter. It notes that the probability of damage **tends towards zero** at a peak component particle velocity below 12.5 mm/sec.
- 10.95 Blast monitoring results at Rossmore Quarry confirm that past blasting operations undertaken at the quarry have complied with the emission limit values for ground vibration (8mm/sec peak particle velocity) and air overpressure (125dB(Lin) max peak with a 95% confidence limit) attached to the existing planning permission ACP Ref. 313903 (Plan. Ref. 21/6983) Condition 13 (d) and (e).
- 10.96 The comprehensive environmental monitoring programme implemented at the quarry and the blast monitoring results presented above confirms that the quarry has operated within the recommended blasting emission limit values set out in the best practice guidelines for the sector and by existing planning conditions.
- 10.97 Based on the above, and with continuation of the industry standard good blasting practices, it is concluded that any future blasting operations within the extension area at Rossmore Quarry will not have a significant impact on any sensitive receptors.

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Ecological Receptors

- 10.98 The impact from blasting activities for ecological receptors largely comprises disturbance (including noise, vibration, and visual disturbance). Increases in human disturbance, including noise and visual disturbance from human activity, can have a range of impacts on an ecological receptor depending upon its sensitivity and the nature and duration of the disturbance and its timing.
- 10.99 The response of individual species to increased levels of human disturbance will depend upon several factors including the sensitivity, reproductive status, previous exposure to human disturbance, behaviour during the event, species tolerance to disturbance, location in relation to the source, availability of alternative nearby habitat, and environmental factors (i.e., topography, vegetation and atmospheric conditions which can influence noise levels).
- 10.100 Any future blasting operations at the eastern extension area will be undertaken subject to the emission limit values set out under condition 13.
- 10.101 At c. 140 metres at its closest point, the Great Island Channel SAC / Cork Harbour SPA is a greater distance than the nearest boundary of the existing quarry and is sufficiently distant that no changes in baseline disturbance levels are predicted to occur within its boundaries which would affect any of its Annex II qualifying species. Consequently, with no likely vibration exposure, no vibration effects are predicted on any qualifying Annex II species, or on the integrity of the European sites.

CUMULATIVE IMPACTS

- 10.102 In essence, cumulative impacts are those which result from incremental changes caused by other past, present, or reasonably foreseeable actions together with those generated by the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development.
- 10.103 This noise impact assessment includes a cumulative noise assessment, with reference to noise baseline measurements that include noise sources from the area surrounding the existing quarry.
- 10.104 A planning search undertaken to determine if there were any other planned developments in the vicinity of the application site did not identify any other potentially significant source of noise or ground-borne vibration, either approved or planned within 2km of the application site. As a result, no potential for significant cumulative impacts has been identified. The cumulative impact of the proposed development on local noise and vibration levels is therefore assessed as insignificant.

DO – NOTHING SCENARIO

- 10.105 At present, the noise environment within the study area is dominated by road traffic noise generated by cars and occasional HGV traffic along the local road network (some of it from existing operations at Rossmore Quarry). Some natural sounds such as farmyard animals or barking dogs are also audible.

- 10.106 Over time, it is anticipated that the volume of road traffic in general, will increase as economic activity increases and that this in turn is likely to lead to a gradual increase in ambient and background noise levels.

INTERACTION WITH OTHER IMPACTS

- 10.107 The potential impact of noise and vibration generated by the proposed development on sensitive receptors including residents and sensitive ecological receptors has been assessed in this Chapter of the EIAR. The impact of the proposed development activity on these receptors is further considered in Chapter 4 'Population and Human Health' and Chapter 5 'Biodiversity'.

MITIGATION MEASURES

Noise

- 10.108 Where necessary, the three established strategies for impact mitigation are avoidance, reduction, and remedy. Where it is not possible or practical to mitigate all impacts, then the residual impacts must be clearly described in accordance with the system for impact description set out in the EPA Guidelines. The adoption of Best Practicable Means is generally considered to be the most effective means of controlling noise emissions.
- 10.109 Notwithstanding the findings of the impact assessment presented above, which determined that the proposed activities at Rossmore Quarry will have no significant noise impact, and in line with best operating practice, the following measures will be implemented across the proposed development to minimise the potential noise impacts of on-site activities:

Screening

- Screening berms will be constructed along the western northern, and eastern boundaries, with tree planting carried out along the northern and southern boundaries of the extension area. These will act as acoustic barriers, refer to EIAR Figures 2-2 and 2-4;
- Screening berms and operational landscaping will be inspected on a regular basis and maintained as necessary.

Plant

- All mobile crushing will take place on the quarry floor, to maximise topographic screening;
- All mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments;
- All plant items will be properly and regularly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e., all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained); and
- All plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced immediately.

Traffic

- Any deliveries to the quarry will be programmed to arrive during daytime hours only;
- Care will be taken when unloading vehicles to reduce or minimise potential noise disturbance to residents;
- Access / internal haul roads will be kept clean and maintained in a good state of repair, i.e., any potholes are filled, and large bumps removed, to avoid unwanted rattle and “body-slap” from heavy goods vehicles; and
- Vehicles waiting within the quarry will be prohibited from leaving their engines running and there will be no unnecessary revving of engines.

10.110 Experience from other sites has shown that by implementing these measures, ambient noise levels from site activities and operations can be reduced by up to 5 dB(A).

Vibration

- 10.111 Blast monitoring results confirm that the air overpressure levels and the ground-borne vibration levels (i.e., measured peak particle velocity) complied with emission limit values set out in the planning permission for the existing quarry.
- 10.112 The blast design and blasting methodology for the site operations carried out at the quarry have, and will continue to be, optimised to ensure that any resulting ground borne vibration levels are comfortably within the prescribed limits.
- 10.113 The following measures shall be implemented at the application site to minimise disturbances due to any future blasting operations:

Blasting operations at the existing quarry are carried out and controlled under the Safety, Health & Welfare at Work (Quarry) Regulations 2008 – 2019.

The following measures will continue to be implemented at the existing quarry and the proposed extension to minimise disturbances due to any future blasting operations. These include the measures set out in condition 13 attached to planning permission ACP Ref. 313903 (Plan. Ref. 21/6983).

- Blasting will be restricted to between 11.00 hours and 15.00 hours Monday to Friday (except in emergencies or for health and safety reasons beyond the control of the operator);
- Blasting will not be carried out on Saturdays, Sundays, or public holidays;
- The frequency of blasting will not be more than two blasts per month;
- Written notification of each blast will continue to be provided a maximum of 7 days in advance of each blast, to all residences within c. 0.5 km radius of the quarry;
- On the morning of each blast, a temporary sign is placed at the quarry entrance alerting neighbours that “Blasting Today” is being undertaken;
- Additional verbal confirmation is provided by the quarry manager later in the day to specified neighbours where monitoring is being undertaken, when the exact time of the blast is confirmed;
- Blast notification is provided by pre-blast and post-blast siren warnings;
- All blasting operations shall be carried out by a certified ‘shotfirer’ in accordance with the relevant health and safety regulations;

- The optimum blast ratio shall be maintained, and the maximum instantaneous charge shall be optimised;
 - The blast design and blasting methodology uses the monitoring results to optimise and ensure consistent blast designs;
- 10.114 These blast mitigation and management measures are provided in accordance with the DoEHLG (2004) and EPA (2006) guidelines for the sector.
- 10.115 Efficient blasts use as much of the explosive energy as possible for rock fragmentation. By implication therefore, any energy dissipated through ground vibration and air overpressure is inefficient use of energy which would otherwise be used to fragment rock. It is therefore in the Applicant's economic interest to ensure that there is continual, ongoing optimisation of blast design to ensure efficient and effective blasting. The added benefit in optimising blast design is that it also minimises potential environmental impacts.
- 10.116 To avoid any risk of damage to properties in the vicinity of the application site, the ground-borne vibration levels from blasting will be limited to a peak particle velocity of 8 mm/sec., as per Condition 13 (d) attached to the planning permission for the existing quarry.

RESIDUAL IMPACT ASSESSMENT

Noise

- 10.117 The noise assessment has confirmed that cumulative operational noise impact at the nearest receptors is Slight to None / Not Significant. With implementation of the noise mitigation and management measures the residual noise impact will reduce to None / Not Significant to Negligible.

Vibration

- 10.118 Based on the proven past performance at the quarry and available historical blasting results, it is concluded that blasting operations carried out within the application site will not have any residual impact on nearby sensitive receptors.

MONITORING

- 10.119 Noise monitoring will continue to be carried out on a quarterly basis at Rossmore Quarry, using a calibrated noise meter. Monitoring location N4 will be relocated to the northern boundary of the extension area and an additional monitoring location N7 will be located at the northeastern boundary of the extension area. Noise monitoring locations shall be reviewed on a regular basis and revised where and as / when necessary.
- 10.120 All blasts carried out at the quarry at Rossmore Quarry shall continue to be monitored to confirm compliance with emission limit values set out in Conditions 13 (d) and (e) of the existing planning permission. Ground-borne vibration and air overpressure will be measured utilising portable seismographs, located at nearby inhabited dwellings (subject to the owner's agreement) and the East Cork Civic Amenity Centre. Air overpressure will be measured utilising a calibrated microphone, incorporated into the seismograph. Each seismograph shall be calibrated in accordance with the manufacture's requirements.
- 10.121 The results of the noise and blast monitoring shall be submitted to Cork County Council on a regular basis for review and record purposes.

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Figures

Figure 10-1: Noise / Blast Monitoring Locations & Receptors

Appendices

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Appendix 10-A: Glossary of Terms

GLOSSARY OF TERMINOLOGY

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. 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 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 10 A-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_{Aeq} is defined as the notional steady sound level which, over a stated period, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L_{10} & L_{90} 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, L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

L_{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may

have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

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Appendix 10-B: Noise Assessment Calculations

Figure 10 B- 1 Noise Assessment Calculations: Construction & Restoration Stages: Soil Stripping, Berms Construction and Restoration Activities

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Soil Stripping, Berms Construction and Restoration Stages

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection	Screening	Activity Distance (m)	Noise Attenuated with Distance dB(A)	Activity LAeq (dB) at Distance		Operational Noise Levels dB(A) at Receptors
		Excavator	Dump Truck	dB(A)	dB(A)			Excavator	Dump Truck	
Soil Stripping, Berms Construction and Restoration	R01	75	74	3	0	215	-27	51	50	54
	R02	75	74	3	0	180	-25	53	52	55
	R03	75	74	3	0	275	-29	49	48	52
	R04	75	74	3	0	345	-31	47	46	50
	R05	75	74	3	0	375	-31	47	46	49
	R06	75	74	3	0	410	-32	46	45	48
	R07	75	74	3	0	445	-33	45	44	48
	R08	75	74	3	0	530	-34	44	43	46
	R09	75	74	3	0	230	-27	51	50	53
	R10	75	74	3	0	245	-28	50	49	53
	R11	75	74	3	0	275	-29	49	48	52

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection	Screening	Activity Distance (m)	Noise Attenuated with Distance	Activity LAeq (dB) at Distance		Operational Noise Levels dB(A) at Receptors
		Excavator	Dump Truck	dB(A)	dB(A)			Excavator	Dump Truck	
Soil Stripping, Berms Construction and Restoration	R12	75	74	3	0	335	-31	47	46	50
	R13	75	74	3	0	355	-31	47	46	50
	R14	75	74	3	0	350	-31	47	46	50
	R15	75	74	3	0	365	-31	47	46	49
	R16	75	74	3	0	380	-32	46	45	49
	R17	75	74	3	0	405	-32	46	45	48
	R18	75	74	3	0	400	-32	46	45	48
	R19	75	74	3	0	425	-33	45	44	48
	R20	75	74	3	0	445	-33	45	44	48
	R21	75	74	3	0	460	-33	45	44	47
	R22	75	74	3	0	475	-34	44	43	47

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection	Screening	Activity Distance (m)	Noise Attenuated with Distance	Activity LAeq (dB) at Distance		Operational Noise Levels dB(A) at Receptors
		Excavator	Dump Truck	dB(A)	dB(A)			Excavator	Dump Truck	
Construction and Restoration	R23	75	74	3	0	410	-32	46	45	48
	R24	75	74	3	0	450	-33	45	44	47
	SAC / SPA	75	74	0	0	140	-23	52	51	55

Figure 10 B- 2 Noise Assessment Calculations: Operational Stage

Rossmore Extension: Operational Stage - Excavator, Dump Truck and Mobile Processing Plant

Activity	Receptor	Activity LAeq (dB) at 10m Distance		Reflection dB(A)	Screening dB(A)	Activity Dist Exc DT (m)	Activity Dist MPP (m)	Noise Atten Exc (dB)	Noise Atten MPP (dB)	Activity LAeq (dB) at Distance		Operational Noise Levels dB(A) at Receptors
		Excavator & Dump Truck	Mobile Processing Plant							Exc & DT	MPP	
Soil Stripping, Berms Construction and Restoration	R01	78	82	3	-10	215	315	-27	-30	44	45	48
	R02	78	82	3	-10	180	280	-25	-29	46	46	49
	R03	78	82	3	-10	275	375	-29	-31	42	44	46
	R04	78	82	3	-10	345	445	-31	-33	40	42	44
	R05	78	82	3	-10	375	475	-31	-34	40	41	44
	R06	78	82	3	-10	410	510	-32	-34	39	41	43
	R07	78	82	3	-10	445	545	-33	-35	38	40	42
	R08	78	82	3	-10	530	630	-34	-36	37	39	41
	R09	78	82	3	-10	230	330	-27	-30	44	45	47
	R10	78	82	3	-10	245	345	-28	-31	43	44	47
	R11	78	82	3	-10	275	375	-29	-31	42	44	46
Soil Stripping, Berms Construction and Restoration	R12	78	82	3	-10	335	435	-31	-33	40	42	44
	R13	78	82	3	-10	355	455	-31	-33	40	42	44
	R14	78	82	3	-10	350	450	-31	-33	40	42	44
	R15	78	82	3	-10	365	465	-31	-33	40	42	44
	R16	78	82	3	-10	380	480	-32	-34	39	41	44
	R17	78	82	3	-10	405	500	-32	-34	39	41	43
	R18	78	82	3	-10	400	500	-32	-34	39	41	43
	R19	78	82	3	-10	425	525	-33	-34	38	41	43
	R20	78	82	3	-10	445	545	-33	-35	38	40	42
	R21	78	82	3	-10	460	560	-33	-35	38	40	42
	R22	78	82	3	-10	475	575	-34	-35	37	40	42
Action and	R23	78	82	3	-10	410	510	-32	-34	39	41	43
	R24	78	82	3	-10	460	560	-33	-35	38	40	42
	SAC / SPA	78	82	0	-10	140	240	-23	-28	45	44	48

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