Attachment-7-1-4 Noise Emission Impact Assessment

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1. Introduction

The Noise Emissions impact assessment is based on the Noise Chapter of the attached EIAR. The EIAR was prepared by Environmental Efficiency and this chapter assesses the noise impacts associated with the proposed activities at the subject site in Graney West, Castledermot, Co. Kildare. The purpose of this assessment was to determine the impact proposed operations associated with the proposed development would have on the surrounding noise environment, and in particular, sensitive receptors surrounding the site.

The noise impact assessment presented herein describes and assesses the existing noise baseline characteristics of the local area. The anticipated effects of proposed development 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.

2. Glossary of Terms and Definition

Noise Monitoring Parameters	
Survey	The measurement of noise over one or more days and is made up of a number of monitoring runs with one or more noise meters.
Run or monitoring run	A single measurement at one location to determine noise level. A number of monitoring runs will be typically be made at each location. The duration of a monitoring run is typically 15 or 30 minutes and is stipulated in the licence
dB(A)	This is the unit used to quantify noise measurements. "dB" stands for decibel and the "A" indicates that the noise reading is A-weighted and therefore is a measurement of noise audible to the human ear. The scale is logarithmic.
LAeq,T	This parameter is measured on-site using a noise meter for a specified time period (T minutes). It represents the average noise level that occurred over that period.
Rated Noise Level or LAr,T	The Rated Noise Level is equal to LAeq,T plus any penalty for confirmed tonal and/or subjective impulsive. The penalty is only added for daytime and evening monitoring.
L_{AF10} and L_{AF90}	The L_{AF10} and L_{AF900} are both statistical noise levels. L_{AF10} indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L_{AF90} indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. The L_{AF90} indicates the background noise levels if short-term, intermittent noise sources were ignored e.g. a passing car. The L_{AF10} can be used to determine the effect to which these short-term noise sources effect the overall average reading i.e. if the L_{AF10} is very different to the L_{AF90}, then intermittent noise is a significant source of noise
L_{AFmax}	The maximum RMS A-weighted sound pressure level occurring within a specified time period. Measured using the “Fast” time weighting.
Continuous	Noise produced without interruption.
Impulsive Noise	A noise of short duration (typically less than one second), the sound pressure of which is significantly higher than the background; brief and abrupt.
Intermittent noise	Noise produced on discontinuous basis e.g. equipment operating in cycles or events such as single passing vehicle or aircraft.
Tonal Noise	Noise, which contains a clearly audible, tone i.e. a distinguishable, discrete or continuous note (whine, hum, drone, screech, etc.).
Ambient Noise	Total sound at a receiving location; comprising sound from on-site and off-site, both near and distant
At-source noise monitoring	Noise monitoring that has taken place at or in the close vicinity of the point of origin
Residual Noise	Ambient noise remaining at a receiving location when ‘Specific Noise’ is not occurring
Specific Noise	Noise originating from the source under investigation

The following definitions apply throughout this Chapter of the EIAR.

- Survey - The measurement of noise over one or more days and is made up of several monitoring runs with one or more noise meters. Run or monitoring a single measurement at one location to determine noise level. Several run monitoring runs will typically be made at

each location. The duration of a monitoring run is typically 15 or 30 minutes and is stipulated in the licence.

- dB(A) - This is the unit used to quantify noise measurements. "dB" stands for decibel and the "A" indicates that the noise reading is A-weighted and therefore is a measurement of noise audible to the human ear. The scale is logarithmic.
- LAeq,T - This parameter is measured on-site using a noise meter for a specified time period (T minutes). It represents the average noise level that occurred over that period. Rated Noise Level or The Rated Noise Level is equal to LAeq,T plus any penalty for confirmed tonal LAr,T and/or subjective impulsive. The penalty is only added for daytime and evening monitoring.
- L AF10 and LAF90 - The L AF10 and L AF900 are both statistical noise levels. L AF10 indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L AF90 indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. The L AF90 indicates the background noise levels if short-term, intermittent noise sources were ignored e.g. a passing car. The L AF10 can be used to determine the effect to which these short-term noise sources effect the overall average reading i.e. if the L AF10 is very different to the L AF90, then intermittent noise is a significant source of noise.
- LAFmax - The maximum RMS A-weighted sound pressure level occurring within a specified time period. Measured using the “Fast” time weighting. Continuous noise produced without interruption.
- Impulsive Noise - A noise of short duration (typically less than one second), the sound pressure of which is significantly higher than the background; brief and abrupt.
- Intermittent Noise - Noise produced on discontinuous basis e.g. equipment operating in cycles or events such as single passing vehicle or aircraft.
- Tonal Noise - Noise which contains a clearly audible, tone i.e. a distinguishable, discrete or continuous note (whine, hum, drone, screech, etc.).
- Ambient Noise - Total sound at a receiving location; comprising sound from on-site and off-site, both near and distant.
- At-source noise - Noise monitoring that has taken place at or in the close vicinity of the point of monitoring origin.
- Residual noise - Ambient noise remaining at a receiving location when ‘Specific Noise’ is not occurring.

3. Baseline Environment

3.1 Local Area Context

The application site is located in the townland of Graney West, approximately 2 kilometres southeast of the town of Castledermot and 12 kilometres west of the town of Baltinglass, in Co. Kildare. There is an established but disused sand and gravel pit at the subject site.

The site has historically been in use as a quarry. The site as it is, consists of an area consisting of residential and agricultural buildings, an area where plant and equipment used in connection with pre-existing quarrying and aggregate production activities are situated and a much larger area consisting of worked out quarry voids.

The applicant intends to backfill soil and stone material into previously extracted quarry voids on-site in order to a achieve land restoration. In addition, the applicant intends on accepting C&D waste on-site for recovery processing. Processed materials will be resold as per market demand. Pre-existing plant and additional proposed plant will be used to process C&D waste materials.

The site is situated in a rural location dominated by agriculture and interspersed with one off housing. There are a small number of residential developments in the vicinity of the site, mainly to the east, north and south of the application site. There are no significant tourism and recreational sites or areas in the local area surrounding the site. There is no commercial or industrial development in the vicinity of the site. There are no plans to develop any sites in the local area surrounding the site.

3.2 Noise Sensitive Locations

There are a number of noise sensitive locations (NSL's) in the vicinity of the site. Noise sensitive locations within 500 metres of the site have been identified. The prediction of noise impacts associated with the proposed development on three NSL's which are in the closest proximity to the site in varying cardinal directions has been carried out. These NSL's are shown in figure 3-1 below.

Figure 3-1 NSL's surrounding the site

4. Impact Assessment

4.1 Criteria for Assessment of Noise Impacts and Determination of Significance

Noise Impact Assessment criteria have been identified to assess and characterize noise impacts upon the surrounding noise environment resulting from proposed development activities.

4.1.1 Guidelines for Noise Impact Assessment (IEMA)

The guidelines for Noise Impact Assessment produced by the Institute of Environmental Management and Assessment (IEMA) are generally recognised as established good practice guidelines for developing noise impact assessments. An example impact scale offered by the IEMA guidelines is shown in the table below.

Table 1: Impact scale taken from IEMA guidelines for Noise Impact Assessment

Very Substantial	Greater than 10 dB LAeq change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB LAeq change in sound level at a noise-sensitive receptor, or a 5 to 9.9 dB Laeq change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB LAeq change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB LAeq change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB LAeq change in sound level at a receptor of some sensitivity
None	Less than 2.9 dB LAeq change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

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 10 dB 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.

It has been decided to refer to the impact assessment scale listed above when assessing the potential impact of noise associated with the proposed development upon sensitive receptors in order to aid the characterization of noise effects.

4.1.2 EPA Guidelines on Environmental Management in the Extractive Industry

The EPA has produced guidelines for Quarries (Environmental management in the Extractive Industry) which define noise limit values for extractive industry sites. Activities occurring on these sites shall typically not give rise to noise levels off-site at any Noise Sensitive Location (NSL) in excess of these limits. An NSL may be described as follows:

'Any dwelling, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity, which for its proper enjoyment requires the absence of noise at nuisance levels.'

Noise limits for quarries prescribed by the EPA are shown below. Noise limits for quarries prescribed by the EPA are shown in Table 2.

- Daytime noise criterion dB LAeq, 1 hour, (08:00 to 20:00 hrs) = 55dB
- Nighttime noise criterion dB LAeq, 1 hour, (20:00 to 08:00 hrs) = 45Db

Given the nature of the proposed activity, it is proposed to refer to the above limits when assessing noise impacts in this instance. Predicated noise levels at each sensitive receptor were compared with relevant EPA limits for relevant periods in order to assess whether proposed development activities are acceptable in terms of noise impact.

4.2 Operational Impacts

4.2.1 Sources of Noise at the Proposed Development

The following noise sources will be present on-site during the operational phase of the Proposed Development.

- Fixed plant used for processing C&D Waste material
- Mobile Plant used for hauling and backfilling material on-site
- Heavy Good Vehicles used for hauling materials to and from the site

The following mobile and fixed plant will be present on-site during planned activities:

- Mobile Loading Machinery
    - Volvo 180 E wheel loader
    - 2x Hitachi excavators 360
    - Kamatsu D65 E bulldozer (for filling)
- Ma Macgen 250 kva Diesel Generator (existing)
- Soil Screening Plant – Soil and Stone Powerscreen MK II (proposed)
- Sand and Gravel Plant (existing)
    - 10 x 5 Powerscreen washing head
    - 10 x 5 Powerscreen commander
    - CDE size cyclone
    - Trident Mark 2 dewatering plant
    - Powerscreen 800 log washing
- 1175 Terex Finlay Jaw crusher (for concrete crushing) (proposed)
- Green Waste Shredder – specific plant yet to be hired (for composting) (proposed)

Table 2: Noise limits for licensed Sites prescribed by EPA Guidelines Environmental Management in the Extractive Industry

Daytime Noise Criterion, dB LAeq, 1 hr (08:00 to 20:00 hrs)	**Night-time Noise Criterion, dB LAeq, 1 hr (20:00 to 08:00 hrs)**
55dB	45dB

Given the nature of the proposed activity, it is proposed to refer to the above limits when assessing noise impacts in this instance. Predicated noise levels at each sensitive receptor were compared with relevant EPA limits for relevant periods in order to assess whether proposed development activities are acceptable in terms of noise impact.

4.3 Operational Impacts

4.3.1 Sources of Noise at the Proposed Development

The following noise sources will be present on-site during the operational phase of the Proposed Development.

- Fixed plant used for processing C&D Waste material
- Mobile Plant used for hauling and backfilling material on-site
- Heavy Good Vehicles used for hauling materials to and from the site

The following mobile and fixed plant will be present on-site during planned activities:

- Mobile Loading Machinery
  - Volvo 180 E wheel loader
  - 2 x Hitachi excavators 360
  - Kamatsu D65 E bulldozer (for filling)
- Macgen 250 kva Diesel Generator (existing)
- Soil Screening Plant – Soil and Stone Powerscreen MK II (proposed)
- Sand and Gravel Plant (existing)
  - 10 x 5 Powerscreen washing head
  - 10 x 5 Powerscreen commander
  - CDE size cyclone
  - Trident Mark 2 dewatering plant
  - Powerscreen 800 log washing
- 1175 Terex Finlay Jaw crusher (for concrete crushing) (proposed)
- Green Waste Shredder – specific plant yet to be hired (for composting) (proposed)

Having regard to the Traffic Impact Assessment undertaken by Transport Insights, in the EIAR, it has been determined that there will be 50 daily HGV trips to the site and 50 daily HGV trips from the site (100 one way trips per day overall)

4.3.2 Noise Prediction Modelling

Noise Prediction Modelling was carried out in order to assess how noise from the proposed development will affect the three closest NSL's to the site in various cardinal directions. Results of the Noise Prediction Modelling Assessment undertaken considering planning activities at the application site are shown in the table below.

Table 3: Noise Prediction Modelling Results

NSL/ Location	Description	Period	Specific Noise Level at NSL, LAeq (dB)	Residual Noise Level, LAeq (dB)	Ambient Noise Level at NSL (Specific Noise + Residual Noise) LAeq (dB)	Level of increase in Noise due to Planned Activities, LAeq (dB)
1	Residential Dwelling North East of Site	Morning	40.3	49.4	49.9	0.5
		Midday	40.3	45.3	46.5	1.2
		Evening	40.3	51.9	52.2	0.3
2	Residential Dwelling South of Site	Morning	43.5	49.4	50.4	1.0
		Midday	43.5	45.3	47.5	2.2
		Evening	43.5	51.9	52.5	0.6
3	Residential Dwelling South West of Site	Morning	36.2	49.4	49.6	0.2
		Midday	36.2	45.3	45.8	0.5
		Evening	36.2	51.9	52.0	0.1

Note:

1. The following assumptions have been made when predicting Ambient Noise Levels at NSL's.
   - All mobile plant (Volvo 180 E wheel loader, 2 x Hitachi excavators 360, Kamatsu D65 E bulldozer) are in operation at the closest point to each NSL for 25% of the 11 hour working day.
   - All stationary plant (Macgen 250 KVA generator, Soil and Stone Powerscreen MK II, 1175 Terex Finlay Jaw crusher) are in constant operation at their defined locations throughout the 11 hour working day.
   - The green waste shredder is in operation at the defined location for 5% of 11 hour working day (This plant will only be used on an occasional basis).
   - Delivery trucks are in operation along the haul routes defined in the Site Layout Plan adjoining this application
   - The proposed Green Waste Shredder plant on-site has yet to be determined. For the purposes of the noise prediction assessment, it has been assumed that the Untha RS30/40 Shredder will be in operation on-site. The site operator is considering the use of this shredder on-site.
   - The attenuating effect of a 2 metre high screening mound around the northern, eastern and southern site boundaries has been taken into account.
   - The attenuating effect of 7m high stockpiles between situated between the Soil and Stone Screening Plant and the Concrete Crushing Plant and NSL1 has been taken into account.
2. In practice sequencing of processes/activities and the timing and duration of the processes/activities on any given day may vary. Therefore, it is deemed that the above assumptions are representative of worst-case scenario noise on-site.

4.3.3 Operational Impacts

The table below shows the level of impact planned activities will have on NSL during the assumed scenario, having regard to Noise Impact Criteria defined by Guidelines for Noise Impact Assessment produced by the Institute of Environmental Management and Assessment (IEMA).

Table 4: impact of Noise upon NSL's considering IEMA Noise Impact Criteria

NSL	Period	Level of Impact
NSL1	Morning	None
	Mid-day	None
	Evening	None
NSL2	Morning	None
	Mid-day	None
	Evening	None
NSL3	Morning	None
	Mid-day	None
	Evening	None

As can be seen in Table 4 above planned activities during the assumed worst-case scenario will have a negligible impact on NSL1, NSL2 & NSL3 during all time periods.

Ambient Noise levels predicted at NSL's do not breach the EPA's prescribed day-time noise limit of 55 dB at any NSL (the facility does not operate during evening or night-time as defined by the EPA).

It is noted that the noise prediction assessment undertaken is representative of the worst-case scenario noise levels emanating from the proposed development and effects on a normal operating day will be significantly reduced.

Mitigation measures for controlling and attenuating noise emanating from the site during operations are defined below. It is considered that the adoption and implementation of these mitigation measures will ensure noise will be controlled and maintained at an acceptable level.

5. Operational Phase Mitigation Measures

The primary Mitigation Measures that will be implemented during the operational phase of the proposed development to attenuate noise emissions emanating from plant, equipment and processes on-site are as follows:

- Site operations will be restricted to between 07:00 - 18:00 Monday to Friday and 08:00 - 16:00 Saturday. No activity will take place outside these hours. The facility will operate under an EPA Waste Licence which will prescribe noise limit values to adhere to.
- A 2-metre-high screening mound will be developed along the northern, eastern and southern site boundaries in order to attenuate noise emissions emanating from on-site plant and processes. These mounds will attenuate noise being directed from onsite activities toward NSL1 & NSL2.
- The Soil and Stone Screening Plant will be situated behind a 7-metre-high proposed material stockpile. The presence of this stockpile will serve to impede and attenuate noise emanating from the Soil and Stone Screening Plant toward NSL1 and NSL2 in particular.
- The proposed Concrete Crusher will be located behind a 7-metre-high proposed material stockpile. The presence of this stockpile will serve to impede and attenuate noise emanating from the Concrete Crushing Plant toward NSL1 & NSL2 in particular. The concrete crushing plant will be further enclosed by cantilever walls to minimize noise emanating from the operation of this plant.

In addition to the above, the following good practice mitigation measures for noise control on-site during the operational phase will be adopted and implemented in order to ensure operational phase noise levels are kept at an acceptable level:

- Chutes and hoppers will be lined with a damping layer (rubber lining) to minimize noise output from plant, where practicable. Manufacturers will be consulted in order to determine whether this is practicable.
- Drop heights will be kept to a minimum to minimize noise arising due to material handling.
- Plant and equipment will be serviced and maintained regularly and in line with manufacturer specification (e.g. lubrication of equipment, fixing loose parts, proper balancing)
- Silencers will be used on engines present on-site, where practicable. Manufacturers will be consulted in order to determine whether this is practicable.
- The unnecessary revving of engines and the idling of mobile plant and HGV’s will be avoided.
- Backfilling and C&D Processing activities will only take place during the designated day-time operating hours (07:00 - 18:00 Monday to Friday and 08:00 - 16:00 Saturday).
- Plant will be orientated in such a manner that noise is directed away from NSL’s, in particular NSL1 and NSL2 which are nearest to the site.

6. Residual Impacts

With the adoption of the above Mitigation Measures, it is deemed that noise impacts upon NSL's as a result of Proposed Development activities will be negligible.