

EIAR FOR POWERSTOWN BIOENERGY

Volume 2 - Main Body of the EIAR

Chapter 10 - Noise and Vibration

Prepared for:

Greengate Biogas 001 Ltd.



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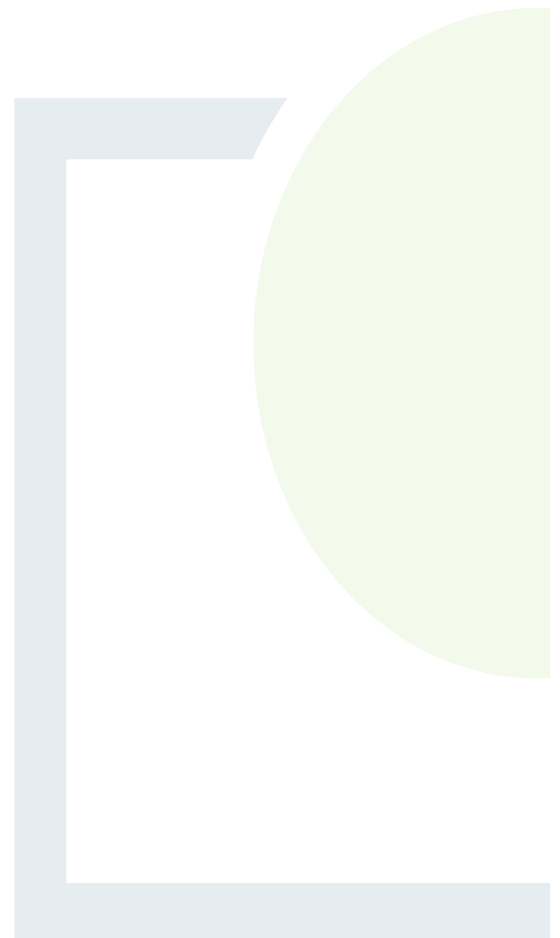


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10. INTRODUCTION

10.1 Introduction

This chapter contains the appraisal of potential noise and vibration impacts arising from the proposed development, undertaken by Fehily Timoney & Company (FT) on behalf of Greengate Biogas 001 Ltd., hereafter referred to as 'the Applicant'.

The proposed development is defined in Chapter 1 – Introduction, and a detailed description of the proposed development is set out in Chapter 3 - Description of the Existing and Proposed Development, in Volume 2 of the EIAR. This project description was used to carry out the predictive noise modelling as described in this chapter and to appraise the resultant noise impact in the local environment, referred to in this chapter as the study area.

10.2 Statement of Authority

This chapter has been prepared by John Cullen and reviewed by Maureen Marsden. John Cullen is an Environmental & Acoustic Engineer with over nine years' experience working in the assessment of environmental noise and vibration, including the preparation and review of EIAR noise and vibration chapters for a range of industrial, waste and renewable energy projects in Ireland. John holds an honours degree in Agri-Environmental Science from University College Dublin, a Post Graduate Diploma in Environmental Engineering from Trinity College Dublin and a Diploma in Acoustics and Noise Control from the Institute of Acoustics. He is a member of the Institute of Acoustics, Institute of Environmental Sciences and Institute of Engineers Ireland.

Maureen Marsden holds a Master of Engineering degree in Acoustics and Vibration from Southampton University (Institute of Sound and Vibration Research). She has 28 years of postgraduate experience and is currently a Senior Project Engineer with Fehily Timoney. Maureen specialises in environmental noise including industrial, energy infrastructure projects and transportation projects. Maureen has a broad range of experience in noise and vibration across a variety of sectors including building, transport, industrial, waste and energy sector projects. She is currently a member of the Institute of Acoustics and Engineers Ireland. CVs are included in Appendix 1.1 of Volume 3 of this EIAR.

10.3 Proposed Development & Potential Impacts

10.3.1 Summary of the Proposed Development

The proposed development is an anaerobic digestion (AD) facility for the production of renewable natural gas (RNG) and biogenic liquified carbon dioxide (biogenic CO₂) from agricultural residues, including liquid farmyard manures (LFYM) and Solid Farmyard Manures (SFYM). The potential sources of noise and vibration associated with the proposed development during the construction, operational and decommissioning phases are outlined in sections 10.3.2. to 10.3.4 as follows.



10.3.2 Potential Construction Noise & Vibration Impacts

The construction works associated with the proposed development will give rise to potential noise and vibration effects in the receiving environment. Construction works will be carried out in phases, with the works estimated to take 24 months to complete and will be confined to the hours of 07:00-18:00 on weekdays (Monday to Friday) and 08:00-14:00 on Saturdays, with no works on Sundays or Public Holidays. The potential for noise and vibration impacts during the construction phase will primarily involve noise emissions and vibration from mobile plant operations, the installation of equipment, general construction works and construction related traffic including Heavy Goods Vehicles (HGVs). The main individual construction works which may generate noise and vibration are listed below:

- Advanced Works (site clearance), Site Entrances, and Contractors Compound
- Storm Water Management
- Earthworks
- Vibro Stone Columns
- Solids Reception Building
- Liquids Reception Building
- Solid Digestate Storage Building
- Circulation Yard
- Bunded Tank Farm
- Desulphurisation Plant
- Gas Upgrade Plant
- CO₂ Liquefaction Plant
- Heating Centre
- Biomethane Network Entry Facility
- Administration Building
- Weighbridge and Weighbridge Office
- Mechanical and Electrical

10.3.3 Potential Operational Noise & Vibration Impacts

Noise during the operational phase will primarily arise from AD management activities and processing, and traffic movements (notably HGVs) entering and departing site and moving around the site. There are no notable sources of operational vibration associated with the operational phase of the proposed development.



The following main activities and equipment will operate at the proposed facility with the potential to generate noise emissions:

- HGV movements including deliveries, collections and movements around the site
- HGVs idling
- digesters, agitators & mixers
- screw press separators
- conveyors
- air intake systems & blowers
- air extraction systems
- cooling units
- shredders
- gas conditioning & upgrading plant
- CO₂ liquefaction plant
- odour abatement system
- electricity substation transformer

10.3.4 Potential Decommissioning Impacts

Decommissioning of the project will involve the removal of the installed equipment/components and materials on-site and noise emissions will be comparable to noise emissions during the construction phase. On decommissioning, the equipment/components will be disassembled, and these residual materials present on site will be removed off site for re-use/recycling/recovery/disposal.

10.4 **Assessment Methodology**

The methodology adopted for this noise assessment is as follows:

- Characterisation of the proposed development.
- Review of relevant guidance and specification of suitable construction, operational and decommissioning noise and vibration criteria.
- Characterisation of the receiving baseline noise and vibration environment.
- Prediction of the noise and vibration levels associated with the construction, operation and decommissioning of the proposed development.
- Evaluation of the potential noise and vibration impacts associated with the proposed development in the receiving environment.
- Specification of mitigation measures, where necessary.



10.4.1 Relevant Guidance

A list of the main guidance documents which informed this assessment is provided below.

- BS 5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration. (British Standards Institution, 2014)
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. (British Standards Institution, 2014)
- Carlow County Development Plan 2022 – 2028, (Carlow County Council, 2022).
- Carlow Noise Action Plan 2024-2028, (Carlow County Council, 2024)
- Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to. Scheduled Activities (NG4), (EPA, 2016).
- Guidelines on the information to be contained in the Environmental Impact Assessment Reports, (EPA, 2022).
- Design Manual for Roads and Bridges; Sustainability and Environmental Appraisal; LA 111 Noise and Vibration; Revision 2, (Highways England, 2020).
- ISO 1996-1:2016, Acoustics – Description, measurement and assessment of environmental noise -- Part 1: Basic quantities and assessment procedures, (ISO, 2016).
- ISO 1996-2:2017, Acoustics – Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels, (ISO, 2017).
- ISO 9613-2:2024, Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors, (ISO, 2024).

10.4.2 Criteria for Rating of Impacts

The significance of noise effects has been assessed in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (EPA, 2022) (hereafter referred to as EPA Guidelines 2022), as described in Chapter 1 – Introduction, in Volume 2 of the EIAR. As these guidelines do not quantify the effects in decibel terms, the following sections discuss the relevant guidelines and standards that have been used to set appropriate noise thresholds or limit values, and to supplement the EPA Guidelines 2022 (EPA, 2022) and describe the significance of effect associated with the proposed development, with regard to noise and vibration. Where feasible, the significance criteria have had regard to the sensitivity of receptors. Receptors which may be sensitive to noise and/or vibration have been identified using the best practice guidelines and standards for each phase of the proposed development and professional judgement. The sensitivity of receptors has been assumed to be 'medium' for any receptors considered moderately sensitive to noise and/or vibration (such as offices) and 'high' for any receptors where occupants or activities may be particularly susceptible to noise and/or vibration (such as residential dwellings, religious institutions, schools, etc.), as appropriate.

10.4.3 Construction Noise Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise levels that may be generated during the construction phase of a project. In the absence of specific noise limits, it is considered best practice to use BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 1- Noise (British Standards Institution, 2014) (hereafter referred to as BS 5228-1) with respect to the assessment of noise impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from BS 5228-1 (British Standards Institution, 2014).



BS5228-1 (British Standards Institution, 2014) describes noise sensitive premises/receivers as: “any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level”.

10.4.3.1 Residential Receptors

BS 5228-1 (British Standards Institution, 2014) contains several methods for the assessment of the potential significance of noise effects at sensitive receivers. The ABC Method was used to derive appropriate construction noise threshold levels (CNTLs) for sensitive premises in the vicinity of the proposed project. The project thresholds to be applied (as defined in Table 10-1) is dependent on the existing ambient noise levels (rounded to the nearest 5dB).

Table 10-1: Threshold of Potential Significant Noise Effect at Dwelling

Threshold value period (L_{Aeq})	Threshold Value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00 - 07:00hrs)	45	50	55
Evenings (18:00 – 23:00 hrs) and weekends (14:00 – 22:00 Saturdays) and (07:00 – 19:00 hrs Sundays)	55	60	65
Daytime (07:00 – 18:00) and Saturdays (08:00 – 14:00)	65	70	75
Note Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.			

The approach adopted calls for the designation of a noise sensitive premises into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. For the appropriate period (e.g. daytime), the ambient noise level is determined and rounded to the nearest 5dB.

The baseline noise survey results were analysed. For residential receptors in the vicinity of site development works, based on the attended baseline data in Section 10.5, a Category A CNTL has been adopted at all residential receptors to ensure a conservative approach. If the site construction noise emissions exceed the Category A values at residential receptors, then a potential significant effect is indicated and mitigation measures may be required to reduce the noise levels below the $L_{Aeq,1hr}$ daytime noise threshold.



10.4.3.2 Commercial Receptors

Construction noise threshold levels (CNTLs) for nearby commercial buildings which may be sensitive to noise, such as offices, are set using fixed noise criteria from BS 5228-1 (British Standards Institution, 2014). The standard provides absolute levels as examples of acceptable limits for construction noise. Paragraph E.2 states:

“Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut.”

and

“Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:

- 70 decibels (dBA) in rural, suburban and urban areas away from main road traffic and industrial noise;
- 75 decibels (dBA) in urban areas near main roads in heavy industrial areas”.

For the purpose of this assessment, given the surrounding industrial environment and nearby main roads, a CNTL of 75 dB(A) has been adopted for nearby commercial buildings with offices (i.e., Carlow County Council Offices adjacent to the proposed development (receptor R9) and Milford Quarries (also referred to as Kilcarrig Quarries) Offices south of proposed development (receptor R11). There is one other commercial property within the study area, R6 (X:670630.33, Y:668499.83) adjacent to the site. This property is listed as commercial on Eircode data, however, the property includes a residence. This is a landowner owned property. The Applicant will upon grant of planning for the proposed development take vacant possession of this property. It will not be occupied. Therefore, this property is not deemed to be noise sensitive and has not been considered in the assessment.

10.4.3.3 Construction Noise Threshold Levels and Significance of Effects

As outlined above, the following Construction Noise Threshold Levels (CNTLs) are proposed for the construction stage of this development during daytime:

- Residential receptors: 65 dB $L_{Aeq,1hr}$ Daytime
- Commercial receptors (offices): 75 dB $L_{Aeq,1hr}$ Daytime

Construction work will be confined to daytime hours, therefore no evening or night time CNTLs have been specified.

In order to assist with interpretation of significance relating to the CNTLs, Table 10-2 includes guidance as to the likely magnitude of impact associated with construction noise, relative to the CNTL. This guidance is derived from Table 3.12 and Table 3.16 of the Design Manual for Roads and Bridges (DMRB) Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2, (Highways England, 2020) (hereafter referred to as DMRB Noise and Vibration) and adapted to include the relevant significance of effects from the EPA Guidelines 2022 (EPA, 2022).



Table 10-2: Classification of Effects for Construction Noise

Guidelines for Noise Impact Assessment Significance (DMRB)	Construction Noise Level	EPA Significance of Effects
Negligible	Below baseline noise level	Not Significant
Minor	Above or equal to baseline noise level and below or equal to CNTL	Slight to Moderate
Moderate	Above CNTL and below CNTL +5 dB	Moderate to Significant
Major	Above or equal to CNTL +5	Significant, to Very Significant

The above criteria will be used to assess the predicted construction noise levels at sensitive receptors and describe the likely effects during the construction stage.

10.4.4 Construction Phase Traffic

Vehicular movement to and from the site for the proposed development construction works will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following guidelines are referenced: Calculation of Road Traffic Noise (CRTN) (Department of Transport Welsh Office, 1988), DMRB Noise and Vibration (Highways England, 2020) and the EPA Guidelines (EPA, 2022).

CRTN (Department of Transport Welsh Office, HMSO., 1988) outlines methods to calculate traffic noise levels based on the Average Annual Daily Traffic (AADT) and percentage of HGVs. For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB Noise and Vibration document and is adapted to include the relevant significance of effects from the EPA Guidelines 2022 (EPA, 2022). Table 10-3 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 10-3: Classification of Effects associated with Change in Traffic Noise Level -Construction Traffic

Change in Noise Level (dB)	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effects
<1 dB	Negligible	Imperceptible
1 – 2.9 dB	Minor	Not Significant
3 – 4.9 dB	Moderate	Slight to Moderate
≥5 dB	Major	Significant



10.4.5 Construction Vibration

There are two aspects associated with the issue of construction vibration that are addressed in best practice standards and guidelines, including the risk of cosmetic or structural damage to buildings from construction vibration, and human perception of vibration associated with construction works.

In best practice acoustic guidance, the most widely used vibration criterion for construction vibration is expressed in terms of Peak Particle Velocity (PPV), expressed in millimetres per second (mm/s).

DMRB Noise and Vibration (Highways England, 2020) defines vibration sensitive receptors as "Receptors which are potentially sensitive to vibration" and provides examples including dwellings, hospitals, healthcare facilities, education facilities, community facilities, buildings containing vibration sensitive equipment and cultural heritage assets". For the purpose of this assessment, vibration sensitive receptors are therefore considered to be the same sensitive receptors as those defined in Section 10.4.3.

10.4.5.1 *Building Damage*

Guidance regarding acceptable vibration in order to avoid damage to buildings is provided in British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings - Guide to damage levels from ground borne vibration (British Standards Institution, 1993) and BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Part 2 - Vibration (British Standards Institute (2), 2014).

Both documents recommend that for soundly constructed residential properties and similar light framed structures that are generally in good repair, a threshold for minor or cosmetic damage (i.e. non-structural damage) should be taken as a Peak Particle Velocity, PPV (in frequency range of predominant pulse) of 15 mm/s (millimetres per second) at 4 Hertz (Hz) increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standards also note that below 12.5 mm/s PPV, the probability of building damage tends towards zero.

According to BS5228-2, minor structural damage is possible at vibration magnitudes which are greater than twice those discussed above, and major damage to a building structure can occur at values greater than four times these values. These vibration values relate predominantly to transient vibration, which does not give rise to resonant responses in structures, and to low-rise buildings. Where vibration may be continuous, the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies, then the guide values above may need to be reduced by up to 50%.

Taking the above best practice guidance and vibration thresholds into consideration, the project construction vibration criteria for building response are set to ensure no risk of cosmetic or structural building damage may occur, and therefore no significant vibration effects on buildings will occur.

Table 10-4 sets out the project vibration limits as they apply to vibration for building response. To ensure a conservative assessment, continuous vibration limits are set at 50% of those for transient vibration across all frequency ranges. The limits apply to vibration frequencies at 4Hz, where the most conservative limits are required. At higher frequencies, the relevant limit values for transient vibration within table B.2 and Figure B.1 of BS 5228-2 (British Standards Institute (2), 2014) apply, with equivalent reductions applied for continuous vibration.



Table 10-4: Construction Vibration Thresholds for Buildings

Vibration Limits for Buildings (PPV), at a Frequency of 4 Hz		
Type of building	Transient Vibration	Continuous Vibration
Reinforced or framed structures (Industrial and heavy commercial buildings)	50 mm/s	25 mm/s
Unreinforced or light framed structures (Residential or light commercial-type buildings)	15 mm/s*	7.5 mm/s

*at frequencies below 4Hz, a maximum displacement of 0.6mm (zero to peak) should not be exceeded.

BS 5288-2 (British Standards Institute (2), 2014) also details that if a building is in an unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration. The vibration limit range for important/historical or vulnerable/unstable buildings may be lower than those for light-framed buildings, depending on their structural integrity. As noted by BS5228-2 (British Standards Institute (2), 2014), a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive.

There are no known vulnerable/unstable or historic buildings noted within the Study Area, therefore no vibration limits are included for any potentially vulnerable structures or special buildings with low vibration thresholds. As outlined in BS5228-2, limits for such buildings will be considered on a case-by-case basis prior to construction, following condition surveys, if required.

10.4.5.2 Human Perception

Humans are particularly sensitive to vibration stimuli, and it is acknowledged that any perception of vibration at sensitive receptors may lead to concern/discomfort.

The threshold of human perception of vibration in terms of Peak Particle Velocity (PPV) in mm/s is in the range of 0.14mm/s to 0.3mm/s, described as “might just be perceptible” in BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites-Vibration (British Standards Institute (2), 2014) and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known. There is typically greater tolerance to higher levels of vibration, when prior notice is given.

DMRB Noise and Vibration (Highways England, 2020), considers that the lowest observed adverse effect level (LOAEL) for construction vibration is 0.3 mm/s PPV and notes that a study area of 100 m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive receptors.

Table 10-5 below presents the significance of effects relating to potential vibration effects at nearby receptors during construction works, based on guidance from BS 5228-2 (British Standards Institute (2), 2014) DMRB Noise and Vibration (Highways England, 2020), and the associated EPA Guidelines 2022 (EPA, 2022) significance of effects.



Table 10-5: Classification of Effects for Construction Vibration (Human Perception)

Vibration Level Range in PPV	Description of Vibration Effects	DMRB Magnitude of Impact	EPA Significance of Effects
<0.3 mm/s PPV	Vibration is unlikely to be perceptible in most situations.	Negligible	Not Significant
≥0.3 to <1 mm/s	Vibration might be just perceptible in residential environments (≥0.3 mm/s), likelihood of vibration perceptibility increasing in this range and approaching likely complaints (at 1.0 mm/s).	Minor	Slight to Moderate
≥1 to <10 mm/s	It is likely that vibration at the lower end of this scale (1.0 mm/s) will cause complaints in residential environments but can be tolerated if prior warning and explanation has been given to residents. Increasing likelihood of disturbance and complaints at higher levels within this range.	Moderate	Moderate to Significant
≥10 mm/s PPV	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.	Major	Very Significant

BS 5228-2 (British Standards Institute (2), 2014) notes that the magnitudes of the vibration levels presented in Table 10-5 above apply to a measurement position that is representative of the point of entry into the recipient. Single or infrequent occurrences of the vibration levels outlined do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects.

DMRB Noise and Vibration (Highways England, 2020) states that construction vibration shall constitute a likely significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

1. 10 or more days or nights in any 15 consecutive days or nights; or
2. A total number of days exceeding 40 in any 6 consecutive months.

10.4.6 Operational Noise Criteria

10.4.6.1 EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

If consented, the Proposed Development will operate under an EPA Industrial Emissions (IE) Licence as the proposed activities will fall within the remit of the Industrial Emissions Directive (2010/75/EU), as implemented by the European Union (Industrial Emissions) Regulations (S.I. 138 of 2013), which amend the First Schedule of the 1992 EPA Act.



It is proposed that the facility will operate in accordance with the noise criteria set out in the requirements of the facility EPA Industrial Emissions licence when operational. The most appropriate noise criteria for the operational phase of the proposed development is therefore contained in EPA document Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), (EPA, 2016) (hereafter referred to as EPA NG4). This document is considered best practice guidance with regard to noise emissions from industrial sites regulated by the EPA.

At the time of writing this report, EPA NG4 (EPA, 2016) is currently being revised, with a final version expected to be released in due course, following the publication of a draft NG4 document (EPA, 2024) and a period of public consultation which closed on 28th February 2025. This assessment has therefore had regard to the guidance set out in the most recent final version of EPA NG4, which is the 2016 document.

EPA NG4 (EPA, 2016) defines a Noise Sensitive Location (NSL) as “any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.”

EPA NG4 (EPA, 2016) requires that sites and nearby NSLs are screened to determine whether they are within a ‘quiet area’ (Step 1 of NG4 noise criteria screening) or ‘area of low background noise’ (Step 2&3 of the screening). This screening is required to determine the appropriate noise limits for licensed sites (Step 4).

For the site to be in a ‘quiet area’, all of the EPA NG4 (EPA, 2016) criteria listed in Table 10-6 must be satisfied. As shown in Table 10-6, the proposed development site does not meet the criteria to be considered a ‘quiet area’, due to proximity to roads, industry and local population.

Table 10-6: EPA NG4 Quiet Area Screening

Criteria	Response
Is the site >3km away from urban areas with a population >1,000 people?	Yes.
Is the site >10km away from urban areas with a population >5,000 people?	No, the site is located approximately 8.6km south of Carlow, with a population of 27,351 (Census 2022).
Is the site >15km away from urban areas with a population >10,000 people?	No, the site is located approximately 8.6km south of Carlow with a population of 27,351 (Census 2022).
Is the site >3km away from any local industry?	No, the site is located adjacent to an existing quarry facility, closed landfill and civic amenity site.
Is the site >10km away from any major industry centre?	No, the site is located approximately 8.6km south of Carlow, with numerous industrial facilities and business parks
Is the site >5km away from any national primary route?	No, the site is located approximately 420 m south of the M9 Motorway
Is the site >7.5km away from any motorway or dual carriageway?	No, the site is located approximately 420 m south of the M9 Motorway



Since it is not within a 'quiet area', NG4 requires the site to be screened to determine if the site is in an 'area of low background noise' (NG4 screening step 3). Measured background noise levels are examined to see if they satisfy the following low background noise criteria:

- Average Daytime Background Noise Level $\leq 40\text{dB } L_{AF90}$, and;
- Average Evening Background Noise Level $\leq 35\text{dB } L_{AF90}$, and;
- Average Night-time Background Noise Level $\leq 30\text{dB } L_{AF90}$.

In order for a site to be considered an 'area of low background noise', all three criteria above must be satisfied. A baseline noise survey was undertaken to determine if the area surrounding the site of the proposed development is considered an 'area of low background noise'.

The survey findings (discussed in Section 10.5) indicate that baseline noise monitoring location NL1 (shown in Table 10-10), approximately 600 m to the east of site, just meets the above criteria and is considered to be within an area of low background noise. Therefore, at this noise sensitive location (i.e., Receptor R3), the EPA noise limit for an 'Area of Low Background noise' applies. At all remaining locations within the study area, including receptors to the south, west and northwest of the proposed development i.e., baseline monitoring locations NL2-NL5, do not meet the criteria to be considered an 'area of low background noise'. Therefore, at all remaining noise sensitive locations, the standard EPA noise limit for 'other areas' applies.

The applicable NG4 noise limits for the proposed development are outlined below in Table 10-7.

Table 10-7: EPA NG4 Applicable Operational Noise Emission Limits

Period	Noise Limit Area of Low Background Noise (R3)	Noise Limit All Remaining Noise Sensitive Locations
Daytime (07:00 to 19:00 Hrs)	45 dB(A) $L_{Ar,T}$	55 dB(A) $L_{Ar,T}$
Evening (19:00 to 23:00 Hrs)	40 dB(A) $L_{Ar,T}$	50 dB(A) $L_{Ar,T}$
Night-time (23:00 to 07:00 Hrs)	35 dB(A) $L_{Aeq,T}$	45 dB(A) $L_{Aeq,T}$

In addition to the numerical limit, the NG4 guidance note states that during the daytime and evening periods, rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all noise sensitive locations. A penalty of 5 dB for tonal and/or impulsive elements is applied to the daytime and evening measured $L_{Aeq,T}$ values to determine the appropriate rating level $L_{Ar,T}$. During night-time, no tonal or impulsive noise from the facility should be audible at any noise sensitive location.

10.4.6.2 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

While not considered noise sensitive within EPA NG4 guidance, neighbouring commercial properties with offices (i.e., Carlow County Council Offices adjacent to the site, Receptor R9 and Milford Quarries Offices south of site, R11) have been considered as part of this assessment, in order to ensure a degree of privacy for office workers and allow concentration, ensuring a conservative assessment. As detailed in section 10.4.3.2, there is one other landowner owned commercial property within the study area, R6, which has not been considered in the assessment, as it will not be occupied and therefore will not be sensitive to noise.



Operational noise limits at the closest neighbouring commercial offices have been set with reference to British Standard BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings (British Standards Institution, 2014). This standard provides advice on appropriate internal ambient noise levels in dwellings and offices.

The standard considers that to allow concentration in executive offices, the internal daytime noise level should not exceed 35-40 dB L_{Aeq} . This corresponds to a derived noise level at the external façade of 50-55 dB L_{Aeq} , using the approximate attenuation provided by a partially open window of 15 dB, as advised in BS 8233 (British Standards Institution, 2014).

For the purpose of this assessment, daytime is considered the period 07:00 to 19:00, in accordance with EPA NG4 guidance (EPA, 2016). Using the above best practice guidance, the proposed noise limit for neighbouring commercial offices during daytime is 55 dB L_{Aeq} . No evening or night-time criteria are proposed for the commercial offices, as they are not operational during evening or night-time hours.

10.4.6.3 Operational Noise Limits and Significance of Effects

As outlined above, the following noise limits are proposed for the operational stage of the proposed development:

Noise Sensitive Locations (Other Areas)

- Daytime (07:00 to 19:00hrs): 55 dB $L_{Ar,T}$
- Evening (19:00 to 23:00hrs): 50 dB $L_{Ar,T}$
- Night-time (23:00 to 07:00hrs): 45 dB $L_{Aeq,T}$

Noise Sensitive Locations (Areas of Low Background Noise)

- Daytime (07:00 to 19:00hrs): 45 dB $L_{Ar,T}$
- Evening (19:00 to 23:00hrs): 40 dB $L_{Ar,T}$
- Night-time (23:00 to 07:00hrs): 35 dB $L_{Aeq,T}$

Commercial Offices

- Daytime (07:00 to 19:00hrs): 55 dB L_{Aeq}

The Guidelines for Environmental Noise Impact Assessment produced by the Institute of Environmental Management and Assessment (IEMA, 2014) have been referenced in order to categorise the potential effects of changes in the ambient noise levels during the operational phase of the proposed development.

The guidelines (IEMA, 2014) address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Varying factors which affect human response to environmental noise (such as background noise level, time period, character of noise, duration and level etc.) must take account of these factors.



The scale adopted in this assessment is shown in Table 10-8 and is based on the scale within the guidelines (IEMA, 2014). The corresponding significance of effects in the EPA Guidelines (EPA, 2022) is also presented.

Table 10-8: Classification of Effects Associated with Operational Change in Noise Level

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night	EPA Significance of Effects
Negligible	Negligible	≥ 0 dB and < 1 dB	Imperceptible
	Minor	≥ 1 dB and < 3 dB	Not Significant
Minor	Moderate	≥ 3 dB and < 5 dB	Slight
Moderate	Major	≥ 5 dB and < 10 dB	Moderate (Long Term) Significant (Short-term)
Major		≥ 10 dB	Significant to Very Significant

The criteria in Table 10-8 reflect the key considerations that relate to human perception of sound levels and are considered to provide a good indication of the likely significance of changes in noise levels as a result of site operations and have been used to assess the impact of operational noise. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear under normal conditions, while a 10 dB(A) change in noise represents a doubling or halving of loudness.

10.4.6.4 Carlow County Development Plan 2022-2028

The Carlow County Development Plan 2022-2028 (Carlow County Council, 2022) includes policies aimed at controlling and reducing noise pollution, including:

Policy NP.P1, which is to:

“Have regard to the provisions of the Environmental Protection Agency (EPA) Acts 1992 and 2003 and the Environmental Protection Agency Act (Noise) Regulations 1994 or any amendments thereto when assessing planning applications.”

Policy NP.P2, which is to:

“Support and seek the implementation of the Carlow Noise Action Plan 2018 -2023 (and any revisions thereto during the life of this Plan).”

Policy NP.P3, which is to:

“Regulate and control activities likely to give rise to excessive noise, other than those activities which are regulated by the Environmental Protection Agency.”



Policy NP.P4, which is to:

“Ensure new development does not cause an unacceptable increase in noise levels affecting noise sensitive properties. Proposals for new development with the potential to create excessive noise will be required to submit a construction and/or operation management plan to control such emissions.”

This assessment has had due regard to the policies, aims and objectives of the Carlow County Development Plan 2022-2028 (Carlow County Council, 2022). The assessment has considered best practice acoustic standards and guidance (including the Carlow Noise Action Plan (Carlow County Council, 2024)), with regards to the receiving environment in the vicinity of the site, and potential noise impacts of the proposed development, which would be subject to best practice noise criteria, as set out in the requirements of the facility EPA Industrial Emissions (IE) Licence, when operational.

10.4.6.5 *Carlow Noise Action Plan 2024 – 2028*

The Carlow Noise Action Plan (NAP) 2024 – 2028 (Carlow County Council, 2024) has been developed as a means of managing environmental noise, and to meet the aims of the European Noise Directive of preventing, and reducing where necessary, environmental noise through the adoption of the Plans. When assessing planning applications, the planning authority will have regard to the noise maps and requirements of the NAP.

The NAP provides a strategic approach to managing environmental noise from transport systems including road traffic and rail traffic, and is underpinned by a set of overarching noise policy principles outlined in the Noise Policy Statement which are:

- “Prevention – manage the risk of additional members of the community being exposed to undesirable noise levels where it is likely to have significant adverse impact on health and quality of life.
- Protection - protect areas which are desirably quiet, or which offer a sense of tranquillity through a process of identification and validation followed by formal designation of ‘Quiet Areas’.
- Mitigation – identify and prioritise appropriate mitigation measures to reduce noise levels where they are potentially harmful”.

This assessment has had due regard for the Carlow NAP and associated noise maps. The principles of the NAP and recognised need for ongoing management of noise have been considered as part of this assessment.

10.4.7 Operational Traffic

Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 10-9 offers guidance as to the likely effect associated with any particular change in traffic noise level using guidance from DMRB Noise and Vibration (Highways England, 2020) and EPA Guidelines (EPA, 2022). For the operational phase, the ‘long-term’ category of impact from DMRB Noise and Vibration (Highways England, 2020) is applicable.



Table 10-9: Classification of Effects Associated with Change in Traffic Noise Level - Operational Traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0 – 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9 dB	Barely Perceptible		Not Significant
3 – 4.9 dB	Perceptible	Minor	Slight to Moderate
5 – 9.9 dB	Up to a doubling of loudness	Moderate	Significant
10+ dB	Doubling of loudness and above	Major	Very Significant

10.4.8 Operational Vibration

There are no significant sources of vibration associated with the operations of the proposed development. The potential for vibration at neighbouring sensitive receptors during operation of AD developments is typically limited to HGV movements on uneven road surfaces.

All surfaces within the proposed development site will be paved and maintained in good repair. Given the distance between the site and the nearest sensitive receptors, and nature of the operational activities, vibration arising from operations will not be perceptible at nearby sensitive locations, and any vibration arising from site activities will be significantly below any thresholds for structural damage to property. As such, no operational vibration criteria have been assigned. Operational vibration associated with the proposed development has been scoped out of the assessment and is not discussed further, as no potential impacts arise.

10.4.9 Decommissioning Noise Criteria

Decommissioning of the project will be comparable to the construction phase. The current best practice guidance for construction noise assessment described above also applies to the decommissioning phase of the project at the end of the service life of the proposed development.

10.4.10 Study Area

There is no guidance or legislation in Ireland regarding the extent/size of the noise study area to adopt for the assessment of noise and vibration effects. The noise and vibration study areas for construction, operation and decommissioning in this chapter have been set, considering the guidance contained in BS 5228 (British Standards Institution, 2014), DMRB Noise and Vibration (Highways England, 2020) and EPA NG4 (EPA, 2016). Professional judgement has been used to determine the distances over which noise and vibration impacts may occur during construction, operation and decommissioning, along with consideration of the likely magnitude and duration of impact, and the sensitivity and locations of receptors.



During the construction and operational phases, the noise study area considers noise sensitive locations up to 600 m from the proposed development. The study area includes the nearest noise sensitive locations to the proposed development as well as noise sensitive locations adjacent to nearby roads and haulage routes. For the purpose of the operational noise impact assessment, 10 no. receptors were modelled, representing noise sensitive locations within 600 m of the site boundary. Noise sensitive locations within 600 m of the site boundary are identified and shown in Figure 10-1.

The study area for construction vibration considers receptors which are potentially sensitive to vibration up to 100 m distance from the proposed construction activities. Operational vibration has been scoped out of the assessment, and there is no requirement to set a study area for operational vibration.

10.5 Baseline Environment

10.5.1 Site Context

The proposed development site is a 9 ha partially restored operational sand and gravel quarry located at Powerstown, Milford, County Carlow, approximately 2.5 km north of Leighlinbridge and 8.6 km south of Carlow.

There is a busy road network in the vicinity of the site. The site is located along the L3045 Local Road, which is accessed along the Carlow to Kilkenny R448 Regional Road. The M9 Motorway is approximately 420 m north of the site.

The site is located directly to the south of Carlow County Council's closed Powerstown Landfill site and to the west of the operational Recycling Centre. The landfill is in the aftercare phase and together with the Recycling Centre is operated under an EPA licence by Carlow County Council. Other local noise sources include operational quarries to the south (ca. 300 m) and north (ca. 1 km) of site, the Dublin to Waterford railway line ca. 320m to the east of the site, and agricultural activities and machinery.

10.5.2 Baseline Noise Survey Details

A noise survey was conducted to establish the existing baseline noise environment. An attended environmental noise survey was undertaken by FT to measure the baseline noise levels at the site during the daytime, evening and night-time periods on the 18th to 19th of June 2025, at five noise monitoring locations. The data from the noise survey has been used to represent the Do-Nothing effect. The data from the noise survey, along with noise predictions has been used to determine the noise impact at the nearest NSLs to the site.

Attended monitoring was carried out using a Svantek Svan 977A Type 1 Sound Level Meter. The noise meter was fitted with a 1/2" microphone. The microphone was fitted with a windshield. The sound level meter was mounted on a tripod at a height of 1.5 m. The microphone was placed at least 3.5 m from reflecting surfaces to obtain 'free-field' conditions. The sound level meter was set to log a range of noise parameters every 15- minutes. The sound level meter was set to a frequency weighting of 'A' in accordance with international standard IEC 61672:2013 and various national standards relating to the measurement of sound pressure level representative of human hearing and a fast response time. All equipment was calibrated before and after the survey and the drift in calibration was within an acceptable range. Details of the noise monitoring equipment calibration certificates are provided in Appendix 10-2 of Volume 3 of the EIAR.

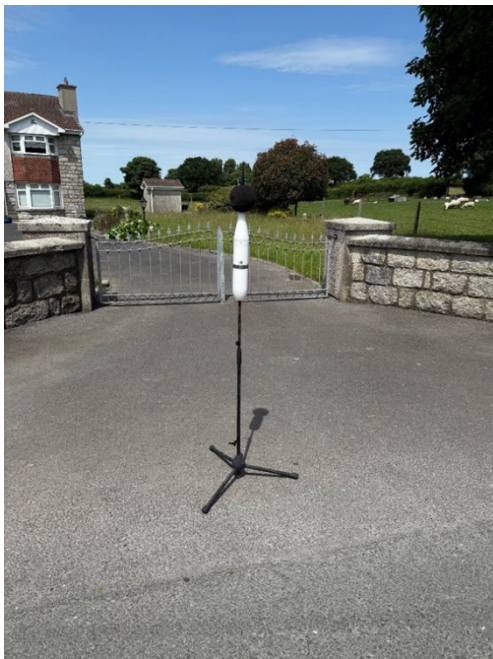
All measurements were taken in accordance with ISO 1996 Standards Acoustics - Description and Measurement of Environmental Noise, Part 1 (ISO, 2016) and Part 2 (ISO, 2017) and EPA guidance document NG4 2016: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (EPA, 2016).



10.5.3 Noise Monitoring Locations

Five noise monitoring locations were identified to the northwest, south and east of site to obtain a detailed representation of the ambient and background noise levels at the nearby NSL's. Details of the noise monitoring locations are presented in Table 10-10. A map of the noise monitoring locations is shown in Figure 10-1.

Table 10-10: Noise Monitoring Locations

Monitoring Location	Location Description	Photograph
NL1 ITM 671454 668890	Located at the entrance to a residential dwelling, along the L3045 Local Road east of the site. The monitoring location is approximately 600 metres east of the site boundary. Representing one-off residential dwellings east of the site.	
NL2 ITM 671081 668668	Located at the entrance to a residential dwelling, along the L3045 Local Road adjacent to the civic amenity site and 150 m east of the proposed development site.	



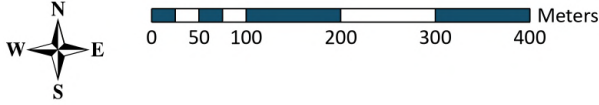
Monitoring Location	Location Description	Photograph
NL3 ITM 670650 668486	Located along public footpath on L3045 Local Road adjacent to commercial building, situated between proposed site and public road.	
NL4 ITM 670511 668422	Located at farm entrance on the L3045 Local Road, southwest of the proposed development site, approximately 20 m from residential dwelling.	



Monitoring Location	Location Description	Photograph
NL5 ITM 670460 668957	Located along R448 Regional Road at entrance to residential dwelling. Situated approximately 280 m northwest of the proposed development site boundary.	



TITLE: Noise Monitoring Locations and Noise Sensitive locations within the Study Area	FIGURE NO: 10.1	
	CLIENT: 	
PROJECT: Bioenergy 001	SCALE: 1:8,000	REVISION: 0
	DATE: 22/06/2026	PAGE SIZE: A3





10.5.4 Monitoring Results

10.5.4.1 *Meteorological Conditions*

EPA' NG4 (EPA, 2016) states that 'ideally' measurements should be taken in 'neutral' weather conditions. "This means in the absence of precipitation, and in conditions of standard temperature and pressure; wind should either be absent or no more than around 1m/s."

However, the EPA recognise that 'these conditions very rarely apply' and state that "An average wind speed of less than 5m/s is the required limit during periods when noise measurements are being taken. Occasional exceedances of up to 7m/s due to gusting wind conditions may be acceptable."

Daytime Period

The weather conditions during the daytime noise survey period were clear and dry, with dry road conditions. The temperature ranged from 18-21 °C. The average wind speed ranged from 1.4-2.9 m/s from a southerly direction, with gusts up to 3.8m/s recorded.

Evening and Night-time Period

The weather conditions during the evening and night-time noise survey period were dry, with dry road conditions. The temperature ranged from 14-16°C. The average wind speed ranged from 0.5 - 1.2 m/s from a south-westerly direction, with gusts up to 2.7 m/s recorded.

All periods were considered to experience acceptable meteorological conditions during the survey, with regards to best practice guidance.

10.5.4.2 *Noise Survey Results*

The results of the baseline noise survey are presented in Table 10-11 to Table 10-15.



Table 10-11: Baseline noise survey Results - Monitoring Location NL1

Monitoring Location NL1					
Period	Date & Start Time	Measured Noise Levels, dB			Comments
		L _{Aeq}	L _{AF10}	L _{AF90}	
Daytime	18/06/2025 13:48	60	52	40	Local traffic and HGVs passing in close proximity to meter dominant, distant quarry process and impact noise audible, trains passing on railway line, distant road traffic audible, birdsong and crow chatter audible.
	18/06/2025 14:03	55	46	39	
	18/06/2025 14:18	61	54	40	
	Arithmetic Average of L _{AF90} (dB)			40	
Evening	18/06/2025 21:47	50	39	30	Local traffic passing in close proximity to meter dominant, train passing on railway line, distant road traffic audible.
Night-time	18/06/2025 23:02	53	36	28	Local traffic passing in close proximity to meter dominant (first run), train passing on railway line, distant road traffic audible.
	18/06/2025 23:17	33	36	29	
	Arithmetic Average of L _{AF90} (dB)			29	

Table 10-12: Baseline Noise Survey Results - Monitoring Location NL2

Monitoring Location NL2					
Period	Date & Start Time	Measured Noise Levels, dB			Comments
		L _{Aeq}	L _{AF10}	L _{AF90}	
Daytime	18/06/2025 13:34	57	49	42	Local traffic passing in close proximity to meter, quarry process and impact noise audible, distant train noise and distant road traffic audible, crow chatter audible, distant crow banger audible (low-level), landfill and recycling traffic movements audible.
	18/06/2025 13:49	63	52	43	
	18/06/2025 14:04	55	48	42	
	Arithmetic Average of L _{AF90} (dB)			42	
Evening	18/06/2025 21:46	50	43	34	Local traffic passing in close proximity to meter, distant train noise and distant road traffic audible.
Night-time	18/06/2025 23:00	50	38	28	Local traffic passing in close proximity to meter (first run), distant train noise (first run) and distant road traffic audible.
	18/06/2025 23:15	35	37	30	
	Arithmetic Average of L _{AF90} (dB)			29	



Table 10-13: Baseline Noise Survey Results - Monitoring Location NL3

Monitoring Location NL3					
Period	Date & Start Time	Measured Noise Levels, dB			Comments
		L _{Aeq}	L _{AF10}	L _{AF90}	
Daytime	18/06/2025 14:38	60	58	47	Local traffic passing in close proximity to meter, R448 traffic and distant motorway traffic audible, landfill and recycling activities audible, dog barking at neighbouring residence.
	18/06/2025 14:53	60	57	47	
	18/06/2025 15:08	63	57	47	
	Arithmetic Average of L _{AF90} (dB)			47	
Evening	18/06/2025 22:06	59	50	34	Local traffic passing in close proximity to meter, R448 traffic and distant motorway traffic audible, dog barking at neighbouring residence.
Night-time	18/06/2025 23:35	45	48	31	Local traffic passing in close proximity to meter, R448 traffic and distant motorway traffic audible, engine idling at neighbouring residence (second run).
	18/06/2025 23:50	57	49	35	
	Arithmetic Average of L _{AF90} (dB)			33	

Table 10-14: Baseline Noise Survey Results - Monitoring Location NL4

Monitoring Location NL4					
Period	Date & Start Time	Measured Noise Levels, dB			Comments
		L _{Aeq}	L _{AF10}	L _{AF90}	
Daytime	18/06/2025 14:41	65	69	53	R448 traffic dominant, local traffic and motorway traffic audible, Digger operating on farm and residential grass cutting audible.
	18/06/2025 14:56	65	69	52	
	18/06/2025 15:11	66	69	49	
	Arithmetic Average of L _{AF90} (dB)			51	
Evening	18/06/2025 22:07	62	58	36	R448 traffic dominant, local traffic and motorway traffic audible.
Night-time	18/06/2025 23:36	53	53	33	R448 traffic dominant, local traffic and motorway traffic audible.
	18/06/2025 23:51	57	55	36	
	Arithmetic Average of L _{AF90} (dB)			35	



Table 10-15: Baseline Noise Survey results - Monitoring Location NL5

Monitoring Location NL5					
Period	Date & Start Time	Measured Noise Levels, dB			Comments
		L _{Aeq}	L _{AF10}	L _{AF90}	
Daytime	18/06/2025 15:32	70	74	55	R448 traffic dominant, motorway traffic audible, distant HGV engine idling audible during gaps in traffic.
	18/06/2025 15:47	70	74	56	
	18/06/2025 16:02	70	74	56	
	Arithmetic Average of L _{AF90} (dB)			56	
Evening	18/06/2025 22:24	66	68	41	R448 traffic dominant, motorway traffic audible.
Night-time	19/06/2025 00:10	63	57	34	R448 traffic dominant, motorway traffic audible.
	19/06/2025 00:25	63	60	33	
	Arithmetic Average of L _{AF90} (dB)			34	

10.5.5 Baseline Noise Survey Discussion

At monitoring location NL1, the noise levels ranged from 35 to 61 dB L_{Aeq} and 28 to 40 dB L_{A90}. The noise environment was dominated by road traffic. Other noise sources included quarry noise (daytime), trains passing on the nearby railway line and birdsong.

At monitoring location NL2, the noise levels ranged from 35 to 63 dB L_{Aeq} and 28 to 43 dB L_{A90}. The noise environment was dominated by road traffic. Other noise sources included quarry noise (daytime), trains passing on the nearby railway line, birdsong, a distant crow banger (daytime) and recycling centre operations (daytime).

At monitoring location NL3, the noise levels ranged from 45 to 63 dB L_{Aeq} and 31 to 47 dB L_{A90}. The noise environment was dominated by road traffic. Other noise sources included recycling centre operations (daytime), dog barking and an engine idling (night-time).

At monitoring location NL4, the noise levels ranged from 53 to 66 dB L_{Aeq} and 33 to 53 dB L_{A90}. The noise environment was dominated by road traffic. Other noise sources included a digger operating and residential grass cutting during daytime.

At monitoring location NL5, the noise levels ranged from 63 to 70 dB L_{Aeq} and 33 to 56 dB L_{A90}. The noise environment was dominated by road traffic. Other noise sources included an engine idling during gaps in road traffic (daytime).

In summary, road traffic on the surrounding road network was noted as the dominant noise source during the baseline noise survey. The highest noise levels were measured west of the site during the baseline noise survey, close to the R448 Regional Road and M9 Motorway, and measured noise levels generally reduced to the East during the survey.

There were no significant levels of vibration noted by the surveyor at any monitoring location during the baseline noise survey.



10.5.6 Review of Round 4 Strategic Noise Mapping

The baseline noise survey has been supplemented with a desk-based review of publicly available noise data to further characterise the baseline noise environment. Road traffic noise was noted as the dominant noise source during the baseline noise survey and reference has been made to the most recent Round 4 Strategic Noise Maps for road traffic noise, as published online by the Environmental Protection Agency (EPA)¹. The published noise maps are provided for the overall day-evening-night period in terms of L_{den} ² and the 8-hour night-time period, L_{night} .

The western part of the proposed development site sits within the 55-59 dB L_{den} noise contour. The L_{den} increases with proximity to the M9 Motorway. The nearest noise sensitive locations to the proposed site are located south of site and are outside the 55-59 dB L_{den} noise contours for road traffic noise.

The western part of the proposed development site sits within the 45-49 dB L_{night} noise contour. The L_{night} increases with proximity to the M9 Motorway. The nearest noise sensitive locations to the proposed development site are located south of the site, and are within, and just outside the 45-49 dB L_{night} noise contours for road traffic noise.

It is concluded that the Round 4 Strategic Noise Maps align with the findings and trends identified during the baseline noise survey.

10.6 Potential Impacts

10.6.1 'Do Nothing' Impacts

The current dominant environmental noise source in the vicinity of the site is road traffic noise, with numerous other local environmental noise sources, including industrial and commercial facilities, and railway noise. It is expected that in the absence of the proposed development being constructed, the existing noise sources and future baseline noise environment would remain unchanged. However, due to the nature of the site's location and condition, it is possible that other industrial/commercial facilities may be proposed on-site, which could result in increased construction or operational noise. Furthermore, a negligible increase in road traffic noise on the local road network may occur, due to population growth and predicted road traffic increases.

10.6.2 Construction Phase Noise Impacts

The predicted construction noise levels at the nearest noise sensitive locations were calculated using data sourced from BS 5228-1 (British Standards Institution, 2014).

The standard sets out sound power levels and L_{Aeq} noise levels of plant items normally encountered on construction sites, which in turn enables the prediction of environmental noise levels at selected locations.

¹ <https://gis.epa.ie/EPAMaps> accessed 11/12/2025.

² L_{den} is defined as the Day-evening-night level. It is a descriptor of noise level based on energy equivalent noise level (L_{eq}) over a whole day with a penalty of 10 dB(A) for night time noise (23.00-7.00) and an additional penalty of 5 dB(A) for evening noise (i.e. 19.00-23.00) (<https://www.eea.europa.eu/help/glossary/eea-glossary/lden>).



For this assessment, it has been assumed that for each of the main activities, all plant will operate simultaneously. The noise impacts from the proposed development construction activities are therefore considered cumulatively and are appraised against the construction noise criteria defined in Section 10.4.3. For each item of plant, the percentage on time has been assumed, depending on the construction activity. The existing topography has also been included in calculations, with a conservative ground cover of $G=0.5$ assumed.

Construction work will be confined to the following times (unless otherwise agreed with the Planning Authority):

- 07:00-18:00 on weekdays (Monday to Friday) and 08:00-14:00 on Saturdays with no works on Sundays or Public Holidays.

Predicted construction noise levels are façade noise levels as per BS5228-1:2009+A1:2014 (British Standards Institution, 2014). Façade noise levels include reflection from the building façade. Façade noise level = Free-field noise level + 3dB.

To evaluate the noise during the construction phase of the development, it is necessary to define the various activities that will be undertaken. Chapter 3: Description of the Proposed Development outlines the proposed construction methodology and phasing for the main construction elements of the proposed development. The key on-site construction elements from a noise perspective are grouped as follows:

- Advance Works and Contractors Compound
- Earthworks
- Vibro stone columns
- Roads, concrete pouring & hardstands
- Construction of Buildings and Weighbridge
- Circulation Yard & Bunded Tank Farm
- Plant Installation and Ancillary Works including Mechanical and Electrical Fit-out
- Gas Network Connection works

All residential dwellings within the study area and the closest commercial offices were considered when carrying out the construction noise predictions. A map showing the location of these receptors is provided in Figure 10-1.

As detailed in Chapter 6 - Traffic and Transportation, of Volume 2 of this EIAR, average HGV traffic generation arising during construction activities is expected to be in the region of 46 return HGV trips or less per day. Therefore, to assess potential noise impacts, 46 two-way HGV movements per day have been assumed for the construction phase.

The findings of each phase of construction works are outlined in the following sections.



10.6.2.1 Advance Works and Contractors Compound

Advanced site works will be required prior to full site mobilisation and will include general clearance of the site area, construction of storm water lagoon, site entrances and establishment of construction stage site services. A construction compound will also be required for the duration of the construction cycles. It will typically consist of a hardcore area surrounded by secure fencing, comprising site offices, canteen, toilet facilities, storerooms and staff parking areas.

The typical plant and activities involved the advance works and contractors compound construction are presented in Table 10-16 below, along with the predicted noise levels at the closest noise sensitive receptors.

Table 10-16: Advance Works and Contractors Compound Expected Plant Predicted Noise Level

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
				R4	R7	R9
Tracked excavator (22t)	C2.21	Ground excavation/earthworks	80	36	41	43
Dump truck (Tipping fill)	C2.32	Tipping fill	10	29	35	50
Dozer (14t)	C5.12	Spreading chipping/fill	80	41	47	50
Vibratory roller (3t)	C5.27	Rolling and compaction	80	31	36	45
Mobile telescopic crane (80t)	C4.39	Lifting cabins/containers	80	41	46	40
Lorry*	C11.9	Delivery and removal of material	46 trips per day	49	40	39
Cumulative				50	51	54

*Drive-by maximum sound level

The nearest residential receptor (R7) to the advance works and contractor compound is over 200 m away. The predicted noise level assuming all plant operate simultaneously is 51 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors (as shown in Figure 10-1).

The nearest commercial offices (R9) to the advance works and contractor compound are over 100 m away. The predicted noise levels assuming all plant operates simultaneously is 54 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.

10.6.2.2 Earthworks

The proposed development will require extensive preparatory earthworks including stripping, clay excavation and reduced level excavation to the necessary foundation level.

The typical plant and activities involved the earthworks are presented in Table 10-17 along with the predicted noise levels at the closest noise sensitive receptors.



Table 10-17: Earthworks Expected Plant and Predicted Noise Levels

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
				R7	R4	R9
Tracked excavator	C2.19	Ground excavation/earthworks	80	48	42	52
Tracked excavator	C10.9	Loading overburden	80	46	40	50
Dozer	C2.12	Ground excavation/earthworks	80	51	45	5
Articulated Dump Truck*	C2.33	Distribution of Material	23 trips per day	39	47	41
Dump truck (Tipping fill)	C2.32	Tipping fill	10	36	30	39
Dozer (14t)	C5.12	Spreading chipping/fill	80	47	41	51
Lorry*	C11.9	Delivery and removal of material	23 trips per day	40	50	42
Cumulative				55	54	59

*Drive-by maximum sound level

The nearest residential receptor (R7) to the earthworks is over 200 m away. The predicted noise level assuming all plant operate simultaneously is 55 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial office (R9) to the earthworks is over 150 m away. The predicted noise levels assuming all plant operates simultaneously is 59 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.

10.6.2.3 Vibro Stone Columns

The proposed development may require vibro stone columns to be placed in the ground prior to the laying of foundations, as detailed in Chapter 3 - Description of the Existing and Proposed Development, in Volume 2 of the EIAR. This may be required at portal frame buildings and the tank bund farm, the gas upgrade plant, the gas desulphurisation plant, the CO₂ liquification plant, the odour abatement area, the admin building and the gas flares area.

The typical plant and activities involved the vibro stone columns are presented in Table 10-18, along with the predicted noise levels at the closest noise sensitive receptors to the vibro stone column works.



Table 10-18: Vibro Stone Columns Expected Plant and Predicted Noise Levels

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB	
				R4	R9
Lorry*	C11.9	Delivery of material	46 trips per day	48	45
Dump truck (Tipping material)	C2.32	Tipping material	10	38	42
Tracked excavator (22t)	C2.21	Moving material	80	44	48
Vibro Stone Columns Vibroprobe (17t)	C3.27	Vibro displacement and compaction of stone columns	80	53	57
Cumulative				54	58

The nearest residential receptor (R4) to the vibro stone columns works is over 190 m from the works. The predicted noise level assuming all plant operate simultaneously is 54 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial offices (R9) to the vibro stone columns works is over 120 m from the works. The predicted noise levels assuming all plant operates simultaneously is 58 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.

10.6.2.4 Roads, Concrete Pouring & Hardstands

The proposed development construction will include the construction of roads/access tracks, drainage, concrete pouring and the construction of hardstands.

Concrete foundations and hardstands will be poured using a concrete pump fed by imported ready mixed concrete. Concrete will arrive to site in concrete mixing wagons which will empty to the concrete pump.

The typical plant and activities involved in this phase of works are presented in Table 10-19 below, along with the predicted noise levels at the closest noise sensitive receptors.



Table 10-19: Roads, Concrete Pouring & Hardstands Expected Plants and Predicted Noise Levels

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
				R4	R10	R9
Tracked excavator (22t)	C2.21	Ground excavation/earthworks	80	40	40	38
Dump truck (Tipping fill)	C2.32	Tipping fill	10	36	35	31
Dozer (14t)	C5.12	Spreading chipping/fill	80	47	46	43
Vibratory roller (3t)	C5.27	Rolling and compaction	80	36	35	33
Excavator (21t)	C4.65	Trench for drainage	80	41	40	38
Lorry*	C11.9	Delivery and removal of material	46 trips per day	48	46	36
Concrete mixer truck + truck mounted concrete pump + boom arm	C4.32	Concrete pumping	100	49	48	45
Poker Vibrator	C4.33	Concrete poking	50	47	45	43
Cumulative				55	53	50

*Drive-by maximum sound level

The nearest residential receptor (R4) to the roads, concrete pouring and hardstands is over 100 m away. The predicted noise level assuming all plant operate simultaneously is 55 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime noise CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial office (R9) to the roads, concrete pouring and hardstands is over 200 m away. The predicted noise levels assuming all plant operates simultaneously is 50 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime noise CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.



10.6.2.5 Construction of Buildings and Weighbridge

The construction of several buildings and installation of the weighbridge will occur during the construction phase of the proposed development. The locations of the buildings and weighbridge are shown on the planning drawings. Buildings include the Heating Centre, Weighbridge Office, Admin Building, Liquid Reception Building, Solid Digestate Storage Building, Solid Reception Building and Substation Building. The weighbridge will be prefabricated off site, delivered by truck to site and craned into place on a poured reinforced concrete foundation. It is expected that the works will be progressed on a phased basis and plant will move around the site, as necessary. The construction works will be progressed in several phases, including:

- site clearance/preparation
- preparation and pouring of foundations and floor areas;
- preparation of subbases, hardstanding areas and pouring of concrete
- general construction including erection of steel work and installation of electrical and mechanical plant

The typical plant and activities involved in the construction of the buildings and weighbridge are presented in Table 10-20 below, along with the predicted noise levels at the closest noise sensitive receptors.

Table 10-20: Construction of Buildings and Weighbridge Expected Plant and Predicted Noise Levels

Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
					R7	R4	R9
Site Preparation	Tracked excavator (22t)	C2.21	Ground excavation/earthworks	80	40	37	44
	Articulated Dump Truck*	C2.33	Delivery and removal of material	46 trips per day	38	46	40
	Dump truck (Tipping fill)	C2.32	Tipping fill	10	34	30	38
	Dozer (14t)	C5.12	Ground excavation/earthworks	80	46	42	49
	Tracked Excavator (25t)	C2.19	Ground excavation/earthworks	80	47	43	50
	Cumulative				50	49	53



Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
					R7	R4	R9
Preparation of sub-bases, foundations and hardstanding's and pouring of concrete	Excavator (21t)	C4.65	Trench for drainage	80	37	40	43
	Lorry *	C11.9	Delivery and removal of material	46 trips per day	49	39	41
	Dump Truck (29t)	C2.30	Tipping Fill	10	35	39	43
	Dozer (14t)	C5.12	Spreading chipping/fill	80	42	45	49
	Vibratory roller (3t)	C5.27	Rolling and compaction	80	32	36	39
	Concrete mixer truck + truck mounted concrete pump + boom arm	C4.32	Concrete pumping	100	44	48	51
	Cumulative				51	51	54
General Construction including erection of steelwork and installation of electrical and mechanical plant	Mobile telescopic crane (80t)	C4.39	Lifting Plant/Material	80	46	42	50
	Telescopic Handler	C4.54	Lifting Plant/Material	80	49	43	52
	Lorry *	C11.9	Delivery of material	46 trips per day	39	49	41
	Angle grinder	C4.93	(grinding steel)	50	49	43	52
	Lifting Platform	C4.57	Lifting personnel	80	41	36	45
	Generator	C4.84	Power for site works	100	44	40	48
	Cumulative				54	52	57

*Drive-by maximum sound level

The nearest residential receptor (R7) to the construction of buildings is over 200 m away. The highest predicted noise level assuming all plant operate simultaneously is 54 dB $L_{Aeq,1hr}$ during general construction. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial office (R9) to the construction of buildings is over 100 m away. The predicted noise levels assuming all plant operates simultaneously is 57 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.



10.6.2.6 Circulation Yard & Bunded Tank Farm

The construction of the circulation yard and bunded tank farm will occur during the construction phase of the proposed development. It is expected that the works will be progressed on a phased basis and plant will move around these areas of site, as shown on the planning drawings. These construction works will be progressed in several phases, including:

- Site preparation;
- Preparation and pouring of foundations, hardstanding areas and pouring of concrete; and
- General Construction including erection of steel work and installation of tanks.

The typical plant and activities involved in the construction of the circulation yard and bunded tank farm are presented in Table 10-21 below, along with the predicted noise levels at the closest noise sensitive receptors.

Table 10-21: Circulation Yard & Bunded Tank Farm Expected Plant and Predicted Noise Levels

Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
					R4	R7	R9
Site Preparation	Tracked excavator (22t)	C2.21	Ground excavation/earthworks	80	35	38	44
	Articulated Dump Truck	C2.33	Delivery and removal of material	46 trips per day	46	37	40
	Dump truck (Tipping fill)	C2.32	Tipping fill	10	29	32	38
	Dozer (14t)	C5.12	Ground excavation/earthworks	80	41	43	49
	Tracked Excavator (25t)	C2.19	Ground excavation/earthworks	80	42	44	50
	Cumulative				49	48	53
Preparation and pouring of foundations, hardstanding areas and pouring of concrete	Excavator (21t)	C4.65	Excavating and placing material	80	35	38	43
	Lorry*	C11.9	Delivery of material	46 trips per day	50	39	41
	Dump Truck (29t)	C2.30	Tipping Fill	10	34	37	43
	Dozer (14t)	C5.12	Spreading chipping/fill	80	41	44	49
	Vibratory roller (3t)	C5.27	Rolling and compaction	80	31	34	39



Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
					R4	R7	R9
	Concrete mixer truck + truck mounted concrete pump + boom arm	C4.32	Concrete pumping	100	42	45	51
	Cumulative				51	49	54
General Construction including erection of steel work and installation of tanks	Mobile telescopic crane (80t)	C4.39	Lifting Plant/Material	80	41	44	50
	Telescopic Handler	C4.54	Lifting Plant/Material	80	43	46	52
	Lorry *	C11.9	Delivery of material	46 trips per day	50	39	41
	Angle grinder	C4.93	(grinding steel)	50	43	46	52
	Lifting Platform	C4.57	Lifting personnel	80	35	37	45
	Generator	C4.84	Power for site works	100	39	42	48
Cumulative					52	51	57

*Drive-by maximum sound level

The nearest residential receptor (R4) to the construction of the circulation yard and bunded tank farm is over 300 m away. The highest predicted noise level assuming all plant operate simultaneously is 52 dB $L_{Aeq,1hr}$ during general construction. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial offices (R9) to the construction of the circulation yard and bunded tank farm is over 150 m away. The predicted noise levels assuming all plant operates simultaneously is 57 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.

10.6.2.7 Plant Installation and Ancillary Works including Mechanical and Electrical Fit-out

The proposed development construction will include plant installation (including Desulphurisation, Gas Upgrade & CO₂ Liquefaction Plant) and ancillary works, including erection of steel work and mechanical and electrical fit-out. Components will be prefabricated off site, delivered by truck to site and craned into place. Electrical and mechanical connections will be made on site aided by mobile cranes and lifting platforms.

The typical plant and activities involved this phase of works are presented in Table 10-22, along with the predicted noise levels at the closest noise sensitive receptors.



Table 10-22: Plant Installation and Ancillary Works including Mechanical and Electrical Fit-out Expected Plant and Predicted Noise Levels

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level ($L_{Aeq,1hr}$) at Receptors, dB		
				R4	R10	R9
Mobile telescopic crane (80t)	C4.39	Lifting Plant/Material	80	48	47	42
Telescopic Handler	C4.54	Lifting Plant/Material	80	50	49	44
Lorry *	C11.9	Delivery of material	46 trips per day	49	46	35
Angle grinder	C4.93	(grinding steel)	50	50	49	44
Lifting Platform	C4.57	Lifting personnel	80	42	41	37
Generator	C4.84	Power for site works	100	46	45	40
Cumulative				56	55	49

The nearest residential receptor (R4) to the plant installation and ancillary works is over 150 m away. The highest predicted noise level assuming all plant operate simultaneously is 56 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 65 dB $L_{Aeq,1hr}$ at all nearby residential receptors.

The nearest commercial offices (R9) to the plant installation and ancillary works are over 350 m away. The predicted noise levels assuming all plant operates simultaneously is 49 dB $L_{Aeq,1hr}$. The predicted noise levels are below the construction daytime CNTL of 75 dB $L_{Aeq,1hr}$ at all nearby offices.

10.6.2.8 Gas Network Connection Works

As described in Chapter 3 - Description of the Existing and Proposed Development, in Volume 2 of the EIAR, it is planned that the gas pipe will be laid in the grass verge alongside the existing road (where possible) or under the existing road itself. This will be determined by GNI at detailed design stage. The pipe will be laid at approximately 100 metres per day by open cut method. The proposed gas pipeline connection will require both standard cut and cover construction (i.e. excavate trench, place pipe, cover pipe and reinstate surface finish) and horizontal directional drilling methods of installation (hereafter referred to as the 'linear' gas connection works). Given the nature of the works, the activities will be consecutive. Predicted noise levels associated with the proposed linear gas network connection works are presented below in Table 10-23.



Table 10-23: Gas Network Connection Works Expected Plant and Predicted Noise Levels

Plant	Activity	Percentage on-time (%)	Predicted Noise Level at Distance, $L_{Aeq,1hr}$, dB			
			10m	25m	50m	100m
Road sweeper (C4.90)	Sweeping and dust suppression	10	69	61	54	47
Mini excavator with hydraulic breaker (C5.2)	Breaking road surface	10	76	68	61	54
Vibratory roller (C5.27)	Rolling and compaction	50	67	59	51	44
Wheeled excavator (C5.34)	Trenching	50	70	62	55	48
Hand-held circular saw (petrol) (C5.36)	Cutting Concrete	10	77	69	62	55
Dump truck (tipping fill) (C2.30)	Tipping Fill	10	72	64	57	50
Vibratory plate (petrol) (C2.41)	Compaction	10	73	65	58	51
Horizontal Directional Drilling (C2.44)	Drilling	50	77	69	62	55

In total, there are 115 no. noise sensitive locations (including residential properties, those classified as both residential and commercial, and commercial offices) within 100 m of the proposed gas connection route. The noise levels presented in Table 10-23 above are predicted maximum levels during the linear works and are expected to occur for only short periods of time.

There are no NSLs located within 10 m of the proposed gas connection route.

Within 10-25 m of the proposed route, there are 36 no. NSLs. For the closer properties in this grouping (i.e. at 10 m), the noise criteria of 65 dB $L_{Aeq,1hr}$ will be exceeded by individual items of plant up to 12 dB. For further properties within this group (at 25 m) the noise criteria will be exceeded by 3 dB during hydraulic breaking and by 4 dB during concrete cutting and drilling.

There are 49 no. NSLs within 25-50 m of the proposed gas connection works. The predicted noise level at closer properties exceeds the 65 dB noise criteria by up to 4 dB during concrete cutting and drilling, and at the further properties in this grouping (i.e. 50 m), the noise levels are predicted to be below the 65 dB $L_{Aeq,1hr}$ noise criteria during all activities.

There are 30 no. NSLs between 50-100 m of the proposed gas connection works. At greater than 50 m from the proposed gas connection works, noise from construction activities is below the noise criteria of 65 dB $L_{Aeq,1hr}$ for all activities. At greater than 100 m distance, noise levels are lower than those presented in Table 10-23 and are below the noise criteria of 65 dB $L_{Aeq,1hr}$ for all activities.



10.6.2.9 Construction Phase Noise Impacts Summary

In summary, the predicted noise levels during the general construction works will be below the CNTL of 65 dB $L_{Aeq,1hr}$ at all residential receptors and below the CNTL of 75 dB $L_{Aeq,1hr}$ at nearby commercial offices. The general construction works are expected to occur in the phases outlined in the sections above, and it has been conservatively assumed for each phase that all plant items operate simultaneously. It is therefore not considered likely that there will be significant overlap between noise sources from different construction phases. However, in the event of any overlap between construction activities from different phases, with items from two different phases operating concurrently, the predicted construction noise levels may rise by up to +3 dB. Nonetheless, in this scenario the predicted noise levels would remain below the noise criteria at all noise sensitive locations. The works associated with the general construction are expected to have a **slight, negative** effect at nearby receptors and will be **short-term** in duration.

The predicted noise levels during the linear works associated with the proposed gas connection route will be above the CNTL of 65 dB $L_{Aeq,1hr}$ at up to 85 no. properties within 50m of the works. Without mitigation, the linear gas connection works are predicted to have a **moderate to significant, negative** effect at these properties. However, given the nature of the gas connection works, construction activities will not occur over an extended period at any one location. It is proposed that works will be conducted in 100m segments and typically the maximum time outside any one property will be 1-2 days and therefore the effects will be temporary. At 50m distance from the works and greater, the effects are expected to be **slight, negative** and **temporary**.

10.6.3 Construction Phase Traffic Noise Impacts

During the construction phase, traffic associated with the proposed development would consist of a mix of construction staff vehicles, LGVs and HGVs travelling to and from the site.

For the purpose of assessing potential noise impact on an existing road, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing road links surrounding the proposed development site both with, and without the development, using the Annual Average Daily Traffic (AADT) data.

In order to increase traffic noise levels by 1dB, total traffic volumes would need to increase by the order of 25%. The maximum total percentage increases in road traffic on the surrounding road network during operations are detailed in Chapter 6 - Traffic and Transport, in Volume 2 of the EIAR.

Only one road link (Link 8) (L3045) is projected to experience an increase in total traffic volumes (AADT) of 25% or greater in the construction year (2029), with a projected increase in road traffic in the order of 26%, based on the maximum construction traffic scenario including gas connection (85th percentile). The predicted change in noise levels due to the increase in road traffic has been calculated for this road link below.

Table 10-24: Predicted Change in Noise Level Associated with Construction Traffic

Road Link	2029 Construction Year 'Do Nothing' Baseline		2029 Construction Year with Development		Predicted Noise Level Change (dB, L_{A10})	Classification of Effects*
	Total AADT	% HGV	Total AADT	% HGV		
L3045 (Link 8)	585	17.5	735	23.9	+1.7	Not Significant

*Classification of effects as described in Table 10-3



In terms of the additional traffic on local roads that will be generated as a result of the construction phase of the proposed development, it is considered that additional traffic introduced onto the local road network due to the construction of this development will result in a worst-case increase in traffic noise of 1.7 dB at road link 8. The resultant effect is expected to be **negative, not significant** and **short-term**. The AADT increases at all remaining road links are lower (and significantly below 25%), with the effects on all remaining road links expected to be neutral, imperceptible and short-term. It is noted that the traffic figures consider a cumulative scenario, with projected road traffic figures on the surrounding road network included.

10.6.4 Construction Phase Vibration Impacts

Vibration is typically generated by construction activities such as rock breaking, driven piling, blasting, plant items and passing heavy goods vehicles on uneven surfaces.

Vibration energy decreases rapidly with distance from the source due to a number of factors including geometrical spreading and material damping. The prediction of vibration propagation is a complex task and is dependent on many factors, including geological/geotechnical factors, environmental factors, source and receiver/structural factors, among others.

The potential magnitudes of construction vibration impacts associated with the proposed development have been determined through a review of published empirical data for varying construction activities, and calculations undertaken based on this data.

10.6.4.1 *General Construction Works*

There is no rock breaking, driven piling or blasting associated with the proposed development construction. The main potential sources of construction vibration on site include the construction of vibro stone columns and plant items and activities associated general construction works, as outlined in Section 10.6.2, including HGVs and plant items such as excavators, dozers, hammers/breakers and compactors/vibratory rollers.

Indicative vibration calculations for the construction of vibro stone columns on-site have been undertaken at a range of distances, using empirical predictors for ground borne vibration arising from mechanised construction work in accordance with Table E.1 of BS5228-2 (British Standards Institute (2), 2014). At 10 m distance, vibro stone columns are estimated to give rise to a resultant PPV³, in millimetres per second of 3.8 mm/s. At 20 m distance, the estimated level of vibration reduces to 1.4 mm/s and at 100 m distance, the estimated level of vibration reduces to 0.15 mm/s during vibro stone columns.

Vibration associated with the vibratory compaction from rollers associated with the construction works (in PPV) is estimated to be in the order of 6.6 mm/s at 10 m distance, 2.7 mm/s at 20 m distance, and 0.3 mm/s at 100 m distance, in accordance with Table E.1 of BS5228-2⁴ (British Standards Institute (2), 2014).

³ With a probability of predicted value being exceeded of 5%

⁴ Roller with 1mm amplitude of drum, 1 no. vibrating drum and drum width of 2m (steady state). Probability of predicted value being exceeded of 5%.



Construction vibration research undertaken during a study by JF Wiss (Construction Vibrations: State of the Art, 1981) provides a generic model of construction vibrations in PPV as a function of distance. Typical vibration levels are provided for general construction items, as well as heavy works such as pile driving. For the general construction items, including jack hammers, trucks, cranes, small dozers, large dozers and Caisson drilling, the vibration levels at 10 m distance (in PPV) range between approximately 0.07 mm/s (small dozer) to approximately 2 mm/s (Caisson drilling & large dozer). At 20 m distance, the range of vibration levels reduce to 0.02 mm/s (small dozer) to approximately 0.6 mm/s (Caisson drilling & large dozer). At 100 m distance, the vibration levels for all general construction items are below 0.06 mm/s.

There are no vibration sensitive locations within 100m of vibro stone columns works. Vibration associated with this activity will not be perceptible at vibration sensitive locations and cosmetic or structural building damage will not occur from construction incurred vibration associated with this activity. The nearest vibration sensitive receptors to the remaining general construction works with potential to generate vibration are located at approximately 100 m distance from the works. The nearest vibration sensitive receptors are sufficiently distant from the general on-site works and predicted vibration levels are significantly below the building damage thresholds for transient and continuous vibration such that cosmetic or structural building damage will not occur from construction incurred vibration associated with the general construction works. However, vibration may just be perceptible (0.3 mm/s PPV) at the closest vibration sensitive locations during vibratory compaction for short periods, and the resultant effects are expected to be **negative, not significant to slight and short-term**.

10.6.4.2 Gas Connection Works

The main potential sources of vibration associated with the linear gas connection works include HGVs and general construction plant items such as excavators, dozers, hammers/breakers, horizontal directional drills and compactors/vibratory rollers operating during the linear gas connection works activities, as outlined in Section 10.6.2.8.

As detailed in Section 10.6.2.8, there are 115 vibration sensitive locations within 100 m of the linear gas connection works, with no vibration sensitive locations located within 10m of the works, 36 no. within 10-25 m of the route, 49 no. within 25-50 m and 30 no. between 50-100 m.

Considering the range of expected vibration levels associated with general construction plant items discussed in 10.6.4.1 above, the worst-case vibration levels at the closest vibration sensitive locations to the linear gas connection works will be below the criteria for cosmetic or structural building damage to occur from transient and continuous vibration. However, vibration may be perceptible at sensitive locations within 100 m of the works, and at the closest vibration sensitive locations (i.e. within 10-25m), the vibration levels may exceed 1 mm/s PPV for short durations during certain activities, and works associated with the gas connection may therefore give rise to complaints in residential environments, if prior warning and explanation is not given to residents.

The duration of the linear gas connection works will not exceed the DMRB (Highways England, 2020) criteria of 10 or more days or nights in any 15 consecutive days or nights; or a total number of days exceeding 40 in any 6 consecutive months at any vibration sensitive location to constitute a likely significant effect. As detailed in Section 10.6.2.8, the gas pipe will be laid at approximately 100 metres per day and typically the maximum time outside any one property will be 1-2 days, with the effects therefore temporary.

The resultant construction vibration effects during the linear gas connection works are expected to be **negative, slight to moderate and temporary**.



10.6.5 Operational Phase Impacts

A detailed description of proposed operational activities is provided in Chapter 3 - Existing and Proposed Development, of Volume 2 of this EIAR.

The activities and noise sources associated with the operation of the proposed development include:

- deliveries to and collections from the facility (daytime only)
- noise breakout from buildings including Solid Digestate Reception, Liquid Digestate Reception Solid Digestate Storage buildings
- noise from mixers and blowers operating throughout the tank farm
- gas conditioning & upgrading plant
- CO₂ liquefaction plant
- odour abatement system
- electricity substation and transformer
- flares (200 hours per year)

Anaerobic digestion is a continuous process and therefore the digestion and gas upgrade and injection processes will operate 24/7. Feedstock deliveries, the loading/unloading of digestate and exports will only occur from 07:00 to 19:00 hrs Monday to Friday and from 07:00 to 12:00 hrs on Saturday.

Chapter 6 - Traffic and Transportation, of Volume 2 of this EIAR provides details on potential HGV traffic generation. The forecasted daily two-way HGV traffic generation arising from the operational phase of the proposed development is 240 HGV trips⁵. For the purpose of assessing the potential noise impacts, a 'worst-case' value of 240 daily HGV trips has been assumed for the operational phase.

Noise emissions from moving vehicles and mobile and stationary plant items have been predicted according to the International Standard ISO 9313-2:2024 Acoustics -Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors using Softnoise iNoise v2024.3.0 noise modelling software. This noise propagation model allows for octave band calculation of noise from multiple sources, including diffraction and reflection around buildings, terrain and ground effects. This allows all significant noise sources and propagation effects to be accounted for in the model.

The geographical features of the area, including existing buildings, local topography, proposed on-site topography and propagation effects were accounted for in the 3D noise model. This includes proposed site structures and neighbouring dwelling buildings. The ground factor ranges from 0 for hard reflective surfaces to 1 for soft, porous surfaces. Roads and hardstanding's were modelled as hard surfaces. Other surfaces can be described as porous surfaces and would have a ground factor akin to 1. However, a conservative ground factor of 0.75 was used to model the porous surfaces. Atmospheric conditions of 10 °C and 70 % humidity were used as they represent a reasonably low level of air absorption. In absence of representative spectral data, an air absorption rate corresponding to the 250 Hz octave band was used.

⁵ 240 trips is 120 vehicles into facility and 120 vehicles leaving the facility



10 no. NSLs within the study area were modelled, including seven no. residential dwellings, one no. mixed use property and two commercial properties. A receptor height of 4m was modelled for all receptors, in accordance with best practice. There is one other commercial premises within the study area, which is not considered noise sensitive and has been considered as part of the assessment, as detailed in 10.4.6.

Activities in the yard include HGVs and mobile plant entering/leaving the site and manoeuvring around the yard. The modelling assumes that all fixed plant items will operate simultaneously and for 100% of the time. The reality is that many of the noise sources will only operate intermittently. This makes the noise modelling assessment a conservative exercise.

Each of the potential noise sources on the proposed site were identified and reference sound power data. The data has been sourced from manufacturers datasheets, an acoustic test report for a similar AD facility, noise modelling software databases, and British Standard BS 5228-1:2009+A1:2014 (British Standards Institution, 2014). Where significant noise sources are located inside buildings, an estimate has been made for the acoustic performance of the building elements, based on manufacturers datasheets and published data.

Details on the main noise sources and assumptions are presented in Table 10-25 and Table 10-26. The A-weighted octave band sound power level data for each of the main noise sources used in the noise model are presented in Table 10-27 and Table 10-28. The sound insulation performance of building elements is provided in Table 10-29.

A 3D render of the overview of the noise model and site overview is presented in Figure 10-2.

Table 10-25: Details of External Operational Noise Sources

Noise Source	Number	% On-Time	Location	Source of Data
HGV and mobile plant movements associated with the delivery/collection of feedstocks/digestate				
Feedstock/Digestate Vehicle – Travel to and from facility	240 Two-way trips (Daytime only)	N/A	Throughout site	BS 5228-1 C11.12
HGVs – Idling	240	50% daytime only	Weighbridge	BS 5228-1 C4.19
Tank Farm				
Primary Digestate Motor (Including attenuation kit)	6	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Secondary Digestate Motor (Including attenuation kit)	3	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Post Storage Digester Motor (Including attenuation kit)	4	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Tertiary Digester Motor (Including attenuation kit)	4	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report



Noise Source	Number	% On-Time	Location	Source of Data
Pre-Storage Tank Blower Unit	1	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Post Storage Digestate Blower Unit	1	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Digestate Storage Tank Blower Unit	1	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Tertiary Digestate Blower Unit	1	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Technical House Blower Unit	4	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Pasteurisation Tank Motor (Including attenuation kit)	3	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Booster Pumps	1 set of 4 no. pumps	100% daytime, evening and night-time	Tank Farm	Acoustic Test Report
Gas Upgrade Plant & Equipment				
Gas Upgrade Blower Unit	3	100% daytime, evening and night-time	Gas Upgrade	Acoustic Test Report
Gas Upgrade Air Intake	1	100% daytime, evening and night-time	Gas Upgrade	Acoustic Test Report
Cooler Air Intake	1	100% daytime, evening and night-time. 100% daytime, evening and night-time	Gas Upgrade	Acoustic Test Report
Cooling Unit	3	100% daytime, evening and night-time	Gas Upgrade	Acoustic Test Report



Noise Source	Number	% On-Time	Location	Source of Data
CO₂ Liquefaction & Desulphurization Plant & Equipment				
Cooling Unit	2	100% daytime, evening and night-time	CO ₂ Liquefaction	Acoustic Test Report
Mobile Compressor	1	50% daytime, evening and night-time	Desulphurization	Acoustic Test Report
Odour Control				
Odour Control Stack	1	100% daytime, evening and night-time	Yard	Acoustic Test Report
Odour Control Unit	1	100% daytime, evening and night-time	Yard	Manufacturer Data (Centriair ColdOx system)
Heating Centre				
Heating Centre Stack Flue	2	100% daytime, evening and night-time	Heating Centre	Acoustic Test Report
Other				
Buffer Tank Motor (Including attenuation kit)	2	100% daytime, evening and night-time	Yard	Acoustic Test Report
Flare	2	100% daytime, evening and night-time	Gas Upgrade	Acoustic Test Report
Substation Transformer	1	100% daytime, evening and night-time	ESB Substation	Manufacturer Data (Trafostar 63 MVA)



Table 10-26: Details of Internal Operational Noise Sources

Noise Source	Number	% On-Time	Location	Source of Data
Solid Digestate Reception				
Shredder	2	100% daytime, evening and night-time	Within Facility Building	FT In-house database (Waste Shredder)
Biomixer	1	100% daytime, evening and night-time	Within Facility Building	FT In-house database (1000kW Pump)
HGV – Idling	-	50% daytime only	Within Facility Building	BS 5228-1 C4.19
HGV - Tipping	-	50% daytime only	Within Facility Building	BS 5228-1 C2.30
Conveyor	1	100% daytime, evening and night-time	Within Facility Building	BS 5228-1 C10.21
Solid Digestate Storage				
Loading Shovel	1	10% daytime, evening and night-time	Within Facility Building	Manufacturer Data (Case Loader 721 GXR)
Screwpress Separator	4	100% daytime, evening and night-time	Within Facility Building	FT In-house database (750kW Electrical Motor)
Liquid Digestate Reception				
HGV – Idling	-	50% daytime only	Within Facility Building	BS 5228-1 C2.30



Table 10-27: External Operational Noise Sources - Sound Power Level - L_{WA} , dB

Equipment	A-weighted Octave Band Centre Frequency (Hz), dB								Overall L _{WA} (dB)
	63	125	250	500	1k	2k	4k	8k	
HGV and mobile plant movements associated with the delivery/collection of feedstocks/digestate									
Feedstock/Digestate Vehicle– Travel to and from facility*	97.8	91.9	94.4	99.8	102	101.2	96	86.9	107.3
HGV Vehicle / Other Vehicles – Idling	78.8	82.9	84.4	89.8	94	95.2	89	77.9	99.1
Tank Farm									
Tank Motors (Primary, Secondary, Tertiary & Pasteurization) (Including attenuation kit)	65.9	69.8	74.6	75.3	76.6	71.3	70.3	54.2	81.7
Blower Units (Pre-Storage, Post Storage, Digestate Storage, Tertiary, Technical House)	55.9	54.5	64.1	73.6	74.8	67.8	63.6	52.7	78.1
Booster Pumps	72.4	76.1	82.9	88.2	93.1	97.1	91.3	82.6	99.8
Gas Upgrade									
Gas Upgrade Blower Unit	55.9	54.5	64.1	73.6	74.8	67.8	63.6	52.7	78.1
Gas Upgrade Air Intake	64.3	70.9	74.6	79.8	86	88.4	89	85.5	93.8
Cooler Air Intake**	75.1	76.1	78	83.7	86	81.8	76.4	62.8	89.9
Cooling Unit	72.8	77.2	81.6	84.8	88.9	88.2	87.2	81.1	94.2
CO ₂ Liquefaction Desulphurization Plant & Equipment									
Cooling Unit	72.8	77.2	81.6	84.8	88.9	88.2	87.2	81.1	94.2
Mobile Compressor	85.4	87.7	93.7	99.1	98.8	98.3	94.9	88.1	104.7
Odour Control									
Odour Control Stack	79.1	82.2	80.9	81.6	81.1	80.7	76.3	67.1	89.1
Odour Control Unit	69	81	94	93	91	90	86	80	98.8
Heating Centre									
Heating Centre Stack Flue	82.9	82.8	85.9	69	72.6	73.2	68.7	57.3	89.2



Equipment	A-weighted Octave Band Centre Frequency (Hz), dB								Overall L _{WA} (dB)
	63	125	250	500	1k	2k	4k	8k	
Other									
Buffer Tank Motor (Including attenuation kit)	65.9	69.8	74.6	75.3	76.6	71.3	70.3	54.2	81.7
Flare	75.1	76.1	78	83.7	86	81.8	76.4	62.8	89.9
Substation Transformer ¥	87	89	84	84	78	73	68	61	93
* - Drive-by maximum sound pressure level/ sound power level **Flare sound power data assumed ¥ - Manufacturer's datasheet provided information on overall sound power levels. Octave band data was sourced from 'An Introduction to Sound Level Data for Mechanical and Electrical Equipment' CED Engineering									

Table 10-28: Internal Operational Noise Sources - Sound Power Level - L_{WA}, dB

Equipment	A-weighted Octave Band Centre Frequency (Hz), dB								Overall L _{WA} (dB)
	63	125	250	500	1k	2k	4k	8k	
Solid Digestate Reception									
HGV - Idling	78.8	82.9	84.4	89.8	94	95.2	89	77.9	99.1
HGV - Tipping	86.8	85.9	97.4	97.8	101	103.2	96	89.9	107.1
Shredder	79.3	84.3	86.1	87.9	88.2	85.5	79.4	72.1	94
Biomixer	69.8	84.8	90.8	93.8	94.8	91.8	87.8	83.8	99.6
Conveyor	74.8	86.9	92.4	97.8	98.0	97.2	95.0	85.9	103.7
Solid Digestate Storage									
Loading Shovel	84.8	89.9	92.4	98.8	97	95.2	89	79.9	103
Screwpress Separator	55.0	69.0	77.0	84.0	89.0	88.0	84.0	69.0	93
Liquid Digestate Storage									
HGV - Idling	78.8	82.9	84.4	89.8	94	95.2	89	77.9	99.1

A detailed description of the proposed site infrastructure is provided in Chapter 3 - Description the Proposed Development, of Volume 2 of the EIAR. There is potential for noise breakout from facility buildings through the building façade, roof structure and fast acting roller shutter doors.



Noise emissions from the main facility buildings that may give rise to noise breakout (i.e., Solid Digestate Reception, Liquid Digestate Reception & Solid Digestate Storage) has been included as part of the detailed operational noise model. The reverberant noise level from the dominant equipment and plant items operating within these buildings (as detailed in Table 10-26 and Table 10-28 above) was calculated, and the calculation conservatively assumed that the absorption characteristics of the internal surfaces are low. The noise model also considered the façade materials, and appropriate sound reduction data for sound propagating from inside to outside the buildings was used to calculate the breakout noise from the building. The sound insulation performance data for the walls and roofs of the facility buildings is based on the manufacturer product datasheets for Kingspan KS1000 insulated roof and wall panels used in the facility construction. The sound insulation data for the roller shutter doors has been sourced from the Softnoise 'Predictor' noise modelling software database 'SourcedB'.

The noise model prepared for the proposed development has included the opening and closing of roller shutter doors throughout the site during daytime HGV deliveries. As described in Chapter 3 - Description of the Existing and Proposed Development, in Volume 2 of the EIAR, the buildings will be fitted with rapid roller doors to minimise the amount of time doors are open and the solids reception building will operate a bell jar system, which will ensure that at no time are the bunker area doors and reception hall door open at the same time.

Based on the proposed number of daytime HGV deliveries to the site, it has been conservatively assumed in the noise model that the buildings roller doors will be open for 20% of the daytime period and closed for 80% of the daytime period. All roller doors will be kept closed during the evening and night-time periods, with no HGVs entering or departing the buildings during evening and night-time.

The sound insulation properties of building elements used in the noise model is outlined in Table 10-29.

Table 10-29: Sound Insulation Properties of Building Elements

Building element	Source of Data	Sound Reduction Index (SRI) Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Kingspan KS1000 Insulated Wall Panels	Manufacturers data	20	15	17	23	18	25	40	46
Kingspan KS1000 Insulated Roof Panels	Manufacturers data	20	18	20	24	20	29	39	47
Roller shutter doors	Noise modelling software database	6	12	15	17	20	21	21	20

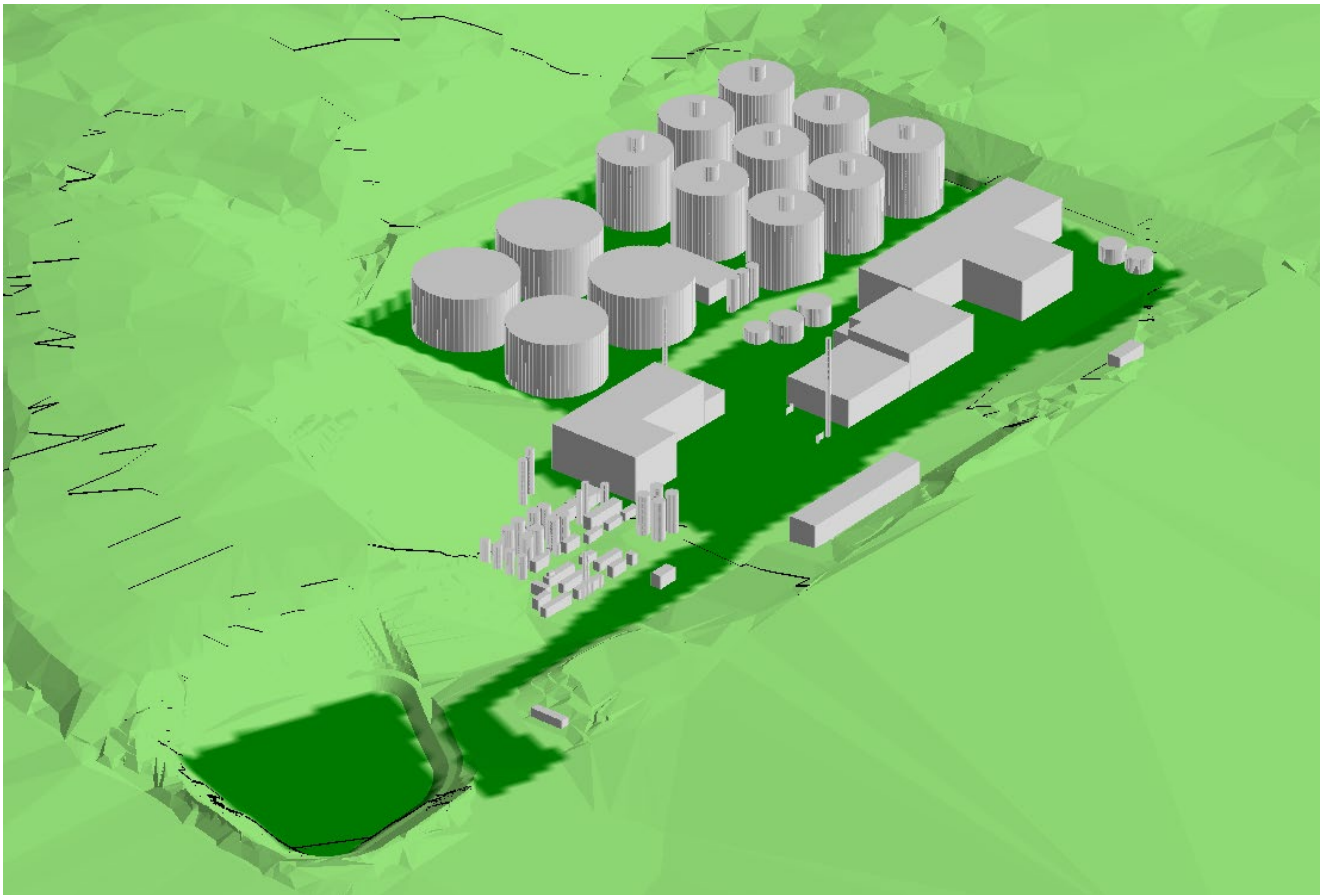


Figure 10-2: 3D Render of Noise Model - Proposed Site Overview

Site operations are to occur during daytime, evening and night-time periods, with noise source assumptions for each period detailed above Table 10-25 and Table 10-26. During all periods conservative assumptions have been applied to ensure the noise modelling is a 'worst-case' exercise.

The principles of Best Available Techniques (BAT) for noise control from site operations will be applied to the site, and the operator will commit to ensuring that no tonal or impulsive noise emissions from site operations are audible at any noise sensitive location. No penalties for acoustic characteristics of the site noise emissions have therefore been included, and the rated noise levels ($L_{A,T}$) are the same as the predicted L_{Aeq} noise levels.

Predicted operational noise levels were calculated at 10 noise sensitive locations and assessed against operational noise criteria described in Section 10.4.6.3.

The predicted operational noise levels at the closest residential NSLs are presented in Table 10-30 and discussed below. Noise model contours are included in Appendix 10.3 in Volume 3 of this EIAR.



Table 10-30: Predicted Operational Noise Levels at Residential NSLs

Receptor ID	Predicted Noise Levels, dB ($L_{Aeq,30min}$)					
	Daytime (07:00 to 19:00)	Daytime Limit	Evening (19:00 to 23:00)	Evening Limit	Night-time (23:00 to 07:00)	Night-time Limit
R1	36	55	31	50	31	45
R2	35	55	33	50	33	45
R3*	37	45	32	40	32	35
R4	49	55	43	50	43	45
R5	41	55	36	50	36	45
R7	46	55	41	50	41	45
R8	46	55	40	50	40	45
R10	47	55	41	50	41	45

*Area of low background noise limits observed at R3

The highest predicted noise level during daytime at residential NSLs was found to be 49 dB L_{Aeq} at R4. The predicted daytime noise levels are below the daytime noise limit of 55 dB $L_{Ar,T}$ defined in EPA NG4 at all NSLs identified as 'other areas' and 45 dB $L_{Ar,T}$ at NSLs identified as within an 'area of low background noise'.

The highest predicted noise level during evening at residential NSLs was found to be 43 dB L_{Aeq} at R4. The predicted evening noise levels are below the evening noise limit of 50 dB $L_{Ar,T}$ defined in EPA NG4 at all NSLs identified as 'other areas' and 40 dB $L_{Ar,T}$ at NSLs identified as within an 'area of low background noise'.

The highest predicted noise level during night-time at residential NSLs was found to be 43 dB L_{Aeq} at R4. The predicted night-time noise levels are below the night-time noise limit of 45 dB $L_{Aeq,T}$ defined in EPA NG4 at all NSLs identified as 'other areas' and 35 dB $L_{Aeq,T}$ at NSLs identified as within an 'area of low background noise'.

The predicted operational noise levels at the closest commercial offices are presented in Table 10-31 and discussed below.

Table 10-31: Predicted Operational Noise Levels at Commercial Offices

Receptor ID	Predicted Noise Levels, dB (L_{Aeq})	
	Daytime (07:00 to 19:00)	Daytime Limit
R9	50	55
R11	42	55

The predicted noise level during daytime (07:00hrs to 19:00hrs) at the closest commercial offices (R9) was found to be 50 dB L_{Aeq} . The predicted daytime noise levels are below the BS 8233 (British Standards Institution, 2014) daytime noise criteria of 55 dB L_{Aeq} at all commercial offices.



10.6.5.1 Operational Phase Impacts Summary

The predicted noise levels from site noise emissions are below the applicable noise criteria at the closest NSLs. The predicted noise levels are also below the daytime, evening and night time ambient noise levels measured at the five noise monitoring locations during the baseline noise survey (i.e., there is no increase in ambient noise levels predicted). Therefore, it is likely that existing road traffic noise will mask the noise from the proposed development. However, the proposed development will introduce a new noise source in the soundscape which may be audible and give rise to increased ambient noise levels at certain locations during certain conditions (e.g. at locations close to the site during periods of low traffic and during night-time).

The operational phase of the proposed development is therefore expected to have an **imperceptible to slight, negative** effect, which will be **long-term** in duration.

10.6.6 Operational Phase Traffic Impacts

During the operational phase, traffic associated with the proposed development would consist of a mix of staff vehicles, LGVs and HGVs travelling to and from the site.

In order to increase traffic noise levels by 1dB, total traffic volumes would need to increase by the order of 25%. The maximum total percentage increases in road traffic on the surrounding road network during operations are detailed in Chapter 6 - Traffic and Transport, in Volume 2 of the EIAR.

For the purpose of assessing potential noise impact of existing roads, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing road links surrounding the proposed development site both with, and without the development, using the Annual Average Daily Traffic (AADT) data.

Only one road link (Link 8) (L3045) is projected to experience an increase in total traffic volumes (AADT) of 25% or greater in the Opening Year +15 (2044) with development, when compared to the Opening Year without the development, with a projected increase in road traffic of 62%. The predicted change in noise levels due to the increase in road traffic has been calculated for this road link below.

Table 10-32: Predicted Change in Noise Level Associated with Operational Traffic

Road Link	2029 'Do Nothing' Baseline		2044 with Development		Predicted Noise Level Change (dB, L _{A10})	Classification of Effects*
	Total AADT	% HGV	Total AADT	% HGV		
L3045 Link 8	585	17.5	950	40.2	+4.3	Moderate

*Classification of effects as described in Table 10-9

In terms of the additional traffic on local roads that will be generated as a result of the operational phase of the proposed development, it is considered that additional traffic introduced onto the local road network due to this development will result in a worst-case increase in traffic noise of 4.3 dB at road link 8 L3045. The resultant effect is expected to be **negative, moderate** and **long-term**. The AADT increases at all remaining road links are lower (and significantly below 25%), with the effects on all remaining road links expected to be **neutral, imperceptible** and **long-term**. It is noted that the traffic figures consider a cumulative scenario, with projected road traffic figures on the surrounding road network included.



10.6.7 Major Accidents and Natural Disasters

The proposed development has been examined with respect to potential noise impact from major accidents and natural disasters. This relates to:

- Flooding
- Fire
- Explosions
- Major incidents involving dangerous substances
- Catastrophic events

Should a major accident or natural disaster occur, it is considered that the potential noise impact associated with the proposed development would be limited to short duration noise events such as explosions, alarms and sirens from emergency vehicles. The proposed development will be constructed using Best Available Techniques (BAT) and will be subject to ongoing monitoring and the conditions of an EPA IE Licence for the site. No significant potential noise impacts from major accidents and natural disasters are considered likely.

10.6.8 Decommissioning Phase Impacts

Decommissioning activities will be undertaken during daytime hours, and noise and vibration, which will be of a lesser effect and duration than for construction, will be controlled through the relevant best practice guidance and standards discussed in this chapter and those in place at the time of decommissioning.

A Closure Plan for the facility will be developed and agreed with the EPA under the Industrial Emissions Licence for the facility prior to decommissioning. This Closure Plan will be designed to ensure prevention and minimisation of emissions associated with decommissioning activities, including noise emissions.

Similar to the predicted effects of general construction works, it is expected that the noise and vibration limits will be met and effects during decommissioning will be slight, negative and temporary in duration.

10.7 Cumulative Impacts

10.7.1 Construction Phase

In terms of assessing the potential for cumulative effects in this EIAR, a review of other projects and existing development was carried out. Existing development, proposed projects and principal plans that have the potential to have a cumulative impact in-combination with the proposed development during the construction phase have been identified and are listed in Chapter 1: Introduction of Volume 2 of the EIAR have been assessed.

These developments have been considered within this assessment, and it is not expected that there will be cumulative construction noise impacts with any other small, medium or large-scale developments in the vicinity of the proposed development, given the predicted noise emissions associated with the proposed development construction, and distance between the proposed development and other developments. The AADT traffic data used in the assessment has considered existing local traffic figures (which includes existing road traffic and projected growth), in addition to the traffic associated with the proposed development construction. Therefore, cumulative construction traffic noise emissions have been included in this assessment.



10.7.2 Operational Phase

The potential for cumulative noise and vibration impacts during the operational phase between the proposed development and other existing development, proposed projects and principal plans listed in Chapter 1: Introduction of Volume 2 of the EIAR have been assessed.

The proposed development will have potential to contribute to cumulative operational noise emissions at noise sensitive locations, primarily through increased road traffic on the surrounding road network during operations. The AADT traffic data used in the assessment has considered existing local traffic figures (which includes existing road traffic and projected growth), in addition to the traffic associated with the proposed development operations. Therefore, cumulative traffic noise emissions with other developments have been included in this assessment.

The site is adjacent to the closed Powerstown Landfill and existing recycling centre. Recent noise monitoring reports for the landfill and recycling centre have been reviewed⁶. There are no significant existing noise sources associated with the closed landfill. The main noise source associated with the recycling centre activities is road traffic, which has been considered cumulatively in the assessment of operational road traffic. There are no other significant operational noise sources noted, which could give rise to significant cumulative operational noise impacts at nearby noise sensitive locations.

Noise from the quarry located south of site has also been considered during daytime quarry operations. Cumulative traffic noise emissions with quarry operations have been considered as part of the operational road traffic assessment. Regarding operational noise, the main quarry area is located approximately 300m from the proposed development site boundary. For quarries, a noise limit of 55 dB L_{Aeq} will typically apply in the daytime during quarry operations. Given the highest predicted noise level from the proposed development is 49 dB, and considering the quarry noise limit, distance to quarry operations, intervening screening and local soundscape dominated by road traffic, it is not likely that noise from the proposed development will contribute to noise from the quarry and no significant cumulative noise impacts are considered likely along with quarry operations.

It is not expected that there will be cumulative operational noise and vibration impacts with any other existing or proposed developments in the vicinity of the proposed development site, given the nature of the proposed development operations, and the distance between the proposed development and other developments and sensitive receptors.

10.7.3 Decommissioning Phase

No potential cumulative impacts have been identified in respect of noise associated with the decommissioning of the proposed development.

10.8 Interactions

An assessment of the interactions that noise and vibration have with other environmental topics is presented in Chapter 17 - Inter-relationships and Interactions, in Volume 2 of this EIAR.

⁶ IED Licence Ref W0025-04. Fehily Timoney & Company Noise Monitoring Reports 2022-2024



10.9 Summary of Potential Impacts

Table 10-33: Summary of Potential Impacts

Activity/Source of Impact	Potential Impact	Description of Effects.
Construction Noise - general works	Noise from construction activities	Negative, slight and short-term.
Construction Noise - gas connection works	Noise from construction activities	Negative, slight to significant and temporary.
Construction Noise - additional road traffic	Noise from additional construction traffic on local roads	Negative, not significant and short-term.
Construction Vibration - general works	Vibration from construction activities	Negative, not significant to slight and short-term.
Construction Vibration - gas connection works	Vibration from construction activities	Negative, slight to moderate and temporary.
Operational Noise - general	Noise from operational activities	Negative, imperceptible to slight and long-term.
Operational Noise - additional road traffic	Noise from additional operational traffic on local roads	Negative, moderate and long-term.
Decommissioning Noise and Vibration	Noise and vibration from decommissioning activities	Negative, slight and temporary.

10.10 Mitigation Measures

10.10.1 Mitigation by Avoidance and Design

Embedded noise mitigation measures have been incorporated into the proposed development design. The site layout and orientation ensure that noise from external sources such as HGVs and plant will be screened from the closest receptors to the south and maximum distance between noise sources and receptors is achieved. The facility will be constructed using Kingspan Quadcore insulated wall and roof panels (or equivalent), which provide a high degree of sound insulation performance and will allow for reduced noise breakout from the facility operations. The facility will also utilise fast acting roller shutter doors, which will ensure that doors will not be left open during operations. HGVs on site will use auto idle shut off technology to avoid engines idling for long periods.

10.10.2 Construction Phase Mitigation

The predicted noise levels from on-site activity from the general construction works associated with the proposed project are below the project noise criteria, while the predicted construction vibration levels are below the criteria for cosmetic or structural damage, and are not expected to result in significant negative effects. Nonetheless, several mitigation measures will be employed as good practice, to minimise any potential construction noise and vibration impacts from the proposed project.



The noise and vibration impacts for construction works traffic will be mitigated by restricting movements along access routes to the standard working hours, unless specifically agreed otherwise. Consultation with the local community is important in minimising noise and vibration impacts, and therefore any out of hours working would be agreed in advance with the planning authority. In addition, residents will be informed of construction activities through the Community Liaison Officer.

The general construction works on site will be carried out in accordance with the guidance set out in BS 5228-1:2009+A1:2014 (British Standards Institution, 2014) and BS 5228-2:2009+A1:2014 (British Standards Institute (2), 2014), and the noise and vibration control measures set out in Appendix 3.1 Construction Environmental Management Plan, in Volume 3 of this EIAR. The following good practice measures will be implemented.

- Proper maintenance of plant will be employed to minimise the noise produced by any site operations. All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the project, with particular attention paid to the lubrication of bearings
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise-sensitive locations.
- A speed limit of 15km/h will be enforced on-site.
- Drop heights for construction equipment/materials will be minimised.
- Training will be provided by the Site Manager to workers and drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall be restricted to between 07:00hrs and 18:00hrs, Monday to Friday, and 08:00hrs to 14:00hrs on Saturdays. No construction work is permitted on Sundays or bank holidays. If it is necessary to work outside these hours, any such out of hours working would be agreed in advance with the planning authority and in consultation with the local community.
- Construction contractors will be required to comply with the requirements of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1988 as amended in 1990 and 1996 (S.I. No. 320 of 1988, S.I. No. 297 of 1990 and S.I. No. 359 of 1996), and the Safety, Health and Welfare at Work (Control of Noise at Work) Regulations, 2006 (S.I. No. 371 of 2006).

There is potential for temporary elevated noise levels due to the gas connection works that has the potential to exceed the noise criteria at up to 85 no. properties within 50 m of the works. However, the impact of these works at any particular receptor will be for a short duration (i.e. 1-2 days) and mitigation measures will be implemented. Where the works may result in noise levels above the 65 dB $L_{Aeq,1hr}$ noise criteria at receptors within 50m of the route, a temporary noise barrier, screen or enclosure will be used to reduce noise levels below the noise limit, as required.

A noise barrier may provide approximately 5 dB attenuation where the line of sight between the source and receiver is partially obscured and by 10 dB where the line of site is fully obscured. Noise barriers that fully block the line of sight between the source and receiver will be used at properties within 50m during the gas connection works and will result in noise attenuation of approximately 10 dB. Noise barriers will have a minimum mass per unit surface area of greater than 7kg/m², with no gaps at the joints.



There is potential that vibration may be perceptible at the closest sensitive receptors to the linear gas connection works for short periods during the works, and may give rise to complaints in residential environments, if prior warning and explanation is not given to residents.

Residents will be informed by the Community Liaison Officer of any construction activities that may give rise to perceptible vibration in advance of the works.

Noise and vibration monitoring will also be undertaken during the construction works. A noise and vibration monitoring programme will be agreed with the Planning Authority prior to the commencement of construction works and will include agreed monitoring locations and durations, a complaint handling procedure, and set noise and vibration limits for the duration of the works.

10.10.3 Operational Phase Mitigation

The noise modelling results for the daytime, evening and night-time scenarios demonstrate that the predicted noise levels are below the noise limits at all noise sensitive locations. No significant noise impacts are anticipated during the operational phase of the proposed development and as such, no mitigation measures are deemed necessary. However, best practicable means to minimise operational noise will be employed by the operator and will include:

- Purchasing low noise generating equipment free from significant acoustic features, such as tonal/intermittent/impulsive sound characteristics.
- Roller doors will be closed during operation of internal equipment.
- Equipment will be properly maintained and inspected regularly.
- Roads and surfaces will be maintained in good repair.
- A speed limit of 15km/h will be enforced on-site.
- The unnecessary revving of engines shall be avoided, and equipment shall be switched off when not in use.
- Regular training for site personnel and drivers on best practice noise control measures.
- The operator will apply the principles of Best Available Techniques (BAT) to noise control from site operations and will commit to ensuring that no tonal or impulsive noise emissions from site operations are audible at any noise sensitive location.
- Routine noise monitoring and assessment will be undertaken during the operational phase, including an assessment of acoustic characteristics (e.g. tonal/impulsive components), in accordance with the requirements of the EPA IE Licence for the site.

10.10.4 Decommissioning Phase Mitigation

No significant noise and vibration impacts are anticipated during the decommissioning phase of the proposed development and as such, no mitigation measures are required. As good practice, the noise control measures outlined in the Appendix 3.1 Construction Environmental Management Plan, in Volume 3 of this EIAR, and in Section 10.10.2 will be implemented, in addition to any measures in best practice guidance available at the time of decommissioning.



10.11 Residual Impacts

10.11.1 Construction Phase

No significant residual impacts will arise as a result of the construction works associated with the proposed development.

The general construction works are expected to give rise to effects which will be **negative, slight, and short-term** in duration.

The effects during gas connection works are predicted to be **negative, slight to moderate and temporary** in duration, post-mitigation.

Effects from the increase in road traffic associated with the construction phase of the proposed development is expected to be **negative, not significant and short-term**.

10.11.2 Operational Phase

No significant residual impacts will arise as a result of the operational phase of the proposed development. The predicted operational phase noise emissions are below the best practice noise limit values at all noise sensitive locations. The operational noise levels are also predicted to be below the measured ambient noise levels at nearby noise sensitive locations. Noise emissions from site during the operational phase of the proposed development are expected to give rise to **negative, imperceptible to slight and long-term** effects.

The effects associated with the increase in road traffic on the surrounding road network are expected to be **negative, moderate and long-term**.

10.11.3 Decommissioning Phase

No significant residual impacts will arise as a result of the decommissioning phase of the proposed development. The effects of decommissioning are predicted to be **negative, slight and temporary** in duration.

10.11.4 Summary of Residual Impacts

Table 10-34: Summary of Residual Impacts

Activity/Source of Impact	Potential Impact	Description of Effects (Pre Mitigation)	Description of Effects (Post Mitigation)
Construction Noise- general works	Noise from construction activities	Negative, slight and short-term	Negative, slight and short-term
Construction Noise - gas connection works	Noise from construction activities	Negative, slight to significant and temporary	Negative, slight to moderate and temporary
Construction Noise - additional road traffic	Noise from additional construction traffic on local roads	Negative, not significant and short-term	Negative, not significant and short-term



Activity/Source of Impact	Potential Impact	Description of Effects (Pre Mitigation)	Description of Effects (Post Mitigation)
Construction Vibration - general works	Vibration from construction activities	Negative, not significant to slight and short-term	Negative, not significant to slight and short-term
Construction Vibration - gas connection works	Vibration from construction activities	Negative, slight to moderate and temporary	Negative, slight to moderate and temporary
Operational Noise - general	Noise from operational activities	Negative, imperceptible to slight and long-term	Negative, imperceptible to slight and long-term
Operational Noise - additional road traffic	Noise from additional operational traffic on local roads	Negative, moderate and long-term	Negative, moderate and long-term
Decommissioning Noise and Vibration	Noise and vibration from decommissioning activities	Negative, slight and temporary	Negative, slight and temporary



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