



Avonmouth Noise Impact Assessment

Environmental Permit Application

Avonmouth Data Centre Limited

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Basis of Report

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by Avonmouth Data Centre Limited to undertake a noise impact assessment (NIA), to support an Environmental Permit (EP) application for the proposed data centre development.

The development is located at Severn Road, Pilning, Bristol, United Kingdom, BS11 0YU (the 'site'), and was previously used as a plastics recycling facility. The Site will be redeveloped for use as a data centre and will include the installation of external plant and structures.

1.1 Standby Generators

Electricity for operation of the data centre will be provided from a number of sources:

- Connection to the local electricity transmission network;
- Via direct wire from the adjacent Viridor operated energy from waste (EfW) facility.
- From on-site solid oxide fuel cells (SOFC), if required.

However, given the nature of data centres and their requirement to have an available energy supply at all times, the site also incorporates 32 emergency standby generators (SBGs), designated for use as emergency backup.

The SBGs will provide power to the data centre in the event of an emergency situation such as a brown-out or black-out of the local electricity transmission network where there are fluctuations or loss of the electrical power provided by the network. During such an event, there is the potential for a delay between fault detection and initial operation of the SBGs; on-site battery arrays will provide a temporary uninterruptible power supply in order to cover such delays and the potential for a loss/reduction in the power supply to on-site equipment.

The SBGs, in accordance with the manufacturer requirements, will be subject to planned maintenance and testing. There are currently no agreements in place for the elective generation of electricity for commercial export to the electricity grid.

1.2 Noise Assessment

As part of the EP application, this NIA considers the noise impact and has been undertaken in accordance with the relevant Environment Agency (EA) technical guidance, and considers the potential impact at noise sensitive receptors (NSRs) surrounding the Site.

This includes *Noise and vibration: environmental permit application guidance* (December 2025), which clarifies that the EA only regulates emissions from back-up generators, along with plant associated with their operation. As such, noise from the data centre itself does not fall under the scope of EA regulation, and is therefore not assessed as part of this EP application.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in **Appendix A**.



2.0 Methodology

This section summarises the assessment standard used in the Noise Impact Assessment (NIA) which follows the methods set out in the relevant Environment Agency (EA) guidance documents, alongside the technical methodologies set out in the relevant British Standard (BS) and ISO documents.

The following documents have been used to inform the assessment:

- Noise and Vibration Management: environmental permits (NVM).
- BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound (BS 4142)
- Noise and Vibration: Environmental Permit Application Guidance.
- Method Implementation Document (MID) for BS 4142.
- ISO 9613-2:2024 – Attenuation of sound during propagation outdoors.

2.1 Noise and Vibration Management: environmental permits (NVM)

The EA published *Noise and vibration management: environmental permits (NVM)* guidance in January 2022 to help holders and potential holders of permits apply for, vary, and comply with their permits.

The NVM details when a noise assessment is required, the competency required to undertake an assessment and how to carry out a noise impact assessment, and references BS 4142 as the appropriate assessment methodology. It sets out how the EA assess noise from certain industrial processes, and provides advice on how to manage noise with the use of Best Available Techniques (BAT) or appropriate measures, in order to prevent significant pollution, or where that is not practicable, to minimise noise impact.

The NVM also outlines how context should be taken into account in the assessment and notes that *“Whilst context allows you to interpret impact thresholds (to a degree), there are practical limits to the extent of the interpretation. It is unlikely you could adjust the assessment outcome beyond the next band (for example, modifying a BS 4142 outcome of more than 10dB to be less than an ‘adverse impact’).”*

Different elements of the context of a situation may sway the assessment outcome in different directions, so all elements should be considered together. Context should consider:

- Weekdays rather than weekends.
- What the sound ‘means’ – meaningful sound is one that conveys an unpleasant meaning beyond its mere acoustic content, for example noise from an abattoir.
- Time of day.
- The absolute sound level.
- Where the sound occurs.
- New industry or new residences.
- Intrinsic links between the source and receptor, for example the source is the resident’s place of work.
- Local attitudes.
- The residual acoustic environment.
- The exceedance (traditional BS 4142).
- Whatever else might be particular to that individual situation.



Based on the results of the BS 4142 assessment the NVM has three distinct requirements as detailed in Table 1.

Table 1: NVM Assessment

NVM Result	BS4142 Descriptor	Next Stage
Unacceptable level of audible or detectable noise	The closest corresponding BS 4142 descriptor is 'significant adverse impact'	You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level.
Audible or detectable noise	The closest corresponding BS 4142 descriptor is 'adverse impact'	Your duty is to use appropriate measures to prevent or, where that is not practicable, minimise noise. You are not in breach if you are using appropriate measures. But you will need to rigorously demonstrate that you are using appropriate measures.
No noise, or barely audible or detectable noise	The closest corresponding BS 4142 descriptor is 'low impact or no impact'	Low impact does not mean there is no pollution. However, if you have correctly assessed it as low impact under BS 4142, the environment agencies may decide that taking action to minimise noise is a low priority.

2.2 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142)

The assessment of impact contained in British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142), is undertaken by comparing the sound rating level, i.e. the specific level of the source plus any acoustic feature corrections, to the measured representative background sound level outside the sensitive receptor location.

In accordance with BS 4142, the significance of an industrial or commercial sound source depends on both the margin by which the rating level exceeds the background sound level and the context in which the sound occurs.

BS 4142 (Section 3) provides the following definitions:

- **Ambient Sound:** Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. *NOTE: The ambient sound comprises the residual sound and the specific sound when present.*
- **Ambient Sound Level, $L_{Aeq,T}$:** Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. *NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.*
- **Background Sound Level, $L_{A90,T}$:** A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given interval, T, measured using time weighting F and quoted to the nearest whole number of decibels (dB).



- **Rating Level, $L_{AR,T}$:** Specific sound level plus any adjustment for the characteristic features of the sound.
- **Residual Sound:** Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- **Residual Sound Level, $L_r = L_{Aeq,T}$:** Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
- **Specific Sound Level, $L_s = L_{Aeq,T}$:** Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T.
- **Specific Sound Source:** Sound source being assessed.
- **Sound and Noise:** Careful distinction is made in BS 4142 between the terms “sound” and “noise”. Sound refers to a physical phenomenon that can be quantified using a sound level meter or other measurement system. In contrast, noise implies a human response—typically referring to sound that is perceived as intrusive, undesirable, or disruptive.

To account for the acoustic character of sound sources, BS 4142 states that character corrections should be applied with respect to “*the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention*”.

In this respect, the acoustic ‘character’ of a specific sound can be described using the following definitions from BS 4142:

- **Tonality** – “*For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible*”.
- **Impulsivity** – “*A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible*”.
- **Intermittency** – “*When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied*”.
- **Other Sound Characteristics** – “*Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.*”

The specific noise level along with any applicable correction is referred to as the ‘rating level’. The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:

- A difference of around +10 dB or more is likely to be an indication of a **significant adverse impact**, depending on the context.
- A difference of around +5 dB is likely to be an indication of an **adverse impact**, depending on the context.



- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a **low impact**, depending on the context.

Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood.

It is therefore essential to place the sound in context, as an “effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs”.

2.3 Method Implementation Document (MID) BS 4142

In addition to NVM, the EA has also published a Method Implementation Document (MID) for BS4142. It notes that national standards sometimes need supporting ‘Method implementation documents’ (MIDs) to make sure they are followed consistently, and the MID explains how to use the standard for regulatory monitoring when applying for a permit.

With regard to BS 4142 it provides extra guidance on how it must be followed for environmental permit applications and variations.

2.4 Noise and vibration: environmental permit application guidance

In addition to NVM and MID, the EA published Noise and vibration: environmental permit application guidance in December 2025. This document sets out the information that applicants must provide when applying for, varying, or complying with an environmental permit where noise and vibration emissions are relevant.

Additionally, the guidance clarifies the scope of EA regulatory control in relation to data centres. Specifically, it states that the EA regulate emissions arising from backup energy generators and associated infrastructure only, rather than from the normal operation of the data centre itself.

This distinction has been used when defining the extent of the assessment, ensuring that it addresses only those sources that fall within the scope of EA regulation.

2.5 ISO 9613-2:2024

The levels of sound generated by the operation of the plant has been predicted using the modelling software CadnaA, undertaken in accordance with the prediction framework within ISO 9613-2:2024 Acoustics – Attenuation of Sound during Propagation Outdoors– Part 2: General Method of Calculation (ISO 9613-2).

This method of calculation takes into account the distance between the sound sources and the closest receptors, and the amount of attenuation due to atmospheric absorption. The methodology also assumes downwind propagation, i.e. a wind direction that assists the propagation of sound from the source to the receiver.



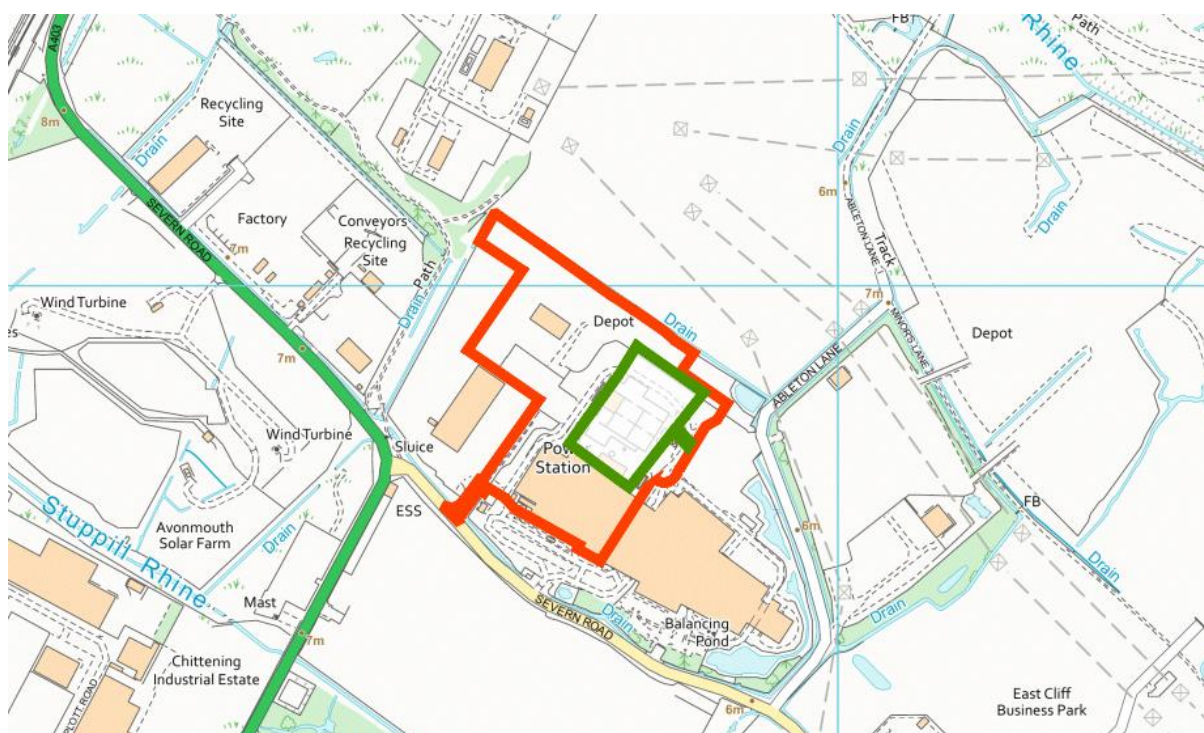
3.0 Site and Receptors

3.1 The Site

The development is located off Severn Road, Avonmouth, at the former Polymers Recycling Facility. To the east, the Site is bordered by the Viridor Energy Recycling Facility, which operates as an energy from waste plant, and forms the dominant industrial use within the local area.

The Site, and wider area, forms part of the Avonmouth and Severnside Enterprise Area, which is characterised by large-scale industrial, distribution, energy, and recycling related operations. The M49 motorway is located approximately 1.1 km to the east of the Site, and the closest residential dwellings lie further east at over 1.5 km from the Site, with the M5 motorway situated beyond. Figure 1 below shows the boundary of the Site (red) and the EP boundary (green).

Figure 1: Site Location Plan (excerpt from Drawing 001)



3.2 The Development

The development comprises conversion of the former plastic recycling facility for use as a data centre, with the data hall accommodated within the retained building. In addition, a range of mechanical and electrical plant will be installed within the external area to the north of the building.

Adjacent to the data centre building will be a new three storey plant gantry structure which will house the SBGs, modular electrical switch rooms and cooling plant. The SBGs will be containerised and will sit at ground level of the gantry within the yard area. Electrical plant will sit on the first-floor gantry and cooling equipment on the second floor.

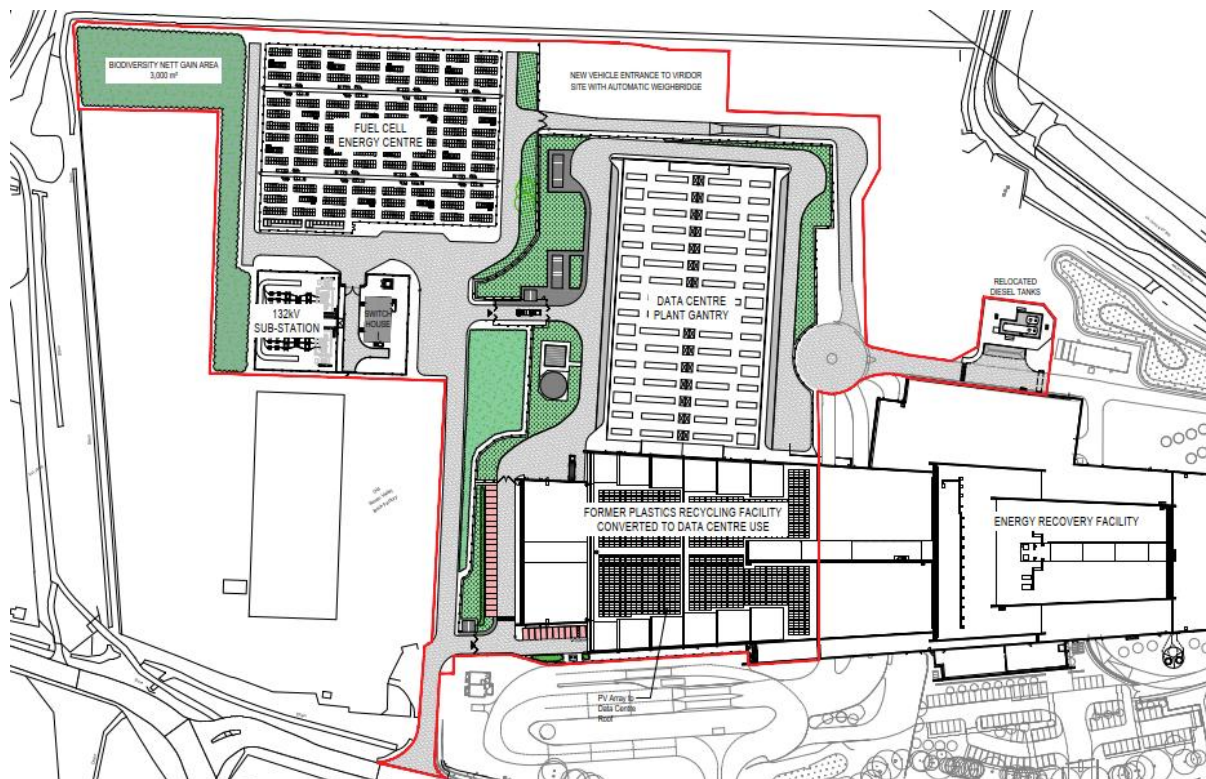
Each SBG will have a single flue for the discharge of combustion emissions; these flues will extend beyond the generator containers and run vertically up through the middle of the gantry building, terminating through the gantry roof above roof height.



In addition to the plant gantry, the overall development includes an energy centre, which includes solid oxide fuel cells and a 132kV substation, however these are outside of the EP boundary.

A copy of the overall site plan is shown in Figure 2, and a full description of the site and operating techniques is detailed within the Best Available Techniques and Operating Techniques (BATOT) report submitted with the EP application.

Figure 2: Full Site Layout Plan



3.3 Receptors

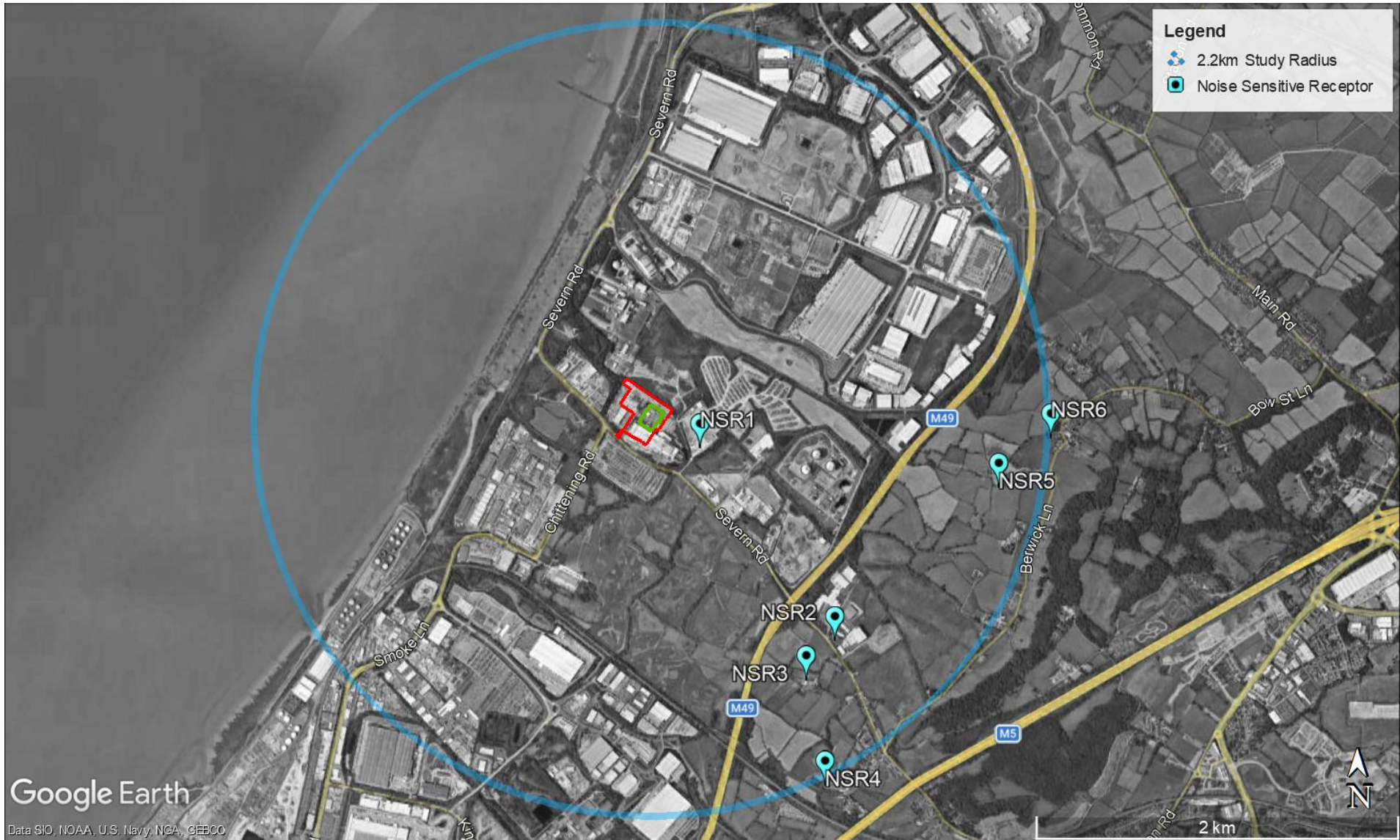
The noise sensitive receptors (NSRs) which have been considered as part of the assessments, and which are considered most likely to be affected by operations, are detailed in Table 2. The location of the NSRs are identified in Figure 3, which also shows a 2.2 km study radius around the Site, based on the distance to the furthest identified NSR.

Table 2: Noise Sensitive Receptors

Receptor	Location	Approx. Distance to Site Boundary	Co-ordinates	
			x	y
NSR1	Offices of Copart Bristol, Ableton Lane	250 m	354089	181757
NSR2	Residential dwellings on Severn Road	1.5 km	354770	180634
NSR3	Residential dwellings at Hallen Farm	1.6 km	354651	180401
NSR4	Residential dwellings on Hi-Ways Park	2.2 km	354769	179871
NSR5	Residential dwellings on Elmington Manor Farm	1.8 km	355662	181501
NSR6	Residential dwellings on Berwick Close	2.2 km	355988	181733



Figure 3: Site and NSR Location Plan



4.0 Noise Survey

As part of the planning application for the change of use at the Site, a NIA was prepared by Himly (the 'Himly' report), dated March 2026 (Ref: U1289-HIM-XX-RP-EN-0001), a copy of which is included within **Appendix B**.

The NIA included a noise survey, undertaken between 14th January 2026 and 29th January 2026, to determine the existing ambient and background sound levels at the NSRs.

The measurements were carried out following guidance from BS 4142 and BS 7445-1:2003 "Description and measurement of environmental noise Part 1: Guide to quantities and procedures". The Himly report provides relevant details of the equipment used during the survey, which conforms to BS EN 61672-1:2013 Class 1 accuracy, and was field calibrated before and after use, and no significant drift was observed between calibrations.

4.1 Monitoring Locations

A noise survey was undertaken at a total of four locations, which included long-term unattended measurements at a single location (LT1), and short-term attended measurements at three locations (ST1 to ST3). The monitoring locations are detailed are shown on Figure 4, and detailed within Table 3.

Figure 4: Monitoring Location Plan

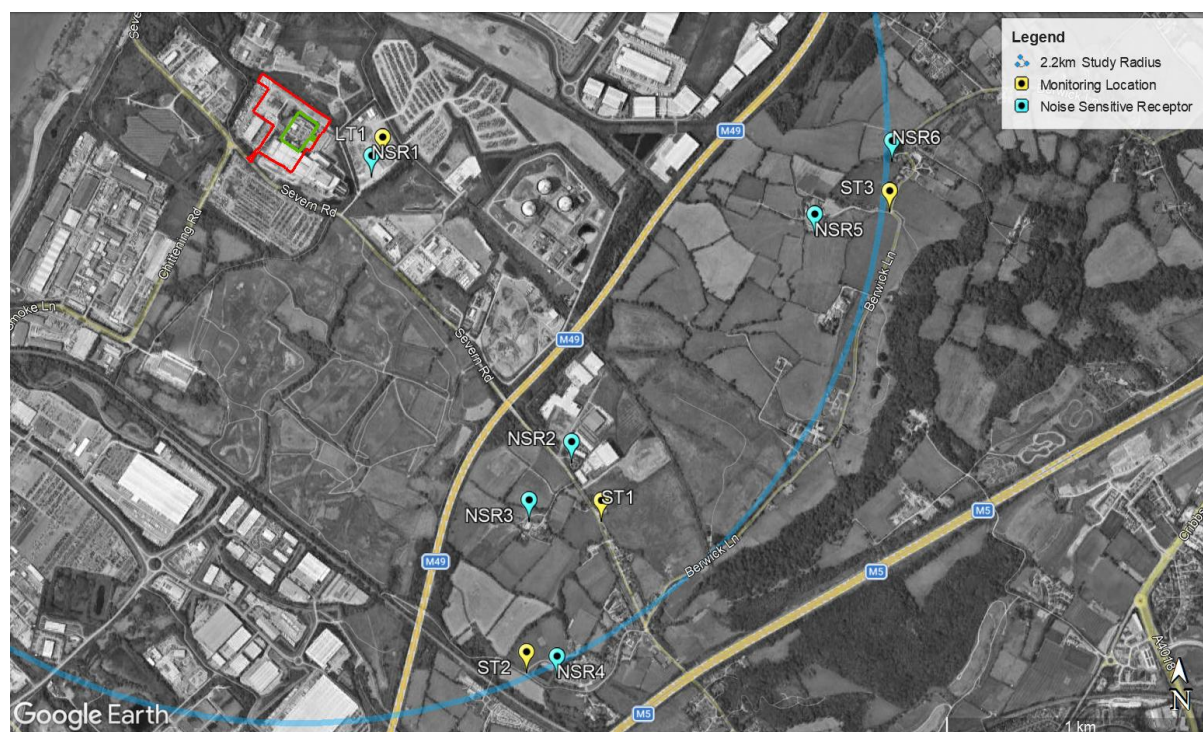


Table 3: Monitoring Locations

Location	Coordinates		Description
	(Easting)	(Northing)	
LT1	354084	181757	<p>Located next to the Copart Bristol office, approximately 300 m south east of the Site. The microphone was mounted on the perimeter security fence, in free field conditions at an approximate height of 2.7 m. This location is considered representative of the closest non-residential receptor to the Site, NSR1.</p> <p>The Copart office has a direct line of sight towards the Site, where the acoustic environment influenced by surrounding industrial activity, and intermittent vehicle movements within the Copart yard, together with distant road traffic associated with the surrounding road network.</p>
ST1	354894	180399	<p>Located on Severn Road at Hallen, and selected representative of the closest residential receptors to the Site, NSR2 and NSR3. Measurements at this location comprised an attended short-term monitoring at a location off Severn Road. The microphone was mounted on a tripod in free field conditions at an approximate height of 1.8 m, set back from the carriageway on the grass verge.</p> <p>The acoustic environment influenced by intermittent local road traffic on Severn Road, along with distant motorway traffic which formed a constant background noise during the daytime and night-time.</p>
ST2	354611	179837	<p>Located on Moorhouse Lane at Hallen, and selected to be representative of residential receptors at NSR4.</p> <p>Measurements at this location comprised an attended short-term monitoring at a location off Moorhouse Lane. The microphone was mounted on a tripod in free field conditions at an approximate height of 1.8 m, set back from the carriageway on the grass verge and close to the nearby junction.</p> <p>The acoustic environment influenced by intermittent local road traffic on Moorhouse Lane, along with distant motorway traffic which formed a constant background noise during the daytime and night-time.</p>
ST3	355978	181546	<p>Located on Berwick Lane, and selected to be representative of residential receptors at NSR5 and NSR6.</p> <p>Measurements at this location comprised an attended short-term monitoring at a location off Berwick Lane. The microphone was mounted on a tripod in free field conditions at an approximate height of 1.8 m, set back from the carriageway on the grass verge.</p> <p>The acoustic environment influenced by intermittent local road traffic on Berwick Lane and other local roads, along with distant motorway traffic which formed a constant background noise during the daytime and night-time.</p>



4.2 Acoustic Environment

The acoustic environment in the vicinity of the Site and at the nearest residential receptors at Hallen and Berwick Lane is dominated by distant road traffic on the M5 and M49 motorways, which was found to be continuous during the daytime and night-time periods.

At the monitoring locations and NSRs, short duration events were driven by occasional vehicle passes on the surrounding local roads, along with occasional birdsong.

Other sources occasionally audible included birdsong, a distant train pass by noted at ST1 during night-time, and low-level industrial noise from the industrial uses surrounding the Site.

4.3 Weather Conditions

Surveys at the residential NSRs which form the principal basis of the assessment were undertaken on an attended basis, and only during periods considered suitable for environmental noise measurement and fully compliant with the requirements of BS 4142.

Meteorological conditions during the attended noise survey were assessed through direct observations. These were as follows:

- During the daytime survey on 14th January 2026, conditions comprised cool mid winter temperatures of approximately 6 to 7 °C. Wind speeds were generally below 5 m/s, and from the south and south east.
- During the night-time survey on 28 and 29 January 2026, conditions comprised cool mid-winter temperatures of approximately 3 to 5 °C. Wind speeds were generally below 5 m/s, with winds predominantly from the east and south east.

The unattended long-term survey was undertaken at NSR1, a non-residential commercial receptor located adjacent to the Site, and data from a nearby weather station has been used to support the screening on data from this location only. The reported conditions during the unattended survey period were considered to be conducive to noise measurements and within the recommended limits in BS 4142.

While there were some periods affected by adverse weather conditions, including high wind speeds and rainfall, these have been excluded from the analysis, as shown within the Himly report (see Figure 16 to Figure 18 in Appendix B).

- Temperatures were typical of mid-winter conditions, ranging from approximately 1.6°C to 10.8°C.
- Wind speeds were generally below 5 m/s during the survey period, however there were some exceedances above, which have been removed from the analysis.
- Wind direction showed strong dominance of easterly winds, mainly from the east and south-east. This shows that during the survey, winds were blowing from the NSRs towards the Site, and not the predominant south westerly direction which would be towards the NSRs.
- Rainfall occurred at times during the unattended survey at ST1. However, these periods have been removed from the analysis.

Although the MID advises that third-party meteorological data should not normally be relied upon, its limited use in this assessment is considered appropriate as it is confined solely to the screening of unattended noise monitoring undertaken at a non-residential receptor, where sensitivity to noise effects is inherently lower. In contrast, measurements at the residential receptors were undertaken on an attended basis and therefore incorporated direct, real-time observations of local weather conditions during the survey. Accordingly, the assessment of noise impacts at residential receptors does not rely on third-party meteorological data and is fully compliant with EA requirements.



4.4 Results

A summary of the measured sound levels from the surveys, undertaken at monitoring locations which are considered representative of the NSRs, is shown in Table 4 below which shows the typical residual ($L_{Aeq,T}$) and background sound levels ($L_{A90,T}$), during the daytime and night-time periods. The monitoring data is detailed in full within Appendix C of the Himly report, along with pictures of each monitoring location.

Table 4: Noise Monitoring Results

Location	Monitoring Periods	Daytime		Night-time	
		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
LT1	14/01/2026 13:00 to 29/01/2026 08:00	60	49	56	47
ST1	14/01/2025 13:33 to 13:43 and 28/01/2026 23:00 to 23:30	67	48	58	50
ST2	14/01/2026 13:15 to 13:25 and 29/01/2026 00:20 to 00:50	57	53	54	50
ST3	14/01/2026 13:50 to 14:00 and 28/01/2026 23:41 to 00:11	51	43	48	46

The combined long-term unattended, and short-term attended measurement approach was used to characterise the existing acoustic environment at the closest NSRs.

A long-term unattended noise monitor was installed adjacent to NSR1 (commercial / office receptor) located immediately west of the site boundary, in a secure location which was representative of sound levels close to the development.

The closest residential property (**NSR2**) is located approximately 1.5 km from the Site, with the M49 located on the intervening land. It was not feasible to install unattended equipment at this receptor, or the remaining receptors. However, it was not considered necessary due to the separation distance and surrounding sources.

Instead, short-term attended measurements were undertaken at residential monitoring locations ST1 to ST3, positioned to reflect the existing environment at the nearest residential receptors to the east. Monitoring was undertaken during the daytime and night-time periods to measure representative background sound levels.

4.4.1 Comparison of Long-Term and Short-Term Data

The attended measurements at ST1 to ST3 show good overall alignment when compared with the long-term data from LT1. Despite localised variations at individual receptors, the background sound levels during the daytime and night-time periods are broadly consistent with the corresponding background sound levels captured at LT1 over the longer monitoring period.

During the night-time attended survey, which included observations at LT1, noise from the motorway was identified as the dominant source at all NSRs, producing steady broadband noise that defined the acoustic character during the more sensitive period.

On this basis, the short-term measurement periods are not considered to limit the reliability or validity of the dataset, as the results follow the patterns expected under typical environmental conditions and are considered representative for the purposes of assessment.



5.0 Noise Predictions

The development involves the conversion of the former plastic-recycling facility for use as a data centre. The scheme includes external mechanical and electrical plant required to support the operation of the data-centre infrastructure.

The proposed operations which are of relevance to this assessment include a three-storey plant gantry structure that accommodates the SBGs at ground-floor level.

To support IT operations, the gantry also includes electrical plant located on the second floor, and chillers/cooling units on the top floor, however these are not considered within this NIA. Additionally, as noted within the BATOT report, the solid oxide fuel cells included within the proposed energy centre are not regulated by the EA, as such they have therefore not been considered within this NIA

The location of the SBGs is shown in Figure 5, and further detail on the noise model, assumptions, and source data used to inform the noise predictions is provided below.

Figure 5: SBG Layout Plan (excerpt from EP application Drawing 002)



5.1 Noise Sources

The main sources of noise at the development will be the SBGs and associated exhaust flues, and these have been used to develop the noise model presented. These will be located within the 3-storey gantry structure, with SBGs at ground floor level, and exhaust flues which terminate above the structure.

Excerpts from the gantry section and the elevation drawings are shown in Figure 6 and Figure 7 below.



Figure 6: Gantry Section Plan

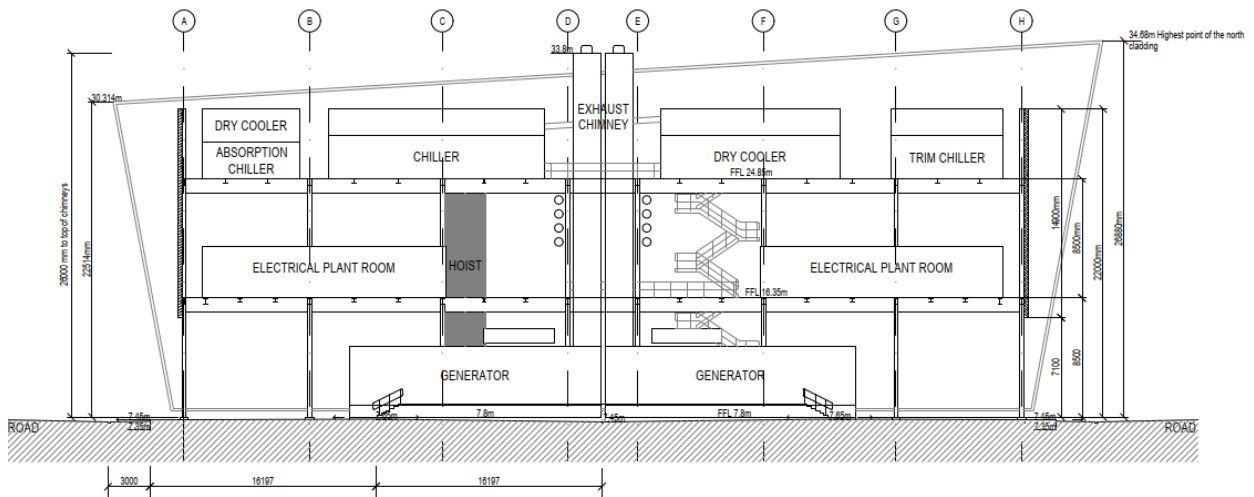
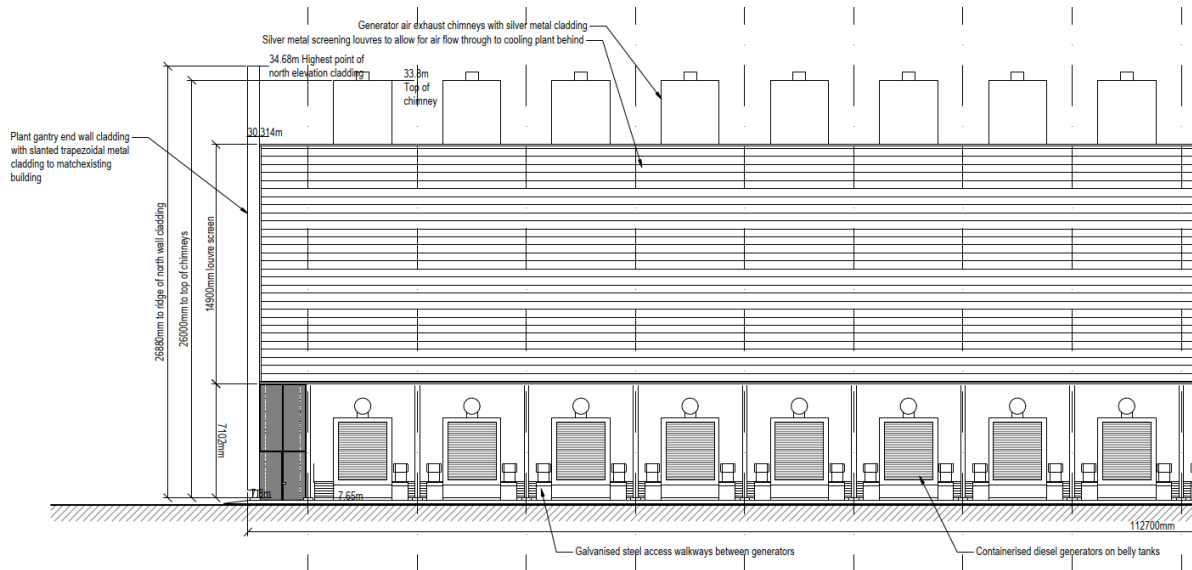


Figure 7: Gantry Elevation Plan (east/west)



While the upper facades of the front and back of the gantry will incorporate acoustic louvres in order to allow natural ventilation through the structure, the sides will feature solid metal cladding to match the existing building. However, as shown above, this will not screen the SBGs and its effect will be negligible. Therefore, the façade has not been included in the noise model.

5.1.1 Backup Generators

Diesel SBGs will provide backup power in case of emergencies and will be located within individual acoustic containers, at ground floor level. The front of the containers features an attenuator for ventilation air, with an exhaust silencer located directly above the container.

Each enclosure has been included in the noise model as a 5-sided box, which radiates noise equally from the top (as an area source), along with the side and rear walls (as vertical area sources). The front of the container has been modelled separately (as a vertical area source) to reflect the higher sound level of the attenuator.

Octave band sound power levels have been provided from a representative supplier, based on the specified engine and attenuation provided by the enclosure and front louvre, as shown in Table 5 below.



5.1.2 Exhaust Flue

Exhaust gases from the SBGs will be ducted through individual exhaust flues, integrated within chimneys in the centre of the gantry, which terminate at 26m above ground level.

Within the model, noise emissions have been represented as point sources which are positioned 5cm inside the exhaust flues, close to the top of the chimney cylinder. This configuration has been used in order to consider the screening and the reflecting effect of the chimney correctly, and in a physically realistic way, consistent with CadnaA modelling guidance. However, the model has been configured to ensure that the cylinder itself does not cause a screening effect.

Octave band sound power levels have been provided from a representative supplier, based on the specified engine and attenuation provided by the silencer. The sound power level of the exhaust flue is shown in Table 5 below.

In accordance with ISO 9613-2, this specific source has been modelled with directivity properties of a chimney, and includes representative data for the diameter, exhaust velocity, and gas temperature.

Table 5: Plant Sound Levels

Item	Sound Power Level per Octave Band, Hz (dBA)								L _{WA}
	63	125	250	500	1k	2k	4k	8k	
Generator - container	60.9	74.9	71.9	69.9	71.9	72.9	71.9	73.9	81.2
Generator - attenuator	67.9	78.9	69.9	59.9	57.9	58.9	60.9	81.9	84.0
Exhaust Flue	50.0	52.1	61.5	73.8	77	78.2	78	68.9	83.3

5.2 Noise Model

The predictions presented in this assessment have been undertaken using environmental noise modelling software, CadnaA, which supports a comprehensive suite of UK calculation methodologies, including the ISO 9613-2 propagation standard, ensuring consistency with guidance and best practice.

For the purpose of this model and assessment, the following assumptions have been used to inform the noise predictions:

- Daytime hours are considered to be between 0700 and 2300 hours, and night-time hours are between 2300 and 0700 hours.
- Daytime predictions have been calculated assuming a receptor height of 1.6 metres, representative of external sound levels at ground floor height.
- Night-time noise predictions (residential only) have been calculated at a receptor height of 4.0 metres, representative of external sound levels at first floor windows (i.e. bedrooms).
- Terrain data has been sourced from the Environment Agency National LIDAR Programme, using 1m elevation data.
- A ground absorption factor of 0.4 (mixed ground).
- A reflection factor of 3.
- All sources associated with generators operating at 100% power during the daytime and night-time.



- The upper facades of the gantry incorporate acoustic louvres, and the side walls will feature solid metal cladding. However, this has not been included in the noise model due to the limited attenuation provided.
- Items of plant not related to the generators have been excluded from the noise model, as testing showed this avoids extended calculation times associated with modelling the full gantry structure. Testing of the model showed that exclusion of these items does not materially influence the predictions, as the associated screening attenuation is limited.
- However, the chimney stacks together with the internal exhaust flues, have been included as structural elements. The exhaust point sources have been modelled using the ISO 9613-2:2 stack-directivity, using the chimney setting.
- Uncertainties and limitations related to the input data, including sound power levels, receptor locations, and reflection assumptions, are acknowledged and have been considered when interpreting the predicted sound levels.

5.3 Specific Sound Level

The predicted sound level at each NSR is presented in Table 6 below and represents operation of all the generators.

The daytime and night-time predictions include the same items of operational plant, however the daytime predictions have been calculated using a receptor height of 1.6 m, and night-time predictions using a receptor height of 4.0 m.

Table 6: Specific Sound Level

Location	Period	Specific Level, dB L _{Aeq, T}
NSR1	Daytime	39
NSR2	Daytime	24
	Night-time	24
NSR3	Daytime	21
	Night-time	21
NSR4	Daytime	13
	Night-time	18
NSR5	Daytime	21
	Night-time	22
NSR6	Daytime	20
	Night-time	20



6.0 Noise Assessment

6.1 Character Corrections

The SBGs could produce some minor tonal characteristics when operating, however such character features are expected to be attenuated at the NSRs due to the prevailing residual sound and the large separation distances. This significantly reduces the potential for tonal features, and/or other distinctive characteristics to be perceptible at the NSRs. Therefore, no character corrections have been included.

6.2 Representative Background Sound Level

At NSR1, the non-residential receptor, the arithmetic average of the measured background levels aligns with the most frequently occurring value identified through the statistical analysis (shown in Figure 19 of the Himly report), and is therefore considered representative for use in the assessment.

At NSR2 to NSR6, the attended measurements undertaken covered relatively short time periods; however, they are considered to be representative of the typical background sound levels during both the daytime and night-time periods. These measurements were free from abnormal noise events and reflect the prevailing acoustic environment observed during the survey. Accordingly, the measured values are used directly in the assessment without further adjustment or analysis.

6.3 Impact Assessment

A BS 4142 assessment has been undertaken to quantify the potential noise impact at the NSRs, and considers a worst-case operating scenario in which all SBGs are assumed to be operating simultaneously during.

Predicted specific sound levels at each noise-sensitive receptor (NSR) have been derived from the noise modelling described in Section 5, and assessed against representative background sound levels. As noted above, no character corrections have been applied. The results of the initial assessment, and the difference between the rating level and background sound level are shown in Table 7 below.

Table 7: BS4142 Assessment

Receptor	Period	Specific Level	Rating Level	Background Level	Difference
NSR1	Daytime	39	39	49	-10
NSR2	Daytime	24	24	48	-25
	Night-time	24	24	50	-26
NSR3	Daytime	21	21	48	-27
	Night-time	21	21	50	-29
NSR4	Daytime	13	13	53	-40
	Night-time	18	18	50	-32
NSR5	Daytime	21	21	43	-22
	Night-time	22	22	46	-24
NSR6	Daytime	20	20	43	-24
	Night-time	20	20	46	-26



6.3.1 Initial Result

The initial result of the BS 4142 assessment indicates that during the daytime and night-time periods, sound from the Site will be below the background sound level at all NSRs. The least difference relative to background is -10 dB at NSR1, which in accordance with BS 4142 corresponds to a **low Impact**, depending on the context.

In the context of the local acoustic environment, the measured background and residual sound levels at the NSRs, is higher than the predicted specific sound level from the Site. As such, any noise from the SBGs would be effectively masked by existing ambient sound sources (e.g. road traffic) and would not be audible or discernible at the NSRs, during the daytime or night-time periods. On this basis, the operation of the SBGs would not represent a material change to local noise conditions, and no further assessment or adjustment is considered necessary.

6.3.2 Routine Testing

In addition to emergency operations involving all SBGs, individual SBG will be operated as part of a routine testing and maintenance schedule. The full schedule is set out in the BATOT report, which notes that each SBG will only be operated for up to 50 hours per year.

As emergency operation represents the worst-case scenario, assuming the simultaneous operation of all SBGs and resulting in a low impact, a separate assessment of routine testing has not been undertaken. Routine testing would involve the operation of fewer SBGs and would therefore give rise to sound levels no greater than those already assessed. On this basis, the noise impact associated with routine testing is considered **negligible**.

6.3.3 Low-Frequency Noise

In accordance with EA requirements, the assessment should determine whether low-frequency noise (LFN) could cause pollution at NSRs.

NANR45¹ states that LFN is generally considered to occur within the frequency range of 10 Hz to 160 Hz, as this is the range most likely to be perceptible, interact with building structures, and give rise to disturbance inside dwellings.

For the SBGs, the octave-band sound power data used in the assessment (which already incorporates the acoustic attenuation of the container) indicates that levels within the lower frequency bands are not dominant. In particular, the 63 Hz octave-band levels from the engine and exhaust are substantially lower than the mid-frequency bands (typically 500 Hz to 2 kHz).

From an acoustic perspective, the presence of significant low-frequency noise below 63 Hz would normally be reflected by elevated energy in the adjacent 63 Hz and 125 Hz octave bands. However, no such increase is evident in the data, indicating that the SBGs do not exhibit a low-frequency characteristic.

At the closest NSRs, the existing acoustic environment is dominated by distant motorway traffic, producing a steady broadband background sound against which low-frequency noise from the Site would not be perceptible.

On this basis, the SBGs are not expected to give rise to perceptible low-frequency noise at NSRs, and no risk of low-frequency noise pollution is anticipated.

¹ NANR45: Procedure for the assessment of low frequency noise disturbance, Defra



6.4 NVM Outcome and Appropriate Measures

When context is considered, the BS 4142 assessment indicates **low Impact**, with the rating level below background at all NSRs during the daytime and night-time periods. In NVM terms this corresponds to “no, or barely audible or detectable noise”.

For this outcome, EA guidance indicates that no additional site-specific noise mitigation is required beyond the implementation and maintenance of appropriate measures, consistent with Best Available Techniques (BAT).

The appropriate measures relevant to the proposed development, and which have been assumed within this assessment, include:

- Use of acoustic containers and inlet attenuators for SBGs, and silencers for exhaust flues.
- SBG testing limited to 50 hours per year.
- Avoidance of concurrent testing across buildings where practicable.
- Preventative maintenance, and complaint response protocols as set out in the BATOT report.

6.5 Statement of Uncertainty

Uncertainty has been considered as a limit to the accuracy of any noise assessment, including associated steps of measurement, calculation, or prediction. Factors which have been considered within this assessment includes (but not limited to) the following:

- The inherent accuracy limitation of methodology in standards and guidance.
- Variability in meteorological conditions.
- The accuracy of sound source input data of a calculation.

It is a requirement of BS 4142 and NVM to consider and minimise uncertainty to a level appropriate with the intention of the assessment objective. Measures taken in this assessment to minimise uncertainty have included:

- Background sound level measurements were undertaken in accordance with recognised Standards, using an environmental windshield and during acceptable weather conditions e.g. low wind speeds and precipitation.
- Field calibration checks were undertaken before and after measurements, and low levels of equipment drift were recorded (no more than 0.06 dB).
- Background sound levels were characterised using a combination of long-term unattended monitoring, and short-term attended measurements undertaken during representative periods. This included typically quieter parts of the day (midday) and night-time (midnight), when sound levels are less influenced by peak road traffic activity.
- Source sound levels have been provided by the project team and are based on data of the proposed plant.
- The modelling, predictions, and calculations have been undertaken on a conservative basis, to ensure a robust assessment which does not under-predict the resulting impacts. Further detail regarding the assumptions used in the noise model are detailed within Section 5.2 above.



7.0 Conclusion

SLR has been instructed by Avonmouth Data Centre Limited to undertake a noise impact assessment (NIA), to support an EP application for a proposed data centre development at Severn Road, Pilning, Bristol. The Site and was previously used as a plastics recycling facility, and will be redeveloped for use as a data centre, and will include the installation of external plant and structures.

In the event of an emergency such as a brown- or black-out of the local electricity transmission network, where there are fluctuations or loss of the electrical power provided by the network, SBGs are used to provide power to the data centre.

In accordance with EA guidance, the NIA considers the noise emissions of back up energy generation and associated infrastructure only, rather than operations at the data centre itself. Therefore, this assessment considered the noise impact associated with the proposed SBGs and associated ventilation plant to be installed within external areas.

The assessment has been undertaken in accordance with BS 4142 and EA noise guidance (NVM and MID), and the predictions have been completed using ISO 9613-2, modelling with appropriate worst-case propagation assumptions, during operations involving the SBGs.

The results of the assessment demonstrate that the rating levels from the SBGs during a worst-case emergency operating scenario, in which all SBGs are assumed to be operating simultaneously, would remain at least 10 dB below the representative background sound levels at all NSRs.

When context is considered, the BS 4142 assessment indicates **low Impact**, at all NSRs. In EA terms, this corresponds to “no, or barely audible or detectable noise” when assessed using the NVM guidance. For this outcome, the EA state that no action is required beyond the implementation and demonstration of appropriate measures and BAT.

With regard to routine testing, the SBGs will typically be operated individually and avoid concurrent testing across multiple SBGs where practicable. Therefore, noise impact of a single SBG will be lower than emergency operations, and thus considered **negligible**.

Overall, operation of the SBGs at the Site is not expected to give rise to adverse noise impacts and is therefore considered acceptable in the context of this EP application.



8.0 Closure

The assessment has required a suitable level of technical ability and has been undertaken by a Suitably Qualified Person (SQP). An individual with all the following credentials has been considered a SQP for this assessment:

- Has a minimum of three years' verifiable experience (within the last five years) of providing noise and vibration assessments in planning. Such experience has clearly demonstrated a practical understanding of factors affecting acoustics in relation to the proposed development use and in the built environment in general, including acting in an advisory capacity to provide recommendations and design advice in planning, and;
- Holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

This assessment has been led and managed by a SQP as defined above. The SQP confirms that the relevant measurements and calculations:

- Represent good industry practice in accordance with available guidance.
- Are appropriate given the development being assessed and scope of works proposed.
- Avoid invalid, biased and exaggerated claims.

The checker and author of this document confirm that they both comply with the definition of a SQP defined in this Section.

Regards,

SLR Consulting Limited

N Auckland

N Auckland, MIOA
Associate Acoustic Consultant



Alasdair Baxter, MIOA
Technical Director - Acoustics





Appendix A Glossary of Terminology

Avonmouth Noise Impact Assessment

Environmental Permit Application

Avonmouth Data Centre Limited

SLR Project No.: 416.066815.00001

29 April 2026

Introduction

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

Table A01 Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

Acoustic Terminology

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

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

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

$L_{A10, T}$ & L_{A90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

$L_{Amax(F)}$ $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.





Appendix B Himly Report

Avonmouth Noise Impact Assessment

Environmental Permit Application

Avonmouth Data Centre Limited

SLR Project No.: 416.066815.00001

29 April 2026



Avonmouth Data Centre

Severn Road, Avonmouth

Noise impact assessment

ENVIRONMENTAL NOISE

20 MARCH 2026



Project details

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Site location: Severn Road, Avonmouth, Bristol BS11 0YL

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Executive Summary

Rivington Grid Limited has commissioned Himly to carry out a noise impact assessment for a proposed Data Centre on land at Severn Road, Avonmouth, Bristol.

The Proposed Development is located in industrial land to the northwest of the City of Bristol, with the closest noise sensitive receptor being the office of an adjacent industrial building. The nearest residential noise sensitive receptors are located over 1600 metres away from the site.

During construction, the Proposed Development is not expected to give rise to either adverse or significant adverse effects due to noise at the nearest sensitive receptors.

To reduce noise emissions during operations, the Proposed Development incorporates embedded mitigation measures, such as acoustic attenuation packages installed on cooling and chilling equipment, utilising close-fitting enclosures with attenuated inlet and discharge systems. The assessment concludes that the development is not expected to result in adverse or significant adverse effects related to noise at the nearest sensitive receptors during normal operations of the scheme and when generators are running in an emergency.

Provided that the embedded mitigation is correctly installed, commissioned and maintained, the Proposed Development is considered to adhere to the National Planning Policy Framework, Bristol's Development Framework and South Gloucestershire's Local Plan in terms of noise.

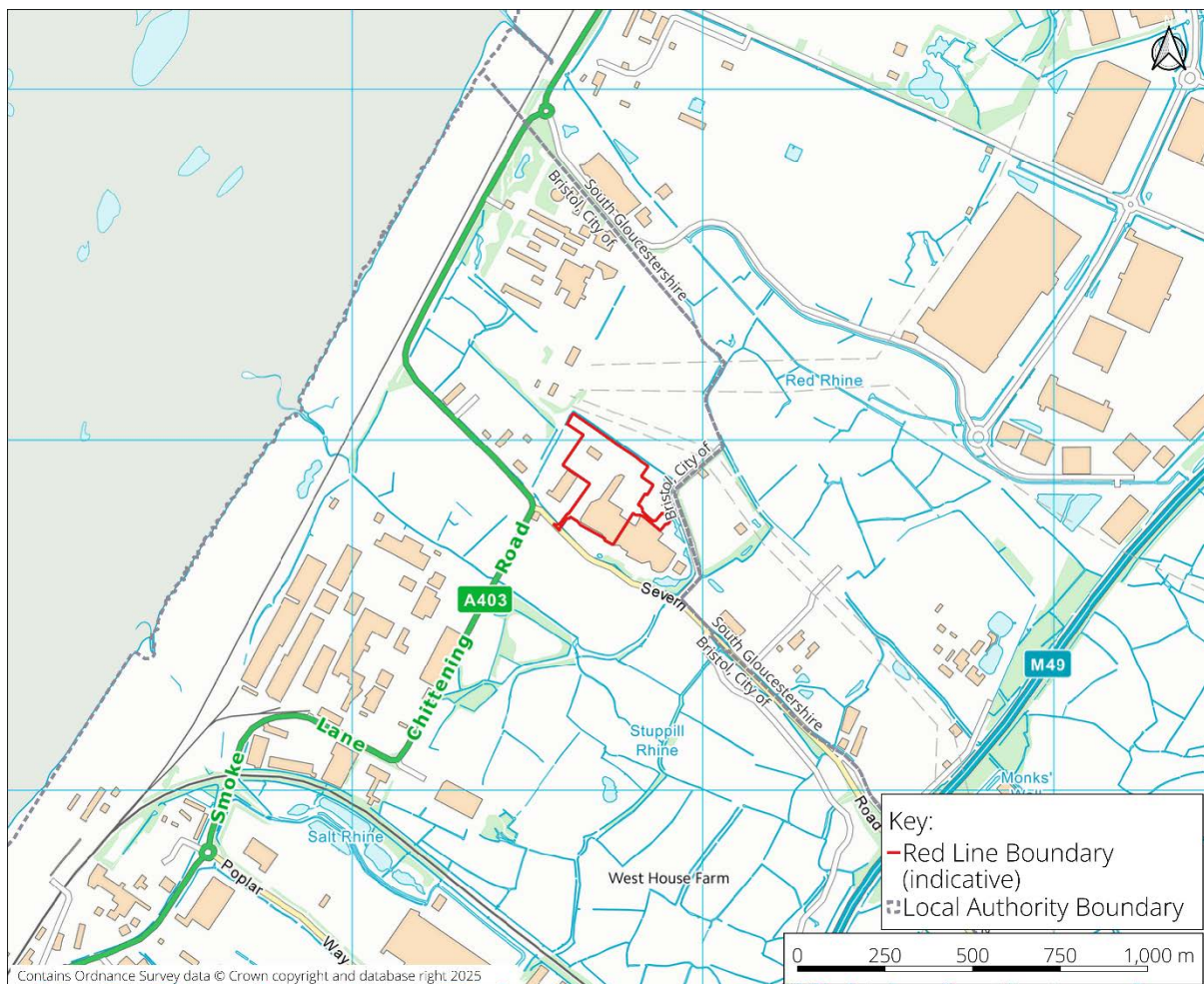
1. Introduction

1.1. Background

Rivington Grid Limited has commissioned Himly to carry out a noise impact assessment for a proposed Data Centre on land at Severn Road, Avonmouth, Bristol BS11 0YL.

Figure 1 below shows the location of the development, which sits in the Avonmouth industrial estate over 1km to the west of the M49.

Figure 1: Contextual image



1.2. Purpose and scope

The purpose of this noise impact assessment is to support the planning process by providing essential data and recommendations that inform decision-makers, ensuring that the proposed development aligns with local and national policies on noise control.

The assessment entails a review of the acoustic environment, construction and operational activities that can give rise to noise impacts, and their projected impact on noise-sensitive receptors, such as nearby offices and residential properties.

2. Legislative and policy framework

2.1. Environmental Protection Act 1990

The Environmental Protection Act¹ s. 79.(g) defines noise emitted from premises so as to be prejudicial to health or a nuisance as constituting a statutory nuisance. It also constitutes a statutory nuisance, according to s. 79.(ga) noise that is prejudicial to health or a nuisance and is emitted (not from premises but) from or caused by a vehicle, machinery or equipment in a street.

A local authority can take legal action to prevent or stop a noise from fixed premises, including land, which it considers prejudicial to health or a nuisance. Any new noise source of that nature has the potential to be a statutory nuisance. In England and Wales, a local authority's power is primarily to be found in s. 80 of the Environmental Protection Act. The Act also makes provision for private individuals to take complaints directly to a magistrate's court (s.82). As referenced in British Standard BS 8233 section F.3², the main principles established under the Act are as follows:

- There is no prescribed level above which a noise automatically becomes a statutory nuisance. Each case is considered on its merits taking account of a range of factors, including the likely reaction of a typical person.
- Where the noisemaker is operating from industrial, trade or business premises, it is a defence to show that the best practicable means to control noise have been used.

Best practicable means are to be interpreted (s. 79(9)) as follows:

- "practicable" means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;
the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;
- the test is to apply only so far as compatible with any duty imposed by law;
- the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances;

and, in circumstances where a code of practice under section 71 of the Control of Pollution Act 1974 (noise minimisation) is applicable, regard shall also be had to guidance given in it.

¹ Environmental Protection Act 1990 (legislation.gov.uk).

² BS 8233:2014 | 28 Feb 2014 | BSI Knowledge (bsigroup.com). Annex F (informative) Legislative framework and guidance. F.3 Noise from other sources (NB other than construction noise).

2.2. Control of Pollution Act 1974

The Control of Pollution Act³ s. 60 deals with the control of noise on construction sites. The local authority can serve a notice imposing requirements as to the way in which the works are carried out. Section 61 allows for a person who intends to carry out construction works to apply to the local authority for consent to follow their own noise management plan. Section 71 refers to the approval of codes of practice for the purpose of giving guidance on appropriate methods (including the use of specified types of plant or machinery) for minimising noise. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015⁴ approves the British Standard BS 5228 as the code of practice for noise and vibration control on construction and open sites.

Section 72 defines best practicable means, with practicable meaning reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications. The means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and acoustic structures. The said test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances.

2.3. Local development plan

The Planning and Compulsory Purchase Act 2004 s.38(6) requires that a determination made under the planning acts must be made in accordance with the development plan unless material considerations indicate otherwise.

2.3.1. Bristol Development Framework

Bristol Development Framework's Core Strategy⁵ was adopted in June 2011.

Policy BCS23 Pollution states the following:

Development should be sited and designed in a way as to avoid adversely impacting upon:

- Environmental amenity or biodiversity of the surrounding area by reason of fumes, dust, noise, vibration, smell, light or other forms of air, land, water pollution, or creating exposure to contaminated land.
- The quality of underground or surface water bodies.

In locating and designing development, account should also be taken of:

- The impact of existing sources of noise or other pollution on the new development; and

³ Control of Pollution Act 1974 (legislation.gov.uk).

⁴ The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 (legislation.gov.uk).

⁵ <https://www.bristol.gov.uk/files/documents/64-core-strategy-web-pdf-low-res-with-links/file>.

- The impact of the new development on the viability of existing uses by reason of its sensitivity to noise or other pollution.

Water quality and associated habitat of surface watercourses should be preserved or enhanced.

Bristol Local Plan's Site Allocations and Development Management Policies⁶ was adopted in July 2014.

Policy DM35 Noise Mitigation states the following:

Noise-Generating Development

Development which would have an unacceptable impact on environmental amenity or biodiversity by reason of noise will be expected to provide an appropriate scheme of mitigation.

In assessing such a scheme of mitigation, account will be taken of:

- i. The location, design and layout of the proposed development; and
- ii. Existing levels of background noise; and
- iii. Measures to reduce or contain generated noise; and
- iv. Hours of operation and servicing.

Development will not be permitted if mitigation cannot be provided to an appropriate standard with an acceptable design, particularly in proximity to sensitive existing uses or sites.

2.3.2. South Gloucestershire Local Plan

South Gloucestershire Local Plan's Core Strategy⁷ was adopted in December 2013.

Policy CS9 Managing the Environment and Heritage states the following:

... In order to protect and manage South Gloucestershire's environment and its resources in a sustainable way, new development will be expected to:

...

11. protect land, air and aqueous environments, buildings and people from pollution...

South Gloucestershire's Local Plan's Policies, Sites and Places Plan⁸ was adopted in November 2017.

Policy PSP21 Environmental Pollution and Impacts states the following:

⁶ <https://www.bristol.gov.uk/files/documents/2235-site-allocations-bd5605/file>

⁷ <https://beta.southglos.gov.uk/static/2d94cc7df5f44948d9203e439cec8cd7/South-Gloucestershire-Core-Strategy-2006-2027.pdf>

⁸ <https://beta.southglos.gov.uk/static/90efa5d673f208a3109ed111ba963a01/PSP-Plan-Nov2017.pdf>

Development proposals will be acceptable where they clearly demonstrate that development is sited and designed to prevent unacceptable risks and avoid unacceptable levels of pollution adversely impacting, by way of; fumes, dust, noise, vibration, odour, light or other forms of air, land, water pollution, exposure to contaminated land or land instability, directly or cumulatively, on:

- environmental amenity; and
- the health, safety and amenity of users of the site or the surrounding area.

Account will be taken of:

- The impact of existing sources of noise or other pollution on the new development; and
- The impact of the new development on existing uses by reason of its sensitivity to noise or other pollution.

...

C. Noise, Air Quality and Contaminated Land

Noise

Noise generating development that would lead to significant adverse effects, including cumulative effects, on health and amenity from noise and vibration will be acceptable where an appropriate scheme of noise mitigation through design is provided. The scheme must be provided to an appropriate standard.

Account will be taken of:

- 1) the location, design and layout of the proposed development;
- 2) existing levels of background noise and the potential for a cumulative impact;
- 3) measures to reduce or contain generated noise;
- 4) hours of operation and servicing; and
- 5) increased HGV traffic generated from the development.

...

2.4. National planning policy

The Noise Policy Statement for England's⁹ vision is to promote good health and a good quality of life through the effective management and control of environmental noise within the context of Government policy on sustainable development. Its aims are to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The sustainable development context includes the following guiding principles:

- Ensuring a strong healthy and just society.
- Using sound science responsibly.
- Living within environmental limits.
- Achieving a sustainable economy.
- Promoting good governance.

The National Planning Policy Framework¹⁰ (NPPF) sets out government's planning policies for England and how these are expected to be applied. Planning Practice Guidance¹¹ (PPG) advises on how planning can manage potential noise impacts in new development. The latest version of NPPF at the time of writing is dated December 2024 (amended 7 February 2025).

National policy requires the following:

- prevent unacceptable levels of noise pollution on new and existing development (NPPF paragraph 187);
- avoid noise giving rise to significant adverse impacts on health and the quality of life (NPPF paragraph 198);
- mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development (NPPF paragraph 198); and
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason (NPPF paragraph 198).

PPG provides further details on how to establish whether noise is likely to be of concern, by providing the following noise exposure hierarchy table (Table 1).

⁹ pb13750-noise-policy.pdf (publishing.service.gov.uk).

¹⁰ National Planning Policy Framework - GOV.UK (www.gov.uk).

¹¹ Noise - GOV.UK (www.gov.uk).

Table 1: Noise exposure hierarchy table (PPG on noise – paragraph 005).

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

PPG states that local planning authorities should take account of the acoustic environment and in doing so consider:

- “whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.”

2.5. Emerging policy

Bristol is in the process of producing a new local plan. At the time of writing, the most recent draft is the Bristol Local Plan: Publication version November 2023¹². Emerging Policy HW1A: Noise proposes the following:

Noise-generating development

Development which would have an unacceptable impact on amenity or biodiversity by reason of noise will be expected to provide an appropriate scheme of mitigation.

Noise-sensitive development

Noise-sensitive development in locations likely to be affected by existing sources of noise such as busy roads, railway lines, industrial/commercial developments, some entertainment uses, waste, recycling and energy plant and sporting, recreation and leisure facilities, will be expected to provide an appropriate scheme of mitigation to ensure adequate levels of amenity for future occupiers of the proposed development and in accordance with the agent of change principle (Policy HW1 'Pollution control and water quality').

Noise mitigation schemes

In assessing such schemes for noise mitigation for either a noise-generating or noise sensitive scheme, account should be taken of:

- i. The location, design and layout of the proposed development;
- ii. Existing levels of background noise;
- iii. Hours of operation and servicing (where relevant);
- iv. Measures to reduce noise within the development to acceptable levels, including external areas or screening with vegetation where possible; and
- v. The need to maintain adequate levels of natural light and ventilation to habitable areas of the development.

Development will not be permitted if mitigation cannot be provided to an appropriate standard with an acceptable design.

South Gloucestershire is in the process of producing a new local plan¹³, with the most recent at the time of writing having been published in February 2025, where Policy PSP21 'Environmental Pollution and Impacts' is retained.

¹²Bristol City Council, *Bristol Local Plan: Publication version November 2023*, November 2023. Available at: <https://www.bristol.gov.uk/files/documents/6894-bristol-local-plan-main-document-publication-version-nov-2023/file>.

¹³ <https://localplan.commonplace.is/en-GB/proposals/v3/local-plan-document?step=step1>

3. Methodology

3.1. Construction: BS 5228: Code of practice for noise and vibration control on construction and open sites

Construction plant and activities (and similarly decommissioning plant and activities) can give rise to noise and vibration. Noise levels are influenced by plant selection and specification, site layout, installation and maintenance, the construction programme, and operating methods and hours. Certain tasks, such as piling and road surfacing, can also generate ground-borne vibration. Typically, vibration effects due to vibration-generating works are negligible beyond 100 m from the works.

The assessment methodology for construction noise and vibration is based on British Standard BS 5228 – Code of practice for noise and vibration control on construction and open sites.

The magnitude of impact to construction noise is defined in accordance with the noise hierarchy provided in PPG, with the definition of the Lowest Observable Adverse Effect Level ('LOAEL') and with the Significant Observable Adverse Effect Level ('SOAEL').

The sensitivity of the area to construction noise depends on the existing ambient sound levels. According to the ABC method outlined in BS 5228-1, areas with lower ambient sound levels are more susceptible to intrusion or disturbance from construction noise. Conversely, noisier environments where ambient sound levels are already high might find the same level of construction noise less intrusive. This assessment changes if construction works last for extended periods exceeding six months at the same location or spans several years. In such cases, limits that are not dependent on the existing ambient sound levels might be required.

The ABC method described in British Standard BS 5228-1:2009+A1:2014¹⁴ will be used to define the LOAEL for construction noise. The thresholds for a Category C area will be used as the SOAEL – see Table 2.

Construction noise levels are predicted in accordance with the calculation methodology described in BS 5228-1 Annex F. BS 5228-1 Annex F provides the calculation method to predict noise from construction sites, using activity-specific plant sound power data and realistic on-time assumptions for each construction phase. The level of sound at noise sensitive receptors that arises from a construction site depends on a number of factors such as the sound power outputs of processes and plant; the periods of operation of processes and plant; the distances from sources to receptor; the presence of screening by ground profile or by barriers; the reflection of sound; and soft ground attenuation, among others, such as meteorological conditions and atmospheric absorption.

¹⁴ BS 5228-1:2009+A1:2014 | 1 Jan 2009 | BSI Knowledge (bsigroup.com).

Table 2: BS 5228-1 ABC method and LOAEL and SOAEL values for construction noise

Assessment category and threshold value period	Threshold value, in decibels (dB $L_{Aeq,T}$)		
	Category A ^{A)} (LOAEL)	Category B ^{B)} (LOAEL)	Category C ^{C)} (SOAEL)
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75
Evenings and weekends ^{D)}	55	60	65
Night-time (23:00-07:00)	45	50	55
<p>Note 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.</p> <p>Note 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise levels is higher than the above values), then a potential significant effects is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.</p> <p>Note 3: Applied to residential receptors only.</p>			
<p>^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p>^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.</p> <p>^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.</p> <p>^{D)} 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays.</p>			

3.2. Operation: BS 4142 Method for rating and assessing industrial and commercial sound

Operational plant such as transformers, fuel cells, dry coolers, trim chillers, chillers, dry coolers and absorption chillers, and other electrical plant can give rise to noise during operation. Generators are also a source of noise during emergencies when they need to provide backup energy. Sound levels are influenced by plant selection and specification, site layout, topography and ground-absorption characteristics, installation and maintenance, and operating methods and hours.

The assessment methodology for operational noise is based on British Standard 4142 and documents providing guidance on its application.

3.2.1. Sound level definitions

British Standard BS 4142:2014+A1:2019¹⁵ provides a method for rating and assessing industrial and commercial sound. This standard is widely used in the UK to assess the impact of sound from some industrial and commercial sources on humans in residential premises. The Environment Agency has published guidance on its implementation in the 'Noise and vibration management: environmental permits'¹⁶ document dated January 2022 and in the

¹⁵ BS 4142:2014+A1:2019 | 30 Jun 2019 | BSI Knowledge (bsigroup.com).

¹⁶ Noise and vibration management: environmental permits - GOV.UK (www.gov.uk).

'Method implementation document (MID) for BS 4142'¹⁷ of December 2023. The Association of Noise Consultants also published a Technical Note¹⁸ on the standard in March 2020.

The standard is designed to consider the effects of industrial and commercial sound giving appropriate consideration to its character and level. To do so, it defines how to determine the ambient, background and residual sound levels and how to derive a rating level for the sources of sound being assessed, which is calculated from the specific sound level plus any character corrections. Thus, the following parameters are used:

- The specific sound level, $L_{Aeq,Tr}$, is the sound pressure level produced by the specific sound source at assessment location over a given reference time interval.
- The residual sound level, $L_{Aeq,T}$, is the sound pressure level at the assessment location when the specific sound source is not operational.
- The ambient sound level, $L_{Aeq,T}$, is the totally encompassing sound level in a given situation at a given time, composed of sound from many sources near and afar. The ambient sound comprises the residual sound and the specific sound when present.
- The background sound level, $L_{A90,T}$, is the sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T.
- The rating level, $L_{Ar,Tr}$, is the specific sound level plus any adjustment for the characteristic features of the specific sound which will attract attention, which are tonality, impulsivity, intermittency and other sound characteristics.

The significance of sound of an industrial or commercial nature depends on both:

1. the margin by which the rating level of the specific sound source exceeds the background sound level; and
2. the context in which the sound occurs.

3.2.2. Significance of sound: sound level evaluation

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

¹⁷ Method implementation document (MID) for BS 4142 - GOV.UK (www.gov.uk).

¹⁸ ANC-BS-4142-Guide-March-2020.pdf (association-of-noise-consultants.co.uk).

3.2.3. Significance of sound: the context

The context in which the sound occurs includes the following:

- The absolute level of sound.
- The character and level of the residual sound compared to the character and level of the specific sound.
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and outdoor acoustic conditions, such as:
 - façade insulation treatment,
 - ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation, and
 - acoustic screening.

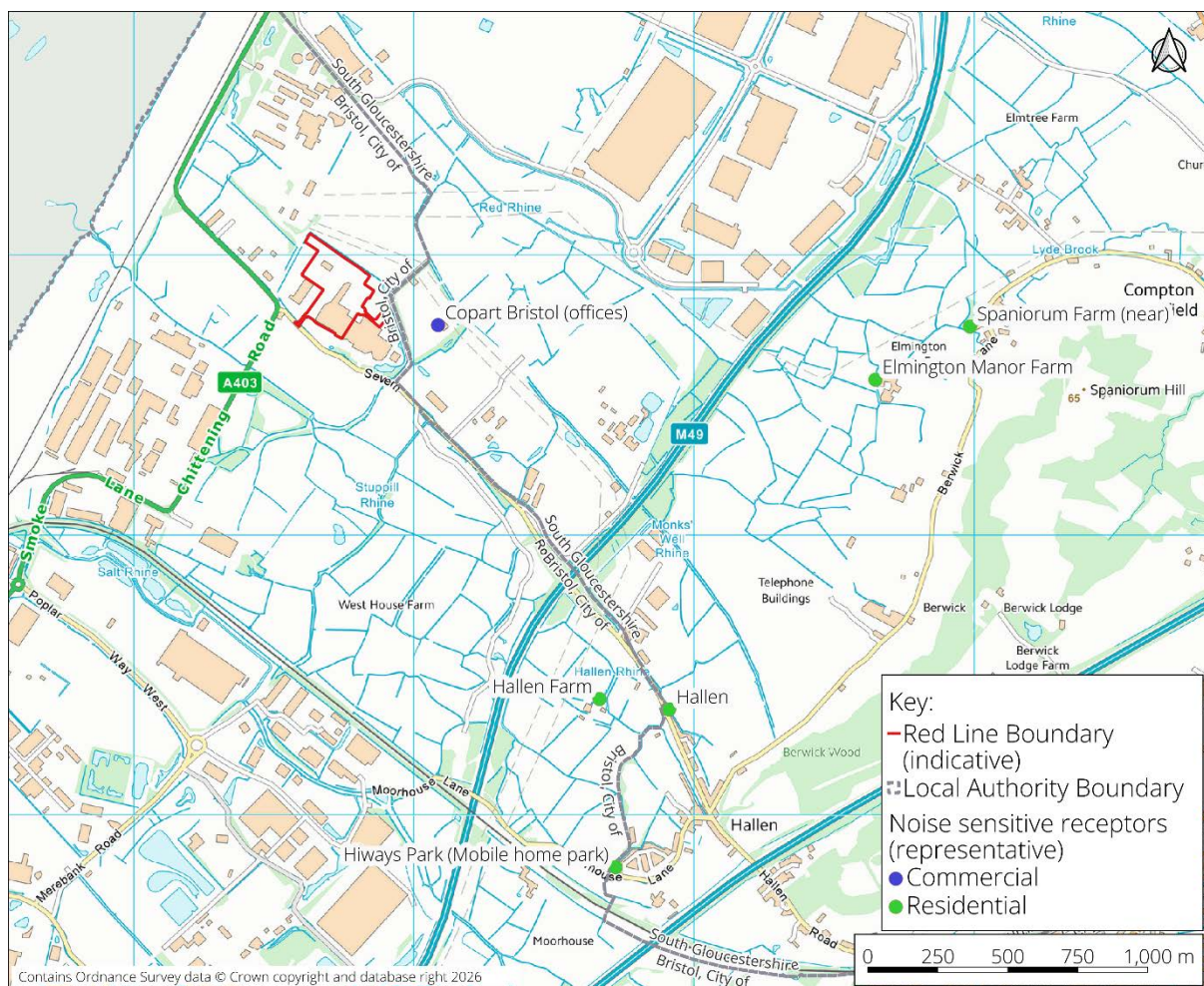
4. Baseline

4.1. Noise sensitive receptors

The site of the Proposed Development is industrial land in Avonmouth, located to the northwest of the City of Bristol (and within its boundaries). The site is a few metres away from South Gloucestershire, which is located to the north and east of the site as shown in Figure 2. There are neighbouring businesses' offices that could potentially be affected by the Proposed Development. Residential properties to the east of the M49 could also be impacted. Many of these residential properties feature both indoor and outdoor amenity, such as a dwelling and a garden.

Figure 2 shows the location of representative noise sensitive receptors. The offices of Copart Bristol are located to the east of the proposed development and represent the closest noise sensitive receptor. Hallen Farm and the village of Hallen are the nearest residential receptors (approximately 1600 metres away from the site). Further north, Elmington Manor Farm and the settlement next to Spaniorum Farm, are the nearest residential receptors with a direct line of sight to the Proposed Development. To the south, Hiways Park include mobile homes.

Figure 2: Potential noise sensitive receptors identified in the vicinity of the site



4.2. Noise survey

4.2.1. Noise survey locations

Suitably qualified Himly acousticians (Fauwaz Baig MIOA, Josep Simona MIOA) carried out a noise survey within the study area between 14 January 2026 and 29 January 2026 to determine the existing ambient and background sound levels on site. The survey involved continuous unattended monitoring throughout the entire period and supplementary attended sound measurements.

Figure 3 illustrates the locations of the long-term monitoring position LT1 and the attended short term positions ST1 to ST3, together with the surrounding receptor context and the principal transport corridors that characterise the baseline. The figure identifies the nearest residential dwellings represented by ST1 on Severn Road at Hallen, ST2 at Moorhouse Lane, Hallen and ST3 on Berwick Lane, and shows more distant isolated dwellings and small clusters within the surrounding rural area for completeness. The M49, M5 and A403 are shown as the dominant road links serving the Avonmouth Severnside area, and the nearest conservation area designation is Kingsweston and Trym Valley Conservation Area to the south within Bristol.

Figure 3: Noise survey locations

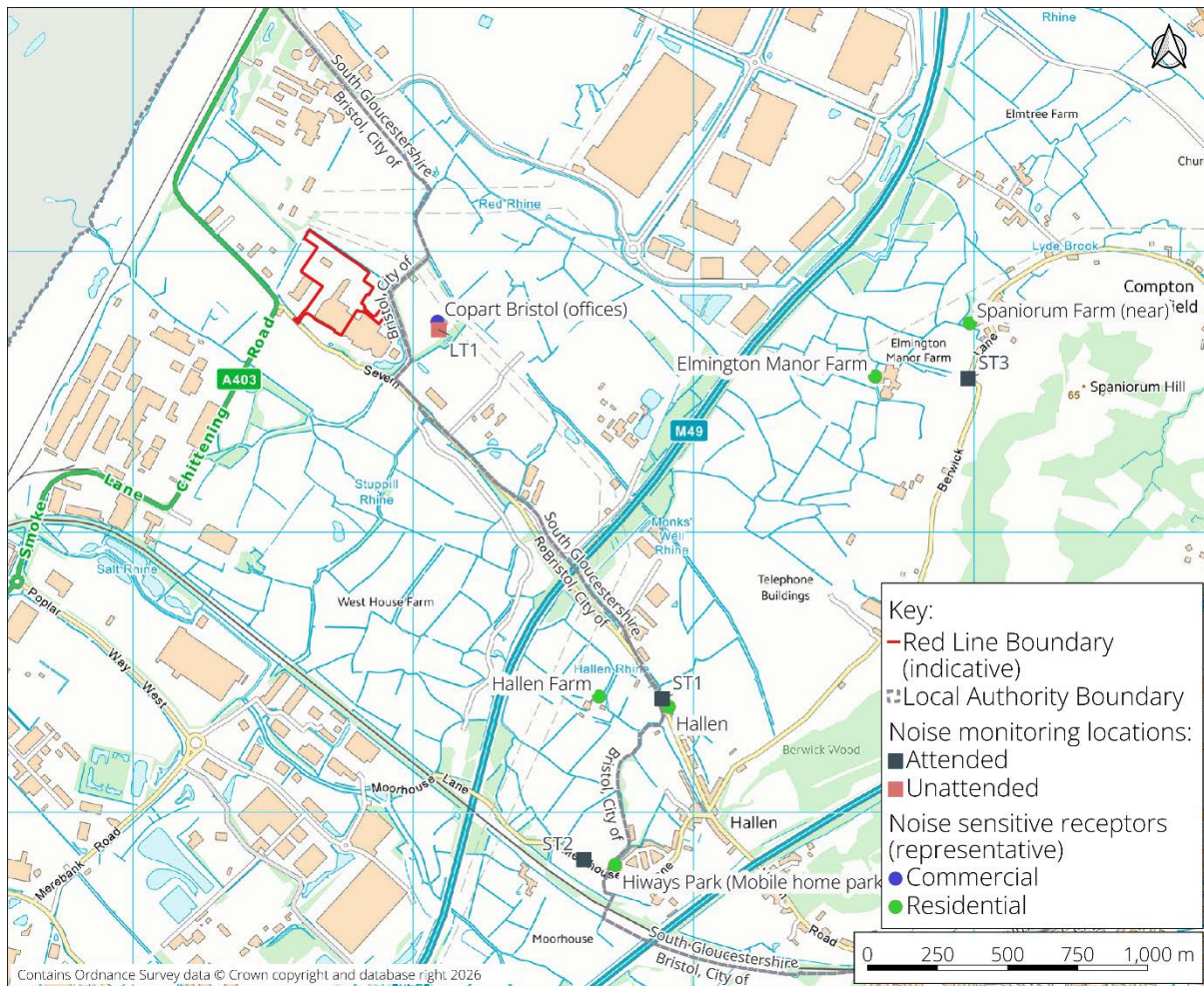


Table 3 describes each of the monitoring locations in more detail. Photographs of each of the locations are provided in Appendix C.

Table 3: Noise survey locations

Position	Coordinates (Easting)	Coordinates (Northing)	Description
LT1	354084	181757	Mounted to the perimeter security fence outside the Copart Bristol office, approximately 300 m southeast of the red line boundary. The microphone was installed in free field conditions at an approximate height of 2.7 m above ground level. This position represents the closest noise sensitive receptor to the proposed development and provides a representative commercial receptor for the daytime period. Copart's office has a direct line of sight towards the Proposed Development, with the local environment influenced by nearby industrial activity and intermittent vehicle movements within Copart's yard, together with more distant road traffic associated with the strategic network.

Position	Coordinates (Easting)	Coordinates (Northing)	Description
ST1	354894	180399	Attended short term free field measurement position on Severn Road at Hallen, selected to represent the nearest residential dwellings on Severn Road to the south east of LT1. The microphone was mounted on a tripod in free field conditions at 1.8 m above ground level approximately, set back from the carriageway on the grass verge. The immediate environment comprises open agricultural fields with overhead electricity lines and intermittent local road traffic passing along Severn Road, with distant motorway noise from the strategic network forming a relatively constant background, particularly during lulls in local vehicle activity.
ST2	354611	179837	ST2 was an attended short term free field measurement position on Moorhouse Lane at Hallen, selected to represent the nearest residential dwellings along Moorhouse Lane to the southeast of LT1. The microphone was mounted on a tripod in free field conditions at an approximate height of 1.8 m above ground level, positioned on the grass verge adjacent to the road, close to the junction and set back from the carriageway. The immediate environment comprises open agricultural land and roadside vegetation, with intermittent local vehicle pass-bys on Moorhouse Lane and occasional activity associated with nearby recreational facilities. Distant motorway traffic from the strategic network forms a relatively steady background noise level between local events.
ST3	355978	181546	Attended short term free field measurement position on Berwick Lane, selected to represent the nearest residential dwellings along Berwick Lane to the east of LT1. The microphone was mounted on a tripod in free field conditions at an approximate height of 1.8 m above ground level, positioned on the verge at the junction, set back from the carriageway and adjacent to roadside hedgerows. The immediate environment comprises open agricultural fields with sparse development and occasional access movements associated with nearby farm properties, with local vehicle pass-bys on Berwick Lane providing the principal short duration events. Between local events, the background environment is characterised by distant strategic road traffic noise, with natural sounds audible during lulls.

4.2.2. Acoustic character of the area. Site observations

The acoustic environment in the vicinity of the proposed development and the nearest residential receptors at Hallen and Berwick Lane is dominated by distant but steady strategic road traffic, with the M5 and M49 during, forming a near continuous baseline at the attended locations, particularly during night-time when M5 motorway tyre noise was described as constant. At the receptor locations themselves, localised short duration events were driven by occasional vehicle pass-bys on Severn Road, Moorhouse Lane and Berwick Lane, with birdlife audible during lulls during the daytime. Intermittent sounds not related to road traffic were limited, including a distant train pass-by noted at ST1 during the night-time period, faint industrial sounds observed to the west at times (in the direction of the Avonmouth industrial

estate), and a brief intermittent distant thumping noise perceived at ST2 from the east from an unconfirmed source. Noise from two nearby wind turbines were not particularly perceptible while the night-time measurements were carried out.

4.2.3. Equipment

The equipment used during the survey, shown in Table 4, was compliant with the requirements stated in BS 7445 'Description and measurement of environmental noise'. The calibration of the sound level meters was field checked at the start and end of the survey periods. No relevant drifts were detected between the start and the end of the chain of measurements.

Table 4: Sound measurement equipment used during the survey. Details of field calibration check.

Manufacturer/model	Serial number	Equipment	Calibration check start	Calibration check end	Calibration drift
Svantek SV307A	154447	Sound level meter	113.94 dB	113.90 dB	-0.04 dB
Svantek SV307A	158652	Sound level meter	113.97 dB	113.91 dB	-0.06 dB
Svantek SV307A	154452	Sound level meter	113.93 dB	113.95 dB	+0.02 dB
Svantek SV36	139153	Acoustic calibrator	---	---	---

Detailed survey data and calibration certificates are available upon request.

4.2.4. Weather conditions

Based on data from a nearby weather station, the baseline survey period from 14 January 2026 13:00 to 29 January 2026 08:00 included periods which were affected by adverse weather conditions, which have been excluded from the analysis:

- Wind
 - Wind speeds were generally below 5 m/s for the majority of the survey period, with only occasional brief exceedances.
- Precipitation
 - Rainfall occurred at times during the survey period. These periods have been marked in Figure 16 to Figure 18 in Appendix C.
- Temperature
 - Temperatures were typical of mid-winter conditions, ranging from approximately 1.6°C to 10.8°C throughout the survey period.

4.2.5. Noise survey results

Appendix C includes details of the noise survey carried out.

Table 5 shows the typical residual ($L_{A90,T}$) and background ($L_{Aeq,T}$) sound levels for daytime and night-time measured at each location where noise monitoring was carried out.

Table 5: Summary of long-term noise monitoring results

No.	Start / end date & time	Daytime		Night-time	
		L _{Aeq,T} (dB)	L _{A90,T} (dB)	L _{Aeq,T} (dB)	L _{A90,T} (dB)
LT1	14/01/2026 13:00 to 29/01/2026 08:00	60	49	56	47
ST1	14/01/2026 13:33 to 14/01/2026 13:43 and 28/01/2026 23:00 to 28/01/2026 23:30	67	48	58	50
ST2	14/01/2026 13:15 to 14/01/2026 13:25 and 29/01/2026 00:20 to 29/01/2026 00:50	57	53	54	50
ST3	14/01/2026 13:50 to 14/01/2026 14:00 and 28/01/2026 23:41 to 29/01/2026 00:11	51	43	48	46

5. Construction noise from the site

5.1. Site and construction assumptions

There is currently limited information about the construction and decommissioning of the proposed development. This document uses typical phases and machinery expected in such projects as outlined in BS 5228-1, the approved code of practice for construction noise.

The following assumptions have been considered:

- It is assumed that each construction phase will take place in isolation of the other phases. Within each construction phase it is assumed that there will be some overlapping between activities.
- It has been assumed that the construction phase will be carried out without an overlapping of both operational and construction noise – in other words operations will not commence until construction has been completed.
- On average, it is considered that the typical construction works are represented for the items of plant listed in Table 6 assuming a percentage of on-time of approximately 100%. In reality, the percentage of on-time will be lower. However, the number of items of plant operating at any time is likely to be higher. On average, one assumption is likely to compensate the other.
- Noise effects during the decommissioning phase of the scheme will be similar to or less than noise effects during the construction phase; therefore construction and decommissioning impacts are considered together. The noise assessment presented is considered a conservative representation of the decommissioning phase.
- It is also assumed that decommissioning activities of the former plastics recycling facility building will be undertaken. However, these activities are not expected to be the dominant noise source with respect to construction noise at the closest noise sensitive receptors.

Table 6: Typical construction phases and equipment

Phase	Activity	Equipment	L _{Aeq,T} at 10m	BS 5228-1 plant item
Site preparation	Clearing site	Dozer (20t)	75	C.2.1
		Excavator (22t)	78	C.2.3
		Backhoe loader (8t)	68	C.2.8
	Haulage	Dump truck	89*	C.6.14
		Road lorry	80*	C.6.21
	Ground excavation / earthworks	Dozer (41t)	80	C.2.10
		Excavator (40t)	79	C.2.14
	Loading lorries	Loader	79	C.2.26
		Excavator (15t)	79	C.2.29
	Distribution of material	Dump truck (29t)	79	C.2.30
		Lorry (4-axle wagon)	80*	C.2.34
		Telescopic handler (10t)	71	C.2.35
	Rolling and compaction	Dozer (20t)	81	C.2.36
		Roller (18t)	79*	C.2.37

Phase	Activity	Equipment	L _{Aeq,T} at 10m	BS 5228-1 plant item
		Vibratory roller (4t)	74*	C.2.39
	Ground investigation drilling	Cable percussion drilling rig (2t/150mm diameter/75m depth)	74	C.2.43
	Pumping water	Water pump (6in)	65	C.2.45
Platform construction works	Distribution of materials	Dump truck (29t)	79	C.2.30
		Lorry (4-axle wagon)	80*	C.2.34
		Telescopic handler (10t)	71	C.2.35
	Mixing concrete	Cement mixer truck	75	C.4.18
		Concrete mixer truck	80	C.4.20
		Large concrete mixer	76	C.4.22
	Pumping concrete	Pump+mixer truck	67	C.4.24
		Pump+boom arm truck	80	C.4.29
	Lifting	Mobile telescopic crane (400t)	78	C.4.38
		Mobile telescopic crane (55t)	82	C.4.45
Trenching	Tracked excavator	77	C.4.63	
	Backhoe loader	69	C.4.66	
Moving equipment	Tractor (towing equipment)	80	C.4.74	
Power for site cabins	Diesel generator	66	C.4.78	
Road construction works	Breaking road surface	Backhoe mounted hydraulic breaker	88	C.5.1
	Road planning	Road planner	82	C.5.7
	Spreading chipping-fill	Dozer (14t)	77	C.5.12
		Dozer (11t)	82	C.5.13
	Earthworks	Bulldozer (35t)	86*	C.5.14
		Dump truck (25t)	81*	C.5.16
		Excavator (35t)	80	C.5.18
	Rolling and compaction	Road roller	80*	C.5.19
		Vibratory roller	75	C.5.20
		Vibratory compacter (asphalt)	82	C.5.29
	Paving	Asphalt paver (+tipper lorry)	75	C.5.30
	Trenching	Wheeled excavator	70	C.5.34
		Tracked excavator	75	C.5.35
Power for site cabins	Diesel generator	66	C.4.78	
Electrical works	Haulage	Dump truck	89*	C.6.14
		Road lorry	80*	C.6.21
	Lifting	Mobile telescopic crane (400t)	78	C.4.38
Mobile telescopic crane (55t)		82	C.4.45	

Phase	Activity	Equipment	L _{Aeq,T} at 10m	BS 5228-1 plant item
	Power for welder	Diesel generator	66	C.4.85
	Power for lighting	Diesel generator	65	C.4.86
Miscellaneous		Angle grinder (grinding steel)	80	C.4.93
		Petrol generator for hand-held grinder	75	C.4.94
		Directional drill (generator)	77	C.4.96
Power for site cabins		Diesel generator	66	C.4.78

* Drive-by maximum sound pressure level L_{Amax} (dB)

5.2. Construction noise arising from the site

Table 7 shows the predicted noise levels at the closest noise sensitive receptors arising from the construction site. As shown in Table 5, LT1, ST2 and ST3 are in a BS 5228-1 Category A area during the daytime, where a LOAEL of 65 dB L_{Aeq,T} and a SOAEL of 75 dB L_{Aeq,T} apply. ST1 is in a BS 5228-1 Category B area during the daytime, where a LOAEL of 70 dB L_{Aeq,T} and a SOAEL of 80 dB L_{Aeq,T} apply. The LOAEL for the evening and night time periods are 55 and 45 dB L_{Aeq,T} respectively. During the night-time period, all LT1, ST1, ST2 and ST3 are in a BS 5228-1 Category C area.

The predicted construction noise levels in Table 7 are below the daytime LOAEL at all receptors for all modelled activities, with the highest predicted level of 59 dB L_{Aeq,T} at Copart's offices and predicted levels of 30 to 36 dB L_{Aeq,T} at the residential receptors. Copart's offices are a commercial receptor and does not operate at night, therefore it is not relevant to night-time assessment. At the time of writing, no reasons have become evident to require night-time works and, therefore, as a mitigation measure, construction works should only take place during daytime.

Table 7: Predicted typical construction noise levels at noise sensitive receptors during construction

Noise sensitive receptor	Site preparation	Platform construction	Road construction	Electrical works
	L _{Aeq,1h} (dB)	L _{Aeq,1h} (dB)	L _{Aeq,1h} (dB)	L _{Aeq,1h} (dB)
Copart Offices (outdoors)	59	59	56	59
Elmington Manor Farm	34	34	31	34
Spaniorum Farm (near)	32	32	30	32
Hallen	36	36	33	36
Hallen Farm	35	35	33	35
Hiways Park	32	32	30	32

5.3. Construction traffic noise

The predicted number of construction vehicles on public roads related to the proposed development during construction has been considered. It is assumed that 5 to 10 HGVs on average will be required on site per day during the majority of the construction period, with up to a maximum of 20 HGVs per day assumed during delivery periods.

In accordance with BS 5228 1 Formula F.6, up to a maximum of 40 HGVs per day would correspond to an equivalent continuous sound level of 48 dB $L_{Aeq,1h}$ at the nearest receptor along the route, namely Copart Offices at a distance of 180 metres, assuming a vehicle speed of 5 miles per hour. At higher speeds the noise levels would reduce due to the lower contribution of the engine level. This noise level is not expected to exceed the LOAEL at the nearest receptor.

Unless otherwise agreed and justified, construction traffic should be limited to daytime periods to avoid exceeding the LOAEL during the evening and night-time periods.

5.4. Other assumptions, limitations and uncertainty

Once further information on the actual construction management plan becomes available, the potential impacts of construction works should be re-assessed.

6. Operational noise from the site

6.1. Site noise

6.1.1. Proposed operational site plan

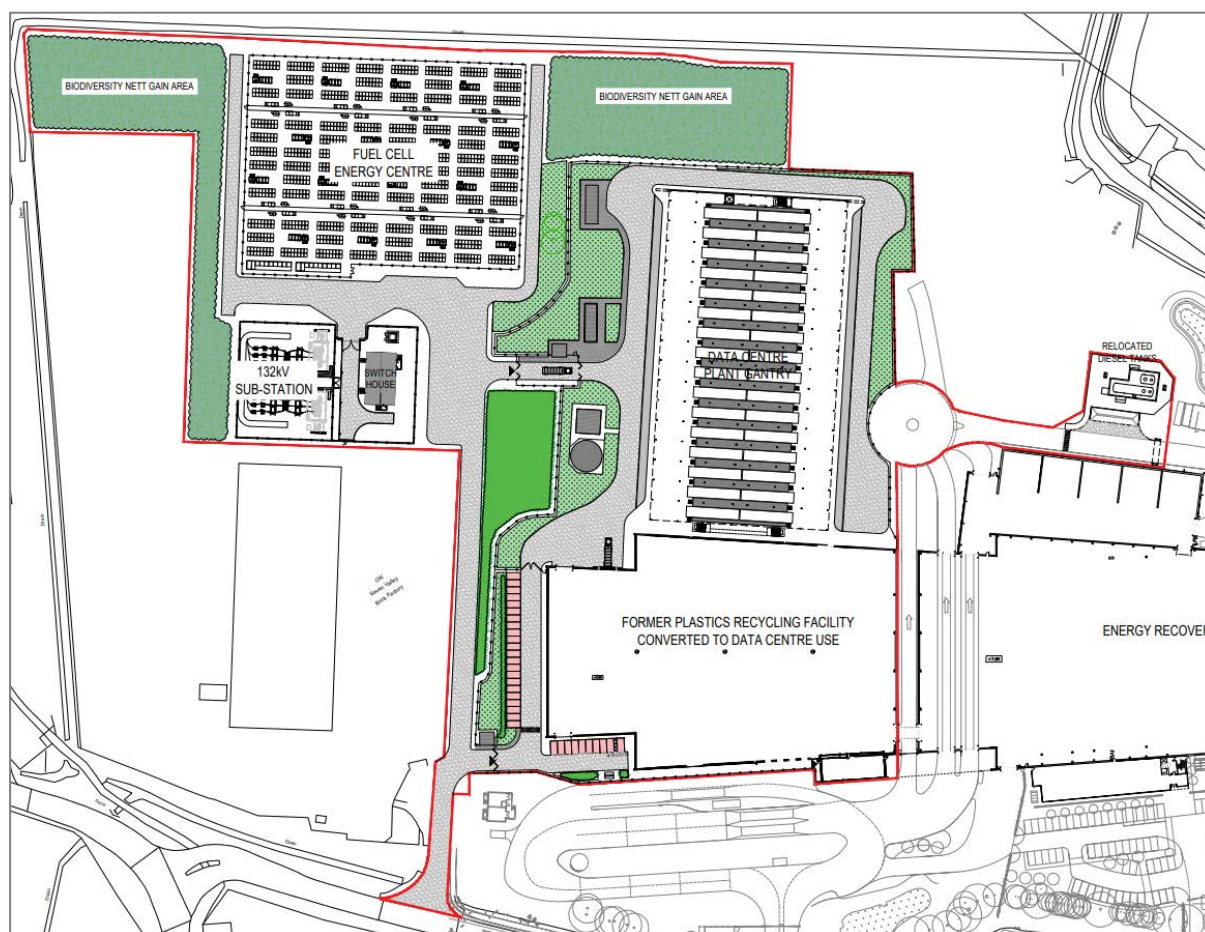
The Proposed Development has been modelled in 3D with specialist environmental noise software CadnaA, which implements the calculation procedures of ISO 9613-2.

Figure 4 shows the proposed overall site plan. Three main areas with noise sources have been identified:

- A High Voltage (HV) substation (132kV);
- A Fuel centre energy centre; and
- A Data centre plant gantry.

Each of these three main areas are described in the following section.

Figure 4: Proposed overall site plan



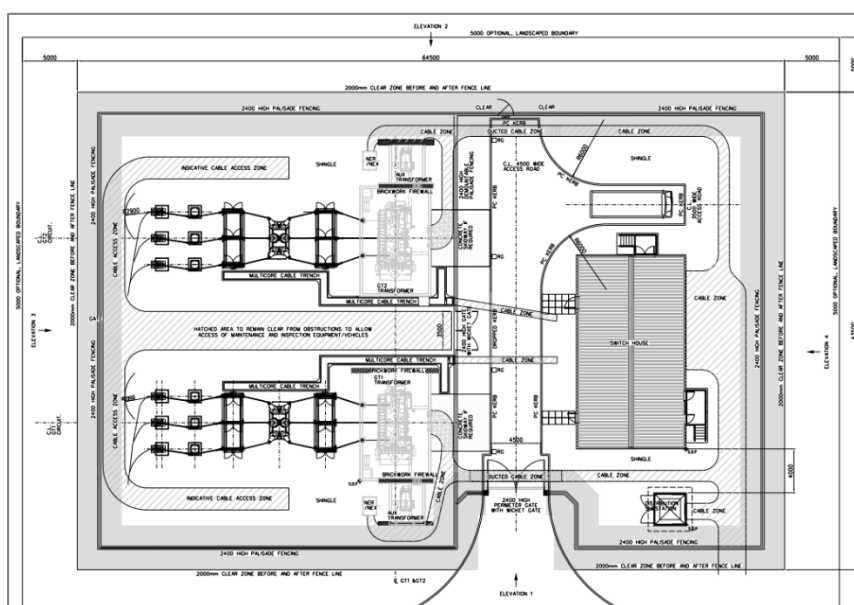
6.1.2. Normal operation

HV Substation

The high voltage (132 kV) substation will have either two 25MVA transformers or four 15MVA transformers. In accordance with standard VDI 3739:1999 'Characteristic noise emission values of technical sound sources – Transformers', the total sound level arising from two 25MVA is slightly higher than the total sound from four 15MVA. The scenario with two 25MVA has been used in the sound predictions used in this assessment.

Figure 5 shows the layout of the substation based on two high voltage transformers.

Figure 5: Substation layout.



Fuel cell energy centre

The fuel cell energy centre will contain two main sources of noise, which are as follows:

- One hundred sixty fuel cells; and
- Sixteen 4MVA transformers.

Figure 6 shows the layout of the fuel cell energy centre. The drawing shows two types of fuel energy cells sets (each set is composed by eight cells), 144 PES (325 kW); and 16 PES (195 kW). Both types have been assumed to have the same sound emission.

Figure 6: Proposed fuel cell energy centre layout



Data centre plant gantry

Figure 7 and Figure 8 show the north and west elevations of the proposed data centre plant gantry. During normal operation, the following plant (all on the second floor of the gantry) will be in use:

- Eight chillers;
- Eight absorption chillers with dry coolers;
- Twenty four dry coolers; and
- Twenty four trim chillers.

Additionally, each electrical plant room (located on the first floor of the gantry) will have two condenser units attached to its rear wall. It has been assumed that these two condensers per electrical plant room will also be in use during normal operation.

The 8 chillers, 24 dry coolers and 24 trim chillers have been modelled with inlet and outlet attenuations provided by a type AA303S attenuator – refer to Figure 9 and to Table 11 below. Figure 7 shows the space available above these pieces of equipment to install the outlet attenuator.

Figure 7: Proposed gantry section (north elevation)

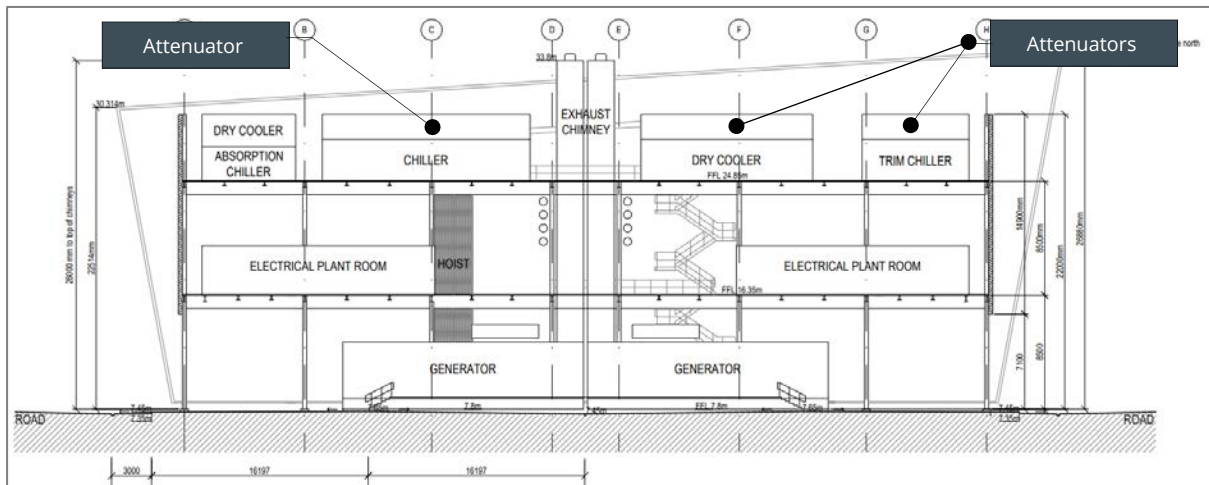


Figure 8: Proposed gantry section (west elevation)

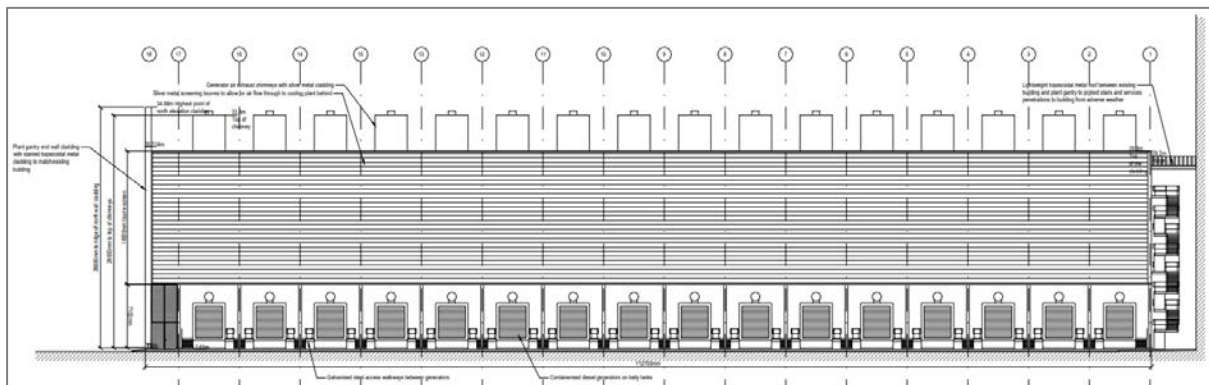


Figure 9: Example of acoustic attenuator AA303S



6.1.3. Emergency operation

During emergency operation, 32 generators could be operational simultaneously. The generators are located on the ground floor of the gantry (refer to Figure 7 and Figure 8 above) and each one is connected to a stack with the stack mouth located at a height of 26m above local ground.

Figure 10 shows the detail of the sound sources in the generator, which are as follows:

- The attenuated inlet; and
- The emission through the container walls, which include the direct and reverberated sound produced by the engine inside and the transmission through the walls. It has been assumed that the same sound level will be present at the exhaust silencer.

Figure 11 shows the connection point between the generator's container and stack and the stack mouth.

Figure 10: Details of the generator's inlet attenuator, container and exhaust silencer

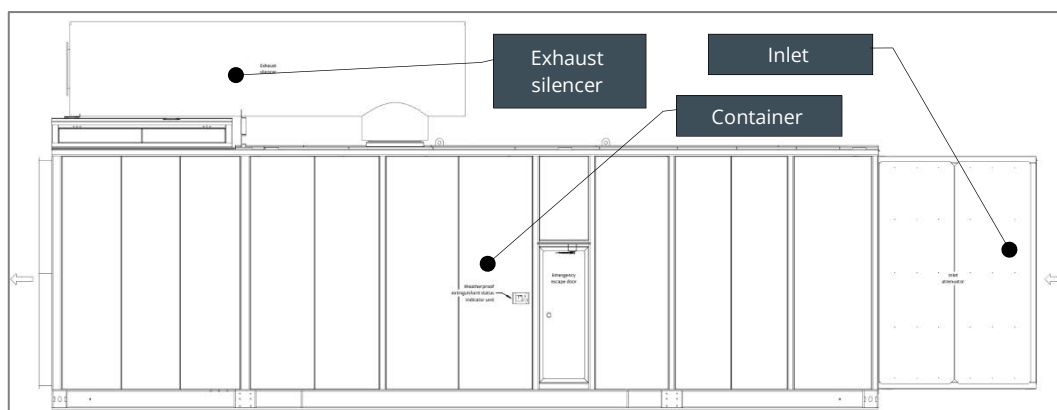
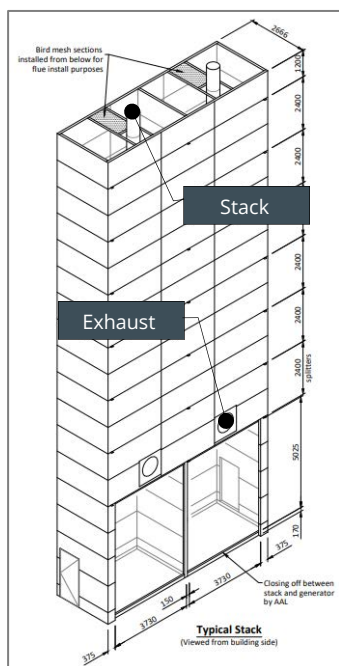


Figure 11: Details of the outlet generator stack and exhaust flue



6.2. Assumptions and limitations: operational noise

This operational noise assessment has been carried out on the basis of the assumptions and limitations highlighted below. The 3D noise model prepared to predict operational noise levels relies heavily on the accuracy of the provided data and the below assumptions. Departing from them could affect the predicted noise levels and associated impacts.

- The Proposed Development will operate every day of the year, 24 hours a day.
- The 8 chillers, 24 dry coolers and 24 trim chillers have been modelled with type AA303S attenuators incorporated at both the inlet and outlet. Noise data provided by the specialist supplier and the manufacturer have been used in the noise model.
- The sound data used for the chillers is based on target load sound levels, as provided by the specialist supplier. It has been considered that chillers will work at the target load as a conservative scenario.
- Dry coolers located on the absorption chillers do not incorporate attenuation. At detailed design stage further attenuation may be incorporated if required – however at this stage it does not appear to be necessary.
- No sound data has been provided for the generator’s stack. However, the specification drawings¹⁹ of the generator’s acoustic stack state the following: “The noise emissions for the generator, enclosure, exhaust duct and flue are designed to achieve 72dBA @ 1m all around generator including 1m from exhaust outlet”. The applicant has confirmed that this includes the stack mouth. As sound spectrums were not made available, the stack mouth has been modelled as an omnidirectional source with a sound power level of 83 dB(A) at 500Hz, which

¹⁹ Document “AVK - 3MVA-2.4MW Outlet Stack” – “Generator acoustic stacks general arrangement”

equates to a sound pressure level of 72 dB(A) at 1m from the stack mouth. It is acknowledged that the actual frequency spectrum from this source will be different – however overall sound levels at the assessed receptors shall be similar.

- The client has informed Himly that the switchgear and other similar ancillary components within the substation, fuel cell plant, and gantry are assumed to rarely operate. However, when such equipment operates, the sound levels generated are negligible compared with other sources included in the noise model. Consequently, the switchgear has not been incorporated into the noise model.
- The typical operational scenario assumes that all items of plant capable of operating under standard conditions are running concurrently at their target load. This represents a robust and conservative scenario, which would only be expected during the few days each year when ambient temperatures are at their highest.
- Generators are assumed to operate concurrently at the target load provided by the specialist designer, only in emergency and maintenance testing scenarios. Noise from the generators (when passed through the attenuators of the acoustic package) is not expected to be tonal or intermittent at the assessed receptors.
- Two prediction models have been produced: one where the generator containers, coolers and chillers have been modelled as point sources – and another where these sources have been modelled as area and vertical area sources. In both models, the fuel cells and the transformers have been modelled as area and vertical area sources, and each pair of condenser units attached to the Electrical Plant Room have been modelled as point sources. The model with point sources yields higher sound levels at the nearest noise sensitive receptors, and is therefore the case presented in this report, as it reflects a worst case scenario. Figure 12 to Figure 14 show 3D views of the two noise model versions.
- The Proposed Development has been modelled in 3D with specialist environmental noise software CadnaA, which implements the calculation procedures of ISO 9613-2, using the following settings and conditions (further details may be provided upon request):
 - Sound propagation calculation in accordance with ISO 9613-2:2014.
 - Ground absorption used was 0.4, which was considered in the context of the overall terrain between the source and the residential receptors – a mix of hard ground and green, acoustically absorptive terrain areas.
 - 2 orders of reflection have been used.
 - Building absorption used was 0.21 across all frequency bands.
 - Meteorological conditions: Temperature 20°C, relative humidity 70%, wind speed 3 metres per second.
 - Sound levels predictions at receivers are in free-field, to align with background sound levels which were measured in the same conditions.
 - All sound data used in preparing the noise model have been provided by the client (except transformer sound data, which have been sourced by Himly).
- It has been assumed that all plant will be installed using suitable fixings, structures, piping and other services and built elements to ensure that plant is adequately isolated from any

potential interconnected elements that may cause sound re-radiation due to structural noise or vibration.

- Low frequency noise has not been assessed for sound sources whose spectral data was not available in one-third octave bands.
- Appendix D lists the noise data sources which have been incorporated into the noise model.

Figure 12: 3D view of the noise model with the fuel cell energy centre in the foreground, the substation at the right and the plant gantry at the left.

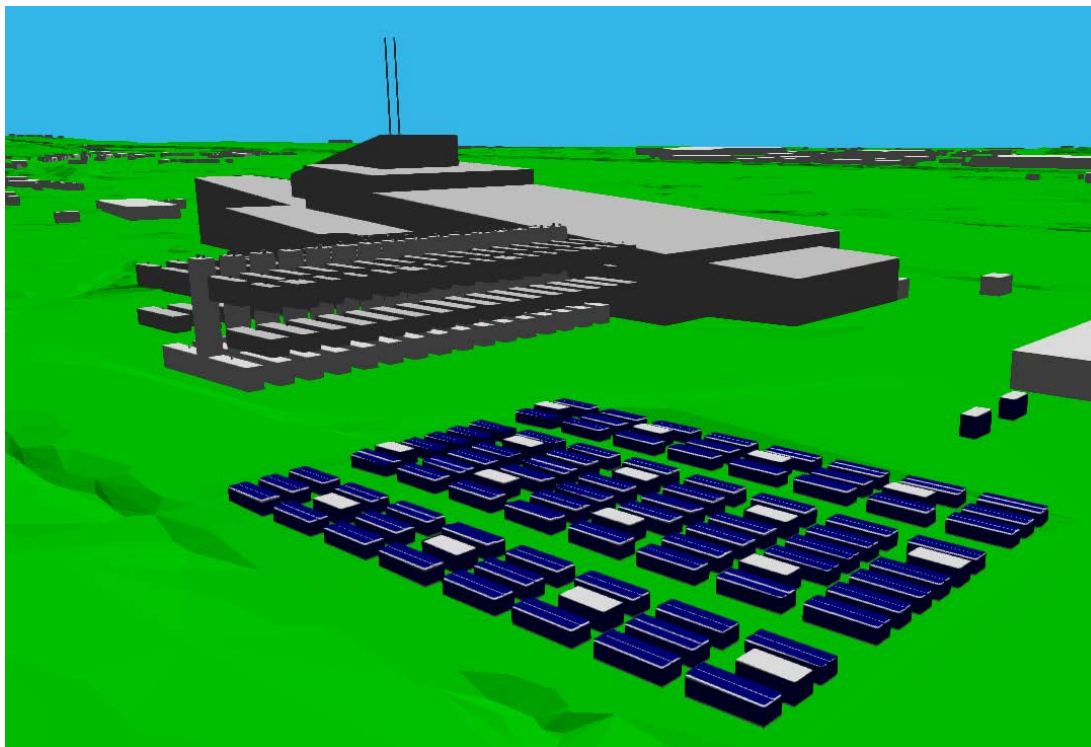


Figure 13: 3D view of the noise model with generators, chillers and coolers modelled as point sources.

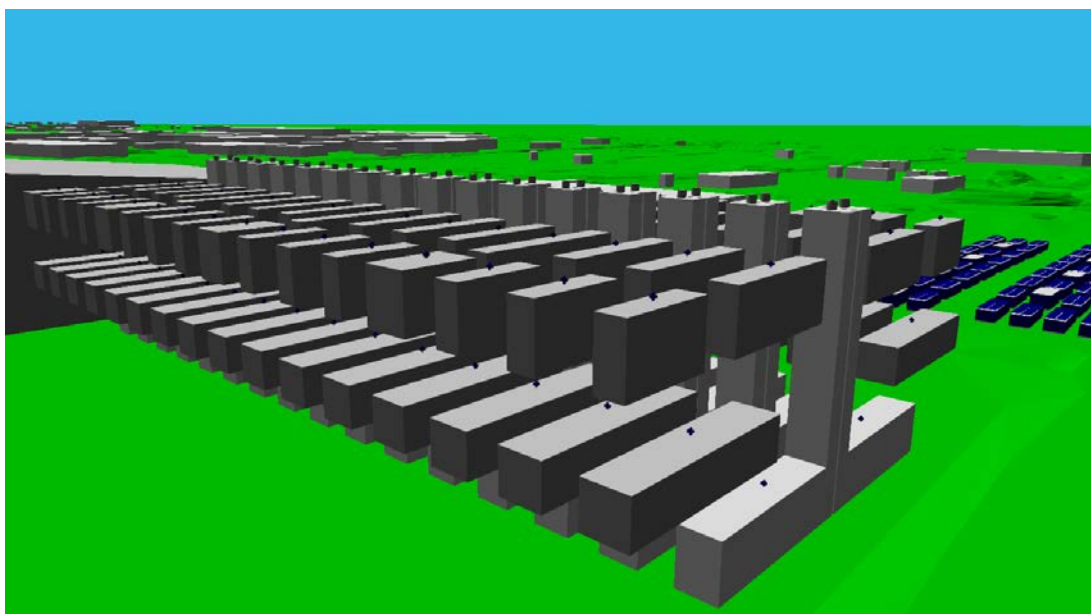


Figure 14: 3D view of the noise model with generators, chillers and coolers modelled as area sources.

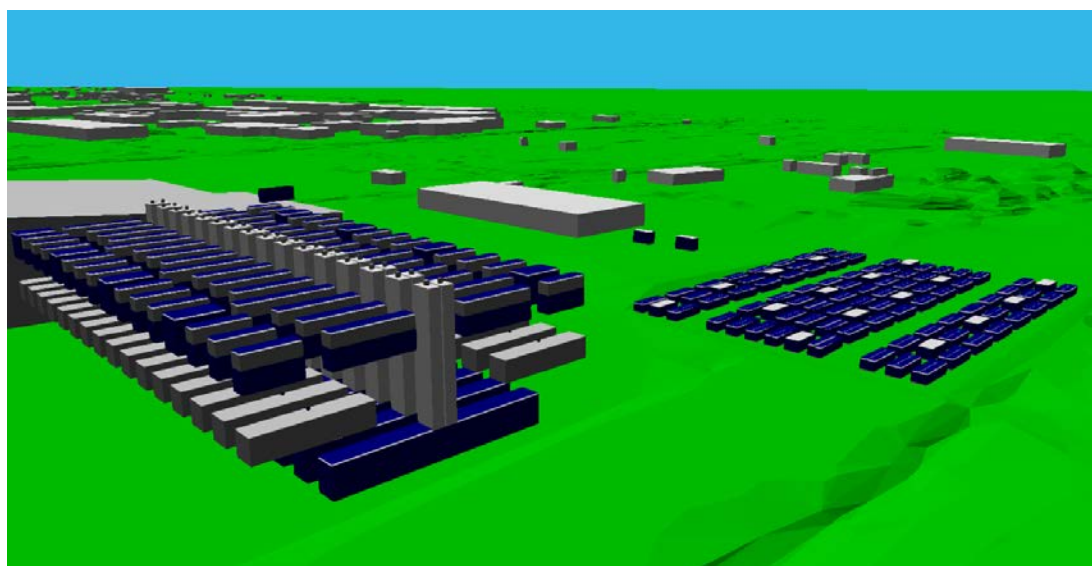


Table 8 shows the sound power level for each proposed plant item.

Table 8: Sound power level spectrum L_{WA} (dB) of proposed equipment

Equipment	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz
Generator: Enclosure	63.9	77.9	74.9	72.9	74.9	75.9	74.9	76.9
Generator: Inlet Attenuator	70.9	81.9	72.9	62.9	60.9	61.9	63.9	84.9
Generator: Stack mouth	---	---	---	83.0	---	---	---	---
Electrical Plant Room: 1xCondenser	50.8	53.4	55.9	59.8	59.0	57.2	52.0	48.9
Trim Chiller*	61.8	72.9	87.9	96.3	92.5	91.2	84.5	79.9
Dry Cooler		84.0	100.0	102.0	101.0	98.0	92.0	82.0
Chiller (target load)	71.8	81.9	97.4	94.8	97.0	95.7	91.0	83.9
Absorption Chiller + Dry cooler		81.0	99.0	101.0	98.0	95.0	91.0	83.0

* Data originally provided in L_w (dB).

Table 9 shows the sound power levels for a fuel cell set, which contains eight fuel cells each.

Table 9: Fuel cells. Sound power level spectrum (L_w (dB))

Equipment	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz
Fuel Cell (x8) top	---	---	---	66.2	66.1	64.6	63.9	66.3
Fuel Cell (x8) front	---	---	---	67.9	68.4	66	65.6	65.9
Fuel Cell (x8) rear	---	---	---	69.7	70.3	68.6	67.2	69.0
Fuel Cell (x8) right and left	---	---	---	58.9	62.1	56.0	57.0	57.5

Equipment	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz
Fuel Cell (x8) top	74.0	73.0	71.3	69.6	67.7	68.4	70.4	71.8
Fuel Cell (x8) front	73.8	74.6	75.6	78	77.2	74.8	75.7	77.1
Fuel Cell (x8) rear	75.8	75.2	75.1	71.7	69.9	68.2	68.0	68.7
Fuel Cell (x8) right and left	60.9	60.5	59.4	58.7	58.2	57.2	58.0	59.0
Equipment	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz
Fuel Cell (x8) top	67.3	64.4	64.8	62.9	63.2	64.6	58.1	56.0
Fuel Cell (x8) front	72.2	69.5	73.2	68.1	70.5	64.3	61.6	60.2
Fuel Cell (x8) rear	63.2	61.2	61.2	57.5	59.1	56.7	54.2	51.5
Fuel Cell (x8) right and left	52.6	51.0	54.4	48.7	51.1	45.2	42.2	40.2

Table 10 shows the sound power levels of the substations' 25MVA transformers and the 4MVA transformers of the fuel cell energy centre.

Table 10: Transformers. Sound power level spectrum L_{WA} (dB)

Equipment	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz
25MVA transformer	---	17.0	22.0	30.2	34.3	38.1	68.4	45.3
4 MVA transformer	---	1.5	6.5	14.7	18.8	22.6	52.9	29.8
Equipment	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz
25MVA transformer	48.3	62.7	49.8	66.9	63.7	68.3	69.6	67.7
4 MVA transformer	32.8	47.2	34.3	51.4	48.2	52.8	54.1	52.2
Equipment	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz
25MVA transformer	63.5	62.1	62.5	62.7	62.8	61.7	59.5	56.1
4 MVA transformer	48.0	46.6	47.0	47.2	47.3	46.2	44.0	40.6
Equipment	6.3kHz	8kHz	10kHz	---	---	---	---	---
25MVA transformer	52.4	47.4	43.0	---	---	---	---	---
4 MVA transformer	36.9	31.9	27.5	---	---	---	---	---

Table 11 shows the acoustic performance of the attenuators available for the trim chillers, chillers and dry coolers. The noise model has considered the attenuation provided by the model AA303S.

Table 11: Attenuation of proposed acoustic attenuators. Minimum insertion loss spectrum (dB).

Attenuator	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz
AA303S	-4	-8	-13	-22	-24	-21	-18	-14

6.3. BS 4142 assessment

A detailed BS 4142 assessment has been carried out for each of the nearest noise sensitive receptors. The detailed assessment is provided in Appendix E.

Table 12 shows the predicted sound levels at the nearest noise sensitive receptors during normal operation. Only Copart's offices are predicted to be subject to operational noise levels from the Proposed Development exceeding the background sound level by up to 3 dB(A). However, the acoustic environment of the area (residual sound) is dominated by road traffic noise arising from the M49 and M5 and other sounds of industrial nature. The sound from the Proposed Development is not expected to be particularly distinguishable in terms of character. It should be noted that Copart's site does not offer outdoor amenity, and therefore the sensitivity is restricted to the actual office space indoors. Consequently, the effect of the sound generated by the Proposed Development on Copart's office is considered non-adverse.

Both the specific sound and rating levels from the Proposed Development are predicted to be well below the background sound level at the nearest residential receptors during both daytime and night-time, being an indication of a low impact, and therefore, of non-adverse effects.

Table 12: Summary of predicted sound levels during normal operation as per BS 4142 assessment

Noise sensitive receptor	Rating sound level	Background sound level	Excess Rating level over Background	Impact
	L _{A,r,Tr} (dB)	L _{A90,T} (dB)	(dB)	
Copart Office outdoors, (day)	52	49	+3	Indicates a low impact
Elmington Manor Farm (day)	37	43	-6	Indicates a low impact
Elmington Manor Farm (night)	37	46	-9	Indicates a low impact
Settlement near Spaniorum Farm (day)	35	43	-8	Indicates a low impact
Settlement near Spaniorum Farm (night)	35	46	-11	Indicates a low impact
Hallen (day)	37	48	-11	Indicates a low impact
Hallen (night)	37	50	-13	Indicates a low impact
Hallen Farm (day)	36	48	-12	Indicates a low impact
Hallen Farm (night)	36	50	-14	Indicates a low impact
Hiways Park (day)	34	53	-19	Indicates a low impact
Hiways Park (night)	34	50	-16	Indicates a low impact

Table 13 shows the predicted sound levels at the nearest noise sensitive receptors during emergency operation. Similarly to the normal operations scenarios, during emergency operation no adverse effects are envisaged at any of the nearest noise sensitive receptors.

Table 13: Predicted sound levels during emergency operation as per BS 4142 assessment

Noise sensitive receptor	Rating sound level	Background sound level	Excess Rating level over Background	Impact
	$L_{A,T,r}$ (dB)	$L_{A90,T}$ (dB)	(dB)	
Copart Office outdoors, (day)	52	49	+3	Indicates a low impact
Elmington Manor Farm (day)	37	43	-6	Indicates a low impact
Elmington Manor Farm (night)	37	46	-9	Indicates a low impact
Settlement near Spaniorum Farm (day)	36	43	-7	Indicates a low impact
Settlement near Spaniorum Farm (night)	36	46	-10	Indicates a low impact
Hallen (day)	37	48	-11	Indicates a low impact
Hallen (night)	37	50	-13	Indicates a low impact
Hallen Farm (day)	37	48	-11	Indicates a low impact
Hallen Farm (night)	37	50	-13	Indicates a low impact
Hiways Park (day)	34	53	-19	Indicates a low impact
Hiways Park (night)	34	50	-16	Indicates a low impact

7. Mitigation

7.1. Construction

The predicted sound levels during the construction phase do not indicate that any restrictions should be imposed to carry out works during evenings, night-time, Saturday afternoons, Sundays, and bank holidays. However, this is subject to construction activities being in alignment with those assessed in section 5.

Notwithstanding the above, best practicable means shall be used at all times during construction.

7.2. Operation

The 8 chillers, 24 dry coolers and 24 trim chillers have been modelled with inlet and outlet attenuations provided by a type AA303S attenuator. An illustrative image is provided in Figure 15, showing a typical arrangement (with a free-standing, sliding attenuator).

Figure 15: Indicative image of an ASHP/Chiller Package type AA303S typical arrangement

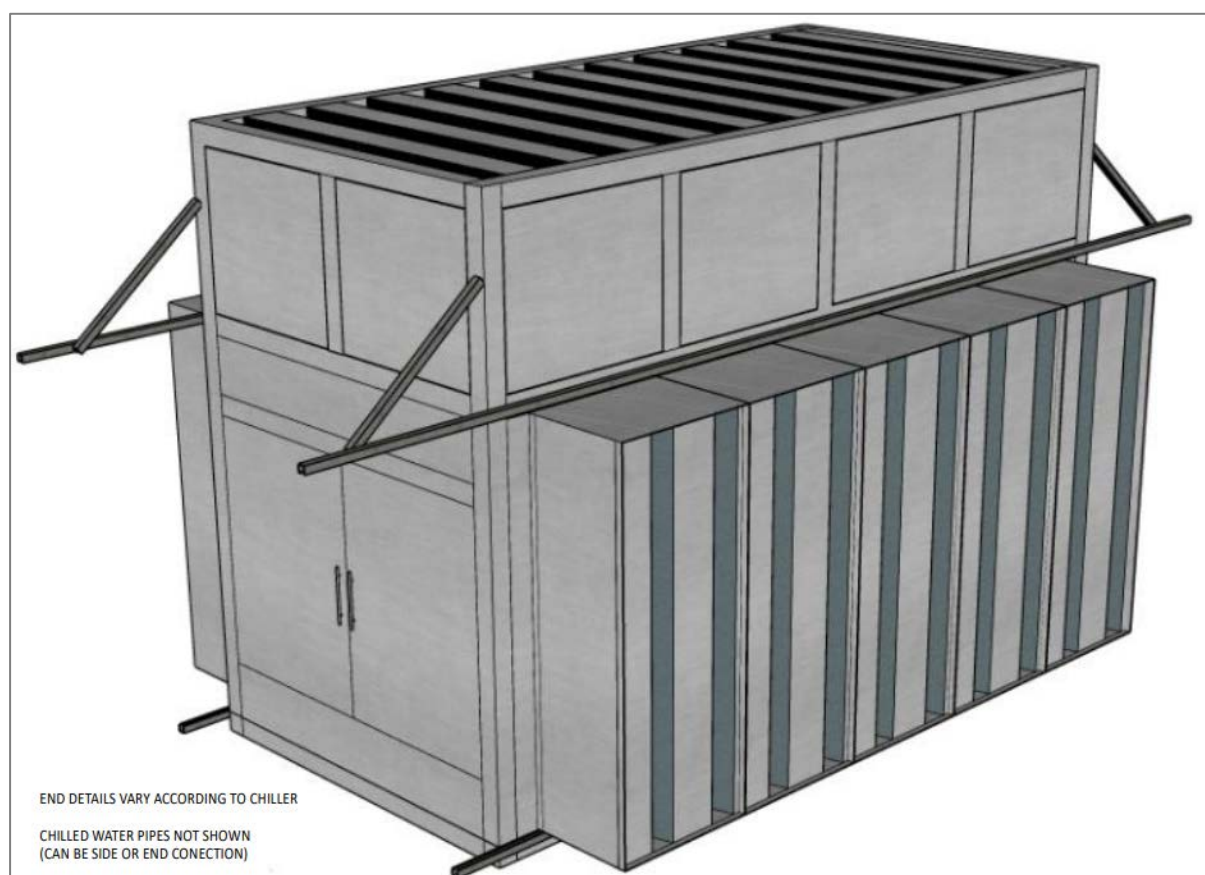


Image courtesy of Allaway Acoustics.

The specification drawings of the generator's acoustic stack state that "The noise emissions for the generator, enclosure, exhaust duct and flue are designed to achieve 72dBA @ 1m all around generator including 1m from exhaust outlet". The applicant has confirmed that this includes the stack mouth. The commissioning of the generator's stack shall ensure that the specified sound emission requirements are met.

8. Conclusions and recommendations

During construction, the Proposed Development is not expected to give rise to either adverse or significant adverse effects due to noise at the nearest sensitive receptors.

To reduce noise emissions during operations, the Proposed Development incorporates embedded mitigation measures, such as acoustic attenuation packages installed on cooling and chilling equipment, utilising close-fitting enclosures with attenuated inlet and discharge systems. The assessment concludes that the development is not expected to result in adverse or significant adverse effects related to noise at the nearest sensitive receptors during normal operations of the scheme and when generators are running in an emergency.

Provided that the embedded mitigation is correctly installed, commissioned and maintained, the Proposed Development is considered to adhere to the National Planning Policy Framework, Bristol's Development Framework and South Gloucestershire's Local Plan in terms of noise.

Appendix A: Authors of this report

XAVIER SANCHEZ-ROEMMELE

Xavier Sanchez-Roemmele has over 28 years' professional experience in environmental noise, architectural and building acoustics, and audio signal processing. He is a Director at Himly, a specialist environmental consultancy, and has previously led Acoustics and Noise teams in major consultancy firms in the UK (Capita, GL Hearn / WSP) and Australia (Hewshott International, Wood and Grieve Engineers).

Xavier is a Chartered Environmentalist (CEnv), Chartered Scientist (CSci), Full Member of the Institution of Environmental Sciences (MIEnvSc), Member of the Institute of Acoustics (MIOA), Member of the Audio Engineering Society (MAES), Member of the Australian Acoustical Society (MAAS), Member of the Institute of Electrical and Electronics Engineers (MIEEE), and a Fellow of the Acoustical Society of America.

Xavier has been a specialist adviser in acoustics on multiple government panels and has had a key role in advising on complex planning applications related to noise. He has also prepared expert evidence for planning inquiries and provided expert advice to support legal disputes.

Xavier has been responsible for the acoustic design of major architectural projects worldwide and for noise impact assessments for large scale key infrastructure and regeneration schemes in the UK. He has been responsible for the delivery of the sound, noise and vibration impact assessments undertaken by Capita for HS2 phase 2b.

JOSEP SIMONA

Dr Josep Simona is a Chartered Environmentalist (CEnv), Full Member of the Institution of Environmental Sciences (MIEnvSc), Member of the Institute of Acoustics (MIOA) and Member of the Institute of Air Quality Management (MIAQM).

Josep has over two decades' experience in environmental noise and vibration. He has undertaken noise assessments for a diverse range of projects, including roads, railway lines and the energy sector including substations and energy generating facilities, with a special focus on renewable and cogeneration technologies. He has produced technical guidelines and taken part with key roles in major infrastructure projects.

Josep Simona is a Director at Himly. He was previously a Technical Director at GL Hearn (Capita) and WSP. He has managed the noise assessments for several community areas affected by high-speed rail HS2 Phase 2b. Josep had previously led the noise assessments for the smart motorway projects at the M1 J23a-25, at the M1 J13-16 and in the A47 Improvements within Highways England's Collaborative Delivery Framework. Josep advised Kent County Council's Planning Applications Group on noise and vibration for five years, which encompassed energy and industrial developments as well as mineral and waste applications. Josep assessed the noise and vibration impacts during construction and operation of several electrical substation projects in Scotland and in the North of England.

FAUWAZ BAIG

Fauwaz Baig is a Principal Acoustic Consultant at Himly with over 10 years' professional experience in environmental noise and vibration, building acoustics, and 3D noise modelling. He has worked across a broad range of sectors, including energy, transport, residential, and industrial developments, providing acoustic consultancy services from feasibility through to planning and post-consent.

Before joining Himly, Fauwaz held positions at Hann Tucker Associates, Capita, GL Hearn, and WSP, where he developed strong technical and project delivery skills across complex infrastructure and environmental projects. His expertise includes construction noise and vibration monitoring and reporting in line with BS 5228, commercial and industrial sound assessments under BS 4142, and road traffic noise assessments in line with DMRB guidance.

Fauwaz has led and contributed to the acoustic input for major schemes, including road infrastructure projects and multiple SSEN energy infrastructure developments, as well as residential masterplans and industrial schemes for local authorities across the UK. He has project managed small to mid-sized schemes and regularly mentors junior staff, contributing to technical development within his teams.

Fauwaz is a Member of the Institute of Acoustics (MIOA) and brings a proactive, solution-focused approach to acoustic challenges in both urban and rural environments.

Appendix B: Glossary of terms

Term	Description
A-weighting	Refers to a standardised frequency response used in sound measuring instruments. Historically it was developed to model human ear response at low-level sounds.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
dB	Decibel
dB(A)	Decibel (A-weighted)
L_{A90,T}	Statistical noise descriptor: noise level not exceeded for 90% of the measurement period. Typically used to represent the background noise level. "A-weighted" over a time period "T".
L_{Aeq,T}	Equivalent noise level: equivalent energy averaged noise level which over a defined time period would contain the same energy as the time varying signal over the same time period. "A-weighted" over a time period "T".
Specific sound level	Sound level generated by a source of noise excluding contributions from other sources in the environment, as described in BS 4142.
L_{Ar,Tr}	Defined in BS 4142 as "rating sound level". Specific sound level as defined by BS 4142, plus any adjustment for the characteristic features of the specific sound which will attract attention, which are tonality, impulsivity, intermittency and other sound characteristics.
L_w	The sound power level is the sound energy constantly transferred per second from the sound source. A sound source has a given constant sound power that does not change. Sound power level (L _w or SWL) is not to be mistaken for sound pressure level (SPL or L _p). A sound source produces sound power (L _w), and this in turn generates a sound pressure fluctuation (SPL) in the air. Sound power (L _w) is not dependent on distance, whereas sound pressure (SPL) is distance-dependent. The sound power level of a noise source is a fixed value, whereas the sound pressure level varies with the location and the environment.

Appendix C: Noise survey supplementary data

Figure 16: L_{Amax} , $L_{Aeq,T}$ and $L_{A90,T}$ at LT1 from 14/01/2026 to 21/01/2026

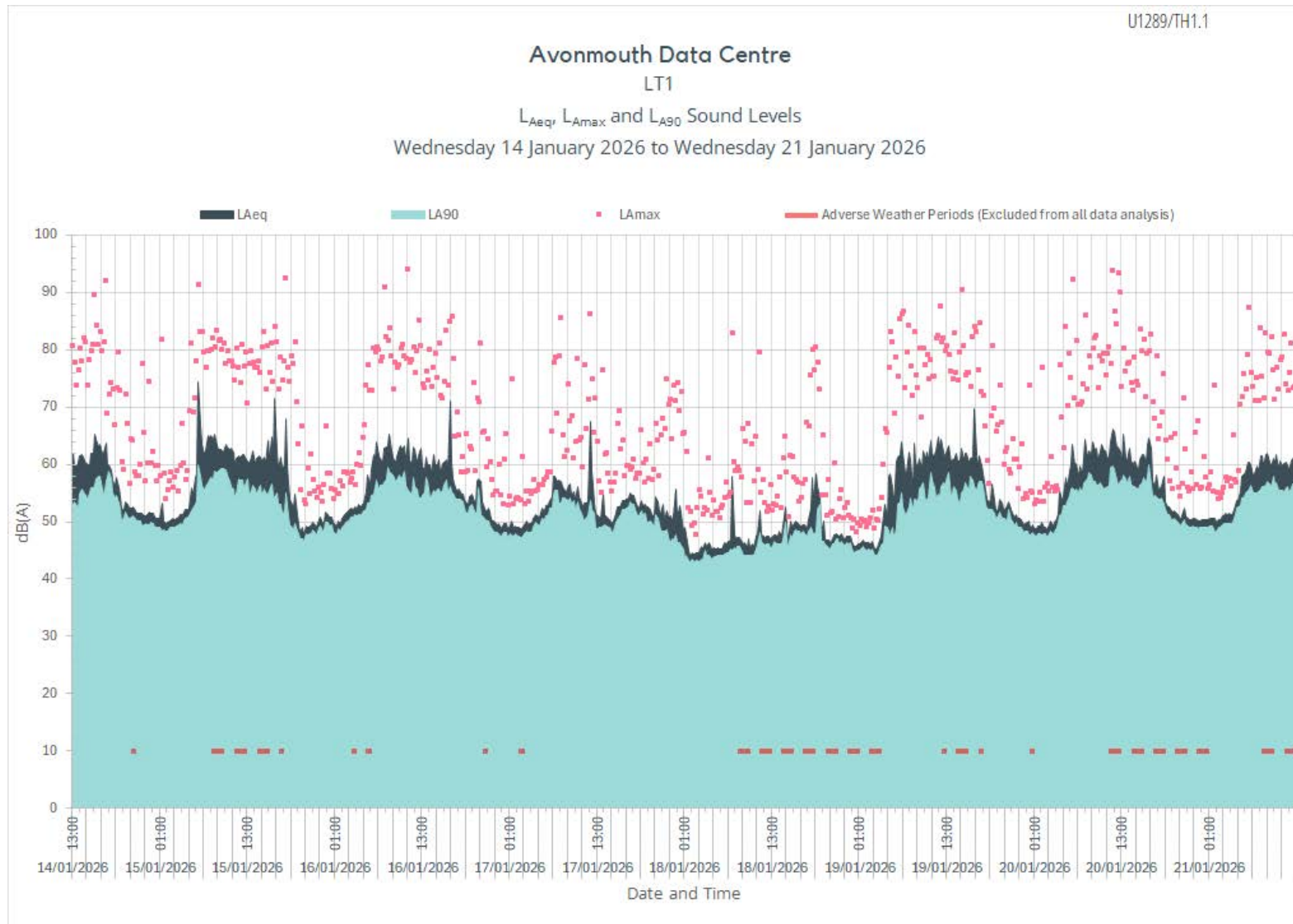


Figure 17: L_{Amax} , $L_{Aeq,T}$ and $L_{A90,T}$ at LT1 from 21/01/2025 to 28/01/2025

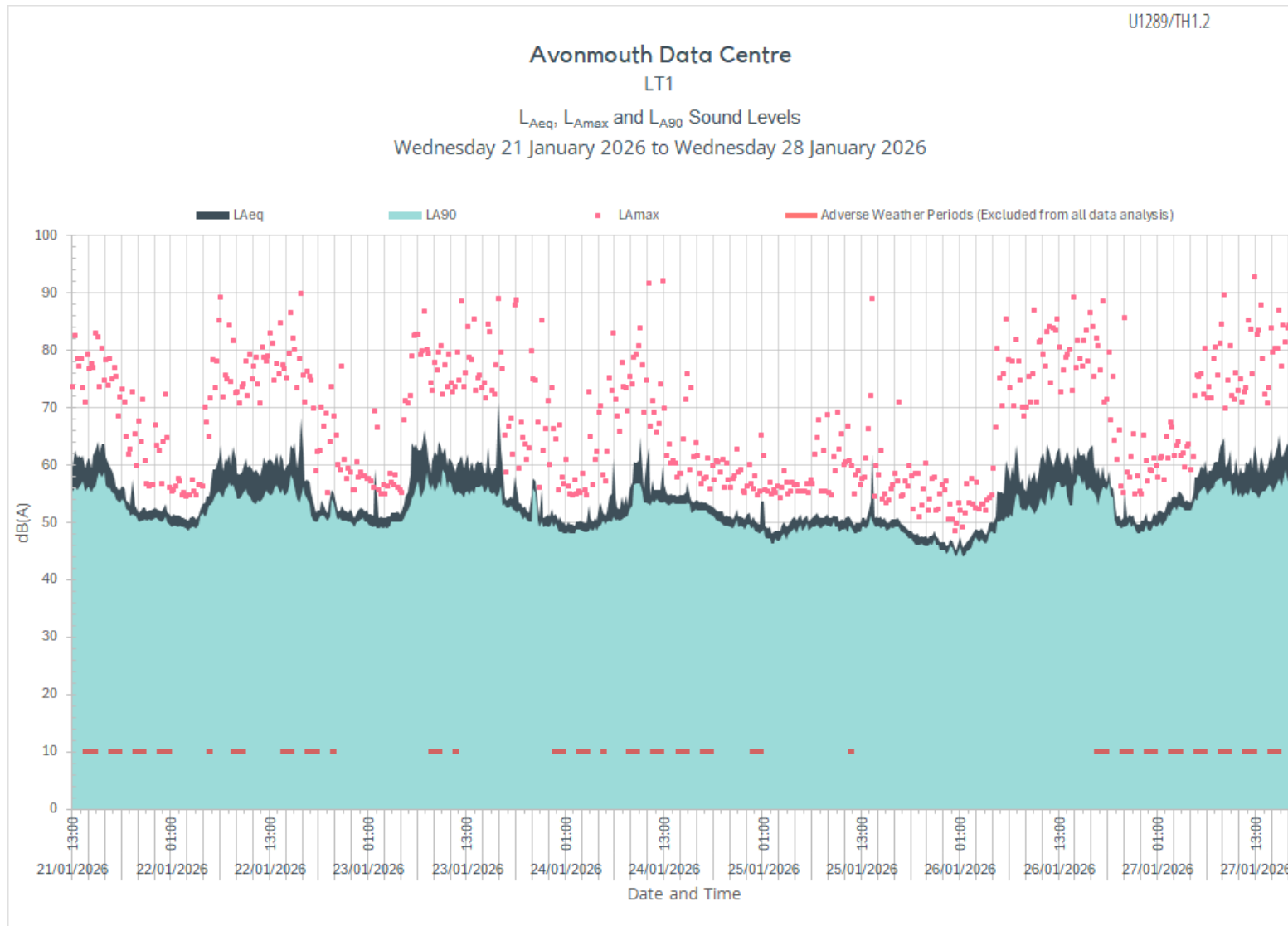


Figure 18: L_{Amax} , $L_{Aeq,T}$ and $L_{A90,T}$ at LT1 from 28/01/2026 to 29/01/2026

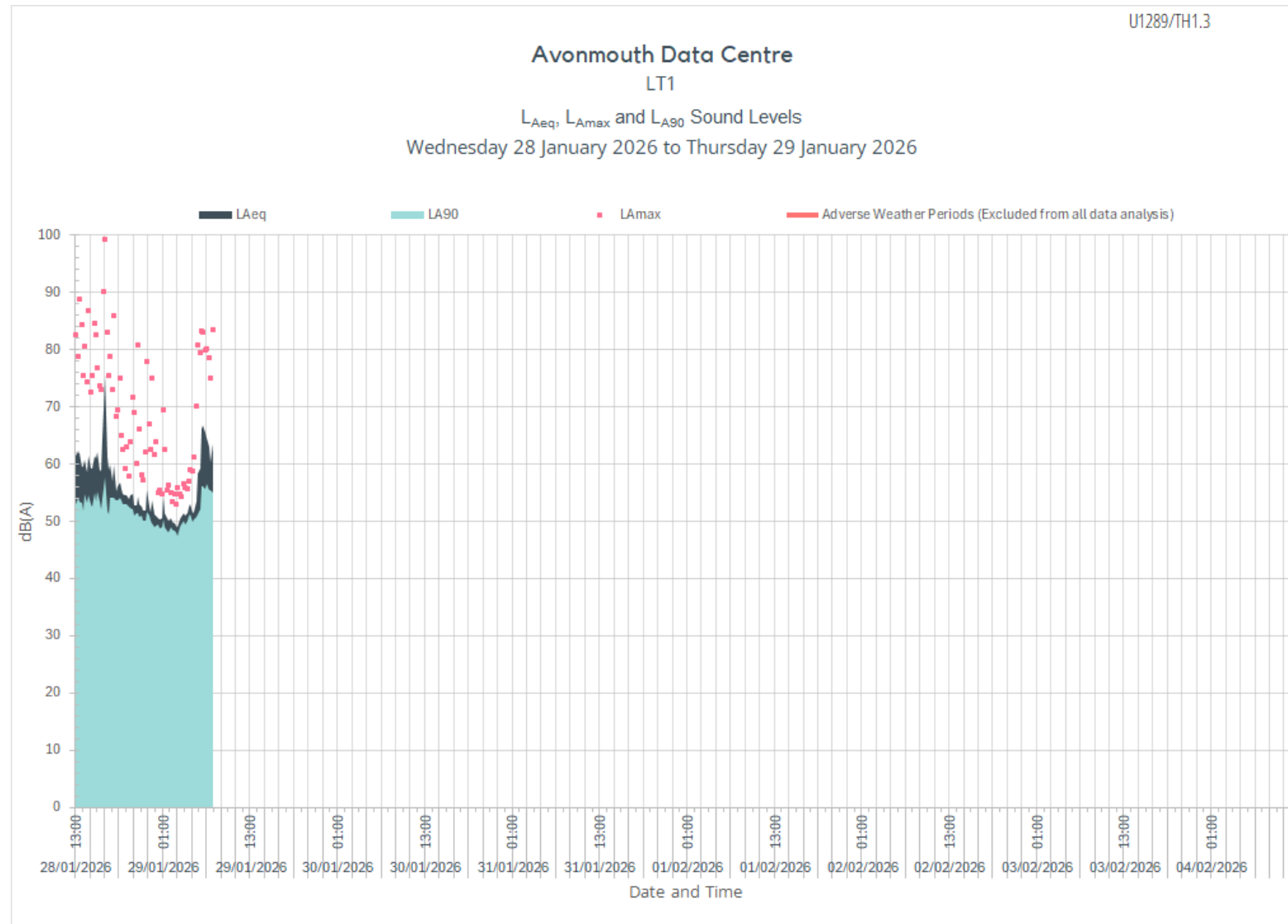


Figure 19: Typical daytime background sound level at LT1.

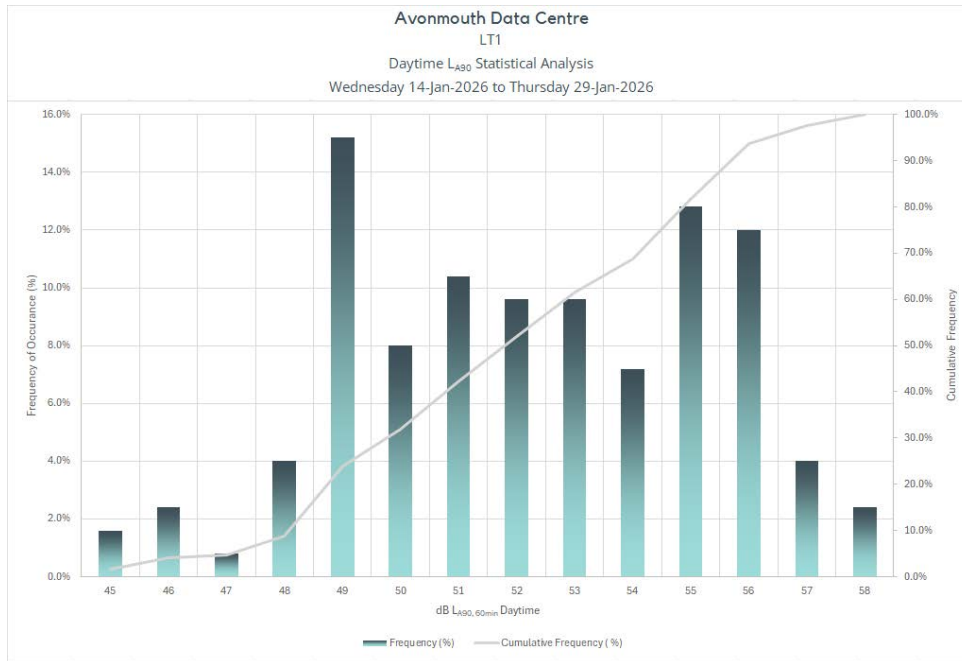
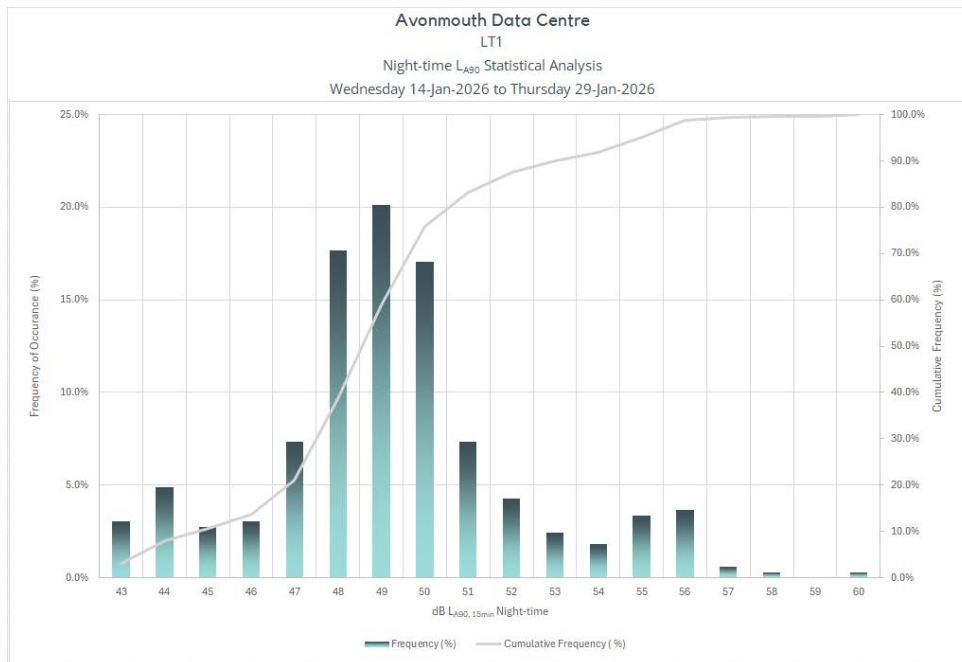


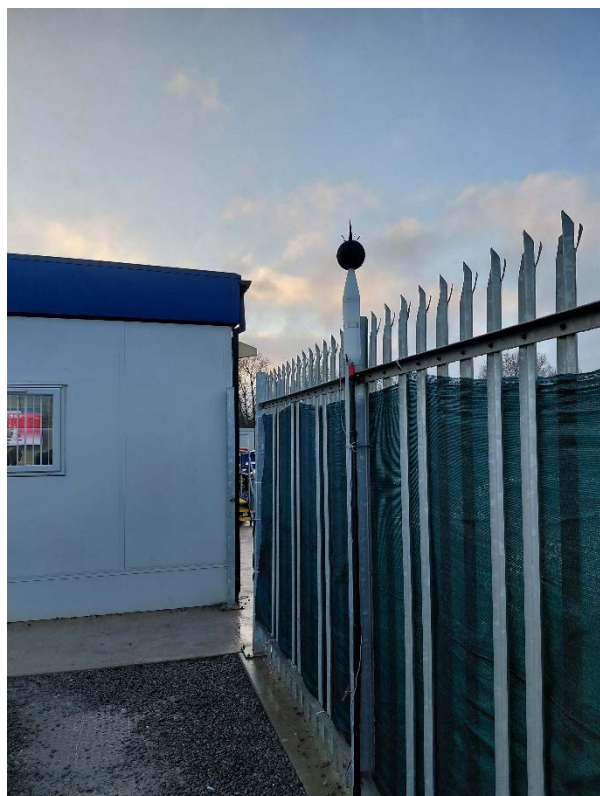
Figure 20: Typical night-time background sound level at LT1.



Photograph 1: Monitoring position at LT1 looking towards the Viridor plant next to the Proposed Development.



Photograph 2: Monitoring position at LT1 looking towards Copart's offices.



Photograph 3: Monitoring position at ST1 (daytime).



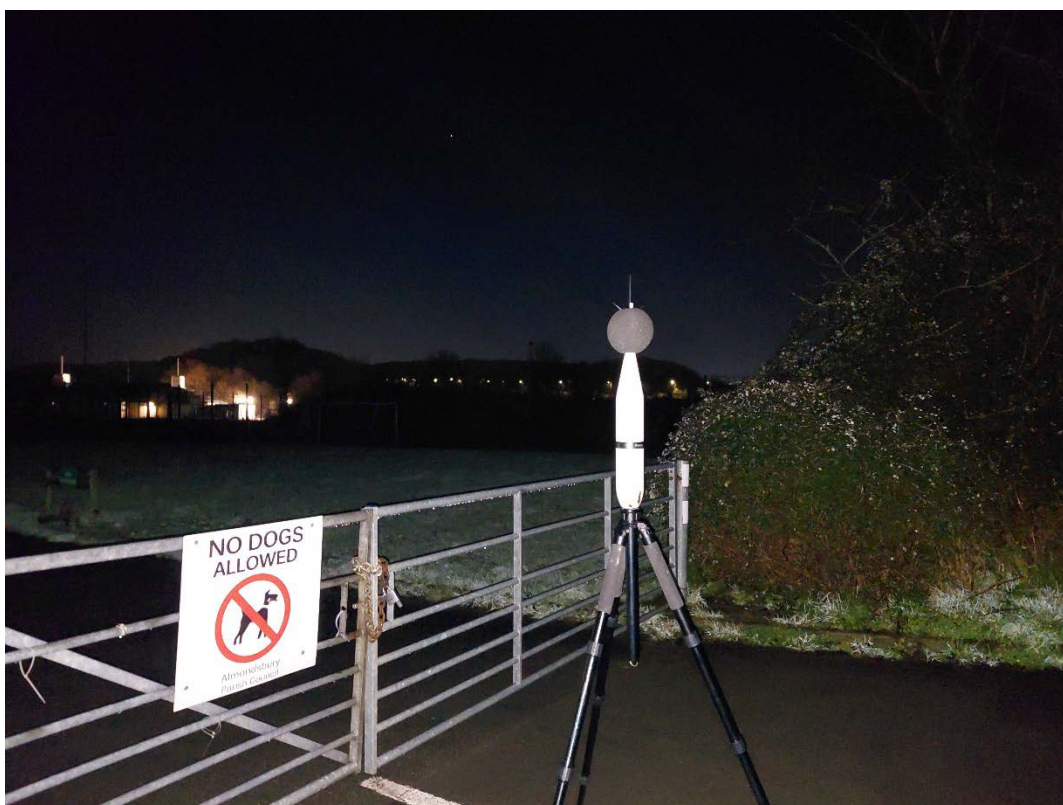
Photograph 4: Monitoring position at ST1 (night-time).



Photograph 5: Monitoring position at ST2 (daytime).



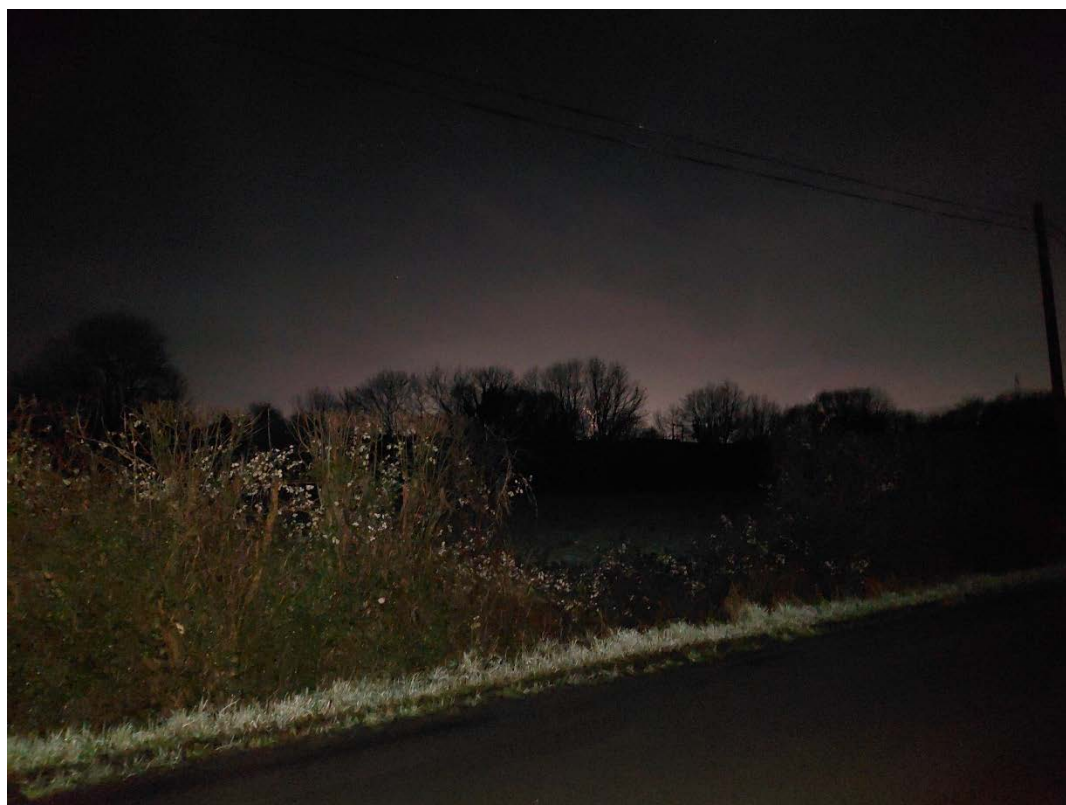
Photograph 6: Monitoring position at ST2 looking towards the south of Hallen (night-time).



Photograph 7: Monitoring position at ST2 looking towards Avonmouth industrial estate (night-time).



Photograph 8: Monitoring position at ST2 looking towards the wind turbines to the south (night-time).



Photograph 9: Monitoring position at ST3 (daytime).



Photograph 10: Monitoring position at ST3 looking towards the direction of Avonmouth industrial estate (night-time).



Appendix D: Assessed noise sources

The following noise sources have been assessed:

Table 14: Noise data sources used in the assessment

Noise source	Data source	Model	Document reference
Generator enclosure and attenuated inlet	Client / specialist supplier	mtu 20V4000 DS3300	AVK - Graven Hill- Generator Container Noise.pdf
Generator stack	Client / specialist supplier	TBC	"AVK - 3MVA-2.4MW Outlet Stack.pdf"
Absorption chiller / dry cooler	Client / specialist supplier	30XF-Z 2100A	"2MW Absorption Chiller & Dry Cooler.docx" "J Dunton Assoc dry coolers data.pdf"
Trim chiller	Client / specialist supplier	N/A	Email from client/designer from 26/1/2026.
Chiller	Client / specialist supplier	30XF-Z 2100	"30XF Z 2100 - JDuntons - Large chiller with acoustics.pdf"
Dry cooler	Client / specialist supplier	09VE 1205 UI 890A9D 12A1V1	DLC Dry Cooler.docx
Electrical plant container condenser	Client / specialist supplier	Mitsubishi PUZ-ZM50VKA	"Prefab Elec Plant Room - CEP - Condensers.pdf"
Fuel cells	Client	TBC	Email from client dated 16/2/2026
4 MVA transformer	Himly (VDI 3739:1999)	N/A	VDI 3739:1999
25 MVA transformer	Himly (VDI 3739:1999)	N/A	VDI 3739:1999
Attenuation (Chiller, Drycooler)	Client / specialist supplier	AA303S	"AA303S Spec.pdf"

Appendix E: BS 4142 Detailed assessment

Table 12 and Table 13 have presented the results of the BS 4142 assessment at the nearest noise sensitive receptors during normal operation and during emergency operation respectively. The emergency operation represents the worst-case scenario. Table 15 to Table 17 show the detailed BS 4142 assessment that has informed the results in Table 12 and Table 13. Only the emergency operation scenarios is presented.

Table 15: BS 4142 assessment Copart Bristol Offices (weekday daytime 8am to 6pm) during emergency operation

Results		Relevant clause	Commentary
Residual sound level	60 dB $L_{Aeq,1h,off}$	7.3.3	Measured
Background sound level	49 dB $L_{A90,1h,off}$	8.3	Measured
Assessment carried out during daytime, so reference time is 1h		7.2	
Specific sound level	52 dB $L_{Aeq,Tr}$	7.3.4	Predicted from sound model.
Acoustic feature correction	0	9.2	The predicted sound level does not contain tonality. The character of the residual sound is a mix of transportation noise and industrial noise. Therefore, of similar character to the sound from the Proposed Development.
Rating level	52 dB $L_{Ar,Tr}$	9.2	
Background sound level	49 dB $L_{A90,15min,off}$	8	
Excess of rating over background sound level	+3 dB	11	
Initial assessment (no context)	Indicates an adverse impact depending on the context	11	
Context – absolute level of sound (clause 11.1)	The absolute level of sound is neither high nor low.		
Context – character and level of the residual sound compared to the character and level of the specific sound (clause 11.2)	The acoustic environment of the area (residual sound) is dominated by road traffic noise arising from the M49 and M5 as well as noise of industrial nature. The sound from the proposed development will not be especially distinguishable in terms of character.		
Context – sensitivity of receptor (clause 11.3)	The office does not offer outdoor amenity, with the sensitivity being restricted to inside the office. The office is considered of moderate sensitivity.		
Final assessment (with context)	Indicates a low impact.	11	
Uncertainty of the assessment	Low	10	The acoustic environment is dominated by the M49 and the M5, whose traffic flows are quite constant. Industrial noise is continuously present.

Table 16: BS 4142 assessment at residential receptors (daytime) during emergency operation.

Results	Elmington Manor Farm	Hallen	Hallen Farm	Highways Park	Relevant clause	Commentary
Residual sound level	51 dB $L_{Aeq,1h,off}$	67 dB $L_{Aeq,1h,off}$	67 dB $L_{Aeq,1h,off}$	57 dB $L_{Aeq,1h,off}$	7.3.3	--
Background sound level	43 dB $L_{A90,15min,off}$	48 dB $L_{A90,15min,off}$	48 dB $L_{A90,15min,off}$	53 dB $L_{A90,15min,off}$	8.3	Predicted
Assessment made during daytime, so reference time is 1h					7.2	
Specific sound level	37 dB $L_{Aeq,Tr}$	37 dB $L_{Aeq,Tr}$	37 dB $L_{Aeq,Tr}$	34 dB $L_{Aeq,Tr}$	7.3.4	Predicted from measurement within the site and attenuation due to distance.
Acoustic feature correction	0	0	0	0	9.2	The predicted sound level does not contain tonality. The character of the residual sound is primarily transportation noise.
Rating level	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	34 dB $L_{Ar,Tr}$	9.2	
Background sound level	43 dB $L_{A90,15min,off}$	48 dB $L_{A90,15min,off}$	48 dB $L_{A90,15min,off}$	53 dB $L_{A90,15min,off}$	8	
Excess of rating over background sound level	-6 dB	-11 dB	-11 dB	-19 dB	11	
Initial assessment (no context)	Indicates a low impact depending on the context	Indicates a low impact depending on the context	Indicates a low impact depending on the context	Indicates a low impact depending on the context	11	
Context – absolute level of sound (clause 11.1) The absolute level of sound is neither high nor low.						
Context – character and level of the residual sound compared to the character and level of the specific sound (clause 11.2) The acoustic environment is dominated by the M49 and the M5, whose traffic flows are quite constant.						
Context – sensitivity of receptor (clause 11.3) The area contains a mix of residential and industrial or agricultural buildings.						
Final assessment (with context)				Indicates a low impact	11	
Uncertainty of the assessment				Low	10	The acoustic environment is dominated by the M49 and the M5, whose traffic flows are quite constant.

Table 17: BS 4142 assessment at residential receptors (night-time) during emergency operation.

Results	Elmington Manor Farm	Hallen	Hallen Farm	Highways Park	Relevant clause	Commentary
Residual sound level	48 dB $L_{Aeq,1h,off}$	58 dB $L_{Aeq,1h,off}$	58 dB $L_{Aeq,1h,off}$	54 dB $L_{Aeq,1h,off}$	7.3.3	--
Background sound level	46 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	8.3	Predicted
Assessment made during daytime, so reference time is 1h					7.2	
Specific sound level	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	34 dB $L_{Ar,Tr}$	7.3.4	
Acoustic feature correction	0	0	0	0	9.2	The predicted sound level does not contain tonality. The character of the residual sound is primarily transportation noise.
Rating level	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	34 dB $L_{Ar,Tr}$	9.2	
Background sound level	46 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	50 dB $L_{A90,15min,off}$	8	
Excess of rating over background sound level	-9 dB	-13 dB	-13 dB	-16 dB	11	
Initial assessment (no context)	Indicates a low impact depending on the context	Indicates a low impact depending on the context	Indicates a low impact depending on the context	Indicates a low impact depending on the context	11	
Context – absolute level of sound (clause 11.1) The absolute level of sound is neither high nor low.						
Context – character and level of the residual sound compared to the character and level of the specific sound (clause 11.2) The acoustic environment is dominated by the M49 and the M5, whose traffic flows are quite constant.						
Context – sensitivity of receptor (clause 11.3) The area contains a mix of residential and industrial or agricultural buildings.						
Final assessment (with context)				Indicates a low impact	11	
Uncertainty of the assessment				Low	10	The acoustic environment is dominated by the M49 and the M5, whose traffic flows are quite constant.

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