Saputo Dairy UK

NOISE ASSESSMENT

Saputo Dairy Works, Davidstow

MARCH 2024

CONFIDENTIAL

Saputo Dairy UK

NOISE ASSESSMENT

Saputo Dairy Works, Davidstow

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1 INTRODUCTION

1.1.1. WSP has been appointed by Saputo Dairy UK to undertake environmental noise assessment work for submission to the Environment Agency as part of an application to vary to the existing Environmental Permit (EP) (reference EPR/BN6137IK/V009), issued 10th November 2020, which covers operations at the Davidstow Dairy facility. The dairy is operated by Dairy Crest Limited ("Dairy Crest"). Saputo Dairy UK (SDUK, or 'Saputo') is a trading name used for Dairy Crest following its acquisition of the company in 2019. Dairy Crest remains the legal trading entity for the company and, therefore, it remains the named operator on the EP.

1.1.2. The application to vary the existing EP is being made to cover a number of changes (some proposed and some completed) to increase cheese and galacto-oligosaccharide (GOS) production capacity as well as making improvements to the management of wastewater at the site. The existing facility comprises a creamery with an associated, but geographically separate, water processing facility (WPF).

1.1.3. WSP previously prepared the following noise impact assessment report which was submitted to the Environmental Agency (EA), along with the required supporting noise modelling and calculation sheets, in support of the permit variation application:

- WSP Report Reference: 70053935-AC-001, Final Report, Dated 18 August 2023 entitled: *Davidstow Dairy, Environmental Permit Variation – Noise Assessment*

1.1.4. Following submission of the variation application, a Schedule 5 request for additional information was issued by the EA, and responded to by the applicant. As part of subsequent discussions with the EA and their Air Quality Modelling and Assessment Unit (AQMAU), it was agreed that the submitted noise impact assessment would be updated to include both 'before variation' and 'after variation' BS 4142 noise assessment results and that those assessments would adopt baseline noise survey results determined in absence of noise from the existing facility.

1.1.5. An outline methodology for additional baseline surveys, proposed to address the Schedule 5 request, was agreed by an Officer of the EA via email on Tuesday 12th March 2024. The agreed outline methodology is provided for reference in **Appendix A**. Part of that methodology included the undertaking of an initial site visit (including spot measurements and observations) to inform the selection of the locations to be used for longer (circa 1 week in duration) baseline noise surveys.

1.1.6. This report details the findings of the initial site visit, which has been undertaken in accordance with the agreed methodology provided in **Appendix A**.

1.1.7. This report is necessarily technical in nature so a glossary of acoustic terminology has been provided in **Appendix B**.

2 INITIAL SITE VISIT

2.1.1. In accordance with the agreed methodology provided in **Appendix A**, an initial site visit was undertaken on 15th and 16th March 2024. The site visit commenced in the late evening on the 15th and concluded in the early hours of the morning on the 16th. During the initial site visit, weather conditions were favourable for noise monitoring. Wind was gentle and was subjectively a gentle breeze, or calm, with estimated wind speeds between 0 to 1.5 m/s. Ambient air temperatures were cool, ranging between around 10 and 5°C over the course of the monitoring. At the start of the monitoring, conditions were overcast (7 oktas), clearing up towards the end of the monitoring (1 okta). There was no precipitation during the monitoring.

2.1.2. Sound level measurements were undertaken with a Rion NA-28 sound level meter that had been subject to traceable laboratory calibration within the preceding 24 months and the hand held calibrator within the previous 12 months. Field calibration checks were undertaken and, after an initial correction of 0.4 dB at the start of the measurements (likely due to significant drop in ambient air temperature from storage location to site location), the maximum drift observed during and after the survey measurements was 0.1 dB.

2.2 MONITORING LOCATIONS

2.2.1. Details of the monitoring locations are provided in Table 2-1 below.

Table 2-1 – Monitoring locations

Location/ Ref.	Approximate co-ordinates		Description/ Remarks
	Latitude	Longitude	
Visitor Car Park (VCP)	50.649170°	-4.633664°	Dairy works visitor car park.
C1	50.651574°	-4.624123°	Approx. 1 m from commercial shed façade, screened from dairy works and WPF. Dairy works approx. 750 m to the west, WPF approx. 400 m south-east
Representative (Rep.) of C2	50.650923°	-4.622212°	Parking space by cottages, WPF visible. Dairy works approx. 850 m to the west, WPF approx. 200 m south-east
D	50.653173°	-4.612304°	By gate to dwelling. Dairy works approx. 1.7 km to the west, WPF approx. 0.7 km west.
E2	50.660061°	-4.627386°	Approx. 20 m from A39 carriageway edge, behind intervening stone wall. Approx. 1.2 km north of dairy works.
Rep. of E3	50.644038°	-4.644978°	Access to field. Very wet and muddy. Loc. Rep. of E3, F1 and F2 used as rep. alternative.
E4	50.639864°	-4.655189°	Ground on access track looked very muddy and rough - considered risk to access at time of site visit.
E5	50.633718°	-4.663994°	In front of cladded gate in layby. Dairy works approx 2.5 km north-east.

Location/ Ref.	Approximate co-ordinates		Description/ Remarks
	Latitude	Longitude	
Rep. of F1 and F2	50.645796°	-4.641454°	Access to field. Very wet and muddy. Loc. Rep of E3, F1 and F2 used as rep. alternative.
Rep. of E3, F1 & F2	50.644959°	-4.643042°	Access to parking area of The Old Herbery. Dairy works approx. 650 m north-east.
Rep. of G1	50.646082°	-4.632053°	Opposite access road to WPF, by access to dwelling, adjacent to road. Dairy works approx. 250 m north-west.
Rep. of G2	50.643541°	-4.630061°	Muddy layby. Dairy works approx. 600 m north-west.

2.2.2. The monitoring locations are shown in the figures* below.

Figure 2-1 – Visitor Car Park

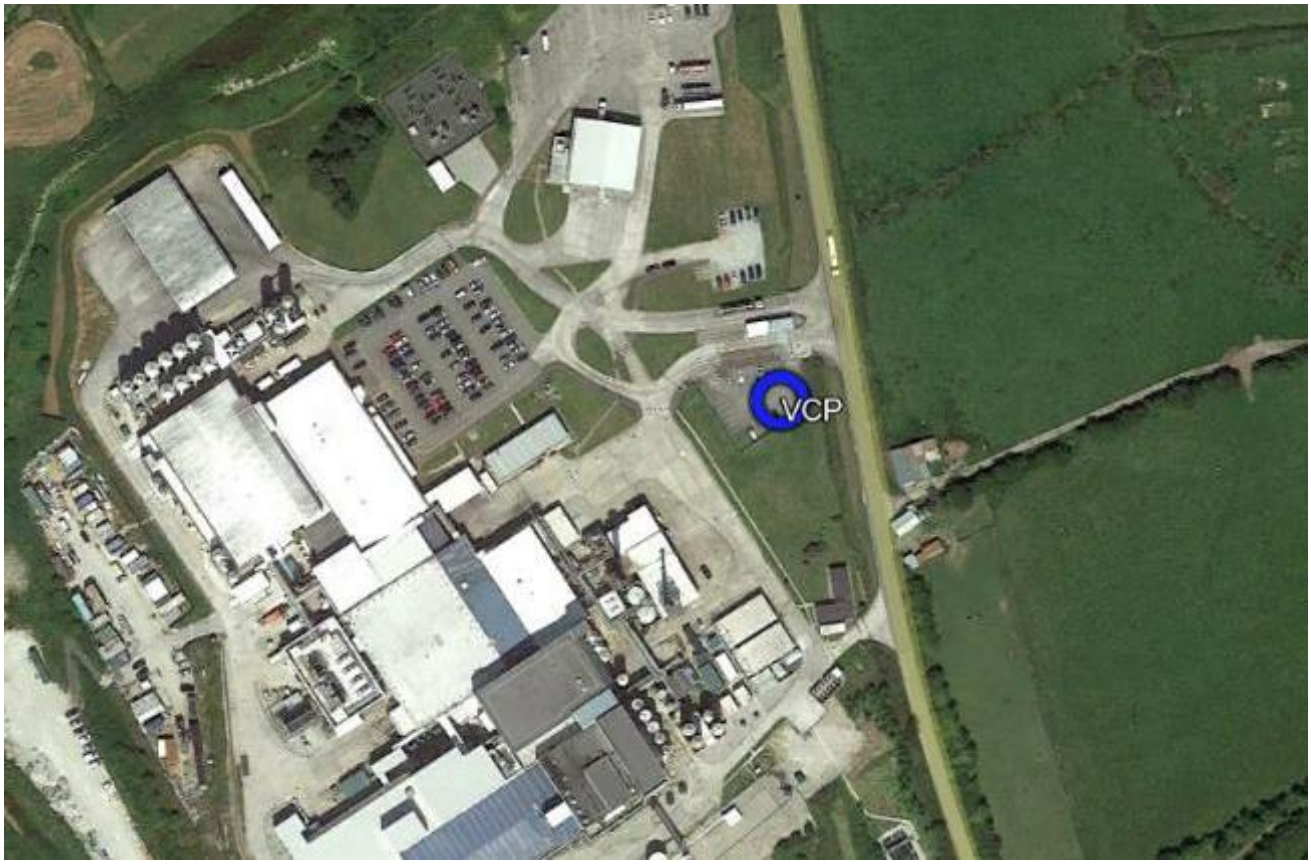

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Figure 2-2 - Location C1

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Figure 2-3 - Location representative of C2

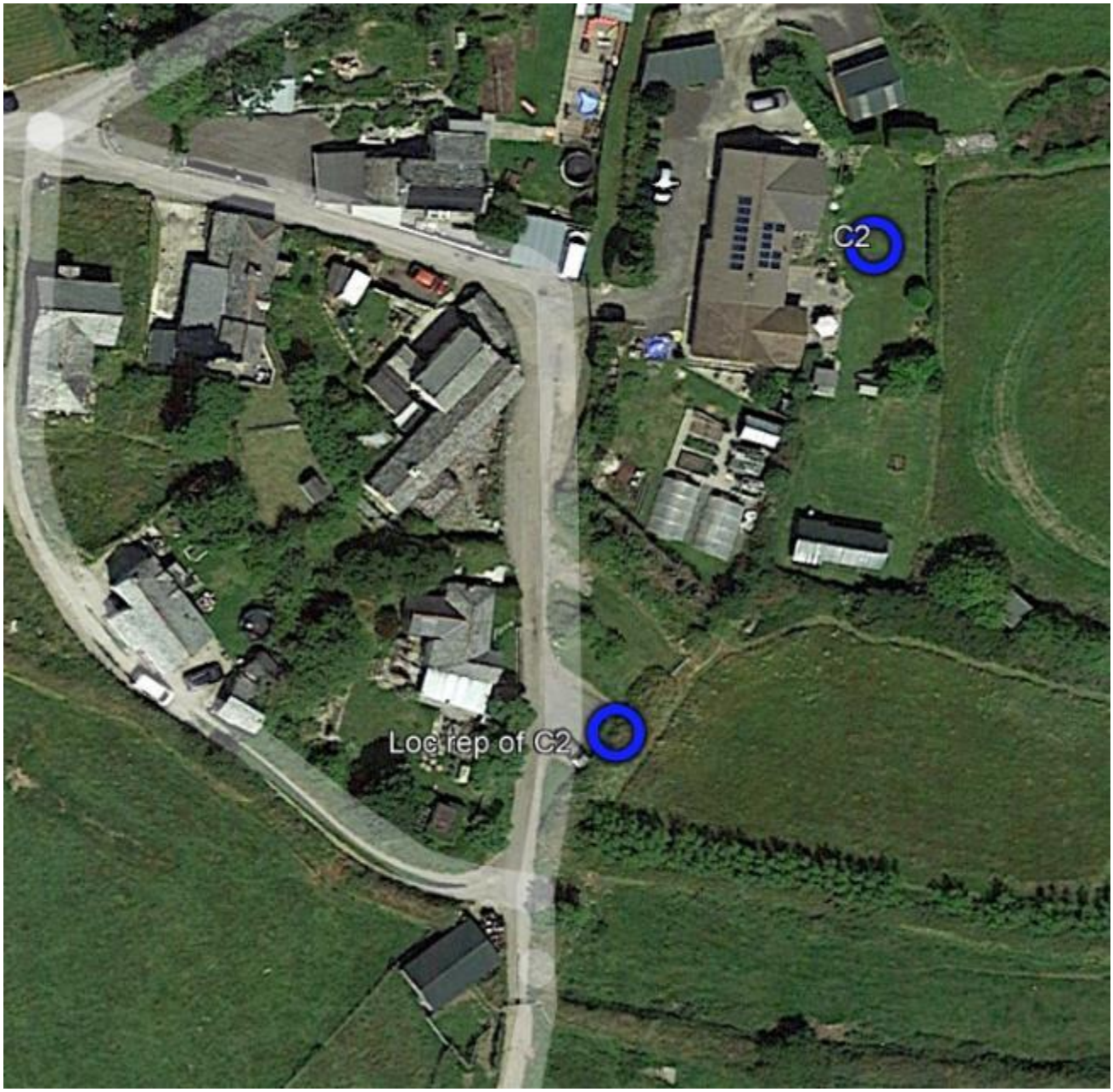

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Figure 2-4 - Location representative of D

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Figure 2-5 - Location E2

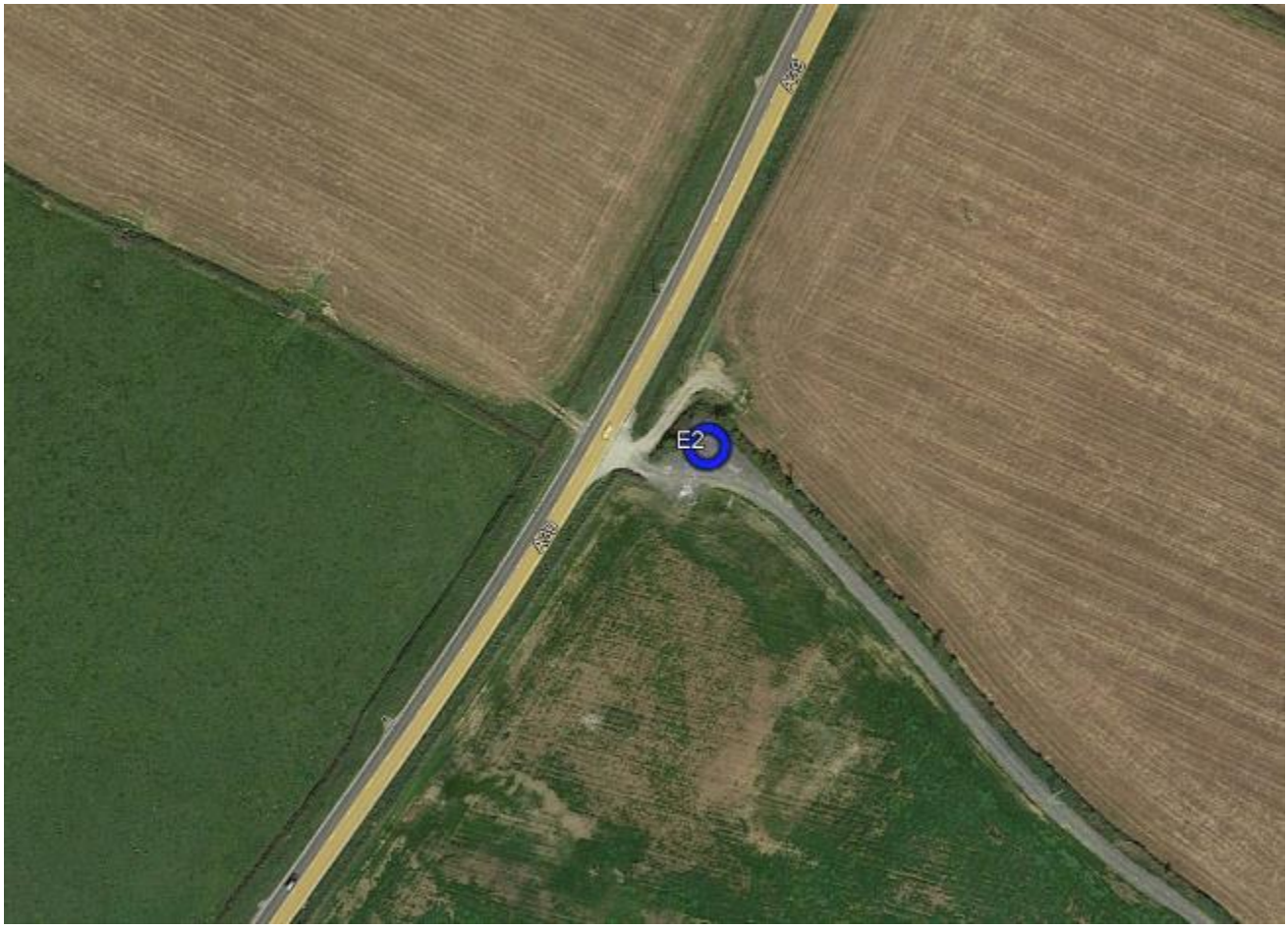

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Figure 2-6 - Location E5

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Figure 2-7 - Location representative of E3, F1 and F2

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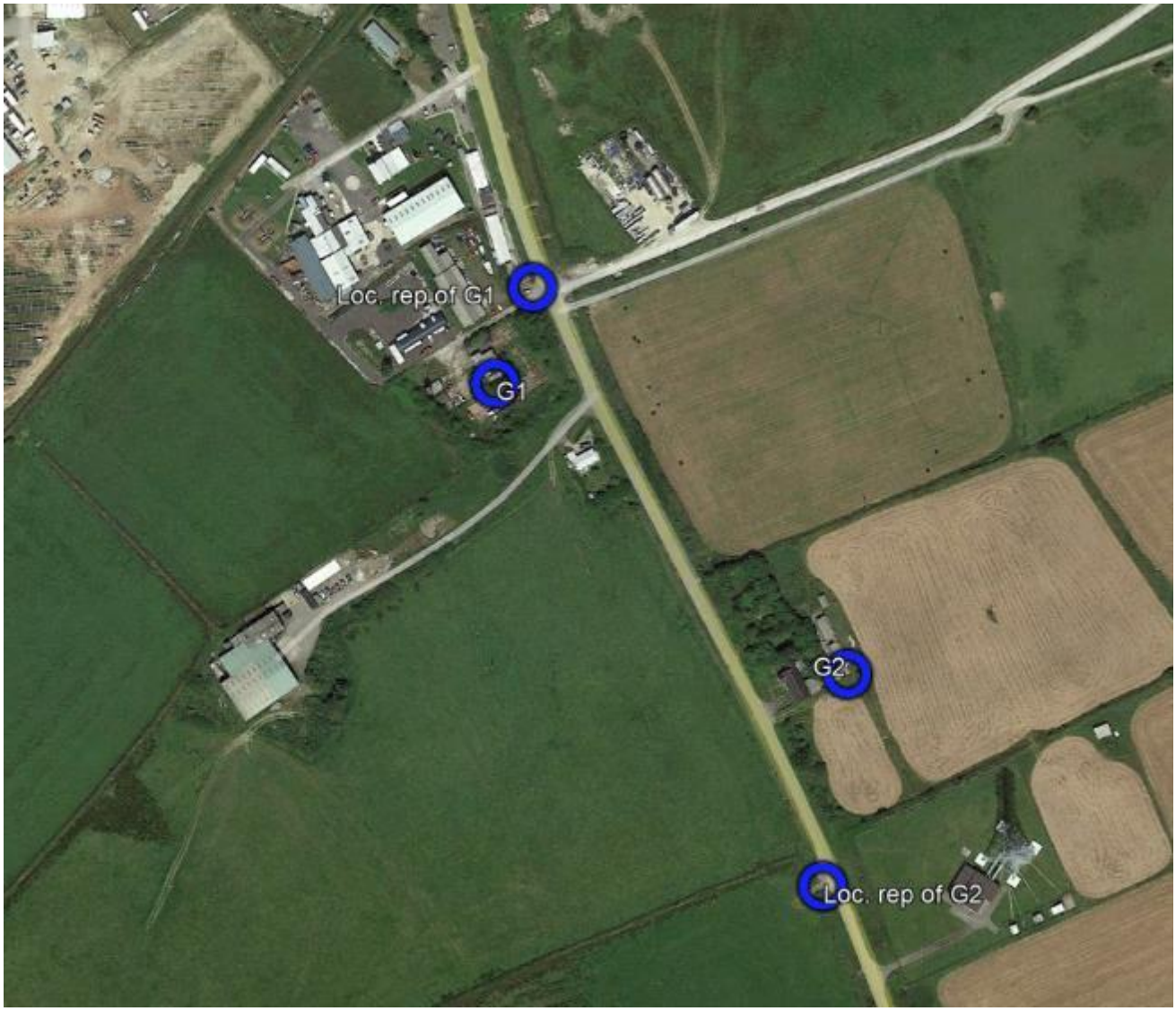
Figure 2-8 - Locations representative of G1 and G2



2.3 RESULTS OF MONITORING

2.3.1. The results of the monitoring undertaken during the initial site visit are provided in Table 2-2, below. Also included are the subjective observations of the ambient acoustic environment and presence or otherwise of noise from the existing dairy and WFP.

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Table 2-2 – Results of monitoring undertaken during initial site visit

Location	Start Date & Time	Duration (mm:ss)	Subjective Audibility (0 - 4) 0: Inaudible, 1: Just/Barely Audible, 2: Audible, 3: Significant source 4: Dominant				Measured Sound Pressure Level, dB				Noise Environment Comments (Including reasons for pausing, audible noise sources etc.)
			Dairy/ WPF	Wind	Road	Other	$L_{Aeq,T}$	$L_{A50,T}$	$L_{A90,T}$	$L_{Afmax,T}$	
Visitor car park	15/03/2024 22:18	05:00	4	0	2	0	48	47	46	60	Two pauses for vehicles entering site. Low frequency sound from site. Compressed air type hiss from site.
C2	15/03/2024 22:37	10:00	4	0	2	0	39	38	37	54	Sound from WPF - mid freq. pump/ air handling/ engine type sound. Low frequency audible but faint. L_{A90} indicative of specific sound from WPF, or L_{pA} which bottoms out around 35 - 36 dBA.
C1	15/03/2024 22:58	10:00	1	0	4	0	40	32	29	58	Occasional car dominating L_{Aeq}. Site very faintly audible, reflection of sound from dairy from adjacent building over road just perceptible. Despite faint audibility of site, consider this location / a nearby location better screened would constitute a good representation of the prevailing background sound levels in absence of noise from the Dairy and WPF.
rep. of G1	15/03/2024 23:19	10:00	2	0	2	2	40	37	34	60	Tractor near WPF access. Dairy works audible. Tractor hydraulics hiss.
rep. of G2	15/03/2024 23:38	10:00	4	0	3	1	36	36	35	44	Sound from dairy works. Distant road noise. Sheep.
E5	16/03/2024 00:03	10:00	0	0	4	1	45	24	22	64	Extremely quiet except for occasional car. Distant aeroplane. Distant dog bark. Noise from the dairy and WPF not audible.
Rep. of E3, F1 & F2	16/03/2024 00:25	10:00	1	0	4	1	41	26	23	62	Occasional car. Low frequency sound from site very faint and just/barely audible. Bird call. Measurements at this location would constitute a good representation of the prevailing background sound levels in absence of noise from the Dairy and WPF
E2	16/03/2024 00:49	10:00	1	0	4	0	44	25	23	66	Site very faint and just/barely audible - less low frequency sound, more air handling sound. Measurements at this location would constitute a good representation of the prevailing background sound levels in absence of noise from the Dairy and WPF
D	16/03/2024 01:13	09:17		0	2	4	39	38	37	59	Determination of contribution from site impossible due to influence of local sounds of water movement in stream and plant buzz/ hum type sound from an apparently local source.

3 DISCUSSION

3.1.1. In accordance with the agreed methodology, the aim of the initial site visit was to identify locations where sound from the dairy works and WPF does not influence the acoustic environment, more specifically the measurable L_{A90} background sound level. Based on the results of the initial site visit and monitoring, the following key points are observed:

- The only location where sound from the dairy works and WPF was found to be entirely inaudible was 'Location E5'. This location is very far removed from the vicinity of the dairy works. Whilst it may be representative of some sensitive receptors, it might not be as representative for others at their respective measurement locations (despite those closer measurement locations having faint audibility of sound from the dairy works).
- At 'Locations C1', 'Location representative of E3, F1 and F2' and 'Location E2' sound from the dairy works and WPF was only just/ barely audible, and the measured L_{A90} sound levels were very low (between 23 and 29 dB $L_{A90,T}$). At these locations, it is considered that whilst noise from the dairy/ WPF was just observable it will have little to no bearing on the measurable background L_{A90} sound levels. In respect of these locations it should also be considered that:
  - The primary objective of further monitoring is to gather daytime sound levels. In comparison to the completed night-time measurements, daytime sound levels will tend to be dominated by the sound of road traffic.
  - Regardless of whether there is any influence on the measured night-time L_{A90} sound levels, where they are very low (i.e. below 30 dBA), consideration of the assessment context, as required in accordance with BS 4142, is likely to be more important than the initial estimate of impact, because the absolute level of the specific sound level may be a better indicator of potential adverse impacts.
- Determination of the audibility of sound from the dairy works at Location D was confounded by local plant noise and the sound of water in a nearby stream.

3.1.2. At Location C1 the sound of the WPF was not subjectively audible, and the measured $L_{A90,T}$ sound level was 8 dB below that measured at Location C2. On this basis, it is considered that Location C1 would likely be suitably representative and would provide good data to inform the assessment. Subject to access, it may be possible to agree to site the monitoring equipment approximately 30 m north-east of Location C2, where additional screening of sound from the dairy works could be provided by the dwelling on the opposite side of the road.

3.1.3. It is considered that Location D would also be suitable for further monitoring. Monitoring locations at similar distances from the dairy works and WPF were found to be unaffected, or the dairy and WPF were only faintly/ barely audible.

3.2 PROPOSED MONITORING LOCATIONS

3.2.1. Based on the results of the initial site visit, and the above discussion, it is suggested that the locations set out in Table 3-1 should be adopted for further monitoring. It is noted that, in accordance with the agreed methodology, that further monitoring would be supported by subjective observations during the daytime, evening and night-time, to identify the presence of the specific sound and remove affected periods.

Table 3-1 – Proposed monitoring locations

Proposed Monitoring Location	To be representative of	Remarks
C1/ nearby alternative – potentially near to dwelling on opposite side of road	Receptors in Trewasa. Receptors south of the dairy works.	At Location C1, there was found to be little to no effect from the specific sound. Subject to access arrangements. Potential for micro siting to provide additional screening to sound from the dairy works.
D/ nearby alternative	Receptors in Davidstow	Results of initial site visit inconclusive. However, based on separation distance from dairy works and WPF, and results from other locations at similar distances, influence of specific sound anticipated to result in little to no effect. Subject to access arrangements. Potential for micro siting to provide additional screening to sound from the dairy works.
E5/ E3/ nearby alternative	Receptors near the A39, south of the dairy works	Location E5 – sound from dairy and WPF inaudible. At Location E3, there was found to be little to no effect from the specific sound. Subject to access arrangements. Micro siting to provide additional screening to sound from dairy works, where possible.
E2	Receptors near the A39, north of the dairy works	Location E2 found to be little to no effect by specific sound. Subject to access arrangements. Potential for micro siting to provide additional screening to sound from dairy works limited.

4 SUMMARY AND CONCLUSIONS

4.1.1. WSP has been appointed by Saputo Dairy UK to undertake an environmental noise assessment work in support of an application to the Environmental Agency to vary the existing Environmental Permit (reference EPR/BN6137IK/V009) covering operations at the Davidstow Dairy facility.

4.1.2. The application to vary the existing EP is being made to cover a number of changes (some proposed and some completed) to increase cheese and galacto-oligosaccharide production capacity as well as making improvements to the management of wastewater at the site. The existing facility comprises a creamery with an associated, but geographically separate, water processing facility (WPF).

4.1.3. Following submission of information to support the application to vary the EP, a Schedule 5 request for additional information was been issued by the EA and responded to by the applicant. Following further discussion it was agreed that the submitted noise impact assessment would be updated to include both 'before variation' and 'after variation' BS 4142 noise assessment results and that those assessments would adopt baseline noise survey results determined in absence of noise from the existing facility.

4.1.4. An outline methodology for additional baseline surveys, proposed to address the Schedule 5 request was agreed by an Officer of the EA via email on Tuesday 12th March 2024. The agreed outline methodology is provided for reference in **Appendix A**. Part of that methodology included the undertaking of an initial site visit (including spot measurements) to inform the selection of the locations to be used in further, longer duration (circa 1 week), baseline noise surveys.

4.1.5. This report has detailed the findings of the initial site visit, which has been undertaken in accordance with the agreed methodology provided in **Appendix A**.

4.1.6. The results of the initial site visit, set out in Section 2.3, have been used to inform the selection of locations proposed to be adopted for the further baseline monitoring. Discussion of the results of the initial site visit and recommended locations for further monitoring are provided in Section 3.

4.1.7. The measurement locations proposed for adoption in the further baseline noise monitoring are set out in Table 3-1. The EA's agreement to adoption of those measurement locations is sought in advance of the commencement of that survey work.

Appendix A

BASELINE SURVEY METHODOLOGY

To determine representative baseline sound levels to inform the BS 4142:2014+A1:2019 assessment required to support the application to vary the EP, a baseline noise survey is proposed to include various measurement locations.

Partially attended monitoring (i.e. subjective observations during installation, decommissioning and additionally during a daytime, evening and night-time period) is proposed at five locations, subject to access arrangements and micro-siting when on site. The monitoring would take place over approximately seven days, inclusive of a full weekend. We will seek to avoid school holiday periods.

Meteorological conditions would be logged with a data logging meteorological station co-located with one of the noise monitors, or at the dairy or WPF itself. The weather station will record wind speed, wind direction, temperature and rainfall to inform the data analysis and exclusion of any monitoring periods due to inappropriate conditions.

The baseline noise survey would be undertaken by a member of WSP Acoustics' staff fully competent in the measurement of environmental noise and in accordance with BS 7445: Description and measurement of environmental noise (Part 1: 2003 Guide to quantities and procedures; Part 2: 1991 Guide to the acquisition of data pertinent to land use and Part 3: 1991 Guide to application to noise limits). All equipment used to undertake the noise survey would conform to Type 1 specification according to BS 61672:2003 Electroacoustics. Sound level meters and acoustic calibrators would be calibrated to national standards as appropriate.

The baseline survey data will be analysed to determine the prevailing underlying daytime and night-time background sound levels.

Noise from the existing creamery and WPF are generally prominent in their vicinity. The proposed measurement locations have therefore been selected to be representative of the nearest sensitive receptors, but in the absence of the influence of sound from the dairy works including the creamery and WPF. The measurement locations will, where necessary, be located behind land features or structures that provide screening to further ensure that sound from the dairy works and associated processes do not influence the measurement locations.

To ensure that sound from the dairy works (including the creamery and WPF) does not influence the measurement locations, an initial site visit will be undertaken prior to installation of the monitoring equipment. The initial site visit will consist of subjective night-time observations supported by brief spot measurements. Firstly, locations in close proximity to the dairy and WPF will be attended to establish the character of sound emitted from the dairy works. Then, the proposed measurement locations (or nearby publicly accessible locations representative of the measurement locations) will be attended and subjective observations and brief spot measurements will be undertaken in an effort to subjectively and/ or objectively determine the presence of sound from the dairy works (including the creamery and WPF) at the proposed baseline measurement locations. Where sound from the dairy works (including the creamery and WPF) is found to influence the acoustic environment at any location, these will not be considered for further monitoring. The results of the initial site visit will be reported to the EA and the final measurement locations confirmed.

Following confirmation of the proposed measurement locations, a further site visit will be undertaken to install the monitoring equipment. During the monitoring period, a round of attended observations

will be undertaken at the measurement locations during the daytime, evening and night-time periods (at least one visit per measurement location per period, i.e. daytime evening and night-time) to confirm that sound from the facility is not influencing the measurement locations. If sound from the facility is found to be influencing any measurement location, then the measured $L_{A90,T}$ sound levels for that period (i.e. daytime, evening or night-time) will not be used, instead measurement data obtained in absence of the specific sound as determined at one of the other locations will be adopted (as selected as most representative).

Proposed Measurement Locations

The initial proposed measurement locations under consideration are described below, and shown in diagrams* (location reference lettering is a continuation from that used in the previous noise assessment work). Each letter represents a single monitoring location, i.e. for locations C1 and C2, these are two options for location C and monitoring would only be undertaken at one of these locations, drawing on the results of the initial site visit. Where considered desirable, we could seek to gain permission to monitor at multiple options for a single location (e.g. seek permission for C1 and C2) and then determine which would be preferable based on the findings of the initial site visit.

Measurement Location C

Trewasa. As used in the Hepworth Acoustics assessment work, selected position to be acoustically screened from creamery and WPF, e.g. behind a large barn.

Concerns have been raised about the influence of sound from fabrication works in/ near to the adjacent barn. It is considered that the influence of any sporadic works would minimally influence background sound levels if present at all.

However, an alternative location (C2) has been suggested, which would also benefit from screening of sound from the dairy by the dwelling at the property.

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Measurement Location D

Lilli Park. As used in the Hepworth Acoustics assessment work to be representative of Treworra, located on the other side of a landscape / hill which provides acoustic screening from the creamery / WPF.

Measurement Location E

To be representative of the receptor known as ‘Nettings Park’ located approximately 80 m north west of site boundary.

A location to be selected as representative of this property, but in absence of noise from the creamery and WPF, potential options listed below:

E2 – approx. 1.2 km north of site, adjacent to A39

E3 – approx. 0.8 km south west of site, adjacent to A39

E4 – approx. 1.6 km south west of site, adjacent to A39

E5 – approx. 2.5 km south west of site, adjacent to A39

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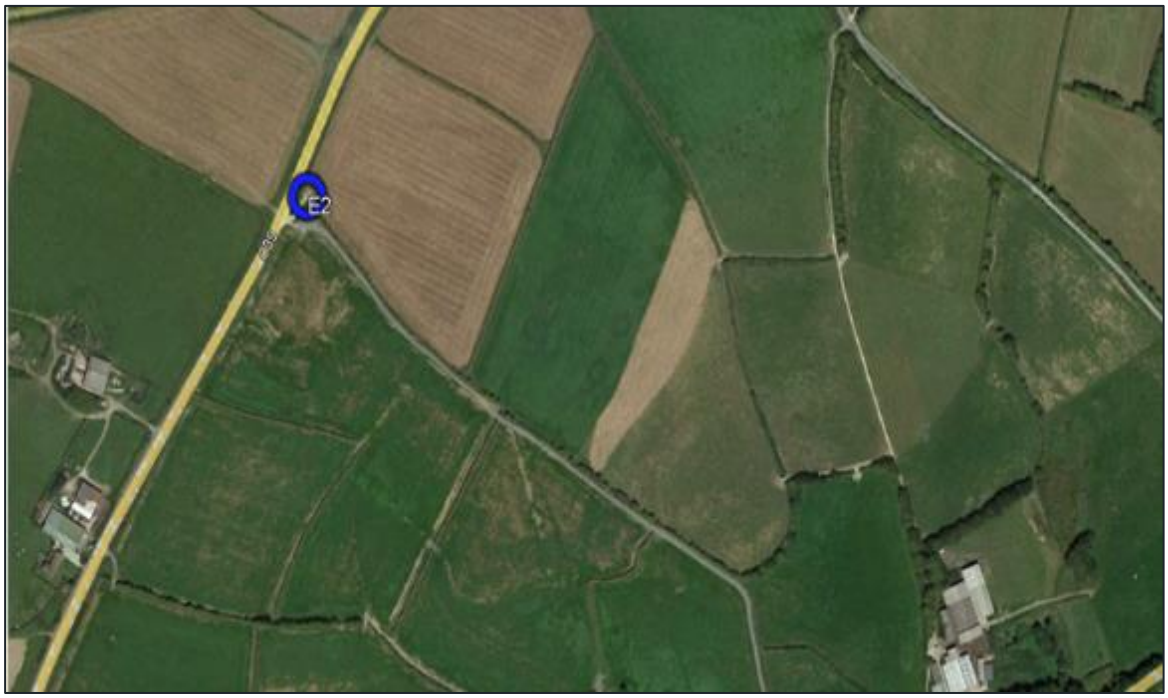

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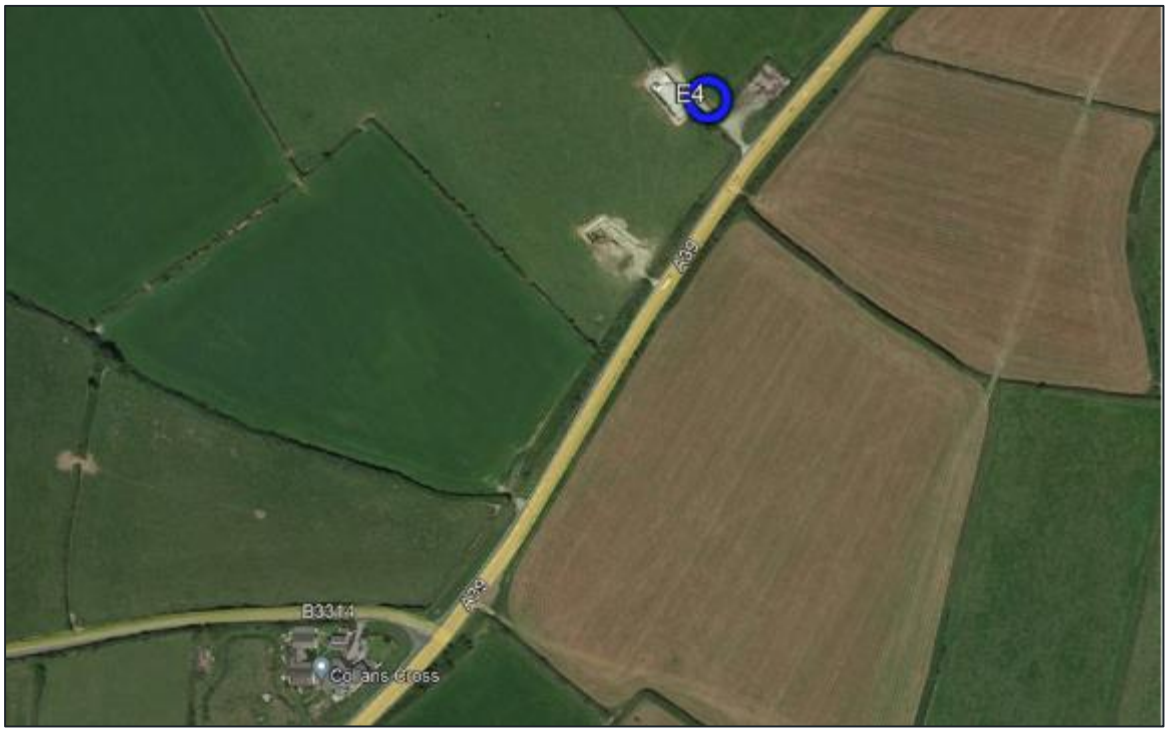

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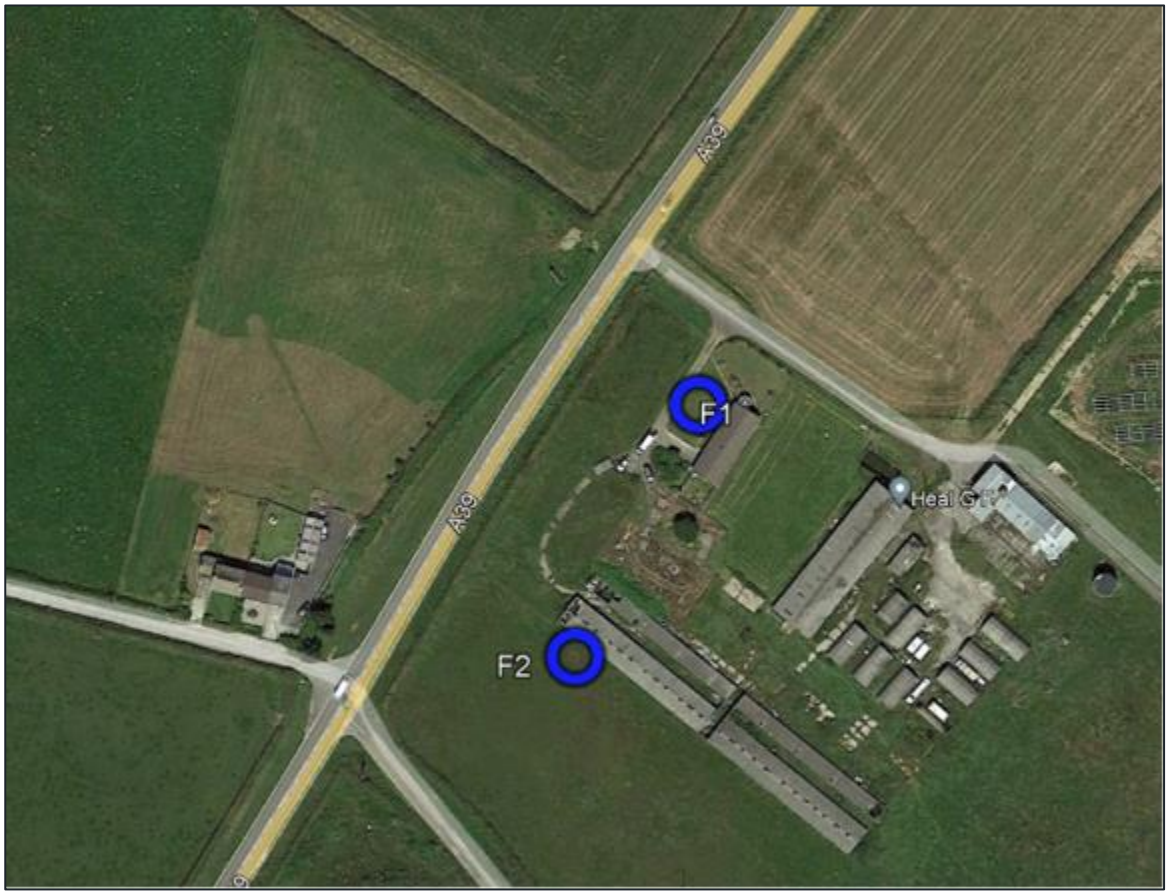
Measurement Location F

St Kitts Farm - A location to be selected as representative of this property, but in absence of noise from the creamery and WPF, e.g. on the western side of this dwelling acoustically screened from the creamery and the WPF (F1), or beyond the adjacent barns (F2).



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Measurement Location G

Fowey Bungalow - A location to be selected as representative of this property, but in absence of noise from the creamery and WPF, e.g. on the south side of the dwelling (G1) or at an alternative property further south (G2).

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Overview – Dairy Site and all proposed measurement locations

* *Mapping imagery from Google Earth © Google 2024. Imagery © 2024 CNES/ Airbus, Getmapping PLC, Infoterra & Bluesky, Maxar Technologies, Map Data © 2024.*

Appendix B

GLOSSARY OF ACOUSTIC TERMINOLOGY

NOISE

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (very deep bass) to 20,000 Hz (very high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

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

Table B-1 – Range of Typical Sound Levels Found in the Environment

Sound Level	Location
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

Table B-2 – Terminology Relating to Noise and Sound

Term	Description
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1 / s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. The ambient sound comprises the residual sound and the specific sound when present. *The ambient sound level, La is defined as an $L_{Aeq,T}$ level*
Residual Sound	The 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 *The residual sound level, Lr is defined as an $L_{Aeq,T}$ level*
Background Sound $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, *T*, measured using time weighting F and quoted to the nearest whole number of decibels
Specific Sound	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, *T*r *The specific sound level, Ls is defined as an $L_{Aeq,T}$ level*
Rating Level	The specific sound level plus any adjustment for the characteristic features of the sound
$L_{eq,T}$	A sound level index called the equivalent continuous sound level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A sound level index defined as the maximum sound level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} sound level but will still affect the sound environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.

Term	Description
Façade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.

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