

# DECIBEL NOISE CONTROL

March 15<sup>th</sup> 2021.  
Attention David Mulcahy.  
Planning Consultant.  
67 Old Mill Race.  
Athgarvan.  
Co. Kildare



39 Mount Eagle Grove.  
Leopardstown Heights.  
Leopardstown.  
Dublin D18P6P3  
Tel: 01 2957220  
Mobile: 087 2510030  
E-Mail: [decibel@indigo.ie](mailto:decibel@indigo.ie)  
**Our Ref. dB 1576.**

## Re. Rathcoole Coffee Drive Thru. & E V Fast Charging Hub Noise.

**Brief:** Consider what impact, if any, noise from the above development would have on the nearest noise sensitive location. Should the impact prove negative put forward such noise control measures considered necessary to alleviate any identified noise problem.

**Noise Survey:** To ascertain the existing level of noise at the site a noise survey was conducted the details of which are as follows.

**Date and Times of Noise Survey:** 09/02/21 at 17:00 to 12/02/21 at 16:00.

**Weather Conditions During Survey Period:** Calm and dry throughout.

### **Instrumentation:**

Sound Level Meter, Bruel & Kjaer Type: 2250 Serial No 2580156.

Microphone, Bruel & Kjaer Type: 4189 Serial No 2377818.

Calibration Certificate 145832 dated 07/09/2020.

Calibrator, Bruel & Kjaer Type: 4231 Serial No 3005620.

Calibration certificate 04661/1 dated 10/03/2020.

Bruel & Kjaer outdoor microphone kit, type UA1404.

Bruel & Kjaer Type AO 0409 Microphone extension cable.

**Field Calibration:** Using the Type 4231 Sound Level Calibrator, that produces a sound level of 93.8dB re.  $2 \times 10^{-5}$  Pa, at a frequency of 1k Hz, instrumentation used was calibrated before and after use to an accuracy of  $\pm 0.3$ dB.

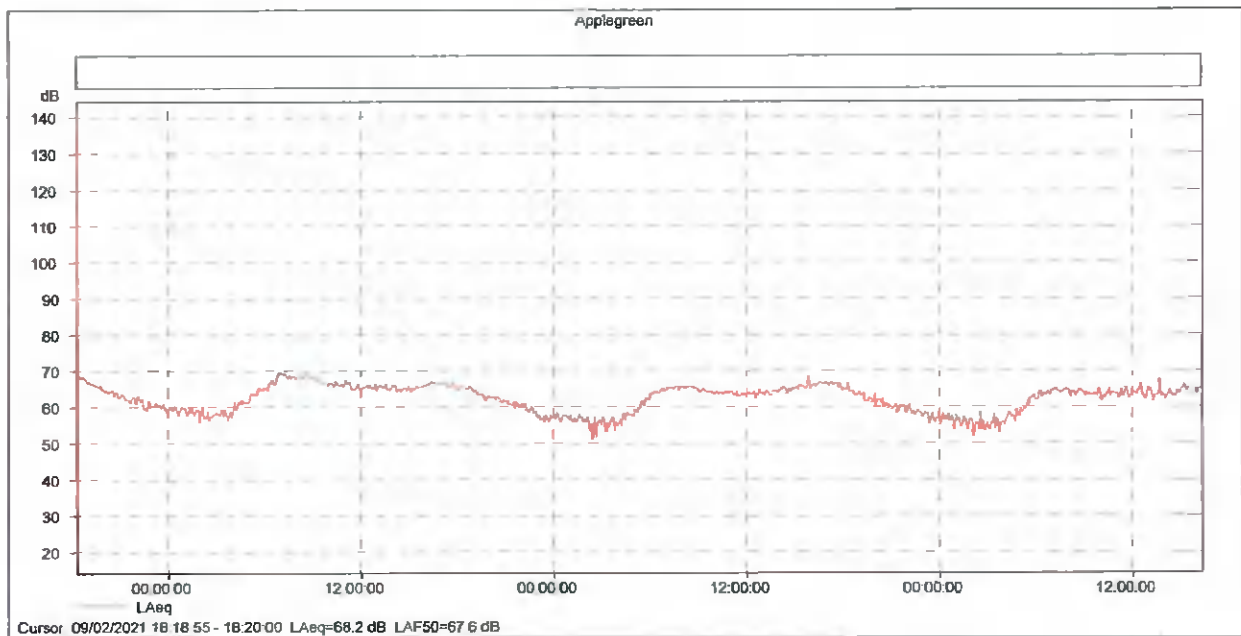
The noise survey was conducted generally in accordance with ISO 1996-2:2017, Acoustics — Description, measurement and assessment of environmental noise — Part 2: Determination of environmental noise levels.

**Survey Procedure:** The instruments microphone was tripod mounted some 3m above ground and positioned at the eastern boundary fence of the Applegreen site so as to capture the existing level of noise on the site prior to any development. The instrument was set to measure and store noise levels of 5 minutes duration and the results of our measurements are presented in tabulated and graphical form as follows.



**Fig (1)** Location of measuring instruments microphone 3m above ground.

A graphical representation of the measurements over the survey period is presented in Fig (2) below.



**Fig (2)** Graph of Noise Survey Results measured at 5 minute Intervals

The results for the relevant days and times are presented in tabulated form as follows.

Daytime					Night Time.				
Start Time	Noise Parameters.				Start Time	Noise Parameters.			
h:m	LAeq	LAF90	LAF10	LAFmax	h:m	LAeq	LAF90	LAF10	LAFmax
19:00	66	61	68	75	23:00	60	52	64	70
20:00	64	58	67	74	23:15	60	51	64	70
21:00	62	55	66	73	23:30	60	51	65	72
22:00	61	53	65	75	23:45	59	50	63	72
<b>Average</b>	<b>63dBL<sub>Aeq</sub></b>				00:00	59	49	64	71
					00:15	60	49	64	72
					00:30	58	47	63	73
					00:45	60	48	64	71
					01:00	58	45	63	72
					01:15	60	46	64	72
					01:30	58	44	63	71
					01:45	58	43	63	71
					02:00	59	44	63	73
					02:15	58	46	62	69
					02:30	57	42	62	70
					02:45	58	41	62	72
					03:00	58	44	63	70
					03:15	59	47	64	71
					03:30	58	47	62	72
					03:45	58	45	61	73
					04:00	60	48	65	71
					04:15	61	49	65	72
					04:30	61	52	65	72
					04:45	61	51	65	72
					05:00	63	54	66	74
					05:15	63	56	67	76
					05:30	65	58	68	75
					05:45	65	60	68	73
					06:00	65	61	68	72
					06:15	67	63	69	74
					06:30	66	63	69	73
					06:45	69	66	71	74
					<b>Average</b>	<b>61dBL<sub>Aeq</sub></b>			

**Table (1) Noise Survey Results Tuesday / Wednesday Feb. 9<sup>th</sup> & 10<sup>th</sup> 20**

Daytime					Night Time.				
Start Time	Noise Parameters.				Start Time	Noise Parameters.			
h:m	LAeq	LAF90	LAF10	LAFmax	h:m	LAeq	LAF90	LAF10	LAFmax
07:00	68	65	71	75	23:00	57	47	61	69
08:00	68	65	71	84	23:15	56	48	60	69
09:00	67	63	70	76	23:30	57	47	61	71
10:00	66	63	68	78	23:45	57	48	61	70
11:00	66	61	68	83	00:00	58	48	62	71
12:00	65	62	68	82	00:15	57	48	60	69
13:00	65	62	68	85	00:30	57	48	62	70
14:00	65	61	67	79	00:45	57	46	62	69
15:00	65	62	67	74	01:00	57	46	61	68
16:00	67	64	68	73	01:15	56	44	61	69
17:00	66	63	68	75	01:30	57	46	62	69
18:00	65	61	67	72	01:45	56	46	61	68
19:00	63	58	66	76	02:00	56	41	61	70
20:00	62	56	65	78	02:15	53	38	57	69
21:00	61	54	64	72	02:30	55	38	60	71
22:00	59	51	63	74	02:45	56	40	61	69
23:00	57	48	61	71	03:00	56	44	61	70
<b>Average</b>	<b>64dBL<sub>Aeq</sub></b>				03:15	54	43	58	69
					03:30	56	46	61	70
					03:45	55	41	59	69
					04:00	55	44	60	69
					04:15	57	48	61	77
					04:30	58	49	62	73
					04:45	57	47	62	69
					05:00	59	51	63	70
					05:15	60	52	64	71
					05:30	61	55	65	70
					05:45	62	57	65	71
					06:00	64	59	66	74
					06:15	64	60	66	71
					06:30	64	60	67	71
					06:45	64	61	67	72
					07:00	65	61	67	72
					07:15	65	61	67	72
					07:30	66	62	68	72
					07:45	65	62	68	72
					<b>Average</b>	<b>59dBL<sub>Aeq</sub></b>			

**Table (2) Noise Survey Results Wednesday / Thursday Feb. 10<sup>th</sup> & 11<sup>th</sup> 2021.**

Daytime					Night Time.				
Start Time	Noise Parameters.				Start Time	Noise Parameters.			
h:m	LAeq	LAF90	LAF10	LAFmax	h:m	LAeq	LAF90	LAF10	LAFmax
07:00	65	62	68	72	23:00	58	50	62	69
07:00	65	62	68	72	23:00	58	50	62	69
08:00	65	62	67	86	23:15	57	47	61	69
09:00	64	60	67	73	23:30	57	47	61	70
10:00	64	60	66	73	23:45	57	47	61	71
11:00	63	59	66	74	00:00	56	46	60	70
12:00	63	60	66	83	00:15	57	47	61	71
13:00	64	60	66	79	00:30	57	46	61	71
14:00	65	61	67	73	00:45	55	45	60	69
15:00	66	62	68	86	01:00	57	44	61	72
16:00	66	63	68	77	01:15	55	41	59	71
17:00	66	62	68	78	01:30	56	45	61	68
18:00	64	60	67	74	01:45	56	43	60	69
19:00	62	57	65	73	02:00	54	41	59	68
20:00	61	55	64	72	02:15	55	41	59	68
21:00	60	52	63	70	02:30	56	42	61	69
22:00	59	50	63	75	02:45	54	41	59	70
Average	64dBLAeq				03:00	54	41	59	71
					03:15	56	43	61	72
					03:30	56	40	60	70
					03:45	56	42	60	70
					04:00	56	44	61	68
					04:15	58	45	63	70
					04:30	57	45	60	75
					04:45	58	48	63	70
					05:00	59	50	63	70
					05:15	60	52	64	70
					05:30	62	54	65	71
					05:45	62	57	66	75
					06:00	62	58	66	71
					06:15	63	59	66	71
06:30	64	59	66	71					
06:45	64	59	66	72					
Average					58dBLAeq				

Table (3) Noise Survey Results Thursday / Friday Feb. 11<sup>th</sup> & 12<sup>th</sup> 2021.

In table (4) below we summarise the typical  $dB_{Leq}$  for the survey periods.

Period	Daytime.	Night Time
Tues.	63 $dB_{Leq}$	61 $dB_{Leq}$
Wed.	64 $dB_{Leq}$	59 $dB_{Leq}$
Thurs.	64 $dB_{Leq}$	58 $dB_{Leq}$
Typical	64 $dB_{Leq}$	59 $dB_{Leq}$

Table (4) Summary of  $dB_{Leq}$  values

**Finding:** As expected with the proximity of the site to the N7 dual carriageway noise is dictated by road traffic. It is worth noting that due to the current Covid restrictions road traffic volumes are considerably reduced and we would expect the noise survey values to increase as soon as restrictions are lifted. Resulting from data taken from our own files for noise measurements along this stretch of motorway for residential development show values of 69  $L_{Aeq16hr}$

The measured noise on site is due to road traffic and by virtue of its character and variation over time it is not suitable as a noise criteria for the development but does act as a benchmark should the need arise. However the Steady State  $L_{A90}$  survey results do show quite low values of noise in the early morning hours when road traffic is reduced and this should be considered when setting noise criteria and to this end we refer to the Environmental Protection Agency (EPA) for guidance as set out below.

**Proposed Development:** It is proposed to provide an Electric Vehicle (EV) Fast-Charging hub along with a Drive-Thru. Standalone Coffee Facility. The charging hub consisting of 8 dedicated EV spaces whilst the drive-thru coffee facility will provide some 50 seats and 22 car parking spaces.

Vehicle access is from the existing service station via. two routes, one to the EV Fast Charging spaces and one leading to the Drive-Thru. Coffee Facility, all a shown in Fig (4) below. Vehicle speeds on site are controlled by the introduction of speed ramps.

**Noise Sensitive Locations:** There are a number of dwellings in the immediate area that could be impacted by noise from the proposed development as shown in Fig (3) below; Broadfield Glen and Broadfield Grove being examples, with the latter afforded extra noise attenuation from the high wall between Broadfield Grove and the proposed development. The noise sensitive locations mentioned above are considered in the following noise assessment.

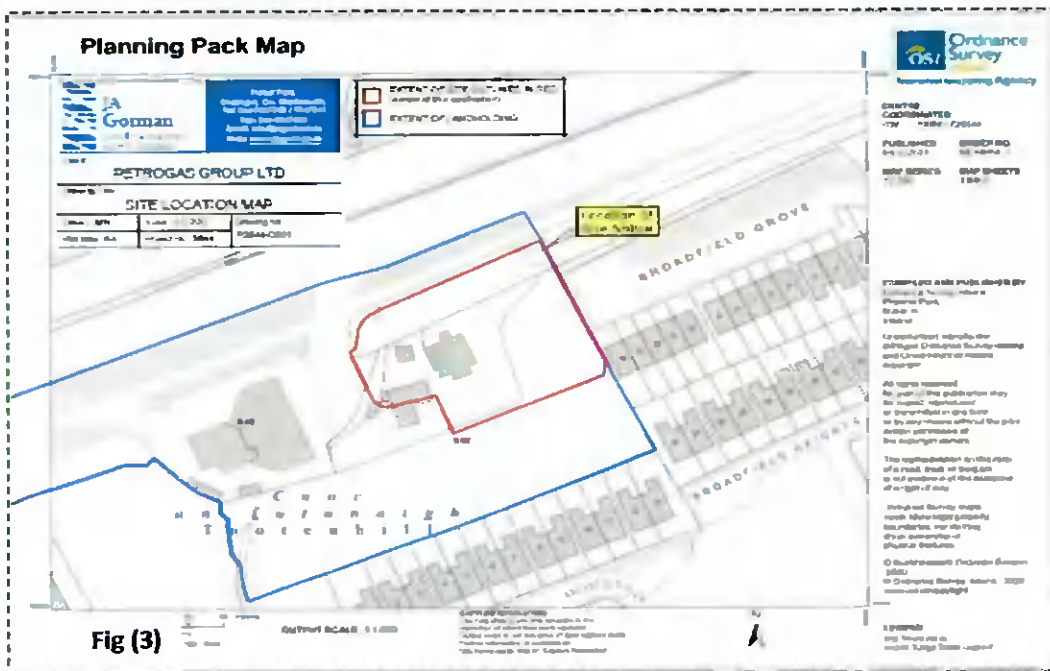


Fig (3)

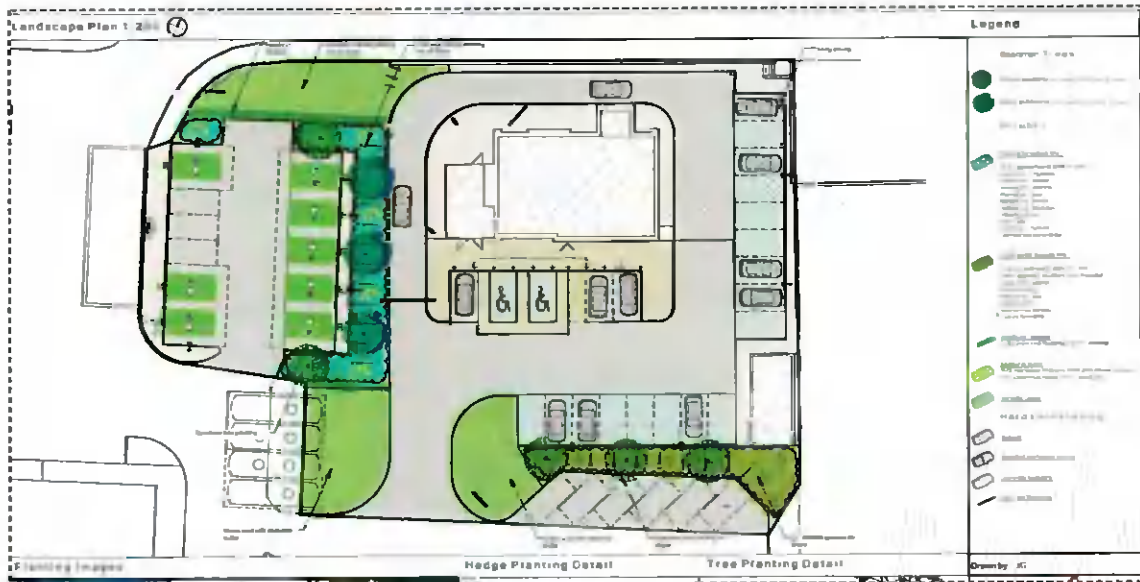


Fig. (4) Showing charging spaces and drive-thru coffee unit.

**Increased Traffic to the site:** In accordance with information submitted by Atkins Ireland, the traffic consultant, the initial predicted increase in traffic onto the site is approx. 17% and as a percentage increase in noise is given by the expression

$$\% \text{ Noise Increase} = \text{anti log } \frac{dB2 - dB1}{10} - 1$$

Where dB2 is the initial noise level and dB1 is the increased level.

It can be seen that a doubling of the traffic flow and noise from say 50dB to 53dB is a 100%, so an increase of 17% is less than 1dB and not measurable or indeed noticeable. Accordingly the predicted increase in traffic onto the site will not cause any noticeable increase in noise.

Since traffic movements on the proposed developments roadways will be slowed by speed ramps we do not foresee any high level of noise from braking or engine noise from vehicles attending the coffee facility or charging hub.

**EV Charging:** This is essentially a very quiet operation and will not be audible on or beyond the site.

#### **Mechanical Services:**

The proposed developments will employ such mechanical services as heating and ventilation and the plant associated with these services will be controlled so as to comply with the relevant noise criteria given in this report.

Mechanical services systems ducted to atmosphere, such as ventilation, will be attenuated to ensure that noise emanating from such sources does not exceed the Environmental Protection Agency (EPA) noise criteria guidelines set out below.

Since the facility operates on a 24/7 basis this means complying with the lower value night time noise criterion given below. Thus ensuring that noise from such sources is within acceptable limits at the noise sensitive location such as Broadfield Glen and Broadfield Grove.

**Fridge Plant:** Plant items serving the likes of fridges will operate over a 24 hour period, and hence any associated noise would be more noticeable during quiet periods such as night time. Accordingly fridge plant units will be selected to be of the low noise type, mounted on suitable antivibration mounts so that noise arising from the operation of fridge plant does not exceed the noise criteria given below or exhibit any tone as measured at the nearest noise sensitive location.

**Noise Criteria:** Plant noise to atmosphere will be designed to conform to Environmental Protection Agency (EPA) guidelines which are set out below.

Noise should *not contain any audible tones or exceed the following at the nearest noise sensitive location.*

*Daytime (07:00 to 19:00 hrs) - 55 dB  $L_{AR,T}$ ;*

*Evening (19:00 to 23:00hrs) - 50 dB  $L_{AR,T}$ ;*

*Night-time (23:00 to 07:00 hrs) - 45 dB  $L_{Aeq,T}$ ;*

#### **Construction Phase:**

Whilst there are no Irish guidelines as to the assessment, prediction or control of noise on building sites *British Standard BS 5228-1:2009+A1:2014 Noise and Vibration Control on Construction and Open Sites Part 1. Code of practice for basic information and procedures for noise control* can and has been referred to in many instances for construction sites. Whilst the document does not give absolute noise limits it contains a number of guidelines and recommendations that are considered appropriate and good working practice for all construction sites.

Some general measures which should be implemented are as follows.

- 1) The contractor should appoint a person who will be present on site during working hours and who will accept, note and act upon any justified noise complaints from neighbours.
- 2) A contact name and telephone number should be made available to the local residents.
- 3) Site equipment should be well maintained and where possible new plant manufactured under EC guidelines for noise limits used.
- 4) Unsuitable plant should be substituted.
- 5) Maintenance of engine silencers, covers and moving parts should be ongoing.
- 6) Temporary acoustic screening, using sand bags, plywood or dense board, may be required on occasions to screen noisy workings or plant from noise sensitive locations.
- 7) The positioning of noise generating equipment, such as compressors, generators, cement mixers etc. should be as far as is practical from noise sensitive locations or the use of temporary screening applied where this is not practical.
- 8) Running or "on time" for plant should be limited, an example of this would be that you do not allow generators or other plant to idle unnecessarily during lunch time or the like.
- 9) Instructions to all drivers attending or working on the site for a need to limit vehicle speeds and engine revs. when passing by any noise sensitive location.
- 10) The maintenance of road surfaces on or leading to the site.

It is accepted that one cannot undertake construction work without making noise and it is likely that some short-term site work may increase the ambient noise level at various noise sensitive locations. However to limit this impact such work should be carried out in a responsible manner and appropriate noise control measures implemented as proves necessary.

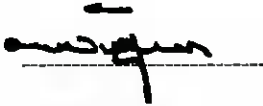


**Conclusions:** Allowing that demolition and construction will be conducted in accordance with *British Standard BS 5228-1:2009+A1:2014* and considering the small 17% increase in traffic to the site, along with the fact that charging Electric Vehicles (EV's) is a relatively quiet exercise and that all mechanical services associated with the proposed development will comply with the Environmental Protection Agency (EPA) noise criteria, we conclude that the development, during both the construction and operational phases will not give rise to justified noise complaint at any noise sensitive location .

It is a recommendation of this report that a noise survey be conducted when the proposed development is complete so as to demonstrate compliance with the recommended noise criteria.

We trust we have suitably addressed your concerns and should any points require clarification please find the writer at your disposal.

Yours on behalf of Decibel Noise Control.

A handwritten signature in black ink, appearing to read 'Noel Tynan', is written over a horizontal dashed line.

NOEL TYNAN

Acoustic consultant.

## Terminology.

**Decibel (dB):** The decibel is a unit of level which denotes the ratio between two quantities that are proportional to the power; the number of decibels corresponding to the ratio of two powers is ten times the logarithm to the base 10 of this ratio.

**Sound Pressure Level (S.P.L.):** Sound Pressure Level (S.P.L.) due to a source, in dB, is equal to twenty times the logarithm to the base 10 of the RMS sound pressure level to the reference level, which in the noise source is located.  $2 \times 10^{-5}$  air is taken to be  $2 \times 10^{-5}$  N/m<sup>2</sup>. SPL is conditioned by the space in which

**dB(A) :** A weighted sound pressure level (S.P.L.) approximately equivalent to the human ear frequency response to noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear frequency response of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to  $2 \times 10^{-5}$  Pa.

$L_{Aeq}$  is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

### Statistical Value [ $L_N$ ] :

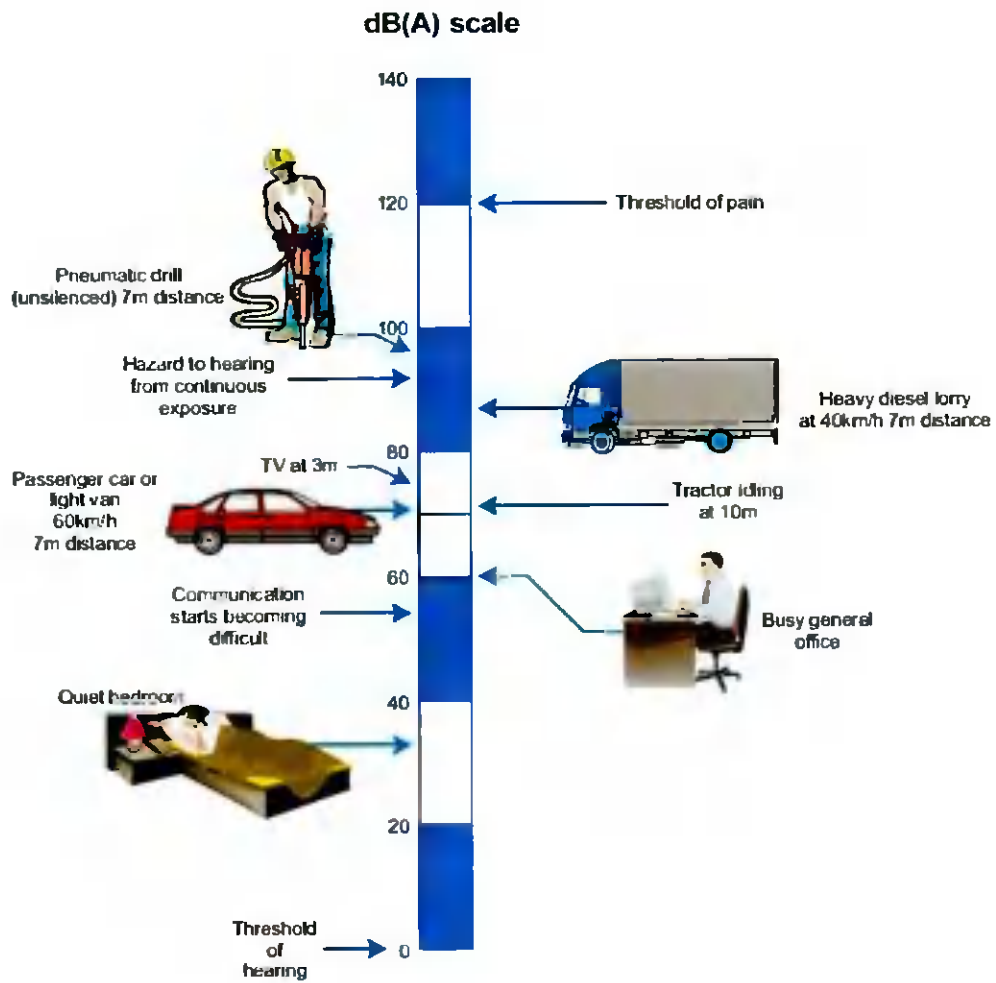
$L_{A90}$  dB(A) sound level exceeded for 90% of the time, captures steady state noise.

$L_{A10}$  dB(A) sound level exceeded for 10% of the time, captures short term fluctuating noise such as that associated with road traffic.

$L_{AFmax}$  : The maximum fast response noise measured during the measurement period.

$L_{AR,T}$ : The rating level ( $L_{AR,T}$ ) is calculated by adding a penalty to the measured equivalent continuous A-Weighted sound pressure level ( $L_{Aeq,T}$ ). Typically, penalties are added for noise with tonal or impulsive characteristics

**Rounded Values:** In accordance with EPA (NG 4) all results are rounded to the nearest whole integer, with 0.5 being rounded up.



**The level of typical common sounds on the dB(A) scale.**

*(NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes, 2004)*