Lloyd George Acoustics
PO Box 717
Hillarys WA 6923
T: 9401 7770
www.lgacoustics.com.au

Environmental Noise Assessment

Cataby Power Station Project – Cataby WA

Reference: 24109527-01

Prepared for:
Alinta Energy (Cataby) Pty Ltd

Reference: 24109527-01

Lloyd George Acoustics Pty Ltd
ABN: 79 125 812 544

PO Box 717
Hillarys WA 6923
www.lgacoustics.com.au

Contacts	General	Terry George	Matt Moyle	Matt Nolan
E:	info@lgacoustics.com.au	terry@lgacoustics.com.au	matt@lgacoustics.com.au	matt.nolan@lgacoustics.com.au
P:	9401 7770	0400 414 197	0412 611 330	0448 912 604
Contacts	Rob Connolly	Hao Tran	Dave Perry	James Leader
E:	rob@lgacoustics.com.au	hao@lgacoustics.com.au	dave@lgacoustics.com.au	james@lgacoustics.com.au
P:	0410 107 440	0438 481 207	0410 468 203	0449 165 803

Date	Rev	Description	Author	Verified
19-Dec-24	-	Draft Issued to Client	Matt Moyle	Terry George
29-May-26	0	Finalised and Issued	Matt Moyle	Terry George
6-25-26	A	Updated and finalised	Matt Moyle	Terry George

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EXECUTIVE SUMMARY

Alinta Energy (Cataby) Pty Ltd (Alinta Energy) is proposing to construct and operate a power station (the Project) located on agricultural land approximately 200 km north of Perth CBD and 3 km south of Cataby Townsite. The Project includes a 400 megawatt (MW) Peaking Power Station (PPS) with connection to the existing South West Interconnected System (SWIS).

The noise impact resulting from the Project was assessed in accordance with the *Environmental Protection (Noise) Regulations 1997*. The assessment was carried out by way of computer noise modelling using Project supplied source sound levels for the proposed plant on site. The facility is to consist of an engine hall with ten (10) reciprocating engines within, and a single gas turbine enclosure.

It is noted that some aspects of the facility are yet to be designed in detail, although sufficient information is available to model noise emissions. It is understood that noise specifications are to be applied on the facilities designers and therefore form the basis of equipment noise sources in the noise model.

The facility is proposed to operate as a peaking power station when there is a high electricity demand, i.e., peak demand. This peak demand could occur at any time and therefore, the night-time assessment is most critical as the allowable levels during this time are the most stringent.

Noting that conservative assumptions have been applied to the predictive calculations, noise impacts are compliant at all noise sensitive premises. It is understood that location R6 is a caretaker's premises and owned by Iluka Resources, being located on the same land as their mine tenement.

With regard to construction activities to establish the facility, precise equipment and construction methods are not known, however these should be reviewed as the site is prepared. It is noted the only potential sensitive receivers are located more than 1.5 km from the project site and construction is likely to be predominantly during the daytime. Therefore, noise impacts from construction activities are considered negligible and were not specifically assessed.

1. INTRODUCTION

Lloyd George Acoustics was engaged by Alinta Energy (Cataby) Pty Ltd to undertake an environmental noise assessment of a proposed gas fired Peaking Power Station (up to 400MW) to be located 3km south of Cataby - refer *Figure 1-1*. The surrounding area is in close proximity to mining activity by Iluka Resources (refer *Figure 1-2*) with several residences within 10 km of the subject site.

Noise impacts are predicted by way of computer noise modelling, utilising source sound data provided by the project team. The facility is proposed to consist of ten (10) reciprocating engines in an enclosed engine hall and one gas turbine enclosure – refer to *Figure 1-3* for a concept 3D render of the site. With regard to noise emissions, consideration is given to noise from the various power station plant, against the prescribed standards of the *Environmental Protection (Noise) Regulations 1997* (The Regultations) to the nearest neighbouring premises.

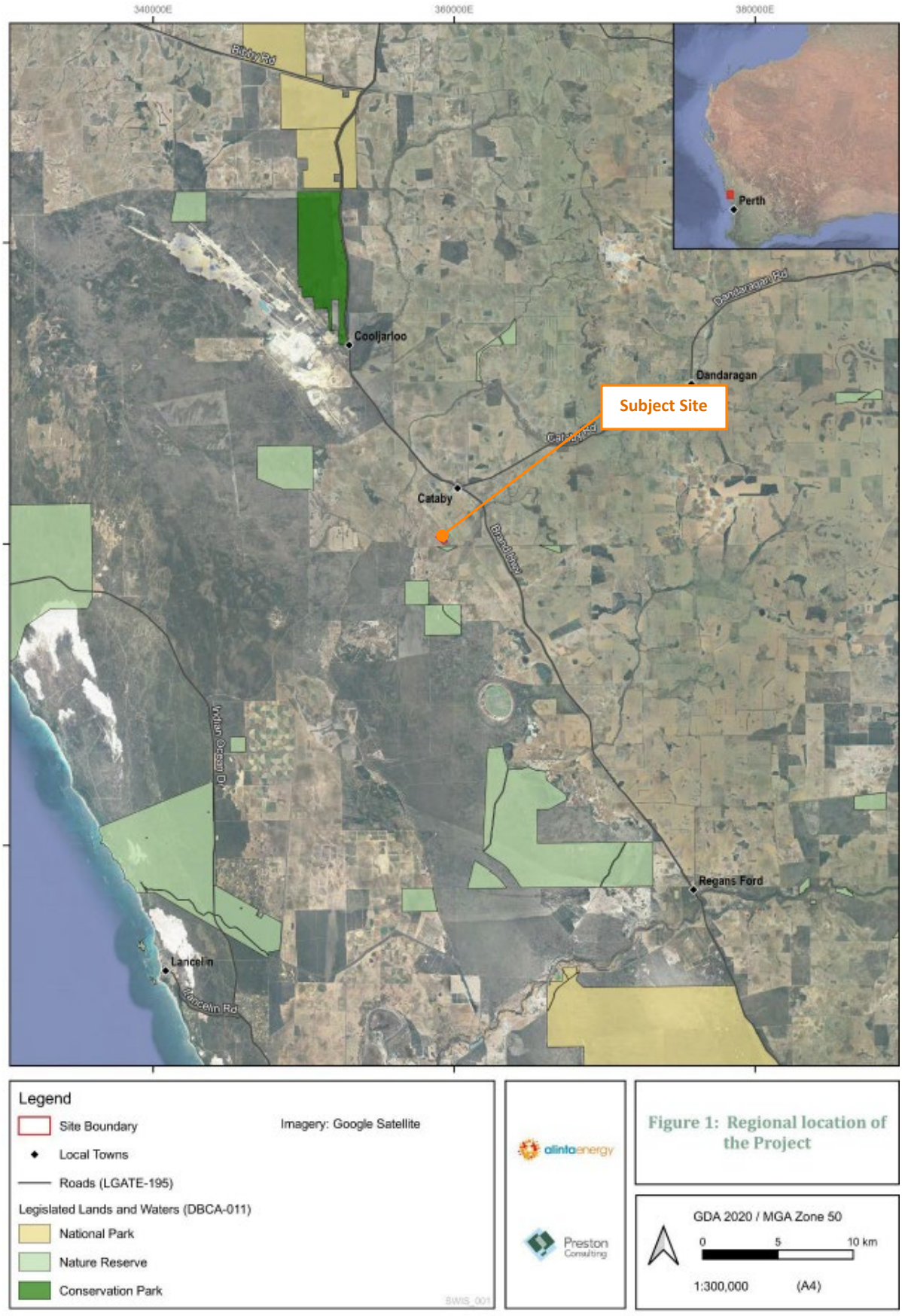


Figure 1-1: Subject Site Location (Source: Preston Consulting)

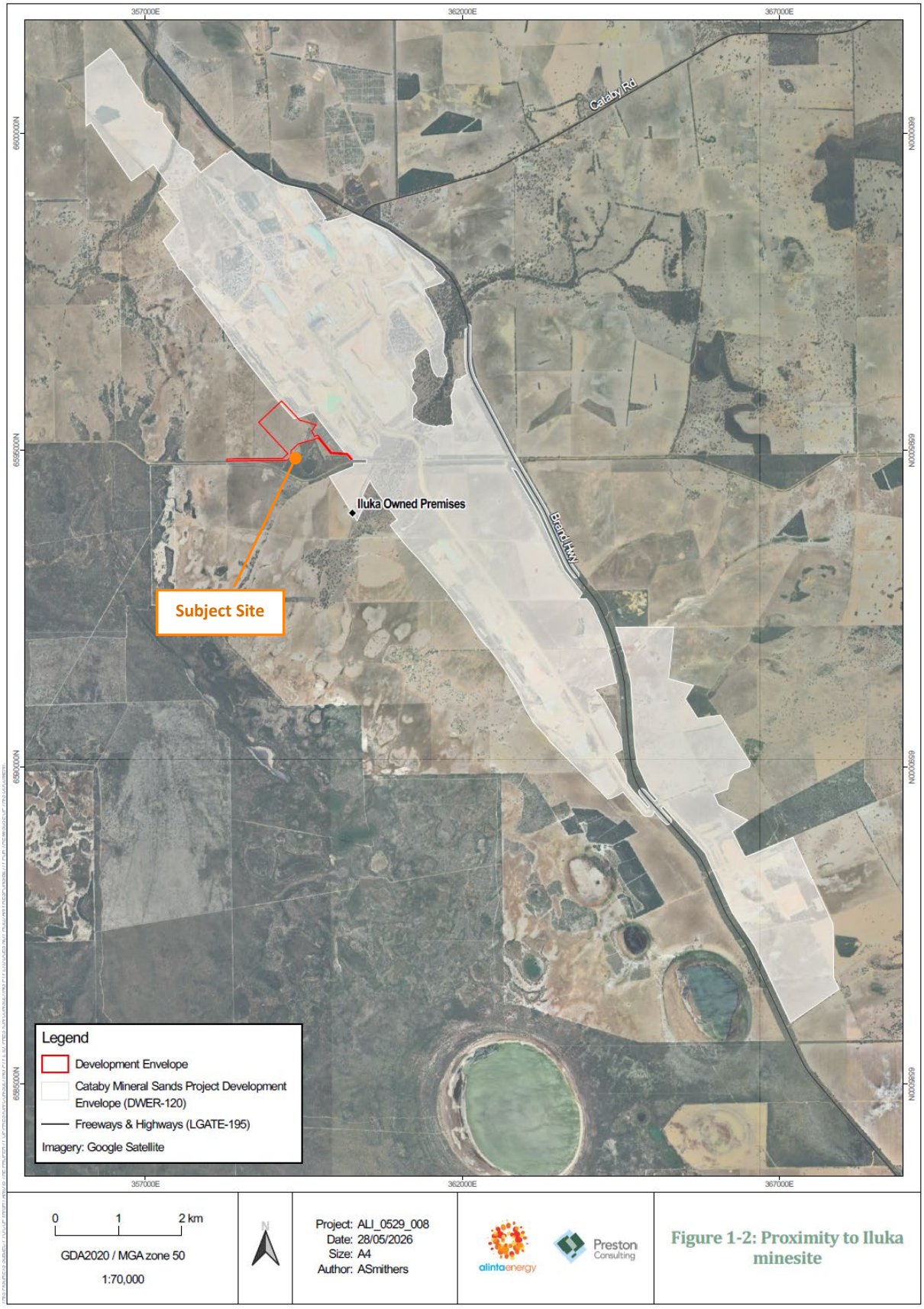


Figure 1-2: Iluka Minesite and Subject Site Development Envelope (Source: Preston Consulting)

Figure 1-3: 3D Render of Site Concept Layout (Source: Alinta Energy)

Appendix B contains a description of some of the terminology used throughout this report.

2. CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* as follows:

"7. Prescribed standard for noise emissions

(1) Noise emitted from any premises or public place when received at other premises –

(a) *must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and*

(b) *must be free of –*

(i) tonality; and

(ii) impulsiveness; and

(iii) modulation,

when assessed under regulation 9.

(2) For the purposes of subregulation (1)(a), a noise emission is taken to significantly contribute to a level of noise if the noise emission … exceeds a value which is 5 dB below the assigned level at the point of reception."

Tonality, impulsiveness and modulation are defined as intrusive or dominant characteristics in regulation 9 (refer *Appendix B*). Under regulation 9(3), noise is to be taken to be free of these characteristics if:

(a) "the characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and

(b) the noise emission complies with the standard prescribed under regulation 7(1)(a) after the adjustments in the table [Table 2-1] to this subregulation are made to the noise emission as measured at the point of reception.

Table 2-1 Adjustments Where Characteristics Cannot Be Removed

Where Noise Emission is Not Music*			Where Noise Emission is Music	
Tonality	Modulation	Impulsiveness	No Impulsiveness	Impulsiveness
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

Note: *The below are cumulative to a maximum of 15dB.

The assigned levels (prescribed standards) for all premises are specified in regulation 8(3) and are shown in *Table 2-2*. The L_{A10} assigned level is applicable to noises present for more than 10% of a representative assessment period, generally applicable to "steady-state" noise sources. The L_{A1} is for short-term noise sources present for less than 10% and more than 1% of the time. The L_{Amax} assigned level is applicable for incidental noise sources, present for less than 1% of the time.

Table 2-2 Baseline Assigned Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area[1]	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial Premises	All hours	60	75	80
Industrial and Utility Premises (and Caretaker)	All hours	65	80	90

1. ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising —
   (a) a building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
   (b) any other part of the premises within 15 metres of that building or that part of the building.

The influencing factor (IF), in relation to noise received at noise sensitive premises, has been calculated as 0 dB, as only rural land uses are noted within 450m of all noise-sensitive premises and therefore the baseline assigned levels of *Table 2-2* are applicable. The following noise sensitive premises were noted to be in closest proximity to the proposal:

- Residence 1 – Approximately 3.3 km west of the site;
- Residence 2 – Approximately 3.5 km north west of the site;
- Residence 3 – Approximately 3.5 km north west of the site;
- Residence 4 – Approximately 3.7 km north west of the site;
- Residence 5 – Approximately 5 km north of the site;
- Residence 6 (Caretaker) – Approximately 1.5 km south east of the site (owned by Iluka Resources);
- Residence 7 – Approximately 4.2 km north east of the site;
- Residence 8 – Approximately 4 km south east of the site;
- Cataby Townsite – Approximately 3.2 km north of the site.

Premises close to the subject site but not considered noise sensitive have been identified as:

- Ampol Cataby – Commercial Premises
- Iluka Offices – Industrial Premises
- Iluka Operations – Industrial Premises
- PWR Hybrid Solar Farm – Commercial Premises

Noise sensitive premises are defined in the *Environmental Protection (Noise) Regulations 1997* under Schedule 1 Part C Items 1 through 3. In this instance many of the receiving premises are considered "Rural Premises" under Item 2, or "Premises occupied solely or mainly for residential or accommodation purposes" under Item 1. Residence 6 is noted to be on the same land as a mining tenement owned by Iluka Resources and therefore is considered a caretaker premises (Industrial) under Schedule Part 1 Item 8. Residence 6 is also owned by Iluka Resources and only occupied occasionally.

The assigned levels are statistical levels and therefore the period over which they are determined is important. The Regulations define the representative assessment period (RAP) as "…*a period of time of not less than 15 minutes, and not exceeding 4 hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission"*.

An *inspector* or *authorised person* is a person appointed under Sections 87 & 88 of the *Environmental Protection Act 1986* and includes Local Government Environmental Health Officers and Officers from the Department of Environment Regulation. Acoustic consultants or other environmental consultants are not appointed as an *inspector* or *authorised person*. Therefore, whilst this assessment is based on a 4-hour RAP, which is assumed to be appropriate given the nature of the operations, this is to be used for guidance only.

3. METHODOLOGY

Computer modelling has been used to predict the noise emissions from the proposed development. The software used was *SoundPLAN 9.0* with the CONCAWE algorithms (ISO 17534-3 improved method) selected, as they include the influence of meteorological conditions. Input data required in the model are listed below and discussed in *Section 3.1* to *Section 3.4*:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

Note that with any theoretical modelling approach, the predicted noise levels are not without a degree of uncertainty. The validity of the CONCAWE prediction model has been tested over the range 100 - 2000 metres. Extrapolation beyond these ranges as required for this project, is to be considered with caution.

3.1. Meteorological Conditions

Meteorological information utilised is provided in *Table 3-1* and is considered by the Department of Water and Environmental Regulation (DWER) to represent worst-case conditions for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1: Modelling Meteorological Conditions

Parameter	Night (7.00pm to 7.00am)
Temperature (°C)	15
Humidity (%)	50
Wind Speed (m/s)	3
Wind Direction*	All
Pasquil Stability Factor	F

* The modelling package allows for all wind directions to be modelled simultaneously.

Alternatives to the above default conditions can be used where one year of weather data is available and the analysis considers the worst 2% of the day and night for the month of the year in which the worst-case weather conditions prevail (source: *Draft Guideline on Environmental Noise for Prescribed Premises*, May 2016). In most cases, the DWER default conditions occur for more than 2% of the time and therefore must be satisfied.

3.2. Topographical Data

Topographical data for the surrounding area was provided by the proponent's environmental consultants as a shape file in the form of contours at 2 metre intervals and combined with the site plan (assumed levelled).

3.3. Ground Absorption

The ground attenuation has been assumed to be 1.0 (100%) throughout the model given the rural nature of the area, noting that 0.0 represents hard reflective surfaces such as water and 1.0 represents absorptive surfaces and soft ground such as grass, agricultural land, forest or gardens.

3.4. Source Sound Power Levels

The source sound power levels used in the modelling are provided in *Table 3-2*.

Table 3-2: Source Sound Power Levels, dB

Description	Source Height (m)	Octave Band Centre Frequency (Hz)									Overall dB(A)
		31	63	125	250	500	1k	2k	4k	8k	
Gas Turbine Enclosure											
Gas Turbine Exhaust Stack	25	133	131	123	113	106	91	81	75	67	**111**
Gas Turbine Package	5	137	135	133	127	126	122	118	115	109	**128**
Engine Hall											
Engine Exhaust Stack (Silenced)	25	129	112	102	98	94	88	86	83	81	**98**
Engine Intake Openings (silenced)	5	137	132	122	108	90	89	84	89	95	**110**
Reciprocating Engine Package	5	127	125	123	117	116	112	108	105	99	**118**

The following is noted in relation to *Table 3-2*:

- In all cases, source sound power levels have been provided by the Alinta Energy's suppliers, based on manufacturers data. It is understood that strict specifications will be applied to facility suppliers as follows:
  - A maximum level of 81 dB(A) at 1-metre from external facades of engine hall;
  - A maximum level of 85 dB(A) at 1-metre from external facades of the Gas Turbine Enclosure, auxiliaries and exhaust stacks.
- The engine hall and gas turbine Enclosure walls and roof elements are assumed to provide R_w 22 dB, being of an assumed sheet metal cladding with a generic internal thermal insulation lining. This is adjusted where necessary to meet the required external noise specifications above.
- It is assumed that all noise sources will be operating simultaneously and at start-up speeds rather than steady state speeds. This is considered to be conservative as start-up noise is highest and the generally plant will only run simultaneously during peak demand.
- Where identified, office buildings and minor sheds have been assumed at 4.0 metres high.
- Sources heights are relative to natural ground.

4. RESULTS & ASSESSMENT

The results for the worst-case scenario of all plant in operation are provided in *Table 4-1,* assessed against the night-time assigned level. A noise contour plot is also provided in *Figure 4-1*.

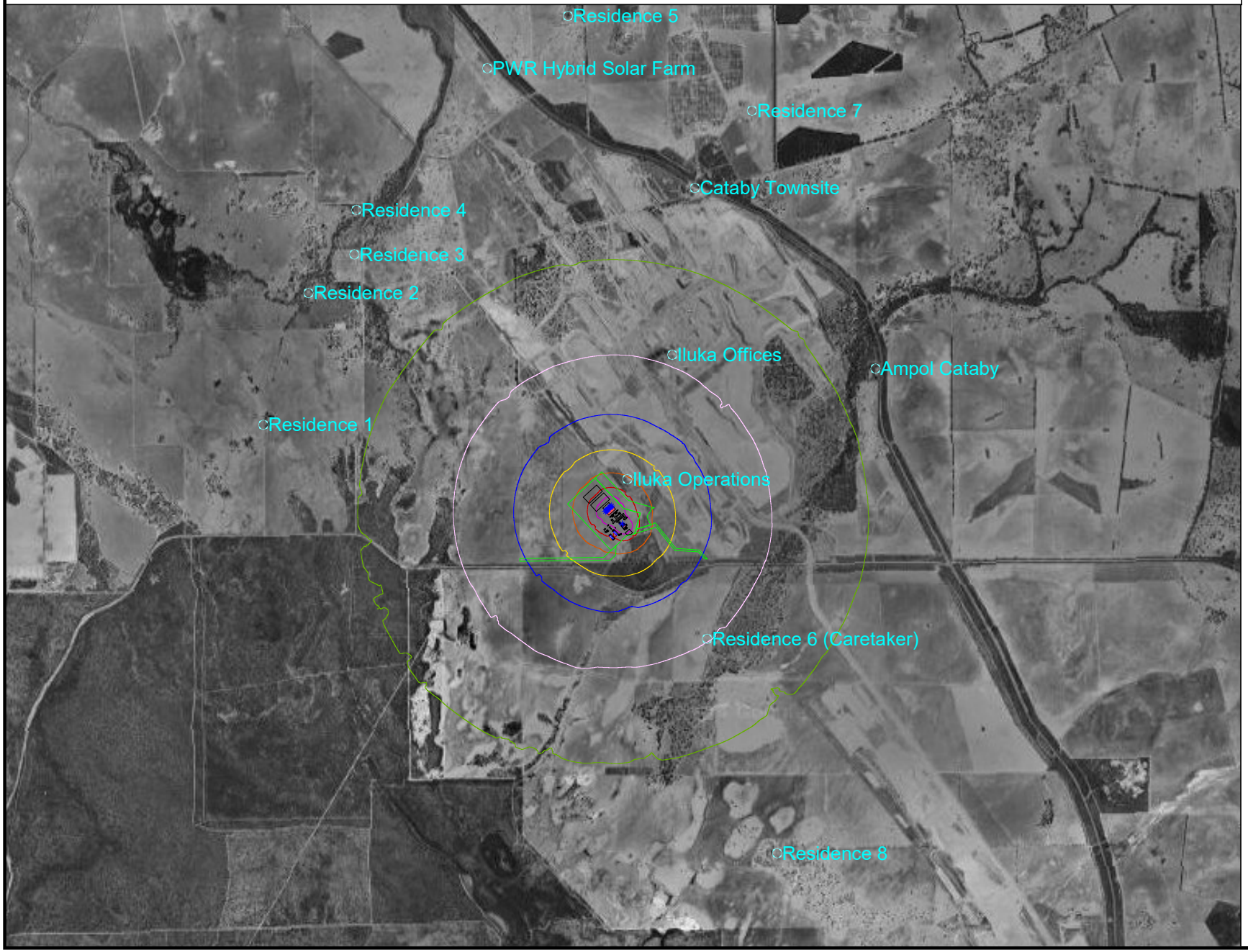
Table 4-1: External Predicted Levels (Night)

Receiver	Predicted Level, dB L_{A10}	Assigned Level, dB L_{A10}	Assessment
Residence 1	26	**35**	*Complies*
Residence 2	26	**35**	*Complies*
Residence 3	26	**35**	*Complies*
Residence 4	25	**35**	*Complies*
Residence 5	<20	**35**	*Complies*
Residence 6 (Caretaker)	35	**65**	*Complies*
Residence 7	24	**35**	*Complies*
Residence 8	26	**35**	*Complies*
Cataby Townsite	27	**35**	*Complies*
Iluka Offices	34	**65**	*Complies*
Iluka Operations	51	**65**	*Complies*
PWR Hybrid Solar Farm	23	**60**	*Complies*
Ampol Cataby	28	**60**	*Complies*

Given the nature of the sources and distance to noise sensitive premises, the noise emissions from the power station are not expected to contain intrusive characteristics. Notwithstanding, the predicted levels in *Table 4-1* comply at all receptors, even if applying a +5 adjustment for tonality.

Figure 4-1: Night Time Noise (1.5m AGL), dB L_{A10}

SWIS Peaker Project - Cataby WA



Predicted Noise level

	= 30
	= 35
	= 40
	= 45
	= 50
	= 55
	= 60

Legend

- Receiver
- Exhuast Stack
- Engine/Turbine Hall
- Development Envelope

N

0 350 700 1400 2100 m

Project No: 24109527
Consultant: MM
Date: 29/05/2026
Algorithm: CONCAWE
SoundPLAN Version: 9.0

Lloyd George Acoustics
PO Box 717
HILLARYS WA 6923
(08) 9401 7770

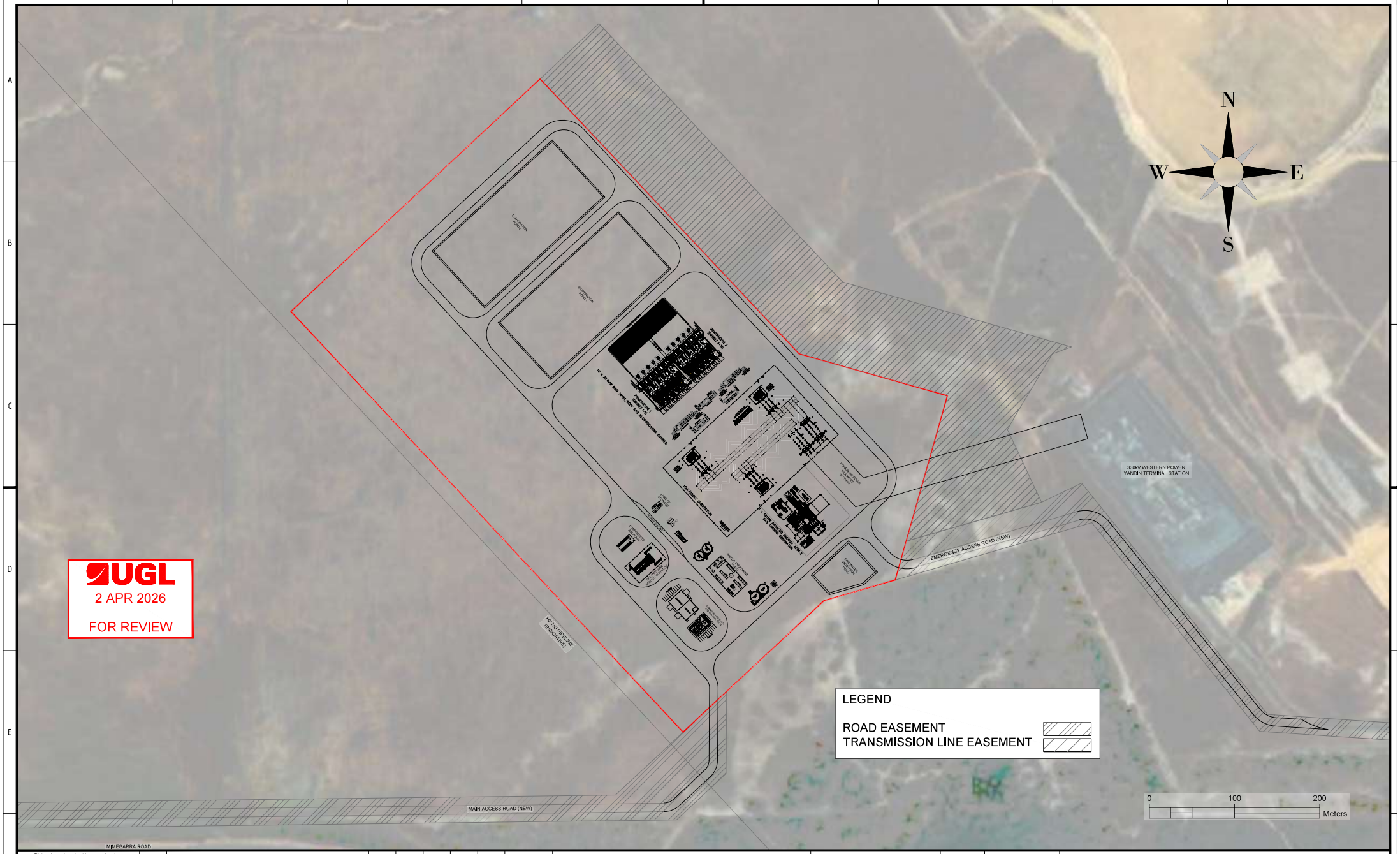
5. CONCLUSION

A study of noise impact was carried out by way of noise modelling and regarding preliminary design of the proposed 400 MW Cataby Power Station Project at Cataby WA.

Noise levels from the site are expected to comply with the most critical, night-time assigned levels at all noise sensitive receptors. This compliance outcome is based on noise specifications meeting Alinta Energy's requirements.

With regard to construction activities to establish the facility, precise equipment and methods are not known however, these should be reviewed as the site is prepared. It is noted the only potential sensitive receivers are located more than 1.5 kilometres from the project site and construction is likely to be predominantly during the daytime. Therefore, noise impacts from construction noise are considered negligible and were not specifically assessed.

Appendix A – Site Plans



UGL
2 APR 2026
FOR REVIEW

REV	REVISION DESCRIPTION	DESIGN	CHK'D	DRAWN	CHK'D	APP'D	DATE
A	FOR REVIEW	BW	SHB	BW	SHB	SHB	2/04/2026

alintaenergy

UGL
ABN 96 096 365 972
40 Miller Street
North Sydney NSW 2060
www.uglimited.com

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A3 SCALE @ A3 N.T.S.

CONFIRM SCALE 100mm ON A3

CATABY POWER STATION
GAS TURBINE GENERATOR AND RECIPROCATING ENGINE GENERATOR
10 x MAN 18V51/60DF RE AND 1 x ANSALDO AE94.2 GT
SITE GENERAL ARRANGEMENT

CLIENT	UGL DRAWING No.	SHEET	REV
ALINTA ENERGY	20112-SITE-GA-0007	01	A

Appendix B – Terminology

The following is an explanation of the terminology used throughout this report:

- **Decibel (dB)**

The decibel is the unit that describes the sound pressure levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

- **A-Weighting**

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A, dB.

- **Sound Power Level (L_w)**

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure level at known distances. Noise modelling incorporates source sound power levels as part of the input data.

- **Sound Pressure Level (L_p)**

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc. and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

- **L_{ASlow}**

This is the noise level in decibels, obtained using the A-frequency weighting and the S (slow) time weighting. Unless assessing modulation, all measurements use the slow time weighting characteristic.

- **L_{APeak}**

This is the greatest absolute instantaneous sound pressure level in decibels using the A-frequency weighting.

- **L_{Amax}**

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

- **L_{A1}**

The L_{A1} level is the A-weighted noise level exceeded for 1 percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

- **L_{A10}**

The L_{A10} level is the A-weighted noise level exceeded for 10 percent of the measurement period and is considered to represent the “intrusive” noise level.

- **L_{Aeq}**

The equivalent steady state A-weighted sound level ("equal energy") in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the "average" noise level.

- **Representative Assessment Period**

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

- **L_{Amax} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded at any time.

- **L_{A1} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 1 percent of the representative assessment period.

- **L_{A10} assigned level**

Means an assigned level, which, measured as a L_{ASlow} value, is not to be exceeded for more than 10 percent of the representative assessment period.

- **Tonal Noise**

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

– the presence in the noise emission of tonal characteristics where the difference between -

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

This is relatively common in most noise sources.

- **Modulating Noise**

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

– a variation in the emission of noise that —

(a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band; and

(b) is present for at least 10% of the representative assessment period; and

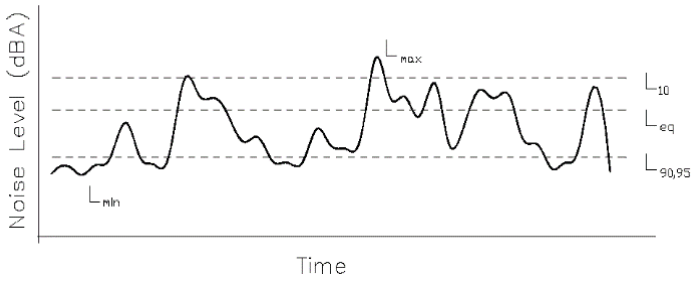
(c) is regular, cyclic and audible.

- **Impulsive Noise**

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness means:

– a variation in the emission of a noise where the difference between L_{Apeak} and L_{Amax} is more than 15 dB when determined for a single representative event.

- **Chart of Noise Level Descriptors**



- **Typical Noise Levels**