Assistance Dogs Australia, Orchard Hills

Noise Impact Assessment

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EXECUTIVE SUMMARY

This report presents the assessment of noise impacts associated with the proposed Assistance Dogs Training Facility to be located at 8 Austin Place, Orchard Hills.

This assessment addresses noise generated by the site in accordance with the requirements of Penrith City Council and the EPA Industrial Noise Policy.

Predicted noise levels based on dogs barking indicate the site can comply with the project noise emission requirements for all periods of the day, evening and night.

This revision includes:

- additional information requested by Penrith City Council in the letter dated 20 November 2017.
- Reduced kennel Stage 2 (E2) kennel size.

1 INTRODUCTION

Acoustic Logic Consultancy (ALC) have been engaged to conduct an acoustic assessment of noise impacts associated with the proposed assistance dogs training facility to be located at 8 Austin Place, Orchard Hills.

This assessment will address noise impacts associated with:

- Dogs within outdoor runs and training yards during the day time assessment period;
- Dogs housed internally within the facility during the night time assessment period;
- Traffic noise generation along Austin Place; and
- Mechanical plant noise in principle.

Noise impacts have been addressed in accordance with:

- Penrith City Council Development Control Plan 2014; and
- Environment Protection Authority (EPA)
    - Industrial Noise Policy
    - Road Noise Policy

Predicted noise levels from the operation of the facility as presented in this report indicate that the proposed development can comply with the aforementioned authorities and regulations for all periods of the day, evening and night.

SoundPlan™ Note

Noise levels have been predicted at the receiver locations using SoundPlan™ modelling software implementing the ISO 9613-2:1996 *"Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation"* noise propagation standard. Noise levels presented in the body of this report are the receiver incidence levels and do not include façade reflection.

2 PROPOSED DEVELOPMENT AND SITE LOCATION

The proposed site is located on the currently occupied parcel of land located at 8 Austin Place, Orchard Hills. The proposed assistance dog training centre is to accommodate the following:

- Enclosed runs for 60 dogs.
- Internal kennels housing the dogs during the evening and night time periods;
- Staff amenities, meeting space, internal training areas and treatment rooms.
- Outdoor training yards (daytime use only); and
- On grade car parking.

Noise emissions from the development will typically be associated with dogs barking within outdoor runs and training yards and internally within the kennels during the night time and evening period.

2.1 SURROUNDING USES

The surrounding uses of the development include the following:

- Rural residential properties to the West, East and Southeast; and
- M4 Western Motorway to the North.

Receiver locations used as a basis for this assessment are as follows (Refer to Figure 1):

- R1 - Residential dwelling to the West at 17 Calverts Road;
- R2 - Residential dwelling to the Northeast at 19 Calverts Road;
- R3 - Residential dwelling to the East at 31 Calverts Road;
- R4 - Residential dwelling to the East at 39 Calverts Road.
- R5 - Residential dwelling to the South at 6 Austin Place.

Figure 1: Site Survey and Monitoring Position

3 EXISTING ACOUSTIC ENVIRONMENT

The acoustic environment is categorised by high background noise levels during the day, evening and night due to the proximity to the M4 Western Motorway.

Acoustic monitoring was conducted at the site to establish the background noise levels which will be used as basis for this assessment.

3.1 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15-minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

3.2 BACKGROUND NOISE LEVELS

Background noise levels which will be used as a basis for this assessment are detailed in the following sections.

3.2.1 Measurement Equipment

Unattended noise monitoring was conducting using Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

The calibration certificate for the noise monitor is appended to this report.

3.2.2 Measurement Location

The noise monitor was installed toward the Southern end of the site amongst existing buildings (Refer to Figure 1).

3.2.3 Measurement Period

Unattended noise monitoring was conducted from 20-26 January 2016.

3.2.4 Weather Affected Noise Data

Meteorological data has been adopted from the Penrith Lakes weather station for the monitoring period. Adverse weather conditions have been highlighted in the monitoring data provided in the Appendix.

Where adverse weather conditions were experienced for significant portions of the respective day, evening or night period, these have been also highlighted in Table 1.

Given that:

- Background noise levels are the lowest 10% of the noise level recorded per 15min period and the RBL is taken as the median of the bottom 10% of the noise levels within a monitoring period, sporadic adverse weather conditions would have negligible impact on the background noise levels established from the monitoring period.

  Council have requested that the peaks caused at 2100 hours on the 22-24th and 26th of the monitoring period be accounted for. With consideration to how the rating background noise level is established, peak events are not included and as such is irrelevant.

- The equivalent continuous sound level experienced during adverse weather conditions does not significantly contribute to the noise level for the full period of monitoring and is generally comparable to adjacent days of monitoring.

On this basis, adverse weather conditions during the monitoring has negligible impact on the establishment of the rating background noise level or representative equivalent continuous sound level.

3.2.5 Monitored Noise Levels

Noise levels established from the unattended noise monitoring are detailed in the Table below.

Table 1 – Monitored Noise Levels

Date	Rating Background Noise Level, dB(A) L_{90}			Equivalent Continuous Sound Level, dB(A) L_{eq}		
	Day	Evening	Night	Day	Evening	Night
20/01/2016	61	55	51	66	63	63
21/01/2016	61	62	48	66	66	64
22/01/2016	64	64	50	68	68	62
23/01/2016	57	56	50	65	64	58
24/01/2016	58	57	46	63	61	60
25/01/2016	60	59	48	64	64	59
26/01/2016	56	58	47	63	62	60
Median	58	57	48	65	64	60

Note: Noise data potentially impacted by significant periods of wind or rain are highlighted in red.

The median background noise recordings are used to established the rating background noise levels for the assessment of noise impacts from the site.

Table 2 – Rating Background Noise Level

Time of Day	Rating Background Noise Level dB(A) L_{90}
Day	58
Evening	57
Night	48

4 NOISE EMISSION CRITERIA

Noise emissions from the site will be assessed in accordance with the Penrith City Council Development Control Plan and the EPA Industrial Noise Policy.

4.1 PENRITH CITY COUNCIL

Section C12 of the Penrith City Council DCP 2014 provides guidance for the control of noise emissions from developments.

Section C12.5 of the DCP relates to Rural Developments, which includes specific controls for animal boarding, training and breeding establishments. Part C of Section 12.5 provides the following controls.

Noise Impact Statements - specific requirements

a) All development applications for dog boarding, training and breeding establishments are required to provide a Noise Impact Statement prepared by a qualified acoustic consultant in accordance with the requirements set out in this DCP.

   The Noise Impact Statement should demonstrate acoustic protection measures necessary to achieve an indoor environment meeting residential standards, in accordance with relevant noise criteria, as well as relevant Australian Standards.

   NOTE: The above noise controls should be read in conjunction with the specific development controls for dog boarding, training and breeding establishments in the Rural Land Uses Section of this Plan.

C. Controls

1) Dog Boarding, Training and Breeding Establishments

a) Council will not grant consent to applications for dog boarding, training and breeding establishments unless it can be demonstrated that:

i) The development complies with the relevant State Government authority or agency standards and guidelines for noise, as well as any relevant Australian Standards;

ii) The development complies with the following locational criteria:

- Kennels are located a minimum distance of 150m from any existing dwelling or potential dwelling site;
- Kennels, which are located 150m from existing or future dwellings, are limited to cater for 10 dogs;
- Council may permit a proportional increase in the number of dogs as the distance from existing or future dwellings is increased, to a maximum of 40 dogs for 300m;

iii) Road traffic noise generated by the development complies with the provisions of Section 12.1 Road Traffic Noise of this Section;

iv) The development manages and mitigates noise so as to not adversely impact on the amenity of surrounding rural properties. This is to be demonstrated in a Noise Impact Statement. The DA Submission Requirements Appendix sets out the minimum requirements for a Noise Impact Statement.

b) All development applications for dog boarding, training and breeding establishments shall also demonstrate the following noise mitigation measures in the design and management procedures:

i) All kennel buildings to be of masonry construction, concrete floors and incorporate screening measures to adequately restrict external stimulation;

ii) Kennels to be separated by a solid divider of adequate height;

iii) Sound-proofed kennels to be provided, incorporating internal absorptive lining to reduce reverberant sound, for particularly noisy dogs. A minimum of one sound-proofed kennel shall be provided for every 10 dogs accommodated;

iv) Dogs to be housed and exercised singly or in compatible pairs;

v) Feeding to be restricted to late afternoon or early evening;

vi) Lights to be extinguished after evening feeding; and

vii) No animals permitted in the run areas between the hours of 8.00pm to 7.00am Monday to Friday and 8.00pm to 8.00am Weekends and Public Holidays.

In addition to above, noise from the operation of the facility will be addressed in accordance with the EPA Industrial Noise Policy.

4.2 EPA - INDUSTRIAL NOISE POLICY

The INP provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The INP has two requirements which both are to be complied with, namely an amenity criterion and an intrusiveness criterion.

Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A).

Rating background noise levels for the area have been established from long term unattended noise monitoring as detailed in Section 3.2. Intrusive criteria based on the noise monitoring conducted at the site are detailed in Table 3.

Table 3 – INP Intrusiveness Criteria

Time of day	Background Noise Level dB(A) L_{90}	Intrusiveness Criteria (Background+5dB(A)) dB(A) L_{eq}
Day	58	63
Evening	57	62
Night	48	53

Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment. The Industrial Noise Policy sets out acceptable noise levels for various land uses. Table 2.1 on Page 16 of the policy has four categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Pursuant to Section 2.2.1 of the INP, 'Suburban' and 'Urban' are defined as areas which have acoustical environments which incorporate the following characteristics.

Suburban - An area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristics:

- Decreasing noise levels in the evening period (1800-2200); and/or
- Evening ambient noise levels defined by the natural environment and infrequent human activity.

Urban - an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise
- Has through traffic characteristically heavy and continuous traffic flows during peak periods
- Is near commercial districts or industrial districts
- Has any combination of the above,

  Where 'urban hum' means the aggregate sound of many unidentifiable, mostly traffic-related sound sources.

ALC would determine the site an 'Urban' noise environment given that the receiver site is within close proximity to the M4 Western Motorway which drives the high background noise levels in the area.

The corresponding Amenity Criteria noise emission goals are presented below.

Table 4 – INP Amenity Acceptable Noise Levels

Type of Receiver	Indicative Noise Amenity Area	Time of day	Recommended Acceptable Noise Level dB(A) L_{eq}
Residence	Urban	Day	60
		Evening	50
		Night	45

The acceptable levels are to be adjusted in accordance with Section 2.2 of the INP.

In this regard, ALC notes the following:

- The background noise and L_{eq} noise level in the vicinity of the site is controlled by traffic noise from the M4 Western Motorway.
- There are no significant industrial noise sources in the area. The surrounding uses are typically rural residential adjacent a significant motorway.
- In this regard, the level of industrial noise contribution will be lower than 6dB(A) below the acceptable noise level as per Table 2.2 of the INP. On this basis, no further adjustment is required to the amenity criterion as detailed in Table 4 above.

4.2.1 Sleep Disturbance

Potential sleep arousal impacts should be considered for noise generated after 10pm or before 7am. Sleep arousal is a function of both the noise level and the duration of the noise. In this instance, the use of the loading dock may have the potential to impact existing residential receivers.

Pursuant to the INP, to assess potential sleep arousal impacts, a two-stage test is carried out:

- Step 1 - An "emergence" test is first carried out. That is, the L_1 noise level of any specific noise source should not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. If the noise events are within this, then sleep arousal impacts are unlikely and no further analysis is needed. The guideline level is set out below.

Table 5 - Sleep Arousal Emergence Criteria

Location	Time of Day	Rating Background Noise Level dB(A) L_{90}	Emergence Level dB(A) $L_{1(1min)}$
All Potentially Affected Residential Properties	10pm-7am	48	63

- Step 2 - If there are noise events that could exceed the emergence level, then an assessment of sleep arousal impact is required to be carried out. As is recommended in the explanatory notes of the EPA Industrial Noise Policy, this more detailed sleep arousal test is conducted using the guidelines in Section 5.4 of the EPA Road Noise Policy (RNP).

4.3 EPA – ROAD NOISE POLICY

Council have no specific noise criteria with respect to traffic generation associated with developments. In the absence of this, EPA guidelines can be used for assistance.

For land use developments with the potential to create additional traffic the development should comply with the requirements for new developments detailed in the EPA Road Noise Policy, criteria as follows.

Table 6 - Criteria for Traffic Noise for New Developments

Time of day	Criteria for Acceptable Traffic Noise Level Local Roads - dB(A)
Day (7am to 10pm)	55 $L_{Aeq\ (1hr)}$
Night (10pm to 7am)	50 $L_{Aeq\ (1hr)}$

However, if existing noise levels exceed those in the table above, the provisions of section 3.4 of the Road Noise Policy will apply.

If practicable, noise on public roads as a result of increased traffic generation should not result in an increase in traffic noise level of more than 2dB(A). In this regard, the Policy relevantly states "*an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person*".

5 ASSESSMENT OF NOISE IMPACTS

5.1 NOISE ASSESSMENT METHODOLOGY

Noise from the operation of the kennels has been assessed for residential receivers surrounding the development. The methodology used to assess noise from the kennels is detailed below:

1. Establish noise limits for the day, evening and night time periods for general operation as per the Industrial Noise Policy.

2. Conduct a comprehensive assessment of noise emissions from a closed kennel for the night time assessment period. That is; noise transmission through windows, walls, ceiling/roof and entry doors. (Assessed in Section 5.2.1.1)

3. Conduct a comprehensive assessment of noise emissions from dogs within runs and the training yards for the day time assessment period. (Assessed in Section 5.2)

4. Recommendation of acoustic treatment, operational and management controls to ensure that the acoustic criteria established in the assessment are maintained. (Detailed in Section 6.)

The specific assumptions of operation including sound levels used for the assessment of the proposed kennel are presented in the discussion following.

5.2 DOG NOISE EMISSIONS FROM KENNELS

Noise from the boarding kennel have been assessed for the following:

- Noise breaking out of the kennel facility during the night time assessment period with dogs located internally only; and
- Noise from dogs within the outdoor runs and training yards during the day time assessment period.

The typical nature of noise and the operation of the kennel during these two periods are discussed in detail below.

5.2.1 Noise Emission Levels

In order to undertake the noise modelling, typical noise emission levels for dogs needs to be established.

5.2.1.1 Breakout from Internal Spaces within the Kennels

Noise from internal spaces in the kennels will potentially be generated at any time of day. Noise impacts will therefore be assessed against the night time acoustic criteria (the strictest acoustic criteria).

Noise emission levels for dogs located internally within the kennel have been assessed based on the following:

- The noise levels in the proposed (enclosed) kennels will be similar to the noise levels measured within an existing operating kennel facility located at Kingsford Smith Airport. Measured noise levels recorded during operation were 89dB(A) L_{eq} (based on the top 10 percent of events) with maximum noise events of 103dB(A) $L_{1(1min)}$. These levels are based on long term noise monitoring. It is noted that the monitoring indicated that night time noise levels are significantly lower than daytime noise levels, so the use of this highest 10^{th} percentile noise level to predict night time noise impacts (as we have done) produces a conservative assessment. Noise data from the monitoring conducted at Kingsford Smith Airport which has been included in the Appendix.
- All animals will be housed internally within the facility between 6pm and 7am, Monday to Friday and 6pm to 8am, Saturday and Sunday.
- The stated noise levels presented above will in addition be penalised (increased) to account for annoying characteristics (tonality and impulsiveness). Refer below.

5.2.1.2 Noise from Outdoor Runs and Training Yards

The outdoor runs and training yards are proposed to be used within daytime hours, that being between:

- Monday to Friday, 7am to 6pm; and
- Saturday and Sunday 8am to 6pm.

A typical noise emission level for dogs located externally has been determined from long-term data obtained at an existing commercial kennel. The details of this monitoring data are provided in the Appendix. A representative noise level for each dog was determined using the following methodology:

- A SoundPlan™ computer model was developed representing the monitored kennels using the number of dogs housed at the kennels during the monitoring period as external noise sources and the layout of the monitored kennels.
- The model was calibrated by varying the noise emission level per dog until the noise level predicted by the modelling at the monitoring location matched the level measured at the monitoring location.

The sound power level determined from this analysis was 96.3dB(A) $L_{eq\ 15min}$ per dog housed in the facility and permitted to be in an outdoor run.

The noise emission level will be penalised (increased) to account for annoying characteristics (tonality and impulsiveness). Refer below.

This dog noise emission level is the level used in the subsequent modelling to determine the typical worst-case noise emission level per dog housed at the proposed kennel.

5.2.2 Corrections for Annoying Characteristics

Noise from dogs barking have been assessed for potentially annoying characteristics as per Table 4.1 of the INP.

Noise measurements conducted of dogs barking indicated the following:

- The spectral characteristics of dogs barking has been assessed as per Table 4.1 of the INP. In this regard, we note that dogs barking does not have:
    - Low frequency characteristics or
    - Tonal characteristics
- Dogs barking have impulsive characteristics and has been adjusted as per the difference between the A-weighted maximum impulse and fast response level. This difference is 3dB.
- A 5dB(A) correction for intermittency has been applied to the night time assessment as per Council's request.

Overall, the noise source data presented in sections 5.2.1.1 and 5.2.1.2 have been corrected as per the following:

- Dogs barking within outdoor runs and training yards to be increased a further 3dB(A) to account for impulsiveness.
- Dogs barking within internal kennels have been increased a further 3dB(A) for impulsiveness and 5dB(A) for intermittency during the night time assessment period.

5.2.3 Summary of Noise Source Data with Correction

Noise levels used in the modelling of dogs barking on the site are summarised below.

Table 7 – Noise Source Data for Assessment

Noise Source	Noise Level, dB(A)	Correction, dB(A)	Assessment Noise Level, dB(A)
Dog barking within outdoor run or training yard	96.3, SWL	3dB(A) impulsiveness	99.3, SWL
Dogs barking with kennel	89dB(A) $L_{eq\ 15min}$ SPL 103dB(A) $L_{1\ 1min}$ SPL	3dB(A) impulsiveness 5dB(A) intermittent (night)	97dB(A) L_{eq} SPL 103dB(A) $L_{1\ 1min}$ SPL

Note: The L_1 noise level for sleep disturbance does not require adjustment.

5.2.4 Temperature Inversions

Screening for potential temperature inversion has been assessed in accordance with Table C1 of the INP and is based on the following:

- Area is non-arid with a rainfall of 500mm or more. Bureau of Meteorology data for the area indicates an annual mean rainfall of 728mm.
- Receiver distances and predicted effects are provided below. Distances are from the nearest point of the kennel structure.

Table 8 – Temperature Inversion Screening

Receiver	Address	Approximate Distance	Predicted Meteorological Effects
1	17 Calverts Road	86	2dB
2	19 Calverts Road	170	2-3dB
3	31 Calverts Road	112	2-3dB
4	39 Calverts Road	131	2-3dB
5	6 Austin Place	193	2-3dB

Table C1 states the following regarding potential impacts from meteorological effects:

'If the predicted noise levels show an increase of less than 3dB, meteorological effects are not considered to be an issue and no further consideration of these effects is required.

If a greater than 3dB increase is predicted, meteorological effects are an issue and further work is needed to determine the meteorological conditions applicable to the site in question'.

We note that the predicted meteorological effects are no greater than 3dB and as such no further work is required.

5.3 NOISE EMISSION PREDICTIONS

A SoundPlan™ computer model was developed for the proposed kennels and used to predict noise emissions from the kennels to the surrounding receivers. Predictions were made for the two following scenarios:

- All dogs located internally representing the worst-case scenario for night time noise emissions.
- All dogs permitted to be external to the building representing the worst-case day scenario.

The assumptions used in the model are:

- ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation Standard. The standard assumes that all receivers are downwind of the noise source.
- Weather conditions – 10 degrees, 70% RH.
- The model considers the noise reduction provided by the building fabric, distance losses, directivity, barrier effects, etc provided by the proposed design and existing boundary survey information to receivers.
- Ground heights have been established from on-site survey information, finished landscape heights and from the Geoscience Australia Digital Elevation Model (DEM) 5 Metre Grid of Australia derived from LiDAR model representing a National 5 metre (bare earth) DEM.
- The facility will hold a maximum of 60 dogs at any one time. All the dogs have been assumed to be in the outdoor runs and training yards during the day time assessment period. The sound power level established in Section 5.2.1 is applied to all dogs (i.e. 99.3dB(A) per dog).
- ALC have adopted the same noise level for dogs barking in outdoor training yards as those barking within outdoor runs. It is expected that dogs barking within supervised training yards will be substantially quieter (or bark less frequently) than those within unsupervised outdoor runs. Dogs within the training yards will always be in a 1 dog 1 trainer arrangement.
- The dog noise emission levels for internal and external dogs as indicated in Section 5.2.1.
- The acoustic treatment and management conditions recommended in Section 6.1 of this report are adopted.
- As per Section 2.2.1 of the INP, noise levels are predicted to the most affected point within 30m of each residence where the residence is more than 30m from the property boundary.

The building fabric for the dog kennels has modelled as per the following:

- Walls have been modelled as rendered concrete tilt-up panels.
- Glazing to be minimum 4mm float glass and closed during the night time assessment period.
- The roof has been modelled as 0.42mm sheet metal backed with 50mm Envirospray 300.

Noise breakout from the kennel using the aforementioned constructions have been calculated as per the following:

- Internal sound pressure level adjusted for corrections as per Section 5.2.2.
- Transmission loss for the constructions applied to the sound pressure level with correction for reverberant area.
- The radiated sound power level for each building element (i.e. walls, glazing and roof) input into the SoundPlan model.

Transmission loss data for the aforementioned constructions have been used to calculate reverberant noise level for the building façade.

Dogs within outdoor yards and training areas are compared against the daytime noise criteria. Dogs will not be permitted externally during the evening and night time assessment period. On this basis, noise breakout from internal areas is assessed against the night time criteria being the more stringent out of the evening and night criteria. Predicted noise levels are provided in Table 9 from dogs barking.

Table 9 –Predicted Activity Noise Levels at Nearest Noise Sensitive Receiver

Source	Receiver	Time	Predicted Noise Level dB(A) L_{eq}	Noise Level Criteria dB(A) $L_{eq\ (period)}$	Complies
Dogs barking within internal kennels	17 Calverts Road	Night	38	45	Yes
	19 Calverts Road		32	45	Yes
	31 Calverts Road		37	45	Yes
	39 Calverts Road		36	45	Yes
	6 Austin Place		21	45	Yes
Dogs barking in outdoor runs and yard	17 Calverts Road	Day	58	60	Yes
	19 Calverts Road		53	60	Yes
	31 Calverts Road		57	60	Yes
	39 Calverts Road		56	60	Yes
	6 Austin Place		41	60	Yes

*NOTE – Predicted levels have been corrected to account for impulsive characteristics for internal and external spaces. A 5dB(A) intermittent correction has been applied for the night time assessment period. Predicted noise levels are based on the recommendations detailed in Section 6 being incorporated into the design and operation of the building.

5.4 SLEEP DISTURBANCE PREDICTION

Noise breakout from dogs barking during the night period has been assessed against the potential for sleep disturbance. Noise levels are predicted to all receiver locations. The model assumes that noise breakout occurs from each kennel block.

Table 10 – Predicted Noise Levels (Sleep Disturbance)

Noise Source	Receiver	Predicted Noise Level, dB(A) L_1	Sleep Emergence Noise Level, dB(A) L_1
Noise breakout from kennels	17 Calverts Road	43	63
	19 Calverts Road	38	63
	31 Calverts Road	42	63
	39 Calverts Road	42	63
	6 Austin Place	27	63

Predicted noise levels from noise breakout of the kennels will comply with the 63dB(A) L_1 sleep emergence level. On this basis, no further assessment is required.

5.5 NOISE EMISSIONS TO BUILDINGS ON THE SITE

Council have requested that an assessment of noise from the kennels be assessed to buildings within the development.

It is our understanding that noise impacts to receivers within the site are outside of Council's scope. There are no Council or statutory requirements for assessing noise to potentially sensitive receivers within the same development. Section 1.3 of the INP states that:

'The policy's focus is on the noise emitted from industrial sites and how this may affect the amenity of nearby receivers'.

Assessing noise from dogs barking within a training facility to the caretaker or occupants of that training facility is outside the assessment scope of the INP.

Notwithstanding, if noise were to be assessed to receivers within the site, the following could be adopted:

- Noise would be assessed for the night time assessment period only. Assessment of noise to the caretaker, staff and guests during the day time assessment period would be redundant as they would be likely working with the same dogs making the noise.
- An internal noise level of 35dB(A) L_{eq} would be suitable for noise within a bedroom as per Australian Standard AS/NZS 2107:2016.
- The predicted noise level from the operation of the site to Building D housing the guests is in the order of 45dB(A).
- A 10dB(A) reduction to satisfy the internal noise objective of 35dB(A) L_{eq} could be achieved by leaving a window open to a maximum of 5% of the floor area of the room.

5.6 INCREASED ROAD TRAFFIC NOISE

The potential for increased traffic noise has been assessed using the traffic generation rates provided by Traffic Impact Services Pty Ltd who advised the following:

Table 11 – Traffic Noise Generation

Road	Existing Traffic	Predicted Generation
Austin Place	10 VPH / 100 AADT	16 VPH / 160 AADT

ALC have assessed noise emissions associated with the use using the volumes above to determine the peak traffic noise generation along Austin Place. The predicted noise levels from traffic generated by the development during the peak 1 hour periods are detailed in the Table below.

Noise associated with vehicles along Austin Place have been predicted to the receiver at 39-49 Calverts Road which will represent the closest most potentially impacted receiver for traffic noise generated by the site.

Table 12 – Traffic Noise Generation

Receiver	Predicted Noise Level, dB(A) $L_{eq\ 1hour}$	Road Noise Criteria, dB(A) $L_{eq\ 1hour}$	Complies
39-49 Calverts Road	41	55	Yes
6 Austin Place	39	55	Yes

6 RECOMMENDATIONS

The following recommendations have been formulated to ensure compliance with the project noise objectives.

6.1 RECOMMENDED MANAGEMENT CONDITIONS

1. Access to dog runs shall only be open to staff or contractors.

2. All doors from the kennel buildings to the outside must be kept closed during the evening and night time periods (unless where required for access) to minimise noise breakout to surrounding receiver locations.

3. All skylights are to be closed during the evening and night time periods.

4. Dogs are to be restricted from outdoor runs and yard areas during the following periods. Restrictions are to ensure compliance with the noise emission criteria detailed in Section 4.2 and Penrith City Council DCP requirements:

    - 6:00pm to 7:00am, Monday to Friday; and
    - 6:00pm to 8:00am, Saturday and Sunday.

6.2 RECOMMENDED ACOUSTIC TREATMENTS

The following acoustic treatments will be required to achieve the noise emission targets detailed in 4.

1. Minimum 4mm float glass for skylights and windows to the kennels will be acoustically satisfactory. Thicker glazing for structural purposes will also be satisfactory.

2. Roof sheeting above kennels is to be constructed from minimum 0.42mm sheet metal with Envirospray 300 adhered to the inside face.

3. Walls separating the kennels from the main office areas are to be constructed from slab to the underside of the roof sheeting.

4. Earth mounds are to be constructed down the East and West sides of the development. The mounds are to be 2.5m in height.

5. Primary entry / exit doors into the kennel are to be constructed from 35mm solid core construction or 4mm glazing.

6. Ensure all penetrations/ gaps in the building façade to the kennel areas are acoustically sealed.

7. Plant and equipment should be designed to ensure compliance with the criteria in combination with dogs barking as per Section 4.

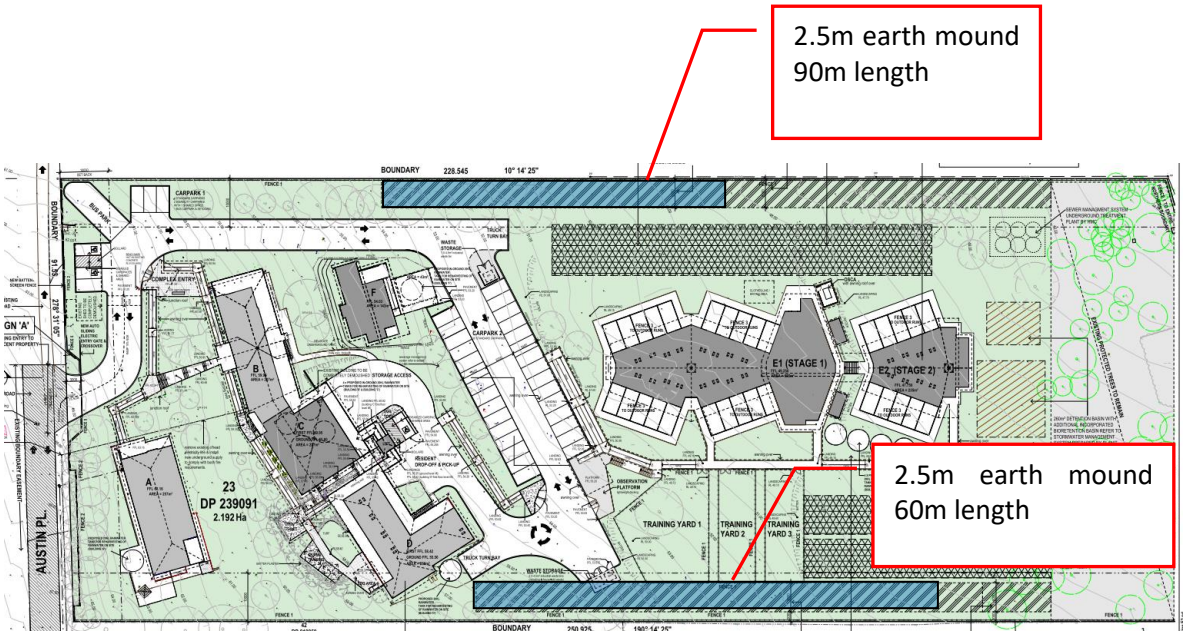


Figure 2: Recommended Earth Mounds

6.3 MECHANICAL PLANT

The proposal will include ancillary mechanical services plant *(e.g. condensing units, exhaust fans, etc).* As detailed plant selections and plans are not available at this stage, it is not possible to carry out a detailed examination of the ameliorative measures that may be required in order to achieve the project acoustic objectives.

Mechanical plant servicing the kennel facility is to be designed and installed to ensure compliance with the noise objectives detailed in Section 4 in conjunction with noise emissions from the general operation of the facility.

7 DISCUSSION

Noise predictions of dogs barking within the development have been assessed. In this regard, ALC provide the following commentary.

7.1 NOISE LEVELS ASSUMED FOR DOGS BARKING

The facility is not intended as a commercial boarding kennel. In this respect, ALC note the following:

- Noise predictions have been based on noise monitoring conducted by ALC at commercial boarding facilities.
- On the basis that dogs will be permanently located in the facility, it is expected that dogs will be more comfortable in the surrounds and familiar with staff and other dogs within the facility.
- In this regard, ALC would suggest that dogs would be unlikely to bark as frequently as in a normal commercial boarding kennel where dogs only temporarily reside.
- In this report, in predicting noise emissions using data from commercial kennels as a basis, it is likely that predicted noise levels will in fact be louder than what is likely to be generated by the proposed site. The assessment is therefore conservative. If compliant noise levels can be demonstrated using the commercial kennel as a basis for prediction, then compliant levels will also be achieved under the proposed operation.

7.2 NOISE CONTOUR PLOTS

Noise contour plots provided in the Appendix illustrate noise propagation from the two modelled noise scenarios. The plots indicate noise levels will comply with noise criteria during the day period (representing worst case with dogs outside) and night period (representing worse case with dogs inside).

7.3 NOISE EMISSIONS DURING THE DAY TIME ASSESSMENT PERIOD

With regard to dogs barking whilst in outdoor runs and training yards we provide the following commentary. Predictions indicate noise levels:

- 2-19dB(A) below the daytime amenity criterion.
- 5-22dB(A) below the daytime intrusiveness criterion.

Noise emissions associated with dogs barking during the day time assessment period will be fully compliant with the INP intrusiveness and amenity criterion (that being the most stringent criteria) during the day time assessment period.

Noise predictions presented in this report are considered conservative given that dogs within outdoor training yards will be supervised in a 1-on-1 training arrangement. It is expected that in line with the dog's training, barking during supervised periods within the yards would not be encouraged and is expected to be substantially less than that associated with dogs in the runs which are not typically supervised.

7.4 NOISE EMISSIONS DURING THE NIGHT TIME ASSESSMENT PERIOD

With regard to dogs barking whilst located within the kennels during the night time assessment period we provide the following commentary. Predictions indicate noise levels:

- 7-24dB(A) below the night time amenity criterion.
- 15-32dB(A) below the night time intrusiveness criterion.

Noise levels associated with dogs barking within the kennel during the night time assessment period will be generally inaudible at residential receiver locations and in full compliance with the INP noise emission criteria. Given that the same operation is proposed during the evening assessment period, noise emissions during the evening assessment period will also be compliant with INP noise criteria.

7.5 TRAFFIC NOISE GENERATION

Predicted traffic noise levels based on volumes provided by Traffic Impact Services indicate that noise levels will not exceed the 55dB(A) $L_{eq\ 1hour}$ noise level for a local road and as such will comply with the requirements of the EPA Road Noise Policy.

7.6 COMPLIANCE WITH REQUIREMENTS OF THE PENRITH COUNCIL DEVELOPMENT CONTROL PLAN

7.6.1 Proximity Requirements

Based on the predicted noise levels, the development can comply with the EPA Industrial Noise Policy which has been adopted to assess noise from proposal.

The proposal will be within the minimum proximity requirements of the DCP. However, potential noise impacts should be considered in context with the existing acoustic environment. For instance, consider the following scenario;

- A 20-dog proposed kennel (Kennel A) in an environment void of major infrastructure or industry with a background noise level of 40dB(A) during the day.
- Kennel A is proposed 150m from the nearest receiver as is compliant with Council proximity requirements. Using a simple distance calculation, noise levels will be in the order of 61dB(A) or 21dB(A) more than the background.
- Alternatively, a 20 dog proposed kennel (Kennel B) next to a motorway (as is this case) with a background noise level upwards of 60dB(A).
- Kennel B is proposed 100m from the nearest receiver and is not compliant with Council proximity requirements. Again, using a simple distance calculation, noise levels will be in the order of 64dB(A) or 4dB(A) more than the background.

On this basis, whilst the proximity requirements may be necessary for consideration with the planning of kennel locations, it does not ensure minimal acoustic impact in comparison with compliance with noise emission criteria at receiver locations. Whilst the development does not adhere to the minimum proximity requirements, it does comply with the noise emission criteria governing the project ensuring minimal acoustic impact.

7.6.2 Sound Proofing of Kennels

Sound proofing of kennels has been provided using the Envirospray 300 layer underneath the sheet metal roofing. Envirospray 300 has high acoustic absorption properties.

Acoustic lining to doors and walls would provide negligible additional acoustic benefit for reverberant sound in addition to the ceiling acoustic treatment (i.e. Envirospray) and in any event, would not be suitable for practical reasons of absorbing water and waste within the kennel. Noise predictions have been based off Envirospray 300 being incorporated and complies with required emission levels.

8 CONCLUSION

This report presents the acoustic assessment of noise impacts associated with the proposed assistance dogs facility to be located at 8 Austin Place, Orchard Hills.

ALC have concluded that:

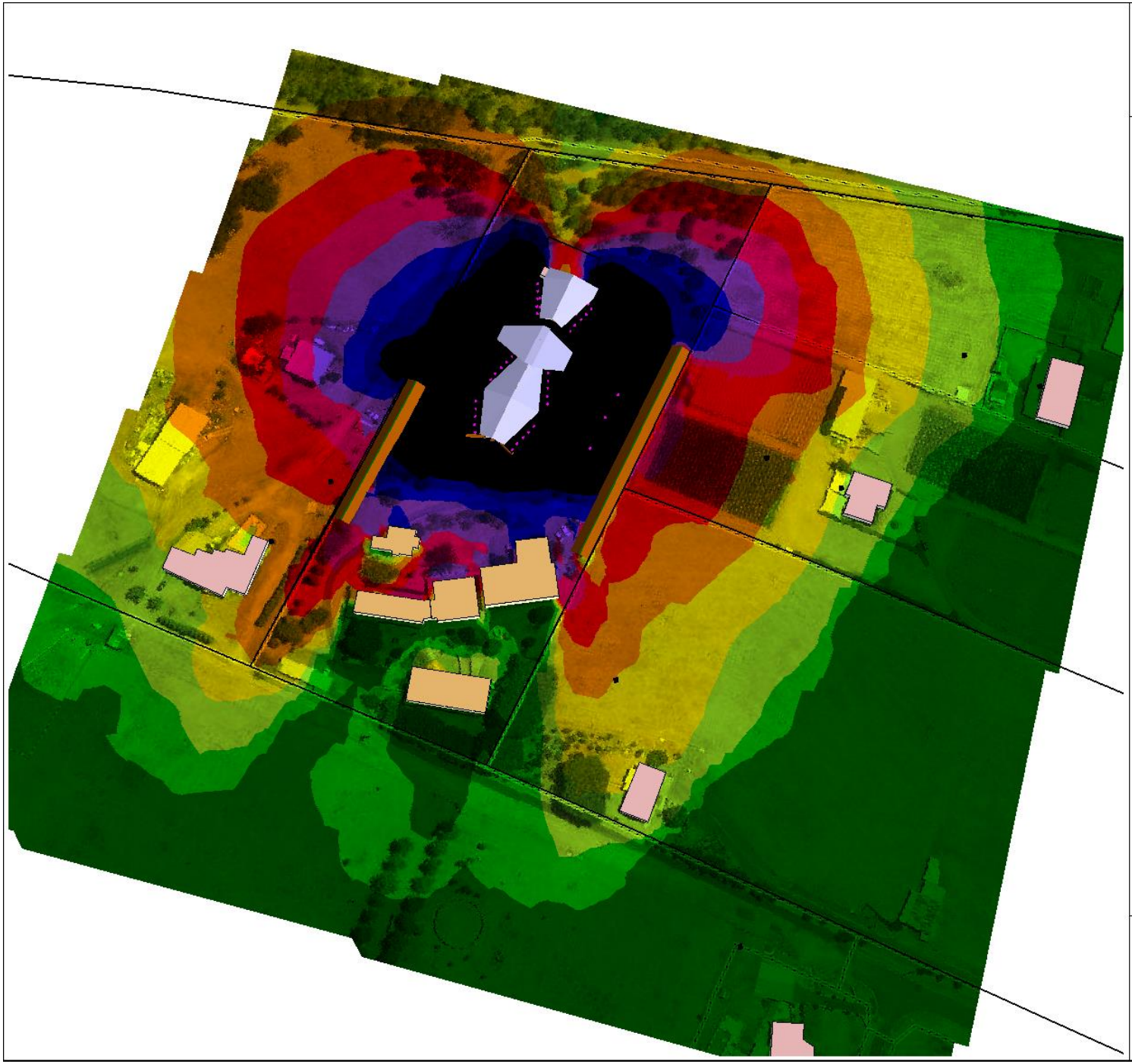
- Noise from dogs barking externally to the building during the day time assessment period and dogs barking internally during the evening and night time assessment periods will comply with the requirements of the EPA Industrial Noise Policy on the proviso that the acoustic treatments nominated in Section 6 are adopted.
- Noise associated with mechanical plant should be assessed upon selection of equipment to ensure compliance with the requirements of Penrith City Council and the EPA Industrial Noise Policy.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
James Small

APPENDIX ONE – SOUNDPLAN NOISE CONTOURS



Assistance Dogs

Day - Kennel Noise Prediction

Noise Contours @ 1.5m

Noise from dogs barking within runs and external yards

60 dogs within external runs and training yards

Prepared by: J. Small
Date: 19/09/2018

Noise Level
$L_{eq\ 15min}$
in dB(A)

< 50
50 - 52
52 - 54
54 - 56
56 - 58
58 - 60
60 - 62
62 - 64
64 - 66
66 - 68
68 - 70
>=70

Signs and symbols

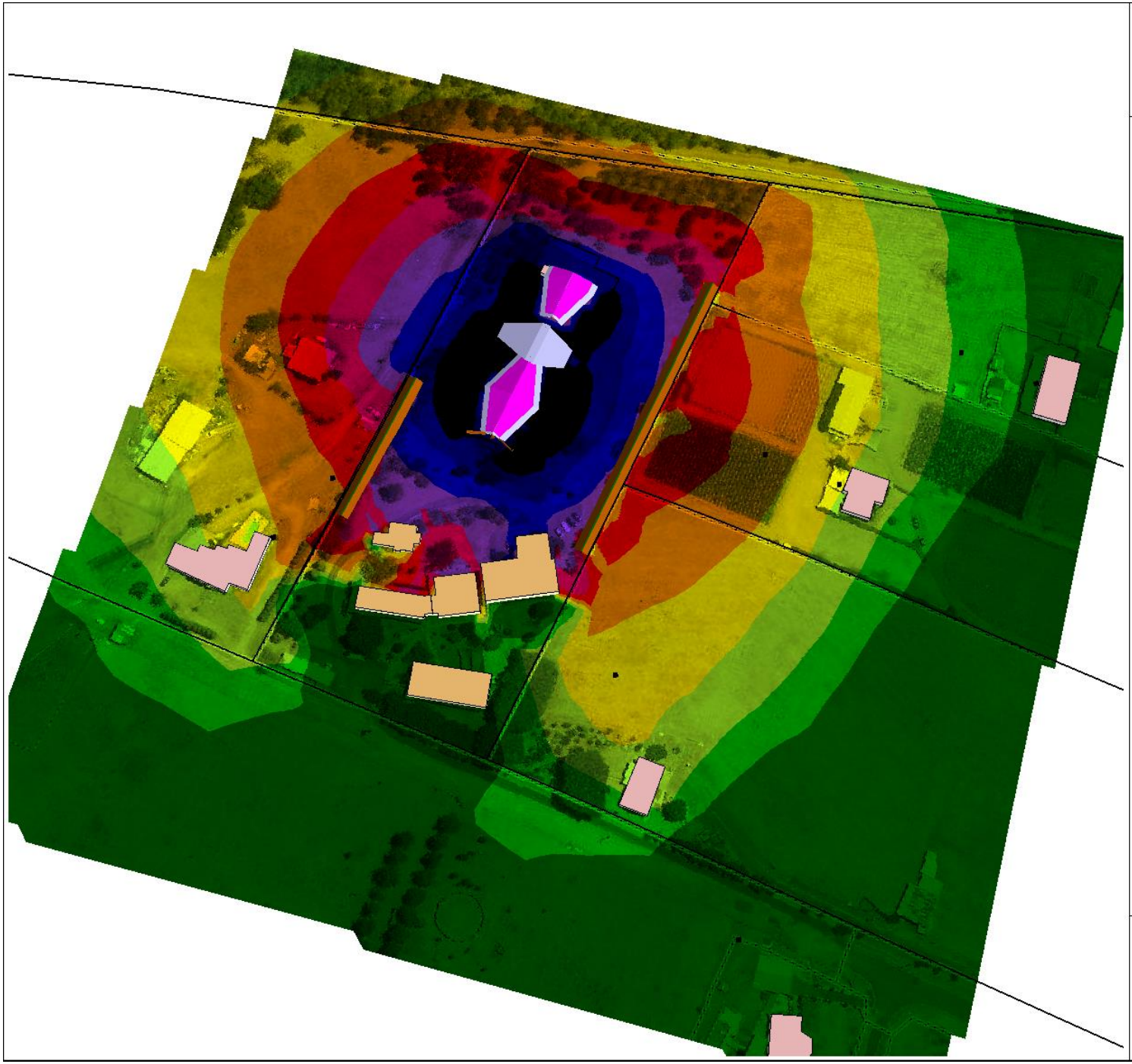
- Surface
- Existing site buildings
- Point source
- Wall
- Roof area
- Point 30m from Residence
- Residential Dwelling

Length scale 1:2000

0 10 20 40 60 m

N

ACOUSTIC LOGIC



Assistance Dogs

Night - Kennel Noise Prediction

Noise Contours @ 1.5m

Breakout noise from dogs barking within kennel building

Prepared by: J. Small
Date: 19/09/2018

Noise Level
$L_{eq\ 15min}$
in dB(A)

- < 30
- 30 - 32
- 32 - 34
- 34 - 36
- 36 - 38
- 38 - 40
- 40 - 42
- 42 - 44
- 44 - 46
- 46 - 48
- 48 - 50
- >= 50

Signs and symbols

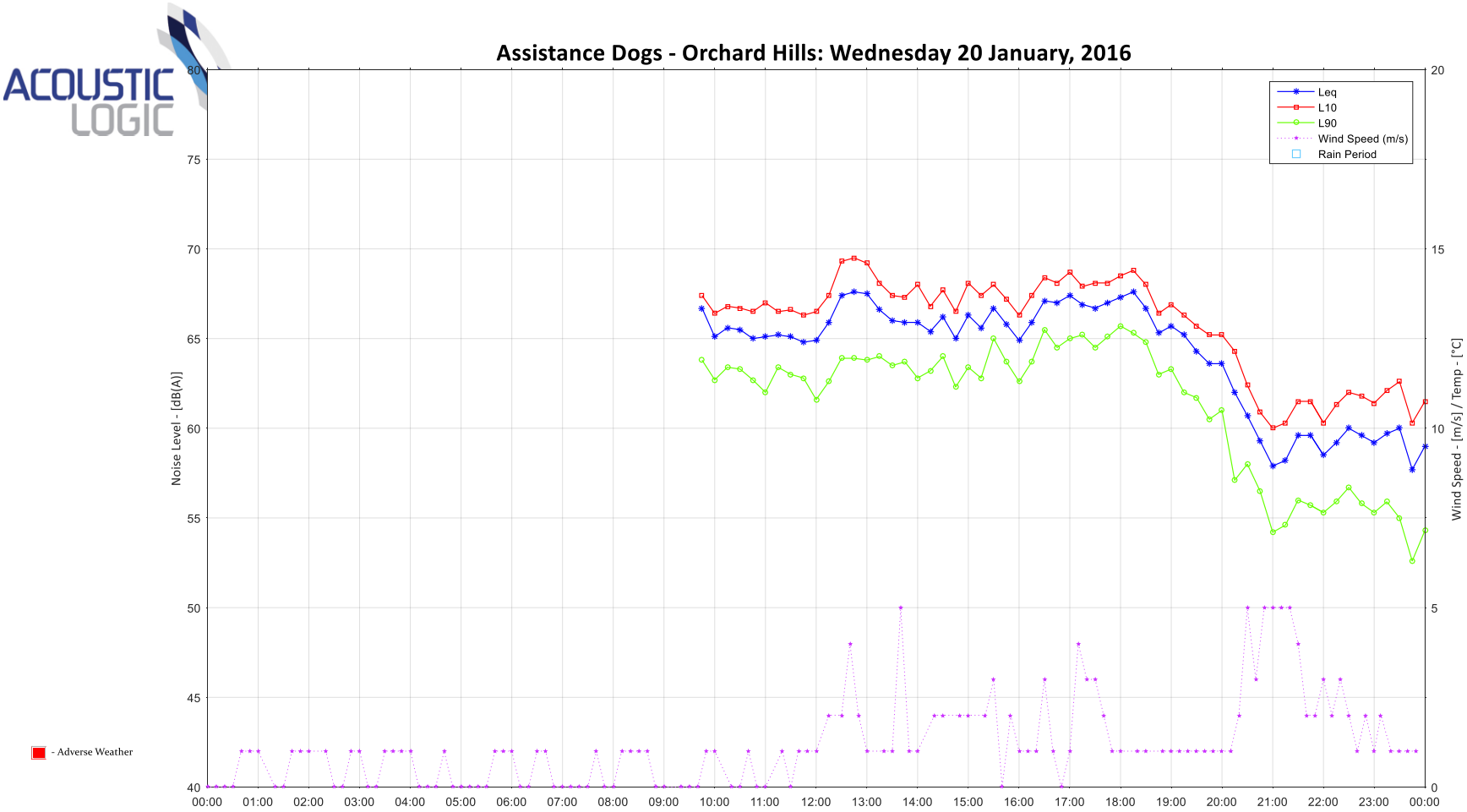
- Surface
- Existing site buildings
- Point source
- Wall
- Roof area
- Point 30m from Residence
- Residential Dwelling
- Area source
- Base line

Length scale 1:2000
0 10 20 40 60 m

N

ACOUSTIC LOGIC

APPENDIX TWO - UNATTENDED NOISE MONITORING DATA – ORCHARD HILLS


Assistance Dogs - Orchard Hills: Wednesday 20 January, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
20
15
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
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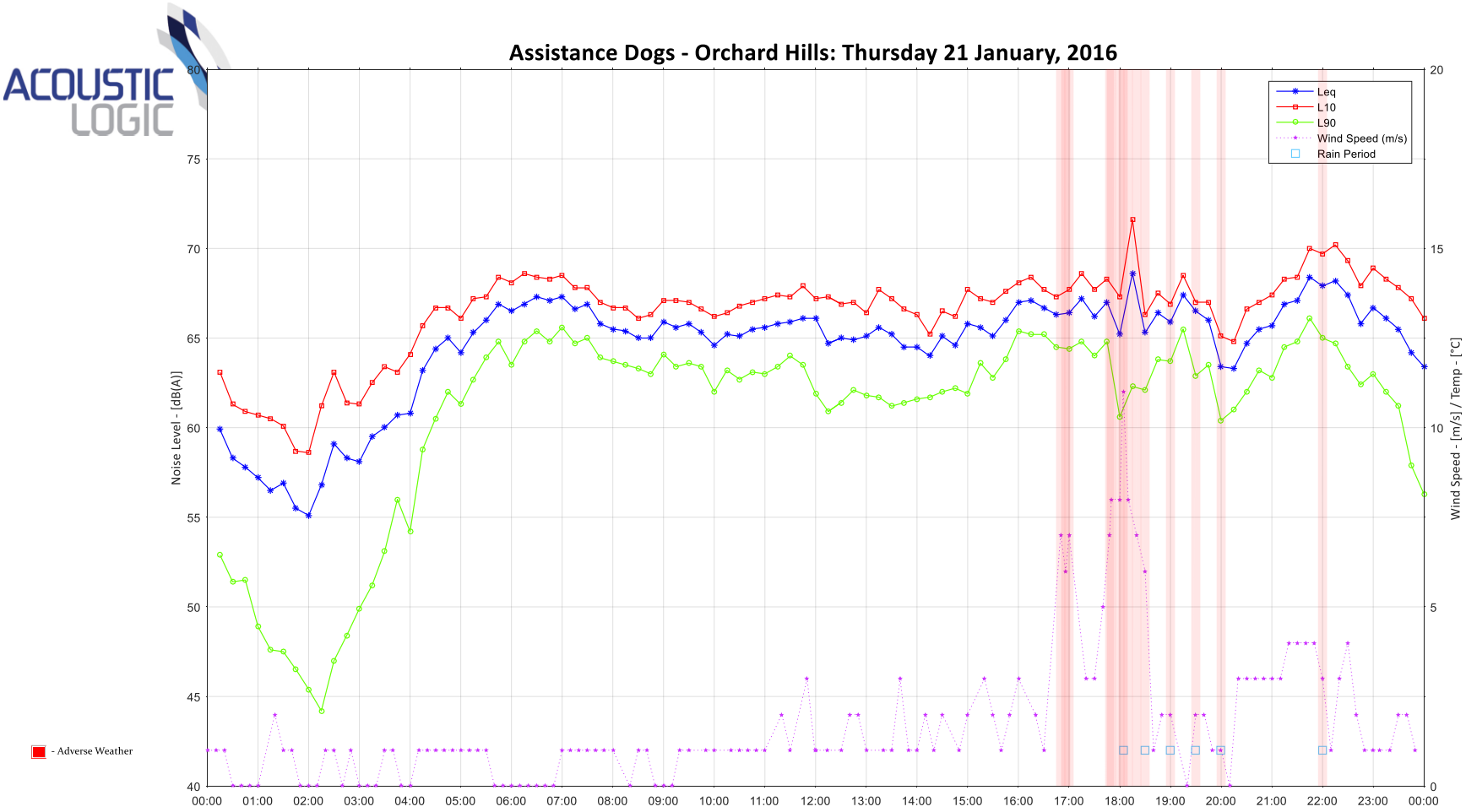
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather


Assistance Dogs - Orchard Hills: Thursday 21 January, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
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19:00
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21:00
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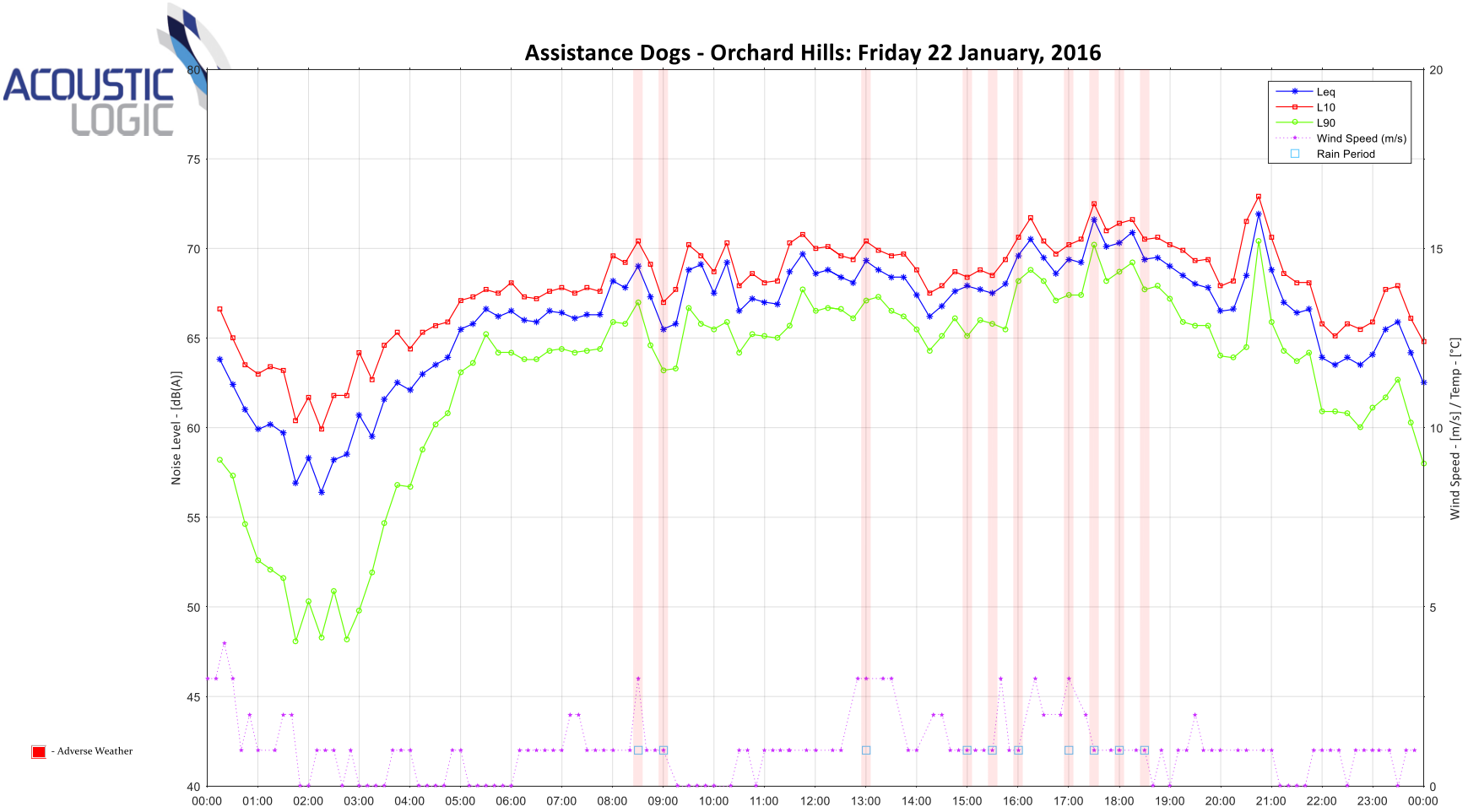
23:00
00:00


Assistance Dogs - Orchard Hills: Friday 22 January, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
20
15
10
5
0
00:00
01:00
02:00
03:00
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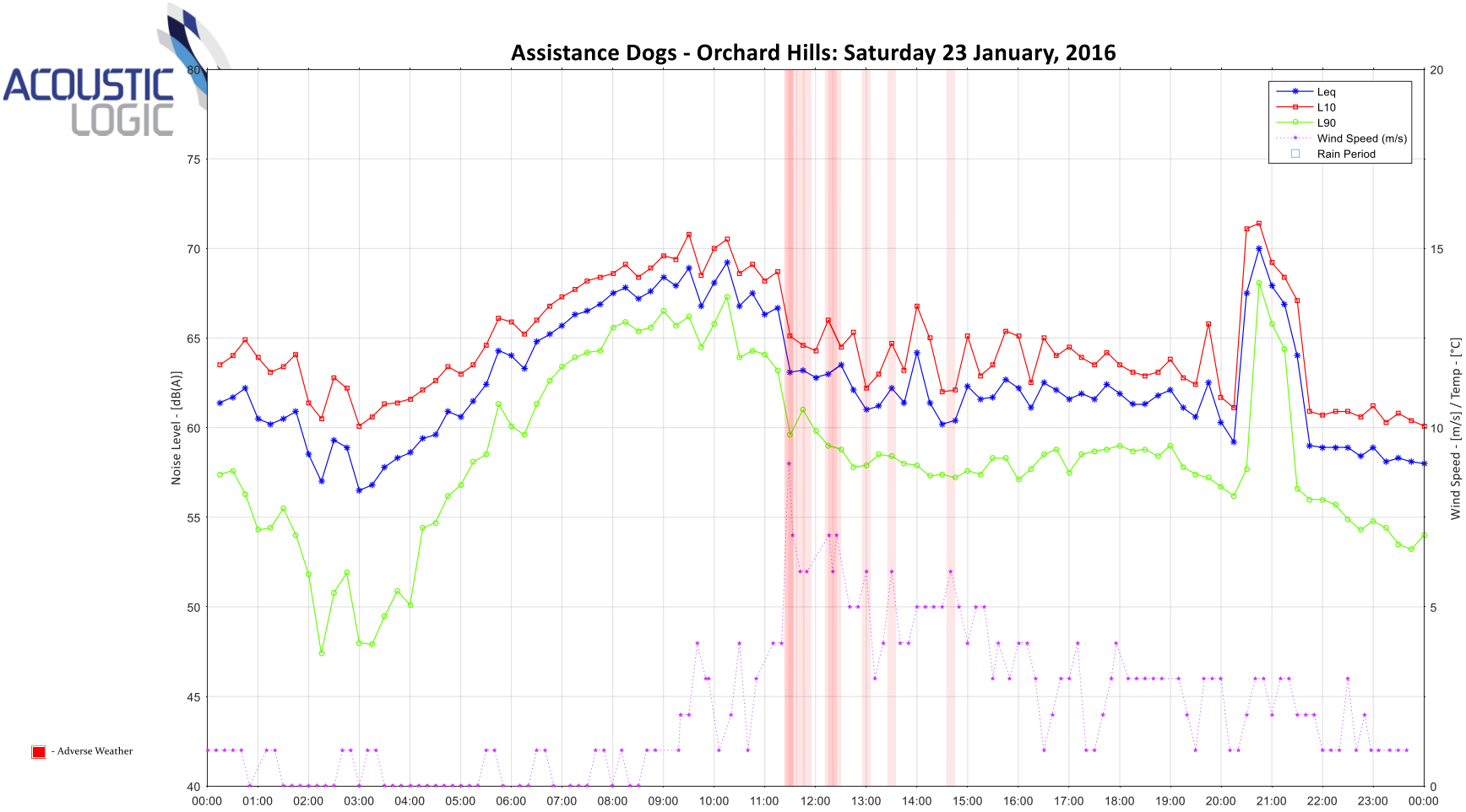
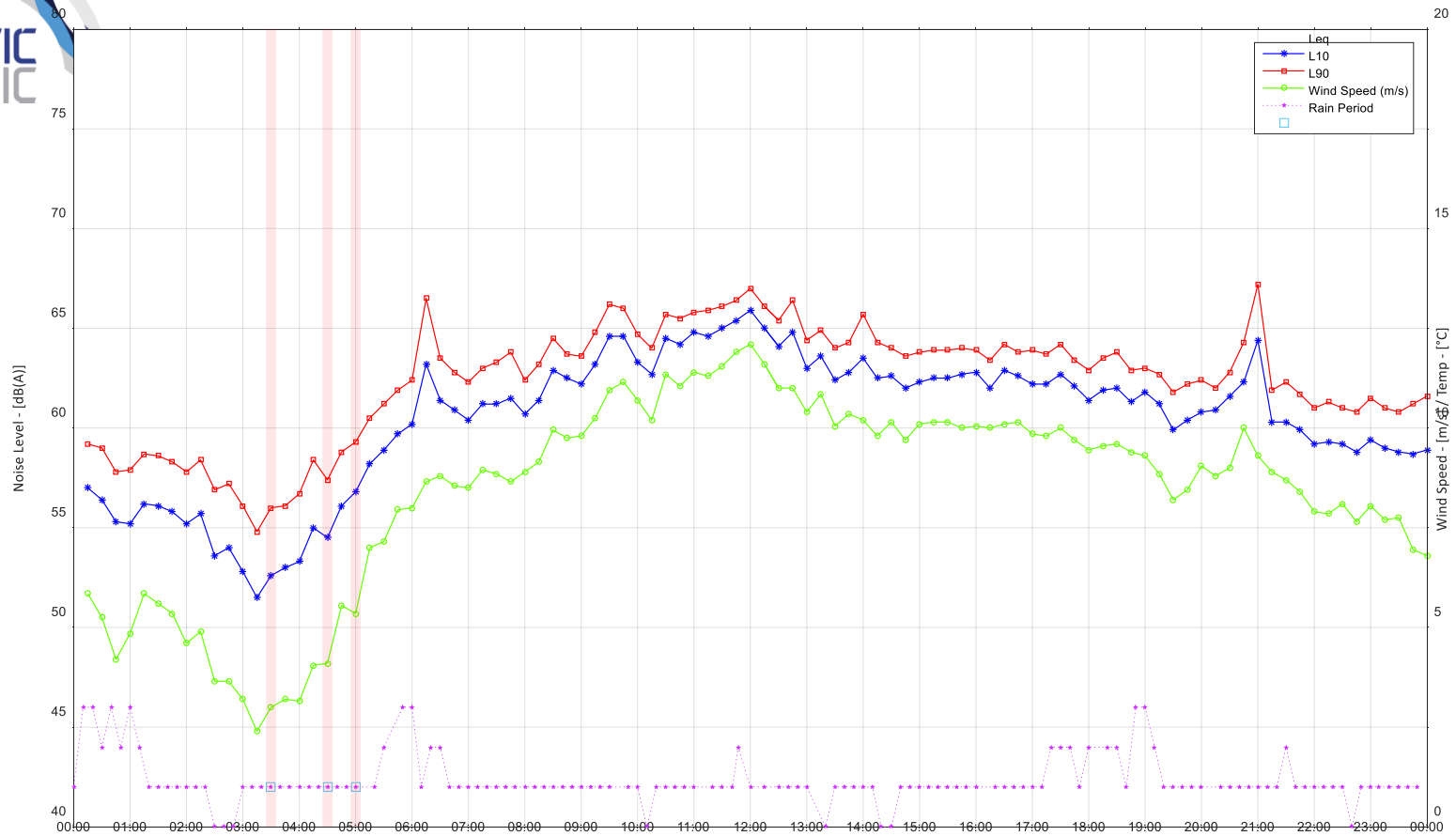
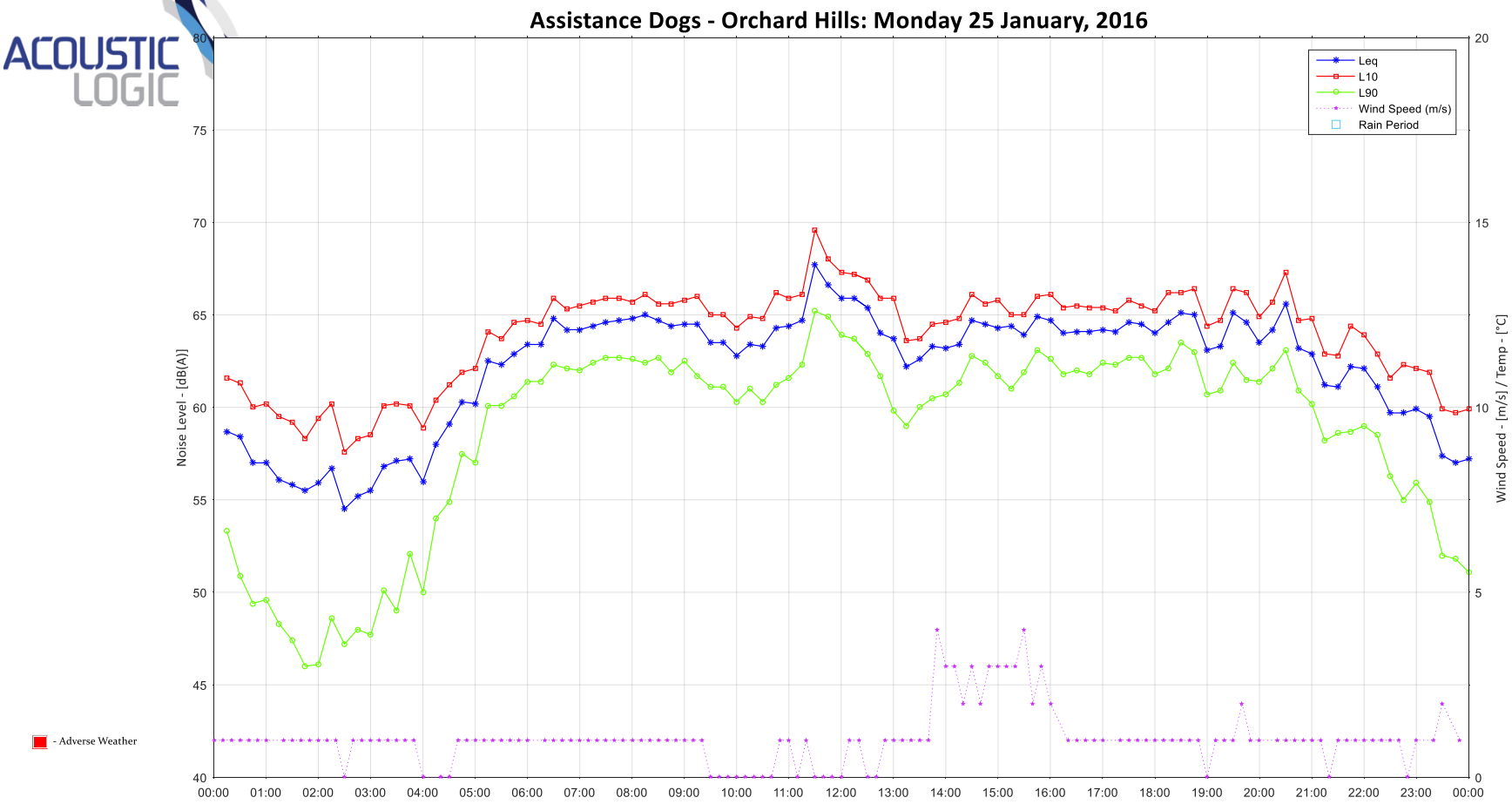
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather


Assistance Dogs - Orchard Hills: Saturday 23 January, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
- Adverse Weather

Assistance Dogs - Orchard Hills: Sunday 24 January, 2016




Assistance Dogs - Orchard Hills: Monday 25 January, 2016
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
Leq
L10
L90
Wind Speed (m/s)
Rain Period
- Adverse Weather
80
75
70
65
60
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23:00
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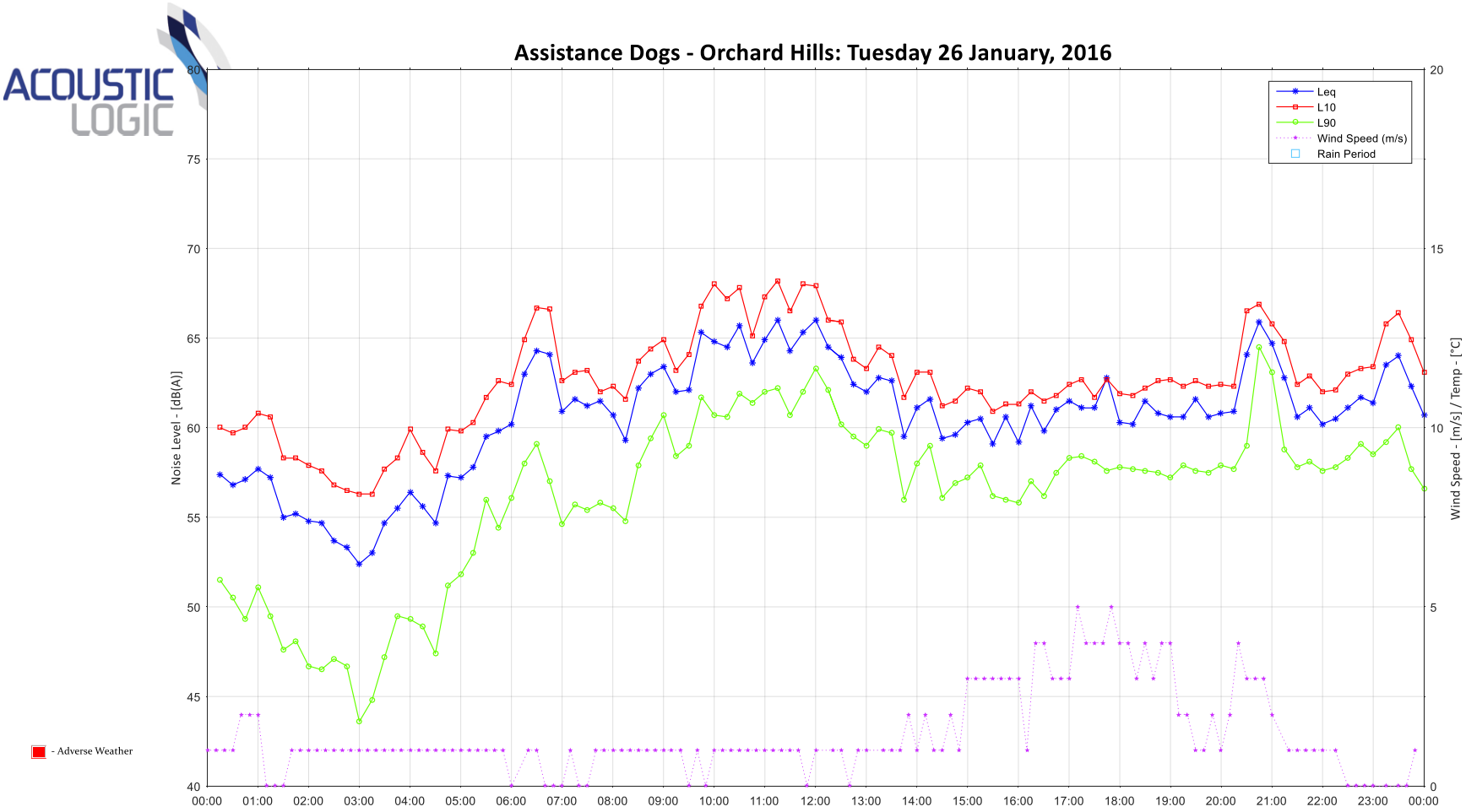
Assistance Dogs - Orchard Hills: Tuesday 26 January, 2016
Leq
L10
L90
Wind Speed (m/s)
Rain Period
Noise Level - [dB(A)]
Wind Speed - [m/s] / Temp - [°C]
80
75
70
65
60
55
50
45
40
20
15
10
5
0
00:00
01:00
02:00
03:00
04:00
05:00
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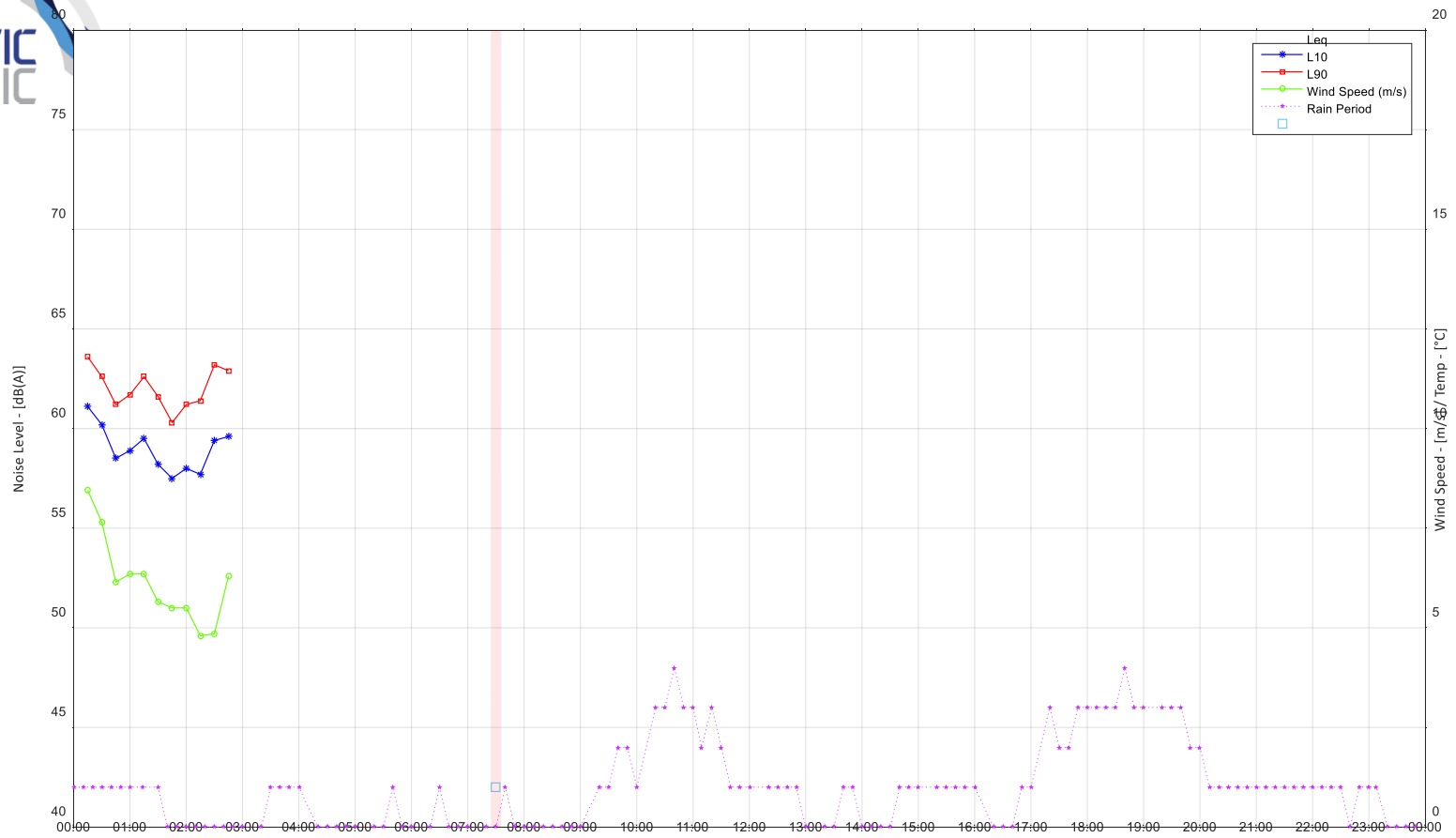
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
- Adverse Weather

Assistance Dogs - Orchard Hills: Wednesday 27 January, 2016



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Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
AS 1259.1:1990 - AS 1259.2:1990
Calibration Certificate

Calibration Number C15002

Client Details Acoustic Logic Consultancy
9 Sarah Street
Mascot NSW 2020

Equipment Tested/ Model Number : ARL Ngara
Instrument Serial Number : 8780C6
Microphone Serial Number : 318885
Pre-amplifier Serial Number : 28004

Atmospheric Conditions
Ambient Temperature : 24.9°C
Relative Humidity : 53.1%
Barometric Pressure : 99.88kPa

Calibration Technician : Adrian Walker
Secondary Check: Tim Williams
Calibration Date : 07/01/2015
Report Issue Date : 08/01/2015

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
10.2.2: Absolute sensitivity	*Pass*	10.3.4: Inherent system noise level	*Pass*
10.2.3: Frequency weighting	*Pass*	10.4.2: Time weighting characteristic F and S	*Pass*
10.3.2: Overload indications	*Pass*	10.4.3: Time weighting characteristic I	*Pass*
10.3.3: Accuracy of level range control	*Pass*	10.4.5: R.M.S performance	*Pass*
8.9: Detector-indicator linearity	*Pass*	9.3.2: Time averaging	*Pass*
8.10: Differential level linearity	*Pass*	9.3.5: Overload indication	*Pass*

Least Uncertainties of Measurement -

Acoustic Tests
31.5 Hz to 8kHz ±0.120dB
12.5kHz ±0.165dB
16kHz ±0.245dB
Electrical Tests
31.5 Hz to 20 kHz ±0.098dB

Environmental Conditions
Temperature ±0.3°C
Relative Humidity ±4.1%
Barometric Pressure ±0.1kPa

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National standards.

APPENDIX THREE - UNATTENDED NOISE MONITORING DATA – PARK, BARK AND PURR – SYDNEY AIRPORT

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

20120228.2/2502B/R0/MS

25/02/2014

Noise Monitoring Park Bark & Purr

1 INTRODUCTION

This report presents the results of noise monitoring conducted within the enclosed kennel facility at Park Bark and Purr, Kingsford Smith Airport.

2 SITE DESCRIPTION

Park Bark & Purr is located in Sydney at Ross Smith Avenue Sydney Airport. The facility incorporates 20 separate kennels with a capacity of 40 dogs within the one kennel enclosure. The kennel boarding area is approximately 12 metres long and 13 metres wide.

The kennels are located either side of a central planter and ancillary low level cupboard area. Photos 1 and 2 below show the internal kennel configuration at Park Bark & Purr.

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SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

Park Bark & Purr - Photos 1 and 2

3 NOISE LEVEL MEASUREMENTS

Measurements were conducted on site within the kennel enclosure with the noise monitor installed on top of the central cupboard bay.

3.1 MEASUREMENT TIME

Unmanned noise monitoring was conducted between 25 January 2008 and 29 January 2008.

3.2 MEASUREMENT EQUIPMENT

An Acoustic Research Laboratories 215 noise monitor with serial number 194449 was used to undertake unmanned monitoring on site. The noise monitor was calibrated at the beginning and end of the measurement period; no significant drift was detected.

3.3 MEASUREMENT LOCATION

Unmmaned monitoring was conducted in the centre of the boarding kennel.

4 MEASURED NOISE LEVELS

The results of unmanned noise level monitoring are provided in Appendix 1. The results presented are the measured LAeq noise level over a 15 minute period. Based on the monitoring conducted on site the measured LAeq noise level during operation was determined as 89 dB(A) L_{eq} based on the top 10 percent of events.

We trust this information is satisfactory. Please contact us should you have any further queries.

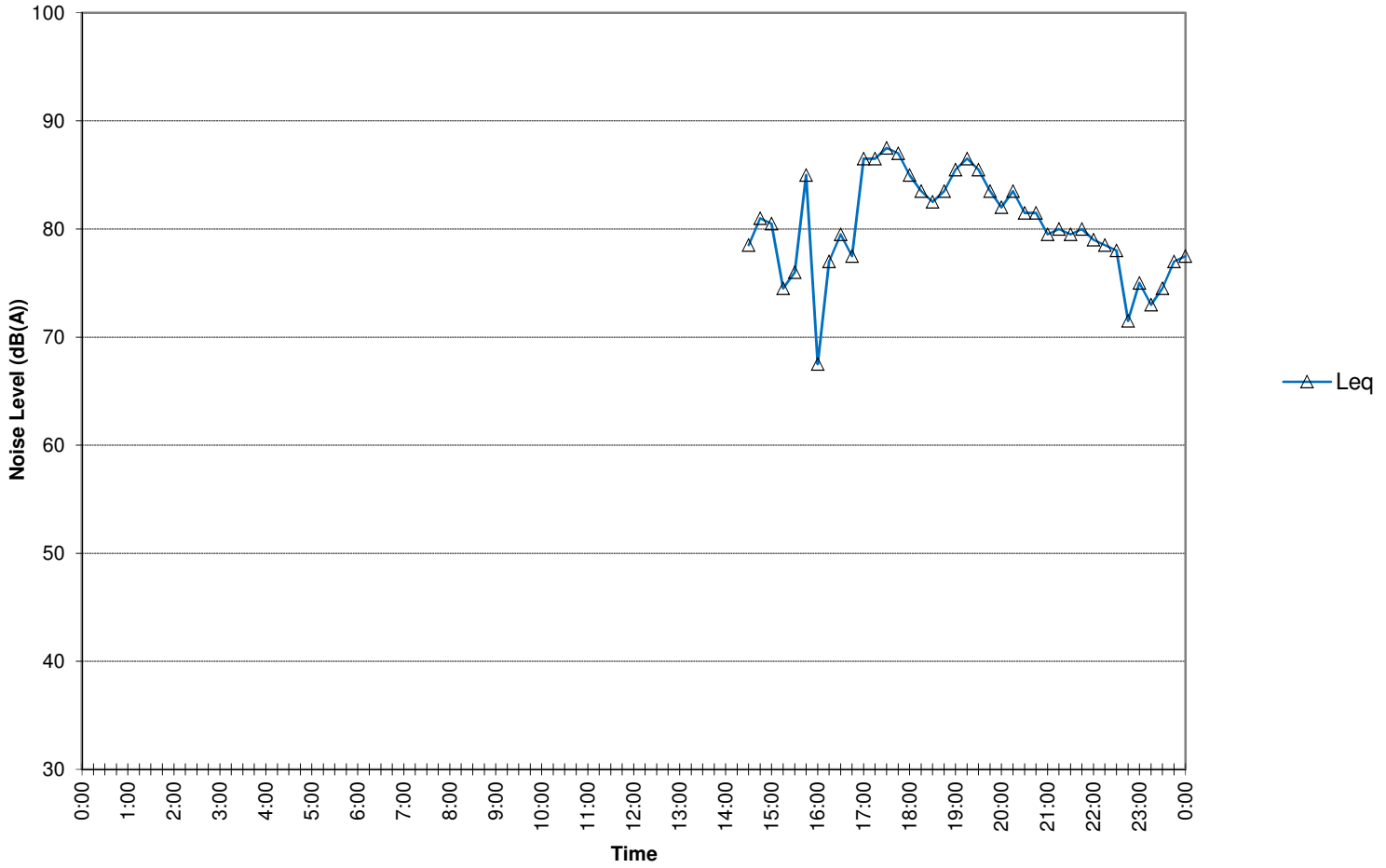
Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Matthew Shields

5 APPENDIX 1 – UNMANNED NOISE MONITORING DATA

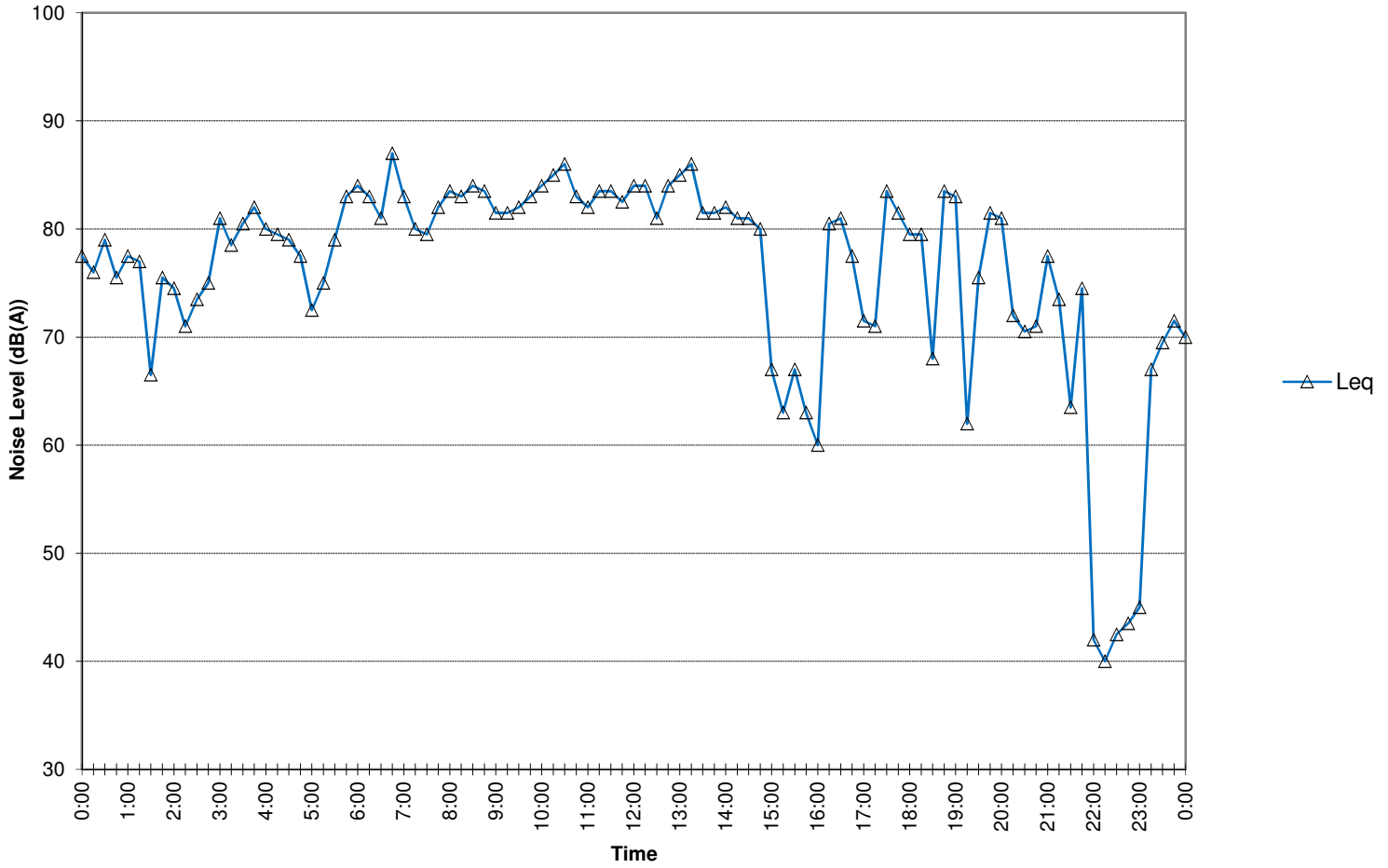
Park Bark n Purr - Unmanned Noise Monitoring

Friday January 25,2008



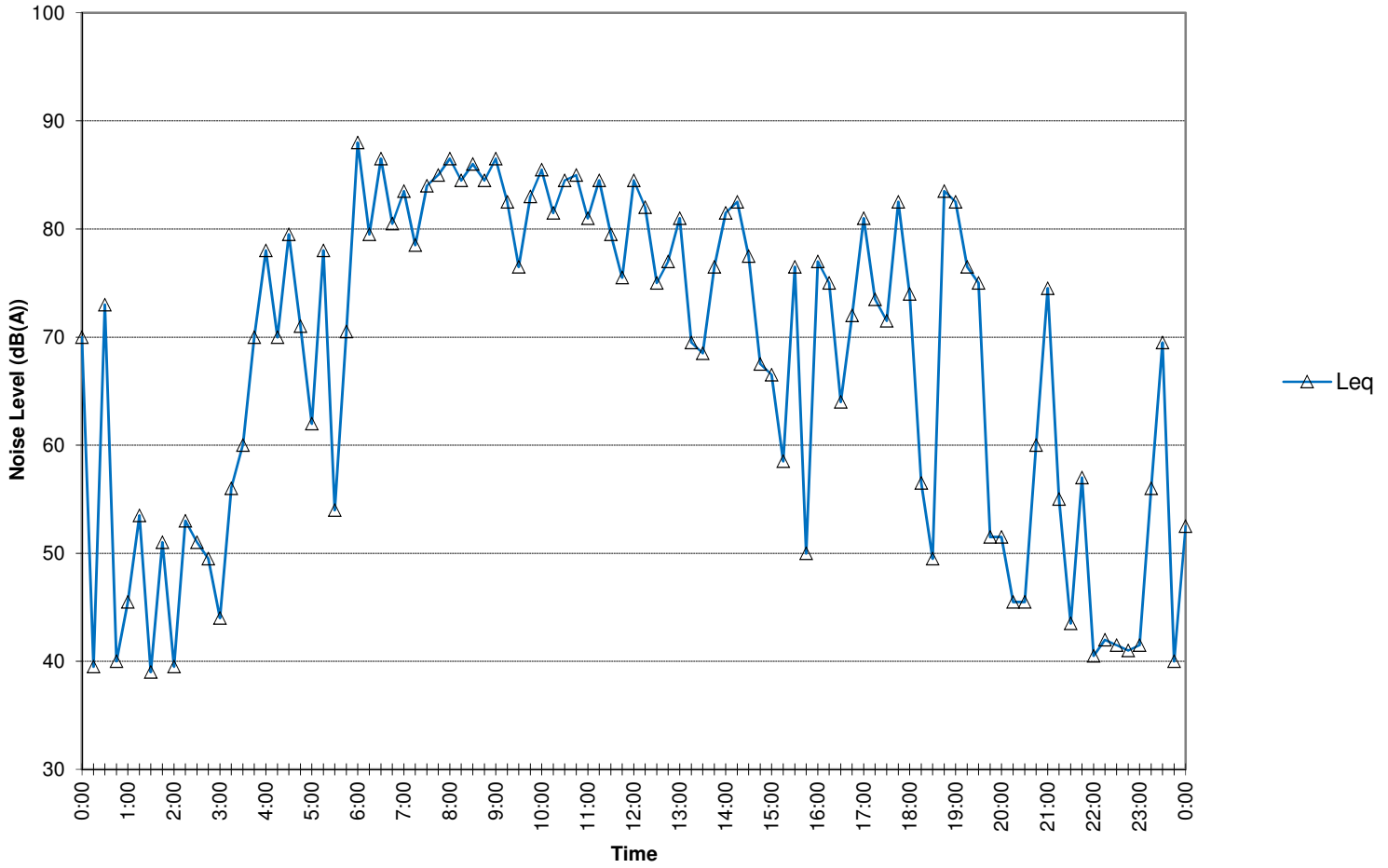
Park Bark n Purr - Unmanned Noise Monitoring

Saturday January 26,2008



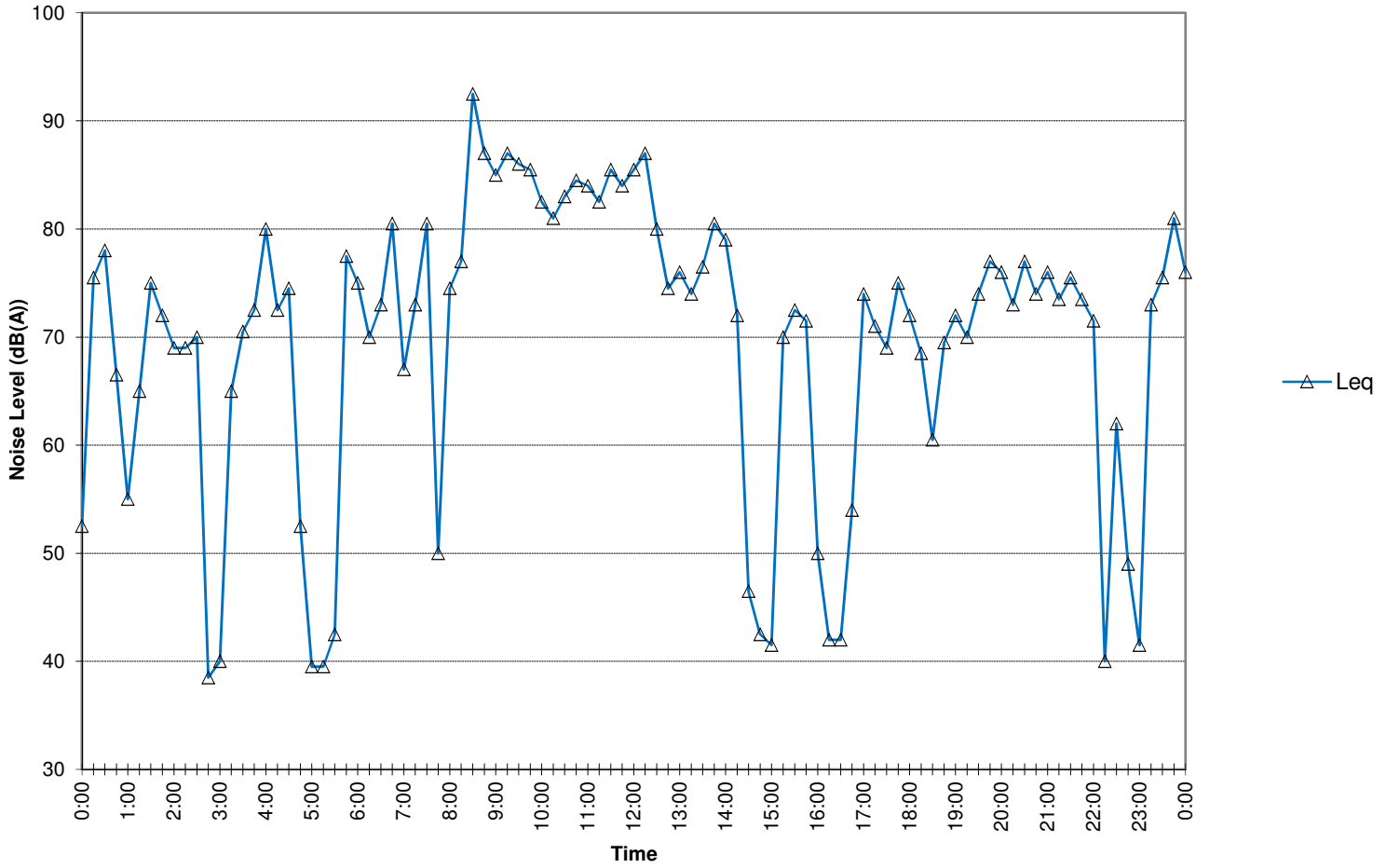
Park Bark n Purr - Unmanned Noise Monitoring

Sunday January 27,2008



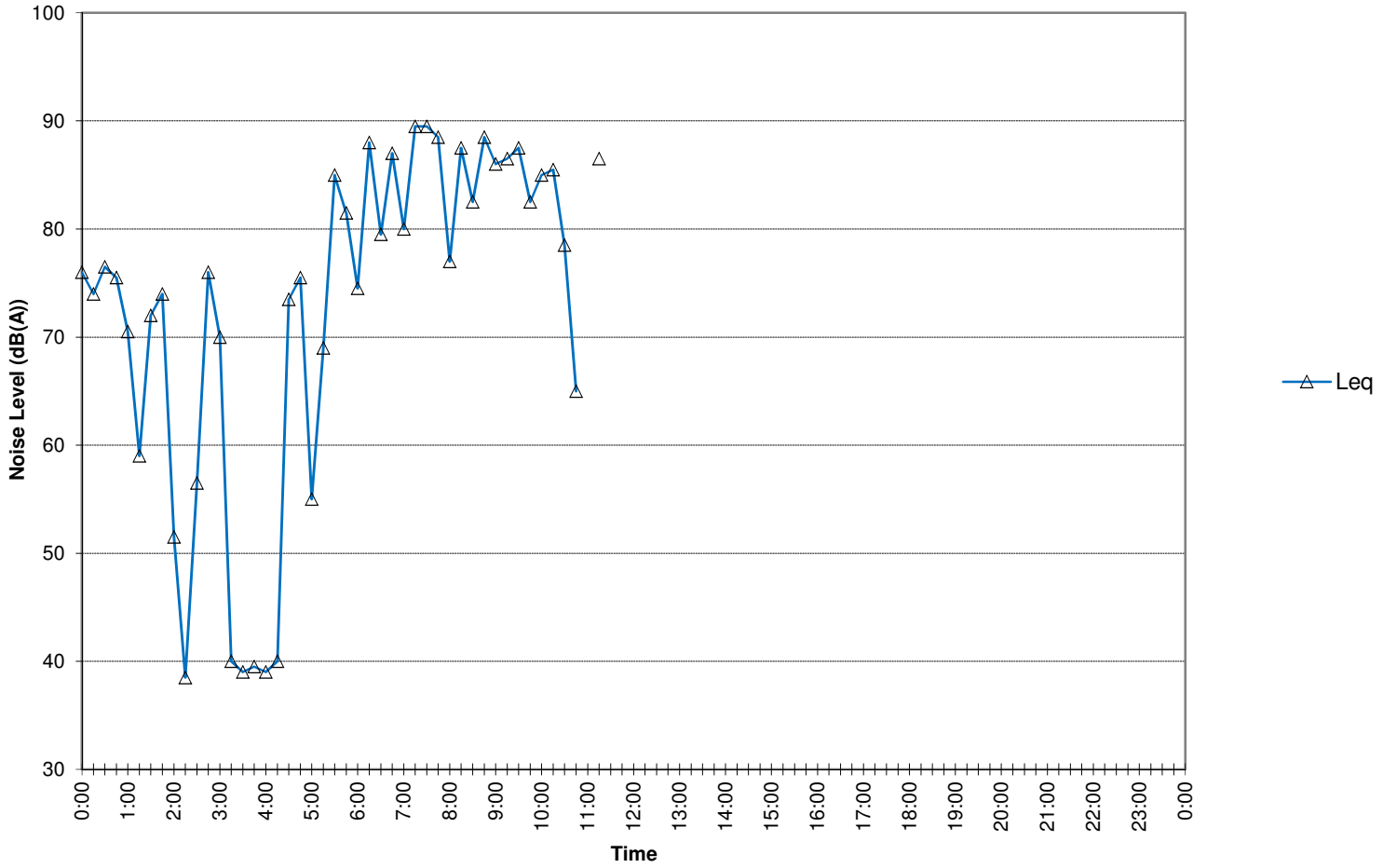
Park Bark n Purr - Unmanned Noise Monitoring

Monday January 28,2008



Park Bark n Purr - Unmanned Noise Monitoring

Tuesday January 29,2008



APPENDIX FOUR - UNATTENDED NOISE MONITORING DATA – PETS HOTEL SOUTH EAST – DANDENONG

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

DIRECTORS
MATTHEW SHIELDS
BEN WHITE

20120228.2/2502A/R1/MS

25/02/2014

Pets Hotel South East - External Run Noise Monitoring

1 INTRODUCTION

This report presents the results of noise monitoring associated with external kennel runs and associated exercise areas conducted at The Pets Hotel South East. Monitoring was conducted to determine noise levels associated with dogs using external runs and associated exercise yard facilities during peak occupancy periods.

2 SITE DESCRIPTION

The subject monitoring site selected was is The Pets Hotel South East located at Lot 4, 59-61 Ordish Road Dandenong South.

The kennel facility incorporates a two storey administration building located at the entry to the site coupled with four separate kennel buildings while a small isolation kennel is located at the rear of the site. Buildings B and C are further divided into two separate wings (East and West) creating four separate buildings. External runs are located on either side of each building with a central exercise courtyard between each. Figure 1 below indicates the building configuration and measurement location while Figure 2 shows the location of external runs.

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SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

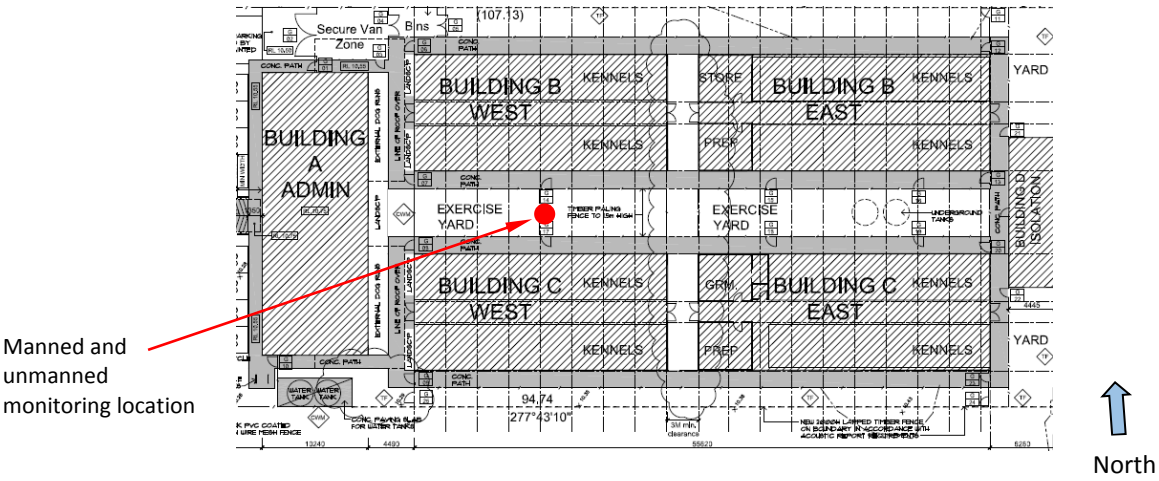


Figure 1: Site plan and monitoring location

Figure 2: Location of external runs

3 KENNEL OCCUPANCY RATES

The Pets Hotel have indicated that during the monitoring period the following kennel occupancy rates were recorded

Table 1 – Boarding occupancy rates

Date	Total Number of dogs boarding	Number of dogs boarded - Zone A
24 December 2013	269	47
25 December 2013	269	48
26 December 2013	269	47

In addition to the above the following occupancy rates were recorded in the kennel Zone A as in Figure 3 below.

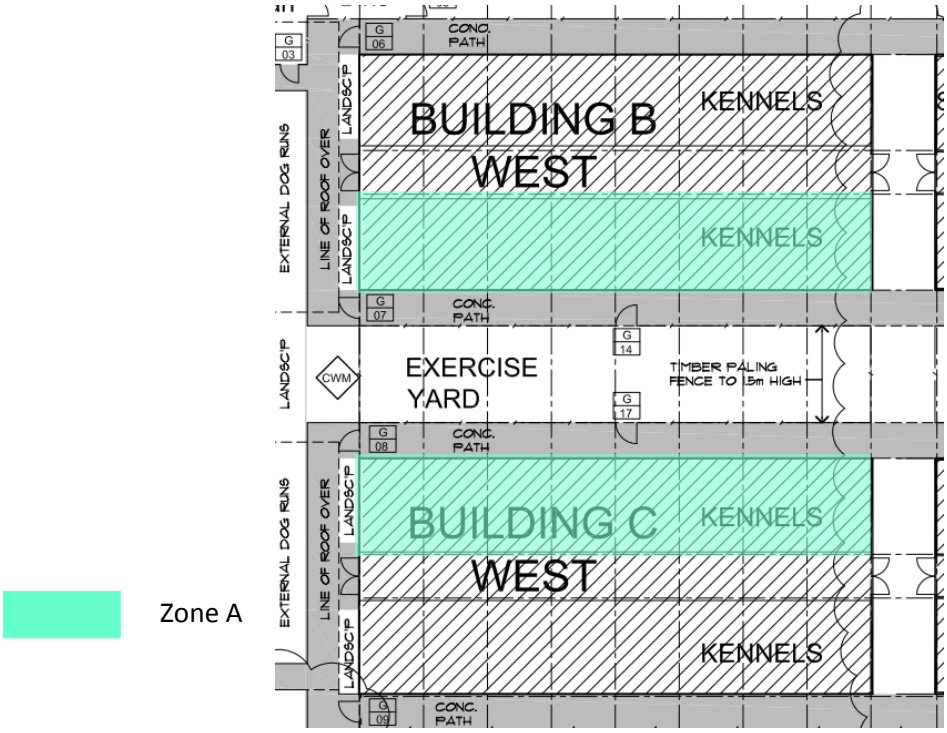


Figure 3: Occupancy rates opposite noise monitoring location

4 NOISE LEVEL MEASUREMENTS

Measurements were conducted on site between buildings B West and C West located centrally between each building within the exercise area.

4.1 MEASUREMENT TIME

Unmanned noise monitoring was conducted between 19 December 2013 and 26 December 2014 while manned measurements were conducted on 24 December 2013 between 730am and 9am. The time of measurements was selected to be associated with peak kennel operation.

4.2 MEASUREMENT EQUIPMENT

An Acoustic Research Laboratories Ngara noise monitor with serial number 878056 was used to undertaken unmanned monitoring on site while manned measurements were conducted using a Norsonic Nor140 with serial number 1403717. The Ngara noise monitor was calibrated at the beginning and end of the measurement period using a Rion NC-74 sound level calibrator while the Norsonic sound level analyser was calibrated with Bruel & Kjaer Type 4231 calibrator; no significant drift was detected.

4.3 MEASUREMENT LOCATION

Manned and unmmaned monitoring was conducted in the location shown in Figure 1 approximately equidistant between Kennel. Manned and unmanned measurements were conducted between building B and C.

5 MEASURED NOISE LEVELS

5.1 ATTENDED NOISE LEVEL MEASUREMENTS

Table 1 below presents the results of manned noise levels recorded on site on 24 December 2013. Measurements were conducted over a 15 minute period. The manned monitoring results are also compared with monitoring conducted using the Ngara noise monitor. In addition Table 2 presents the measured 1/3 Octave band L_{eq} noise levels from 25 Hz to 16 kHz.

Table 2 – Attended Noise Level Measurements 24 December 2013

Time of measurement	Monitoring Equipment	Measured Noise Level dB(A) L_{eq}
7:38am – 7:53am	Norsonic Nor140	87.8
	Ngara noise monitor	88.0
8:27am – 8:42am	Norsonic Nor140	88.3
	Ngara noise monitor	87.9

5.2 UNATTENDED NOISE LEVEL MEASUREMENTS

The results of unmanned noise level monitoring are provided in Appendix 2. The results presented are the measured LAeq noise level over any 30 minute period. Based on the monitoring conducted on site the LAeq noise level was determined (based on the top 10 percent of events) between 8am and 4pm daily and is presented in Table 2 below.

Table 3 – Unmanned Noise Monitor Measured Noise Level

Time	$L_{eq,\ 30\ min}$ dB(A)
8am – 4pm	88

5.3 MEASURED SPECTRA LEVELS

Appendix 1 provides measured noise level spectra for four 30 minute monitoring periods based on the Ngara noise monitoring data recorded at the unmanned monitoring location.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

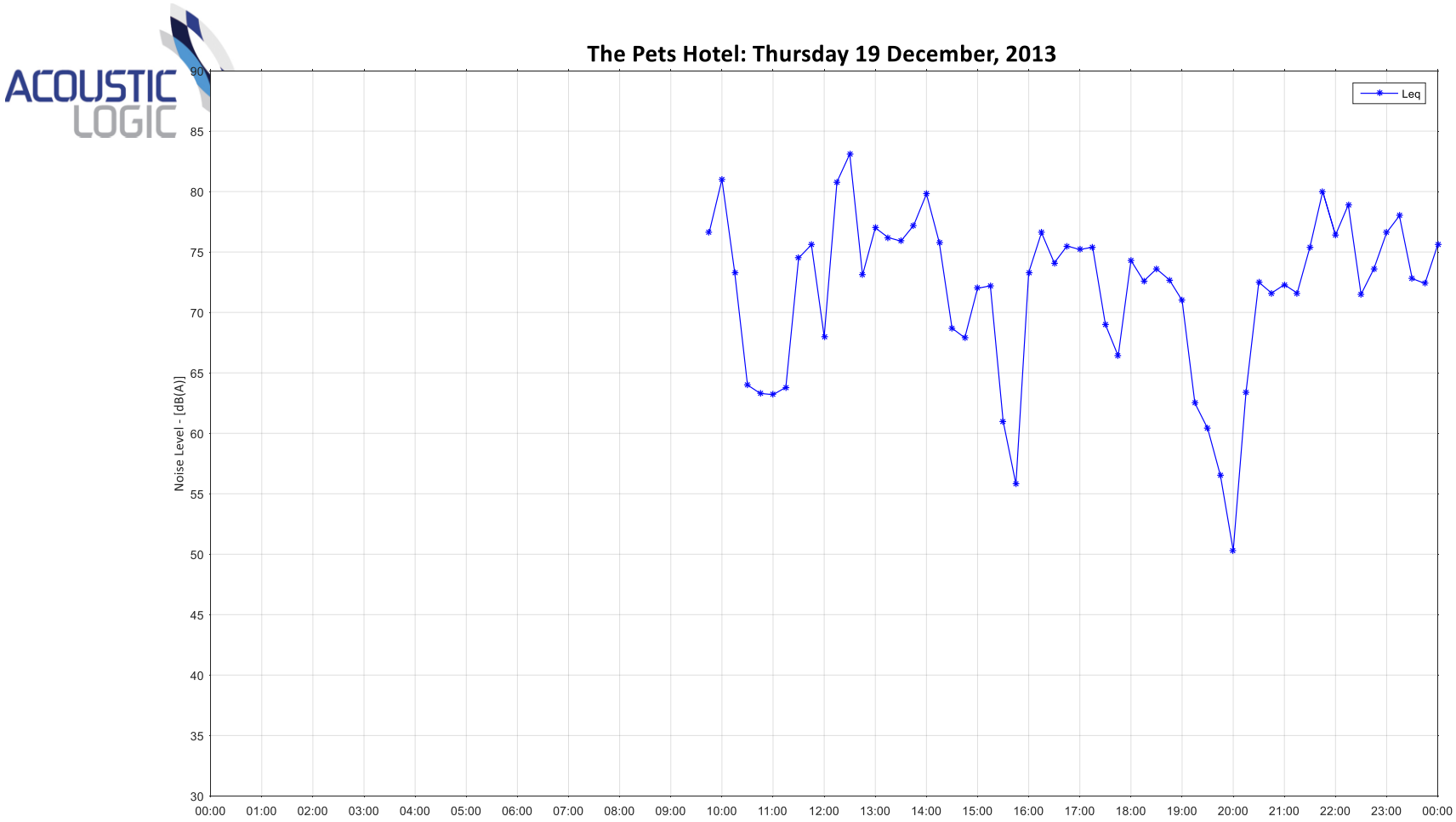
Acoustic Logic Consultancy Pty Ltd
Matthew Shields

6 APPENDIX 1 – MEASURED SPECTRUM NOISE LEVELS

Table: Measured 1/3 Octave Noise Level

Date	Time	Noise Level Leq dB																										
		25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz
24/12/2013	11.00am	55.7	60.3	57.6	56.8	58.0	55.9	53.1	51.4	51.4	51.6	54.0	62.6	72.1	79.1	78.2	79.5	76.7	74.5	72.4	67.7	62.5	56.6	52.1	49.9	48.2	46.1	42.6	37.5	30.4
	11.30am	55.1	57.7	58.1	57.3	58.3	56.6	53.7	53.1	53.1	54.0	55.8	62.2	72.2	79.5	80.3	79.4	78.9	74.8	72.7	67.8	60.3	55.5	52.9	52.0	50.6	47.7	44.2	38.8	31.4
26/12/2013	11.00am	55.7	57.7	58.4	59.2	58.3	56.7	54.5	54.1	53.6	54.4	57.0	63.6	73.8	82.1	84.7	83.4	83.5	82.6	79.0	76.0	70.5	60.6	57.6	56.3	55.0	52.5	48.8	44.2	37.9
	11.30am	50.4	52.3	53.8	52.5	54.2	53.5	50.9	49.2	49.0	50.6	53.4	62.2	72.9	78.2	78.6	75.7	74.7	73.2	70.3	65.4	58.7	51.8	46.8	46.2	45.0	39.8	33.3	26.1	17.6

7 APPENDIX 2 – UNMANNED NOISE MONITORING DAT


The Pets Hotel: Thursday 19 December, 2013
Leq
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
50
45
40
35
30
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
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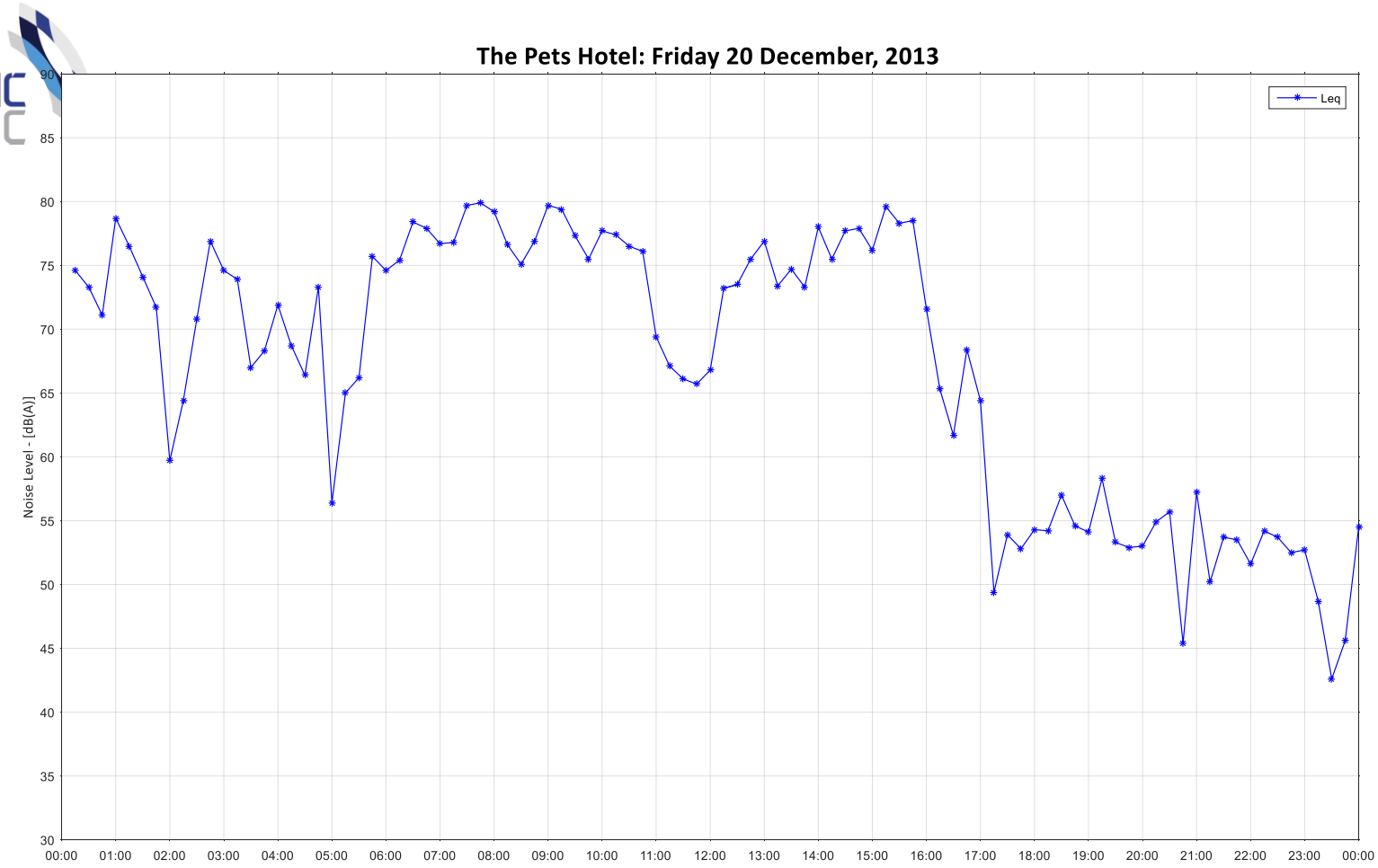
23:00
00:00


The Pets Hotel: Friday 20 December, 2013
Leq
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
50
45
40
35
30
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
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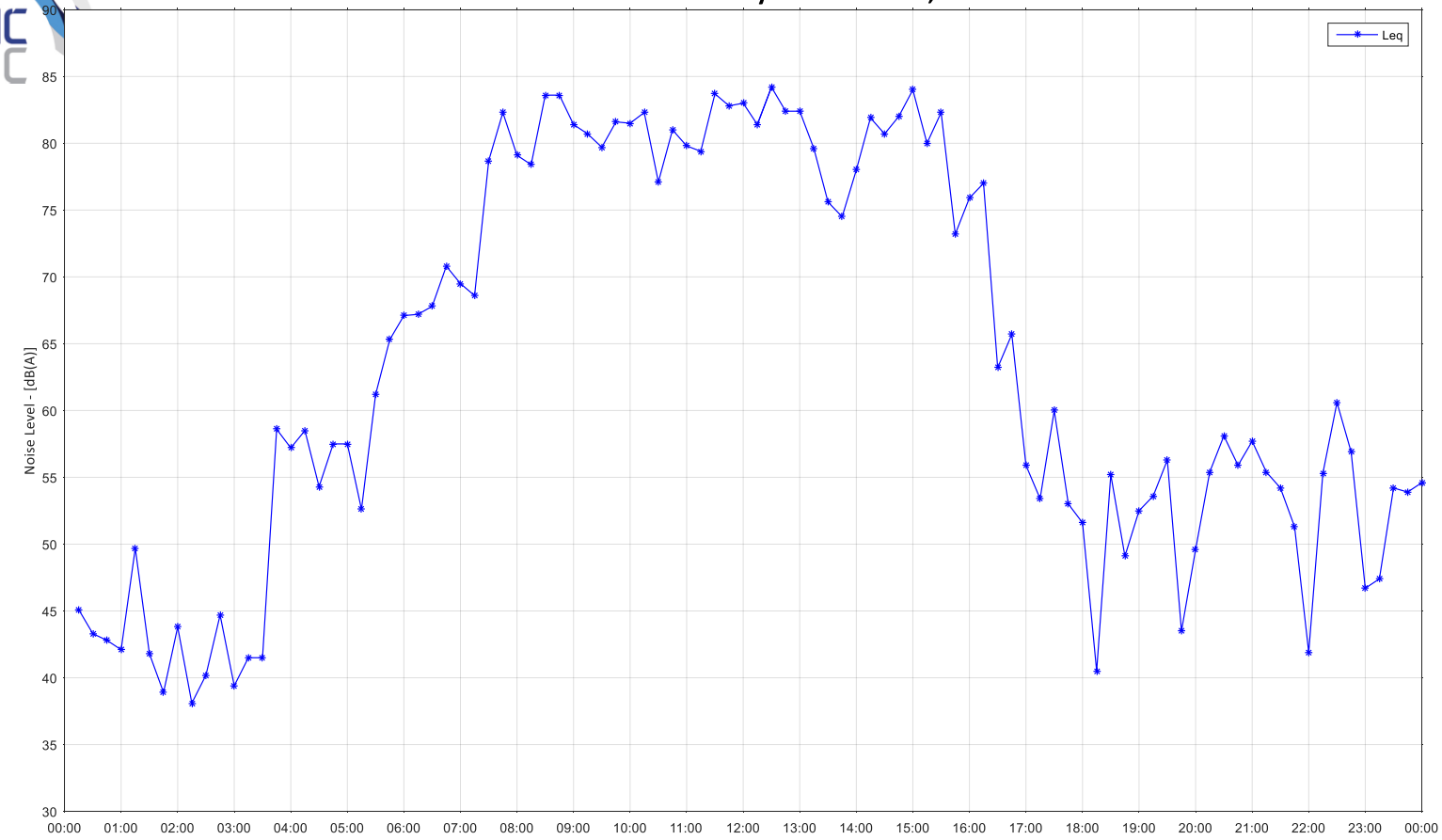
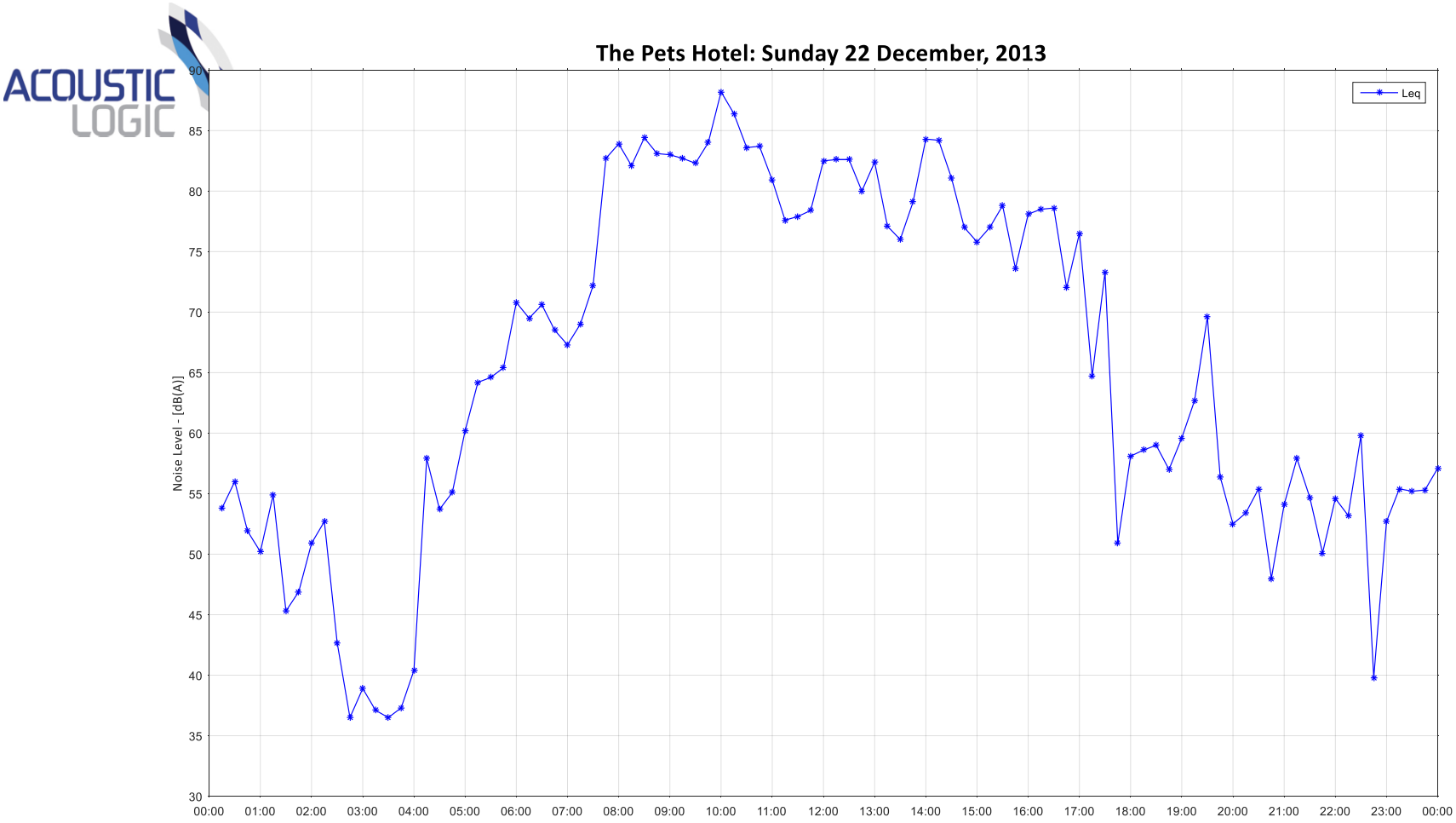
The Pets Hotel: Saturday 21 December, 2013




The Pets Hotel: Sunday 22 December, 2013
Leq
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
50
45
40
35
30
00:00
01:00
02:00
03:00
04:00
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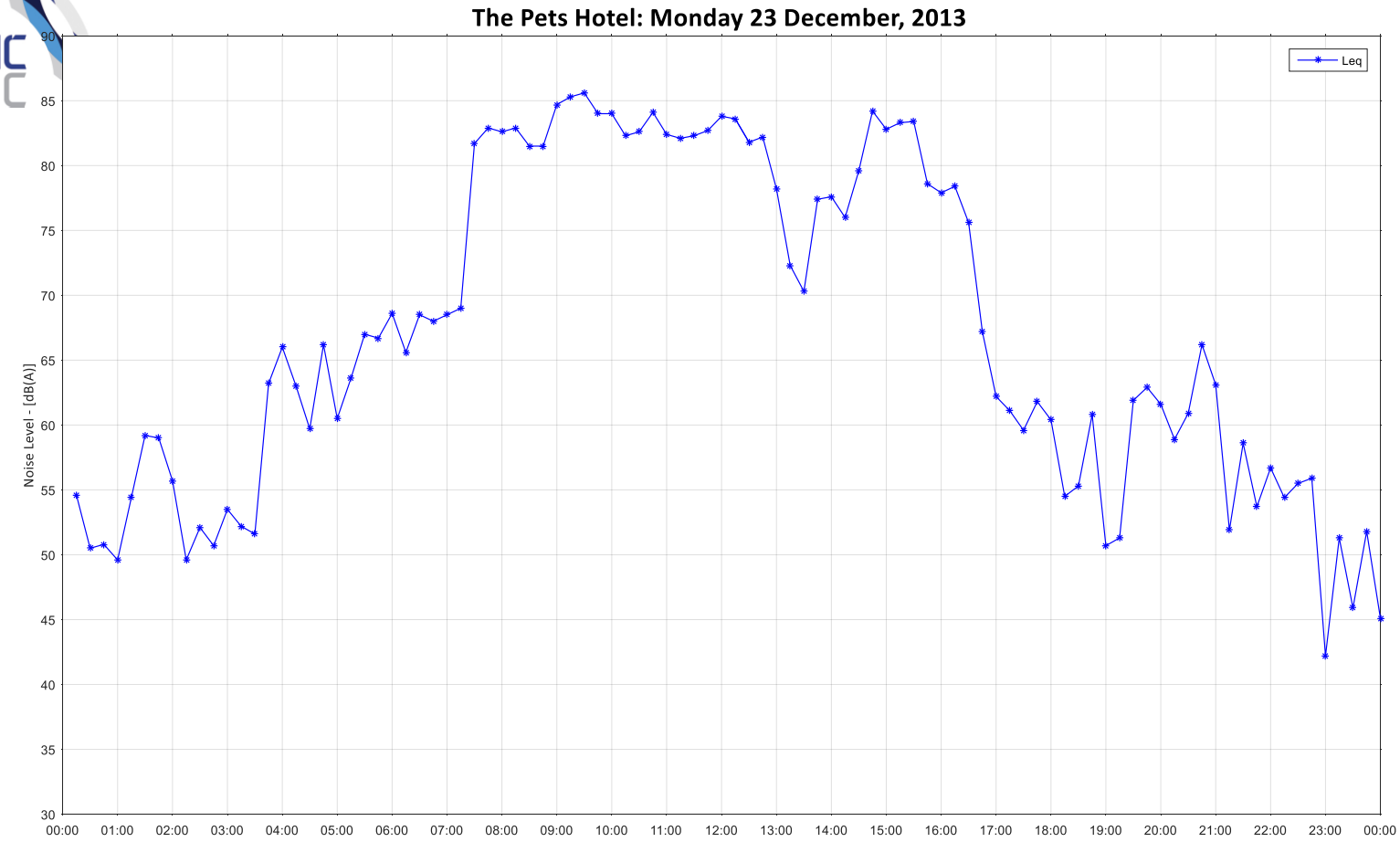
The Pets Hotel: Monday 23 December, 2013
Leq
Noise Level - [dB(A)]
90
85
80
75
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65
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55
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45
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35
30
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01:00
02:00
03:00
04:00
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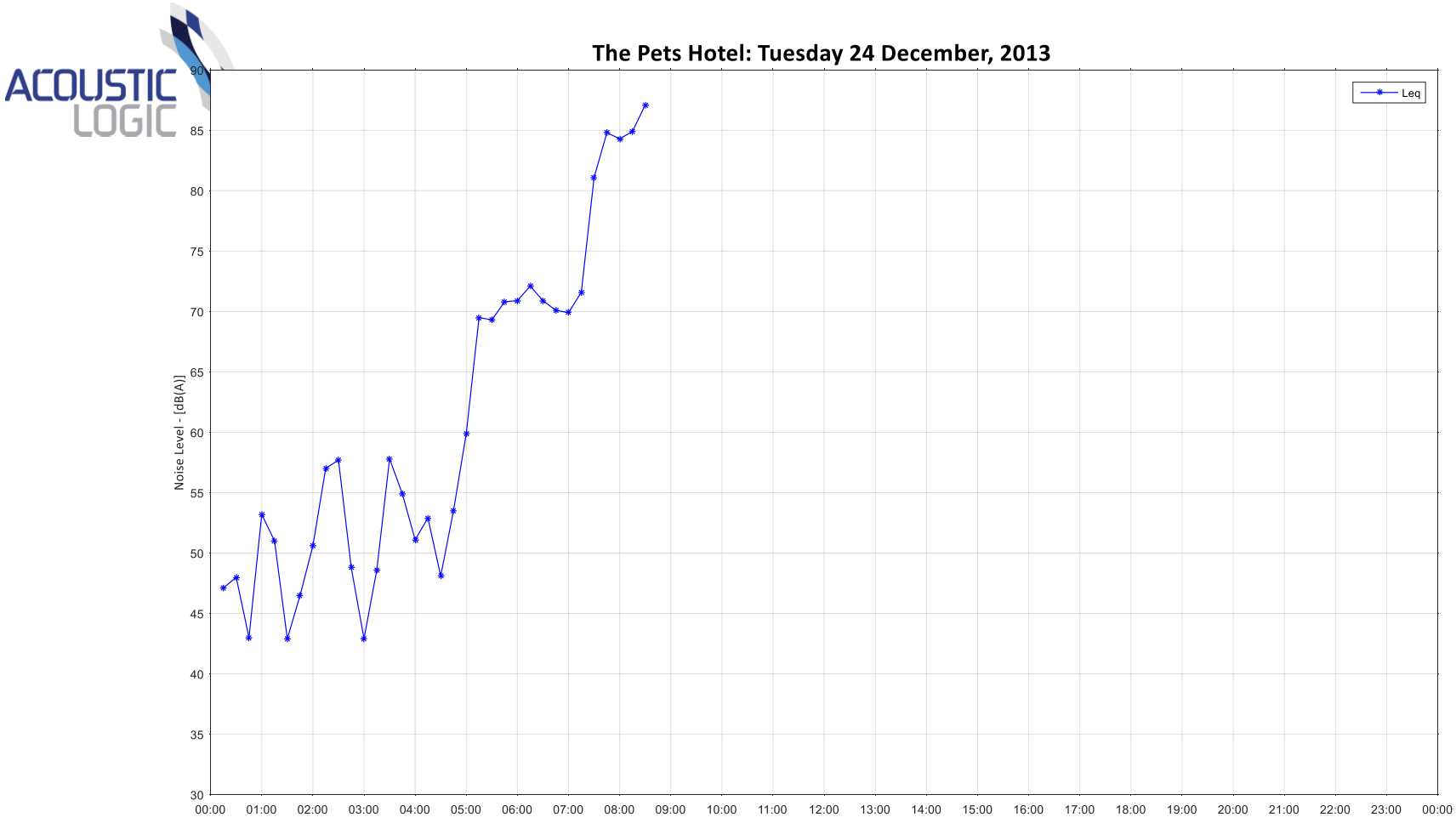
The Pets Hotel: Tuesday 24 December, 2013
Leq
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
50
45
40
35
30
00:00
01:00
02:00
03:00
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